CDC B4N051

Aerospace Medical Service Journeyman

Volume 2. Patient Care Skills II

Air Force Career Development Academy
The Air University
Air Education and Training Command

B4N051 02 1612, Edit Code 05
AFSC 4N051

Author: SMSgt Christopher Cole and MSgt Lecia D. Hankinson
383d Training Squadron
59 Training Group (AETC)
383 TRS/TRR
2931 Harney Rd.
Fort Sam Houston, Texas 78234
DSN: 420–5299
E-mail address: lecia.d.hankinson.mil@mail.mil

Instructional Systems Specialist: Regina Lucas
Gordon Morrison

Editor: Geri W. Lang
Carrie Rodgers

Air Force Career Development Academy (AFCDA)
The Air University (AETC)
Maxwell-Gunter Air Force Base, Alabama 36114–3107

THIS SECOND VOLUME of CDC B4N051, *Aerospace Medical Service Journeyman,* addresses a variety of information and procedures normally encountered with the inpatient setting. Information ranges from the preadmission setting through surgical procedures and nursing care for patients with special needs. While this volume is aimed at the inpatient and advanced care skills, much of the information can also be applied to patients in the clinical setting. This volume should build on the information you gained in Volume 1 and will give you insight to the type of patients and care you may provide in a large hospital or in a deployed hospital.

In this volume, the following material is covered:

- Unit 1 introduces you to the procedures for admitting patients, pre- and postsurgical care, planning and documenting patient care, patient assessment, and blood transfusions.
- Unit 2 begins with discussion on orthopedic disorders for background knowledge and moves into management of bone and joint problems. The unit will then take you through the care and management of patients with special limitations and needs, such as pediatrics and elderly, caring for patients with diabetes, to mental health issues.
- Unit 3 addresses nursing care of patients who are bedridden for various reasons, transfer techniques, nutrition, and elimination care and procedures.
- Unit 4 culminates with a more in-depth look at the physiology behind oxygenation, circulation, and wound management. This unit also exposes you to several procedures that assist in the diagnosis or treatment of oxygen or circulatory problems.

As you study the information in this volume, it is important to understand that this volume will give you basic knowledge of inpatient-related activities and some advanced procedures. Your on-the-job training (OJT) in conjunction with the information you learn here and through further study of recommended nursing training references will arm you with the knowledge needed to provide excellent nursing care to all of your patients.

A glossary of abbreviations and acronyms used in this course is included at the end of this volume.

Code numbers on figures are for preparing agency identification only.

The use of a name of any specific manufacturer, commercial product, commodity, or service in this publication does not imply endorsement by the Air Force.

To get a response to your questions concerning subject matter in this course, or to point out technical errors in the text, unit review exercises, or course examination, call or write the author using the contact information on the inside front cover of this volume.

NOTE: Do not use the IDEA Program to submit corrections for printing or typographical errors.

If you have questions that your supervisor, training manager, or education/training office cannot answer regarding course enrollment, course material, or administrative issues, please contact Air University Educational Support Services at http://www.aueducationsupport.com. Be sure your request includes your name, the last four digits of your social security number, address, and course/volume number.

This volume is valued at 27 hours and 9 points.

Acknowledgment

Special appreciation is extended to SSgt Jordan Vasquez for his exceptional contributions to the development and review of the training material in this volume. His dedication is greatly appreciated and was instrumental in creating the best possible product.

NOTE:

In this volume, the subject matter is divided into self-contained units. A unit menu begins each unit, identifying the lesson headings and numbers. After reading the unit menu page and unit introduction, study the section, answer the self-test questions, and compare your answers with those given at the end of the unit. Then do the unit review exercises.

Page

Please read the menu for Unit 1 and begin ➔

Unit 1. Aerospace Medical Service Journeyman

OVER THE PAST five years or so, the Air Force has significantly reduced the number of inpatient facilities and has converted them to clinics. The likelihood that every medical technician will have the opportunity to work in a bedded facility is decreasing. So, you may ask yourself why this information is important to you? First, the training is required for all medical technicians in accordance with (IAW) our Career Field Education and Training Plan (CFETP); and second, because our mission is to fly, fight, and win. That means that you could be sent anywhere in the world at a moment's notice where you will be expected to have at least a basic understanding of the care and treatment of patients. That includes care that is normally provided on an inpatient unit. Many of the skills you've learned as a clinical technician will carry over to your job on an inpatient unit and vice versa. However, you will see that some skills will be specific to certain areas of a clinic or hospital. Remember that just because you may not be doing a specific job or task today, does not mean that you won't find yourself performing in a different environment tomorrow. What better place is there to begin our discussion than with a routine admission to such a unit? We will also talk about other administrative activities, including discharges, transfers, general patient guidance, and some aspects of patient care and treatment.

1–1. Admission and Disposition Process

The most common type of admission is the clinic patient admission. Other types include direct and newborn admissions. We will discuss the entire clinic patient admission process from the time the patient steps into the healthcare provider's office until he or she is established in your unit. Since your main concern will be with the patient when he or she reaches the inpatient or same-day surgery unit, other parts of the admission process will be covered briefly.

201. Patient admissions and dispositions

An important aspect of your job as a medical technician is to care for patients in various settings. This lesson covers important aspects of admission to an inpatient unit, caring for the patient, and various dispositions patients may experience.

Medical treatment facility

Today, the US military medical service provides healthcare to millions of beneficiaries worldwide. To deal with this enormous caseload, the military has expanded existing information management systems and implemented new ones. The two systems currently used by the military include Composite Health Care System (CHCS) and Air Forces Health Longitudinal Technology Application (AHLTA). These systems have enhanced the quality, efficiency, and care we provide in our military treatment facilities (MTF) across the world. These systems assist with admissions and dispositions, scheduling patient follow-up appointments, and healthcare providers ordering patient prescriptions, laboratory tests, radiology requests, and so forth.

AHLTA has reduced the massive amounts of paperwork and has become a major support tool in managing information at both large and small MTFs. It has improved patient information provided to healthcare providers and hospital administrators, and it has improved communication throughout the MTFs. The system has many capabilities that you will learn during orientation or specialized training at your facility. Your local policy will determine the needed level of training for the job you are assigned to do. While automated systems have improved many aspects of patient care, you must remember that automated systems do fail occasionally, and you may find yourself in locations without computer capabilities (such as a deployed setting). You must be prepared to manually complete all aspects of patient admission as well as discharge.

USE BALL POINT PEN
PRESS HARD

AUTHORIZATION AND TREATMENT STATEMENT

(THIS FORM IS SUBJECT TO THE PRIVACY ACT OF 1974 - See Reverse)

I. ADMISSION *(CLINIC PERSONNEL OR PROVIDER FILLS IN CIRCLED ITEMS)*

1. REGISTER NO.	NBSUF	(2) NAME (Last, First, Middle Initial)	3. RELIGION
0011		Clearly, Seymour NMI	Methodist

4. FACILITY CODE	5. MEDICAL TREATMENT FACILITY	6. TIME OF ADM	(7) DATE OF ADM	8. TYPE OF CASE
	Wilford Hall Medical Center	1400	20080401	Injury

9. FMP	SSN	10. BENEF TYPE	11. GRADE	12. AFSC	13. AVIATION SVC CODE	14. RATING	15. LENGTH OF SVC	16. AGE
20	123-45-6789	AD	E-5	4N071	N/A	N/A	4 yrs	24

17. SEX	18. MARITAL STATUS	19. RACE/ COLOR	20. ZIP CODE	21. CURRENT ORGANIZATION	(22) INPATIENT UNIT
M	S	Cau	78236	59th Medical Group	3W

23. FAC INT ADM CODE	24. FACILITY OF INITIAL ADMISSION	25. DATE INITIAL ADM	26. ROOM	27. BED

28. PRIOR ADM	29. CLINIC SERVICE(S)	30. ADMISSION CLERK
☐ YES ☒ NO	Orthopaedics	

31. EMERGENCY ADDRESSEE/RELATIONSHIP	32. NAME AND ADDRESS OF SPONSOR

(33) PRIMARY ADMISSION DIAGNOSIS	(34) SECONDARY ADMISSION DIAGNOSIS

35. CAUSE OF INJURY

36A. DEPOSIT VALUABLES FOR SAFEKEPPING	36B. I have read and understand the Privacy Act and Disengagement Statements on the reverse of this form.	SIGNATURE OF PATIENT OR SPONSOR	(37) ADMITTING PROVIDER
☐ YES ☒ NO			

II. TREATMENT

38. DIAGNOSES - PROCEDURES	39. PROVIDERS OF CARE

LOD: ☒ YES ☐ EPTS, LOD not applicable ☐ AF Form 348 *(Check ☐ if continued on reverse)* *(Check ☐ if continued on reverse)*

40. ADMINISTRATIVE DATA *(Change in physical profile required* ☒ *YES (Prepare AF Form 422)* ☐ *NO)* *(Meal Card* ☐ *YES* ☒ *NO)*

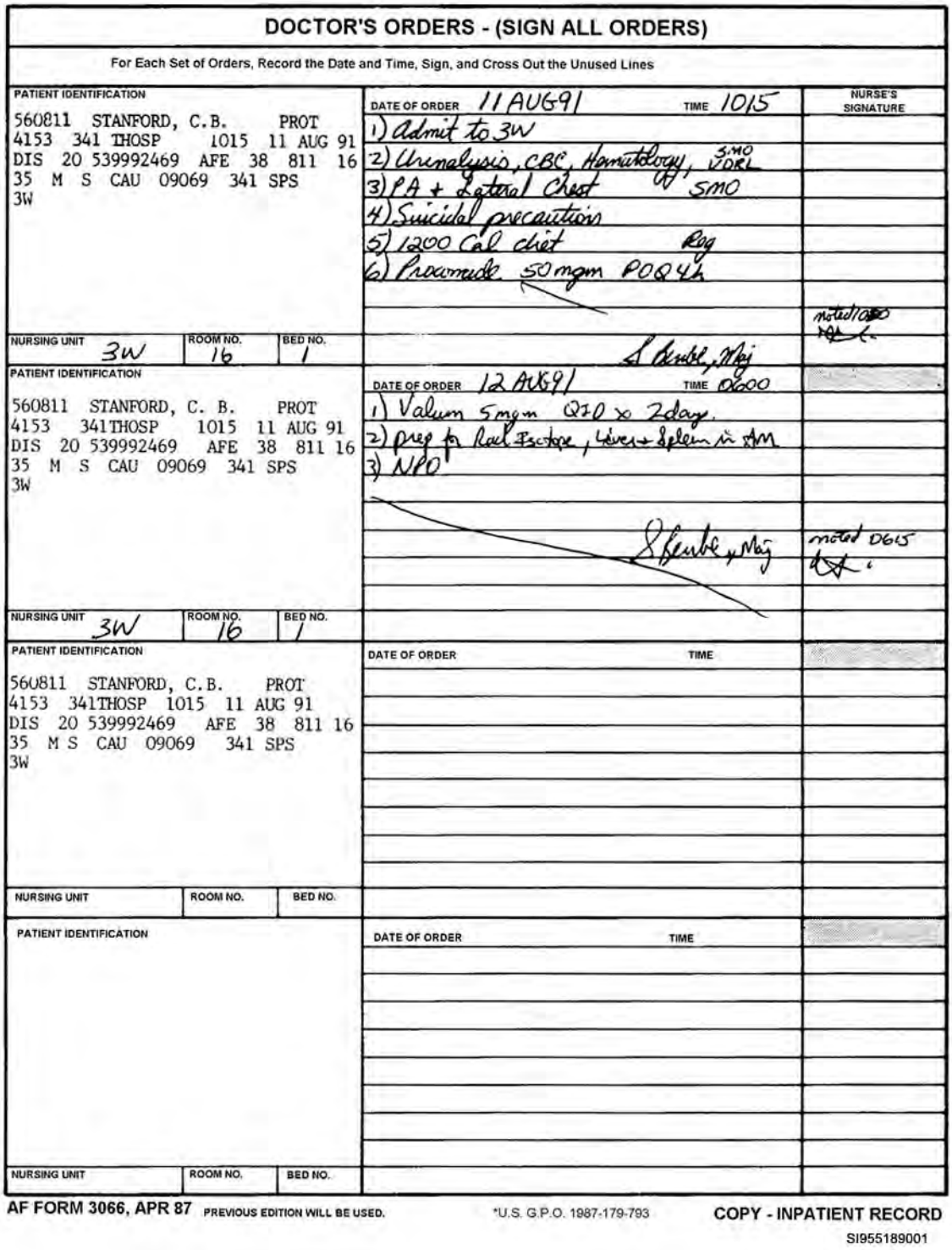
(Check ☐ if continued on reverse)

41. DISPOSITION	42. DATE OF DISPOSITION	43. TIME OF DISPOSITION	44. CC OF WHOLE BLOOD	45. CC OF PACKED CELLS	46. CONVALESCENT LEAVE	
					TAKEN	RECOMMENDED

47. SIGNATURE OF ATTENDING HEALTH CARE PROVIDER	48. SIGNATURE OF PATIENT AFFAIRS OFFICIAL

AF IMT 560, 19870101, V2 PREVIOUS EDITION WILL BE USED. SI085182111

Figure 1–1. AF Form 560, Authorization and Treatment Statement.



DOCTOR'S ORDERS - (SIGN ALL ORDERS)

For Each Set of Orders, Record the Date and Time, Sign, and Cross Out the Unused Lines

PATIENT IDENTIFICATION

560811 STANFORD, C.B. PROT
4153 341 THOSP 1015 11 AUG 91
DIS 20 539992469 AFE 38 811 16
35 M S CAU 09069 341 SPS
3W

DATE OF ORDER 11 AUG91 TIME 1015

1) Admit to 3W
2) Urinalysis, CBC, Hematology, S:MO V:DRL
3) PA + Lateral Chest S:MO
4) Suicidal precautions
5) 1200 Cal diet Reg
6) Procomide 50 mgm PO Q4h

NURSE'S SIGNATURE: noted 1015

NURSING UNIT 3W | ROOM NO. 16 | BED NO. 1

S Gentile, Maj

PATIENT IDENTIFICATION

560811 STANFORD, C. B. PROT
4153 341THOSP 1015 11 AUG 91
DIS 20 539992469 AFE 38 811 16
35 M S CAU 09069 341 SPS
3W

DATE OF ORDER 12 AUG91 TIME 0600

1) Valium 5mgm Q2H x 2days.
2) prep for Rad Fracture, Liver + Spleen in AM
3) NPO

S Gentile, Maj

noted 0615

NURSING UNIT 3W | ROOM NO. 16 | BED NO. 1

PATIENT IDENTIFICATION

560811 STANFORD, C.B. PROT
4153 341THOSP 1015 11 AUG 91
DIS 20 539992469 AFE 38 811 16
35 M S CAU 09069 341 SPS
3W

DATE OF ORDER TIME

NURSING UNIT | ROOM NO. | BED NO.

PATIENT IDENTIFICATION

DATE OF ORDER TIME

NURSING UNIT | ROOM NO. | BED NO.

AF FORM 3066, APR 87 PREVIOUS EDITION WILL BE USED. *U.S. G.P.O. 1987-179-793 COPY - INPATIENT RECORD

SI955189001

Figure 1–2. AF Form 3066, Doctor's Orders.

Healthcare provider

In AF medical facilities, there are a number of healthcare providers who are authorized to see and treat patients. They include military and civilian physicians, dentists, certified nurse-midwives (CNM), physician assistants (PA), and nurse practitioners. Although a patient may be seen initially by any of these individuals, only physicians, dentists, and in some cases, CNMs are authorized to admit patients. Since dentists and CNMs are only authorized to admit specific types of patients (dental and

obstetrical), the majority of your patients will be admitted by physicians. (**NOTE:** For the sake of simplicity, we will use the term “physician” or “doctor” in reference to the individual who is responsible for directing patient care and treatment activities.)

Most people put off visiting a physician until they can no longer ignore their symptoms. When they come in, the physician decides whether to treat them on an outpatient or inpatient basis. The physician bases this decision on the nature of the problem, the condition of the patient, and the need for extensive diagnostic tests. To save resources (money), patients are treated on the outpatient basis whenever possible.

Once the physician decides to admit a patient to the hospital, he or she initiates an Air Force (AF) Form 560, Authorization and Treatment Statement (fig. 1–1). The physician fills out the identification and diagnostic portions and signs this form. The physician also writes out the admission orders on the AF Form 3066, Doctor’s Orders. These orders specify what initial care (diet, activity level, special treatments, etc.) is to be provided on the inpatient unit (fig. 1–2). If the patient’s condition is relatively stable, the physician may order labs or other diagnostic tests in AHLTA or CHCS so the individual can complete them on the way to the inpatient unit. Once the provider (or representative) has filled out these forms, the patient receives the paperwork and proceeds to the admissions and dispositions (A&D) office. The physician (or physician’s representative) admits the patient through AHLTA or CHCS, and then calls the nursing unit to let the staff know that the patient is coming and the general condition of the patient.

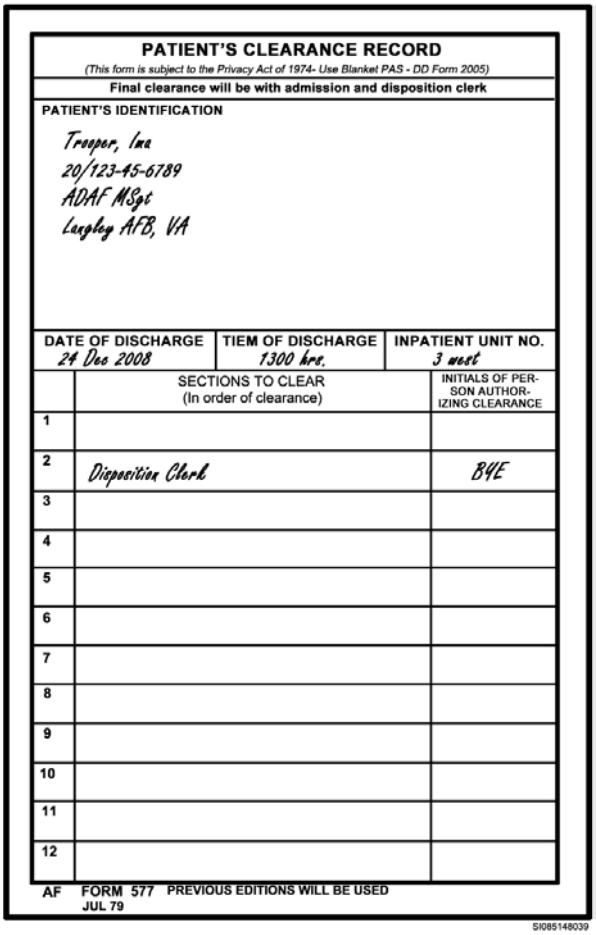
Admission procedures

Routine or clinic admissions differ from other types of admissions because of the order in which the various procedures are carried out. For example, in a direct admission, the patient requires immediate or intensive care. Such a patient is usually taken directly from the emergency room (ER) or provider’s office to the inpatient unit where he or she will receive the required care. Also, patients with contagious diseases are sent directly to the inpatient unit. Most of the paperwork involved in the admission process is done after the patient is already in the unit and the patient’s condition has been stabilized. Similarly, the admission paperwork for a newborn is done after the baby is in the nursery.

A routine admission, on the other hand, occurs in a sequence of steps. Each facility will tailor these steps IAW their local policy; however, the information here will give you a good idea of a common admission. The process generally begins in the healthcare provider’s office. From there, the patient goes to the A&D office. The next step varies according to the patient’s condition and facility’s policy. If diagnostic testing is required and the patient is able, he or she stops by the lab and/or x-ray departments on the way to the inpatient unit. If the provider has not ordered any tests or the patient’s condition is such that he or she is not able to walk to each office, the patient goes directly from the A&D office to the inpatient unit. Some medical facilities have an admissions nurse that will go to the ward and complete some of the preliminary procedures that are normally done by nursing personnel. Whether you are the technician in the clinic or on the ward (inpatient unit), you should always keep the welfare of the patient in mind. Sometimes during a busy day, a provider may not think to tell the patient to wait for assistance or to tell the technician to arrange transportation to the ward. You should always be an advocate for your patient and clarify whether the patient is able to ambulate on his or her own or not. When in doubt, have the patient wait while you check with the provider, or if you are able to leave your section, assist the patient by wheelchair. Put yourself in the patient’s place for a moment. Would you want to walk all over a hospital if you were very sick or had an injury? Probably not! If you cannot assist the patient yourself, make arrangements for someone else to help or make arrangements for the tests to be completed after the patient is admitted to the ward (ensure you have the provider’s permission to delay testing until the patient is admitted!). These actions are basic aspects of customer service that a patient may expect and will likely appreciate. More importantly, it ensures you are keeping your patients safe. Make sure your team knows where you are going before you leave the section. It is also possible that you may have a local policy in place that dictates how patient’s are to be admitted from an area within your facility.

The A&D office is responsible for most of the paperwork involved in the admission process and admission into CHCS. When the patient arrives from the physician's office, the admissions clerk first checks the identification and verifies enrollment in the Defense Eligibility Enrollment Reporting System (DEERS) program.

NOTE: The CHCS automatically verifies DEERS enrollments.



PATIENT'S CLEARANCE RECORD

(This form is subject to the Privacy Act of 1974- Use Blanket PAS - DD Form 2005)

Final clearance will be with admission and disposition clerk

PATIENT'S IDENTIFICATION

Trooper, Ima
20/123-45-6789
ADAF MSgt
Langley AFB, VA

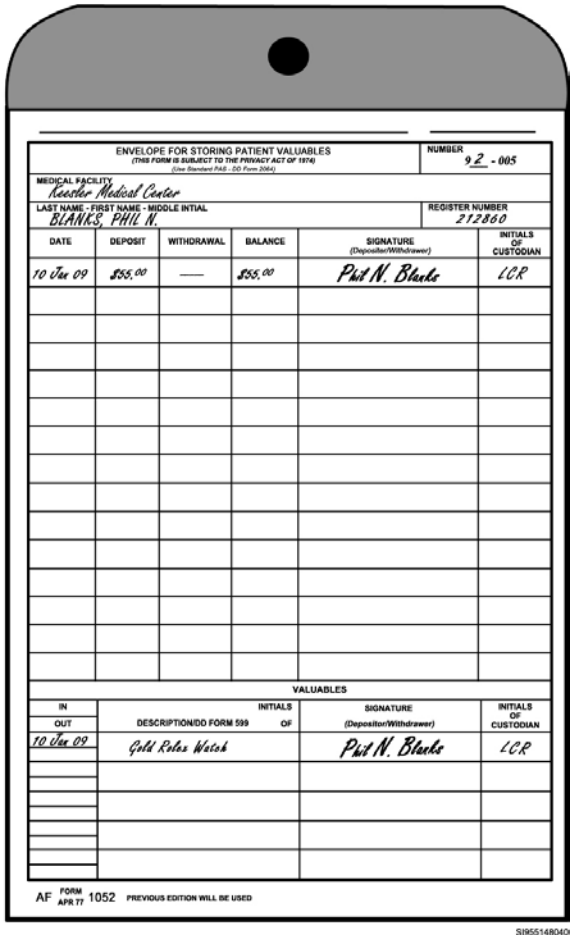
DATE OF DISCHARGE	TIEM OF DISCHARGE	INPATIENT UNIT NO.
24 Dec 2008	1300 hrs.	3 west

	SECTIONS TO CLEAR (In order of clearance)	INITIALS OF PERSON AUTHORIZING CLEARANCE
1		
2	Disposition Clerk	BJE
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		

AF FORM 577 JUL 79 PREVIOUS EDITIONS WILL BE USED

SI085148039

Figure 1–3. AF Form 577, Patient's Clearance Record.



ENVELOPE FOR STORING PATIENT VALUABLES
(THIS FORM IS SUBJECT TO THE PRIVACY ACT OF 1974)
(Use Standard PAS - DD Form 2064)

NUMBER 92 - 005

MEDICAL FACILITY: Kessler Medical Center

LAST NAME - FIRST NAME - MIDDLE INTIAL: BLANKS, PHIL N.

REGISTER NUMBER: 212860

DATE	DEPOSIT	WITHDRAWAL	BALANCE	SIGNATURE (Depositor/Withdrawer)	INITIALS OF CUSTODIAN
10 Jan 09	$55.00	—	$55.00	Phil N. Blanks	LCR

VALUABLES

IN / OUT	DESCRIPTION/DD FORM 599	INITIALS OF	SIGNATURE (Depositor/Withdrawer)	INITIALS OF CUSTODIAN
10 Jan 09	Gold Rolex Watch		Phil N. Blanks	LCR

AF FORM APR 77 1052 PREVIOUS EDITION WILL BE USED

SI95514R040

Figure 1–4. AF Form 1052, Envelope for Storing Patient's Valuables.

Patients who are not eligible under the DEERS program are treated only in emergency circumstances. Once the clerk verifies eligibility, he or she receives a register number and completes AF Form 438, Medical Care Third Party Liability Notification, if applicable, and AF Form 560 and enters data into an automated system. A small card or plate, much like a credit card, is created and used to imprint the other admission forms. The plate is sent to the inpatient unit to be used to imprint the forms in the patient's inpatient record. The clerk also prepares a patient identification (ID) band and places it on the patient's wrist. From that point on, the ID band becomes a positive means of identifying the patient. Other forms that are assembled and sent to the unit with the patient include a locator card; an AF Form 577, Patient's Clearance Record (fig. 1–3); the outpatient records; and all available inpatient records from previous hospitalizations. If the patient decides to store valuable items (money and jewelry), send him or her to the resource management office (RMO). Once at the RMO, the patient will place his or her valuables in an AF Form 1052, Envelope for Storing Patient's Valuables (fig. 1–4), and receive a tear-off receipt to claim the valuables at a later date. If the valuables are too large for the AF Form 1052, a Department of Defense (DD) Form 599, Patient's Effects Storage Tag (fig. 1–5), is used to tag items and then the items are placed into a safe storage area.

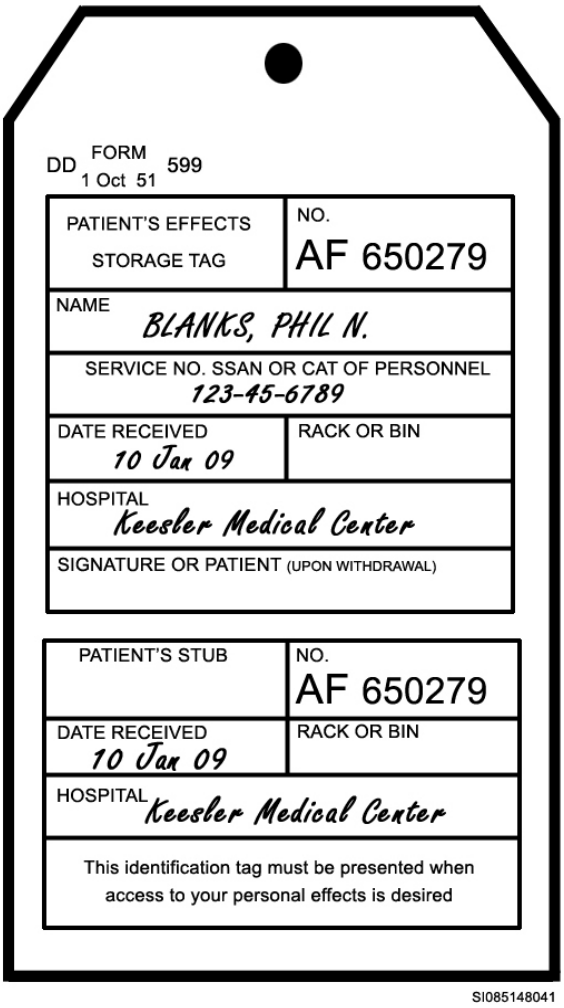


Figure 1–5. DD Form 599, Patient's Effects Storage Tag.

Preadmissions

In many cases, if the patient is being admitted for tests, specialized treatment, or routine surgery, then preadmission is appropriate. Preadmissions reduce waiting time for the individual and the frustration associated with normal admission procedures. Before being admitted to the hospital, the patient visits the doctor's office or clinic for a complete physical examination and medical history. Many procedures and tests are ordered and done during this visit. The consent form and other documentation are also often initiated during this office or clinic visit. Then, the patient usually goes to the preadmission clinic or office. In the preadmission area, the following takes place:

1. A&D personnel obtain initial patient information and begin the paperwork. This reduces administrative time and patient stress on the actual day of admission.
2. A member of the clinical nursing staff (usually a registered nurse) conducts a preliminary nursing interview and works with the patient to formulate a nursing-care plan. This plan becomes part of the patient's medical record and helps establish priorities, goals, and nursing interventions. Any required preoperative teaching is usually done at this time. The nurse also ensures the patient understands and agrees to the procedures involved and tries to establish realistic expectations of the outcome.
3. An operating room (OR) nurse interviews the patient and formulates a perioperative nursing-care plan. Also, the nurse discusses the various procedures and events the patient will

experience in the OR, tries to physically and psychologically prepare the patient, and answers as many of the patient's questions as possible.

4. An anesthetist or anesthesiologist also interviews the patient and makes an anesthesia assessment; sometimes this involves a brief physical exam. The patient and anesthetist review and consider all realistic anesthesia options and then decide upon the best anesthesia method for the patient. The anesthetist ensures that the patient understands all risks and consequences of the anesthetic chosen before obtaining the patient's informed consent for anesthesia.
5. The patient is given written instructions for any special procedures to accomplish beforehand, as well as how, when, and where to report for admission. The patient then reports to the inpatient or ambulatory surgery unit on the day of his or her surgery.

Once the clinic or ER calls to say that a patient is on the way or your scheduled preadmission patient arrives, your work begins. At the nurse's direction, you will assemble an inpatient record and prepare a room and bed for the patient. Normally, there are 4As, Patient Administration personnel, assigned to your unit and they will help prepare patient records. You should know what paperwork to put in the patient's chart and how to properly label the chart and paperwork in the event that you do not have a 4A or in case he or she is busy with another task when your patient is about to arrive.

Day before surgery

Inpatients are usually admitted to the hospital the day before the scheduled surgery. They report to the A&D office to finish admission paperwork, receive their patient ID bands, and then go to the patient-care unit. In some hospitals and most medical centers, the patient is assigned to a patient-care unit according to the type of surgery he or she is scheduled to have (the surgical specialty he or she falls under). For example, a patient scheduled for a total joint replacement of the knee is assigned to the orthopedic-care unit; a patient scheduled for a hysterectomy is normally assigned to the gynecology unit. Each patient-care unit is equipped and staffed to deal with the special care and treatment required for patients admitted under the particular specialty.

Room preparation

Preparing a patient's room is much simpler than dealing with all the paperwork. Your nurse in charge decides which room and bed to put each patient, based on what beds are available and the patient's sex, diagnosis, and condition. For example, let's say you get a patient who has a highly infectious disease. Unless you have a number of patients with the same disease, you must place this new patient in a private room. You must also consider the patient's sex, because you can't place male and female patients in the same room. You may have to move some patients around to arrive at a satisfactory arrangement.

Once you know which bed is the patient's, make an open bed by folding back the top sheet and blanket. If you know that the patient is ambulatory or in a wheelchair, leave the bed in the lowest position. If the patient is being brought on a litter, raise the bed to the highest position and move the other furniture to provide easy access. You will need a pair of pajamas or a gown, slippers, a towel, a washcloth, a bath basin, an emesis basin, a water pitcher, a cup, and a urinal and/or bedpan. In some facilities, most of these items are available in disposable admission packs. Do not fill the water pitcher until you know the patient's dietary limitations. You should also have a urine specimen cup and an IV pole available, if needed.

Admission to the unit

Once on the nursing unit, the patient is assigned a particular room and bed and interviewed to reinforce the preadmission interview and update the nursing-care plan. Your specific unit admission procedure will vary according to local and command policies. As we mentioned earlier, some facilities have an admissions nurse and possibly a medical technician assigned to perform the initial admission procedures for all incoming patients. Normally, the admissions nurse is responsible for

evaluating the patient and getting the patient's nursing medical history. You will be responsible for assisting the nurse by getting the patient's vital signs, height, and weight.

If you are the first to see the patient, greet the individual in a friendly manner, introduce yourself, and escort him or her to the nurses' station. Compare the patient's ID band with the admission paperwork and ask the patient to verify the information. Explain that the ID band will be checked frequently to prevent any errors in treatment or medication. Introduce the patient to the nurse who will handle the admission. Review the doctor's orders for any immediate treatments, and escort the patient to his or her room, as directed by the nurse.

When you take the patient to his or her assigned room, make sure you introduce any roommates who are present. Place the locator card in the bed cardholder. Ask any family members or friends of the roommate or of the patient, or both, to leave for a few minutes so that you can help the patient change into pajamas (be sure to tell them how to get to the lounge or waiting area.). Allow a family member to help if the patient so desires and it is not against your unit policy. Draw the curtain or close the door to provide privacy. Ask the patient whether he or she would like you or a family member to assist him or her. Always remember to keep the patients' safety in mind and do not allow them to do anything that puts them at risk for a fall or other type of injury. When the patient has changed, make him or her comfortable in either the bedside chair or the bed, according to the activity level specified in the doctor's orders and the desires of the patient. Take the patient's vital signs and measure his or her height and weight. Explain that this information is important for planning treatments and calculating medication doses. If you need a urine sample, explain why and how to get it, and assist the patient to the bathroom or with the bedpan, if necessary. If the patient wants to see the chaplain or other religious person, notify the nurse so that arrangements can be made.

Once you have completed these tasks, you can orient the patient and the patient's family to the unit's policies for such things as visitation, use of day rooms, unit sign-in and sign-out, patient passes, physical layout of the unit, procedures to follow in an emergency, such as fire safety and evacuation procedures, and so forth. Any last-minute lab work or other tests are now accomplished, and any treatment required to regulate a disease or other condition before surgery is begun. If any postoperative exercises are ordered, the nurse or medical technician usually uses this time to begin teaching the patient. Teaching patients these exercises before surgery increases the likelihood they will remember how to do them properly after the surgery, even if they are disoriented or in pain.

When the patient is back in bed, show him or her how to use the equipment in the room. The amount of explanation needed varies with each patient. Just be sure to provide enough information so that each patient understands. Explain how the call bell works, and attach it to the bed within the patient's reach. Show the patient how to work bed, TV, and radio controls. Show the patient what equipment (washbasin, bedpan, urinal, emesis basin, and tissue paper) is stored in the bedside stand; and if water is permitted on the patient's diet, fill the water pitcher. Tell the patient the following information:

- What the doctor ordered and what treatments, medications, and so forth he or she can expect.
- What limitations have been set on activities, ensuring that the patient understands the limitations.
- What diet the doctor ordered, asking the patient about likes or dislikes.

Tell the patient about the unit routines. Explain what time you serve meals, check vital signs, give AM and PM care, and turn the lights out. Ask the patient if he or she has any habits that conflict with these routines, and make any adjustments you can. When you have answered all the patient's questions and made the person as comfortable as possible, go back to the nurses' station and report your observations to the nurse. Tell the nurse whether the patient is at risk of falling. Document the patient's vital-signs spreadsheet, and ensure that the patient's ID is imprinted on all the forms in the inpatient record. Notify the dietary department of the patient's diet and where the patient will be eating. Add the patient's name and diet to the AF Form 1094, Diet Order, for the next day, or place the information into the hospital computer system. Put the patient's name on the unit's status board

and enter vital-sign frequency, diet, and any special treatments the patient is to receive. Initiate any ordered treatments that have not already been started.

At some point, while you are doing all of this, the nurse will take the patient's history, notify the physician of the patient's arrival, and write the admission note. From information gathered from the patient's medical history, doctor's orders, and your observations, the nurse will establish a problem list and plan of care for the patient. Participate as much as possible in this process and make sure you know what your responsibilities are for the patient's care.

Admitting a patient in this manner will certainly take you longer than it would to simply put him or her in a bed and zip through the other admission procedures; however, if you follow the procedures described here, your rapport with your patients will be much better. Patients will feel reassured and welcome, and they will be much more likely to participate willingly in any care plans.

Patient absences

Your patients may be away from the unit for any number of reasons. Patient absences include going to appointments and pass, leave, and absent without leave (AWOL) status. Many patients are classified as "ambulatory" and can walk around at their own discretion. Under certain circumstances, patients may be allowed to leave the unit to run errands (Base Exchange [BX], dining hall, etc.), or just to take a walk when authorized by their healthcare provider.

Nursing personnel are responsible for managing a patient's care while the individual is hospitalized. This includes making sure the patient is available as scheduled for tests and procedures. You can't do that very well if you don't know where the patient is. Inpatient units use patient status boards and sign-out registers to help keep track of patients. Usually, the status board is mounted on the wall in a prominent place in the nurses' station. Due to protection of patient privacy, the board should be placed in an area that is only accessible to hospital staff with a "need to know." As we mentioned earlier, the patient's name is entered next to his or her room and bed number. When a patient is scheduled for a treatment or test, the date, time, and type of appointment are also entered on the board. Either you or the nurse may be responsible for keeping the status board updated. In either case, you should check it often to know where your patients are and what treatments they should be receiving.

The sign-out register is simply a hardcover notebook with spaces designated for a patient's name, time departed, destination, and time returned. Ambulatory patients are required to sign out when leaving the unit and sign in upon returning. All you have to do is make sure a patient uses the book and keeps it up-to-date.

Between the status board and sign-out register, you should be able to tell where your patients are at any time. Most of the time, the patient tells you where he or she is going. If the patient can't walk, you probably will have to take the individual to the appointment.

Passes

A pass allows a patient to depart from the medical facility for a short time, usually between 24 and 48 hours. Patients occasionally ask for a pass to participate in some special event, or just to get away from the hospital. The patient's physician is the approving and disapproving authority. If the patient's condition is relatively stable and no essential treatments are scheduled, the physician usually approves the pass. The physician approves the pass by annotating the approval on the AF Form 3066, Doctor's Order and including the destination and number of hours the patient is authorized to be away from the unit. (NOTE: Any patient who normally is not authorized care in a military facility should be advised that hospitalization charges will continue while on pass.) After the patient leaves, make an open bed to indicate that individual will be returning.

Before leaving, the patient signs out on the register, the nurse makes a note of the departure time on standard form (SF) 509, Medical Record–Progress Notes in the patient's record. The patient's status

is indicated on the status board (and in the Kardex). Be sure to notify the dietary department so meals can be canceled.

Upon returning, the patient signs in on the register and the nurse notes the return time on SF 509. Don't forget to correct the status board and notify the dietary department that the patient is back.

AWOL

When a patient does not return from pass as scheduled or leaves the hospital without permission, he or she is considered AWOL. The nurse in charge immediately notifies the physician, admissions office, and other individuals as locally required. The nurse must complete, assemble, and forward the inpatient record to the disposition clerk within 24 hours of the AWOL notification.

When (and if) the patient returns from being AWOL, the admissions clerk prepares an AF Form 564, Return of Patient Record, to readmit the patient to the inpatient unit. The clerk sends the original copy of AF Form 564, previous inpatient records, outpatient records, and a locator card with the patient to the unit.

When the patient arrives, essentially the same admission process as before is followed; vital signs are checked, patient's clothing is collected, diet is arranged, and any other admission procedures appropriate to the situation are completed. The nurse annotates the circumstances of the patient's return on SF 509 and monitors the patient for any signs of distress.

Convalescent leaves

Convalescent leave is an authorized absence normally for the minimal time essential to meet the medical needs for recuperation. It is not chargeable leave and the Air Force Surgeon General oversees the convalescent leave program. It is primarily used when a patient is absent from the medical facility for convalescent (recovery) purposes. For example, postoperative and postpartum patients commonly are placed on convalescent leave after their operations or deliveries. Of course, the length of leave varies according to the patient's disorder but normally does not exceed 30 days. If leave for more than 30 days is required, the patient must return to the provider for further review and consent.

EXCEPTION: Postpartum convalescent leave may be granted for up to 84 days. Convalescent leave in excess of 90 days must be approved by the MTF's major command (MAJCOM) Surgeon General's Office.

When a patient requires convalescent leave, he or she fills out AF Form 988, Leave Request/Authorization (fig. 1–6). In most cases, the provider recommends a certain period of convalescent leave and the patient's unit commander is the approving authority. For individuals returning to inpatient status, the MTF commander approves convalescent leave.

Leave requests require considerable coordination and paperwork. The procedure is very similar to a discharge. Complete the patient's chart (including discharge summaries and final nursing notes) and send it to the dispositions clerk. The patient must clear the hospital, including the medical service account (MSA) (cashier) for active duty patients. Because of the extensive preparation needed, the physician should not approve the request unless the patient's record can be completed within 24 hours. The unit personnel forward the record to the dispositions clerk. The patient is given an AF Form 577 and clears the hospital in the same manner as in a routine discharge. After the patient clears, when convalescent leave is recommended, he or she hand-carries AF Form 988 to the unit commander. If the commander approves the leave, an AF Form 988 is signed as previously mentioned. Send the record to the disposition clerk. The nurse gives the patient final discharge instructions and any prescriptions the doctor has ordered.

For specific leave information, see Air Force Instruction (AFI) 36–3003.

LEAVE REQUEST/AUTHORIZATION
(See Privacy Act Statement and General Instructions below)

SECTION I

TO: ACFP

1. DATE OF REQUEST	2. TYPE OF TRANSACTION (1-5) (AFO Use Only)
20081201	

3. SSN (6-14)	4. NAME (Last, First, Middle Initial) (15-19)	5. GRADE	6. CURRENT LV BALANCE	6a. DOS
123-45-6789	Blanks, Phil N.	A1C	16	1 Mar 2010

7. RECOMMEND CONVALESCENT LEAVE
FROM 20081202 TO 20081212

PROVIDER'S SIGNATURE & STAMP

8. TYPE OF LEAVE (Check one)
- ☐ Ordinary (A)
- ☒ Convalescent (F)
- ☐ Terminal (P)
- ☐ Emergency (D)
- ☐ Appellate Review (R)
- ☐ Special (H)
- ☐ Reenlistment
- ☐ Graduation (J)
- ☐ Other (Specify)
- ☐ Permissive TDY (T)

PTDY Reason (AFI 36-3003)

REMARKS:

9. NO. DAYS REQUESTED (33-35)	10. LEAVE AUTH NO. (37-43)	11. FIRST DAY/TIME OF LV STATUS	12. FIRST DAY OF CHARGEABLE (47-52)	13. LAST DAY OF CHARGEABLE (53-58)
10		20081202 0700		

14. LEAVE AREA (36)	15. EMERGENCY PHONE NO.	16. LEAVE ADDRESS (Street, City, State, Zip Code, and Phone No.)
☒ CONUS ☐ OS ☐ OS to CONUS	(940) 676-0001	1515A Hartford Ct. Wichita Falls, TX 76306 (940) 555-1211

17. DUTY PHONE NO.	18. UNIT	19. DUTY SECTION
(210) 377-2000	81 Med Center	SGNE

20. DUTY LOCATION
Keesler AFB, MS

LEAVE REQUEST CERTIFICATION: *I acknowledge that the leave requested by me will be charged against my leave account unless otherwise cancelled or corrected through Part III of this form. In addition, if I cannot earn enough leave before separation to cover this request, I consent to withholding from current pay, final pay, or any other pay due me to satisfy this indebtedness. I understand that there is no actual debt until my final separation from the Air Force; however, I consent to this withholding of pay in anticipation of the indebtedness for the unearned portion of my leave balance. I further consent to such withholding at a rate sufficient to satisfy this indebtedness no later than my requested or projected separation date, and understand that this could result in the withholding of 100% of any current pay, final pay, or any other money due me. I have read the instructions on PART II.*

21. MEMBER'S SIGNATURE	22. LEAVE IS ☐ APPROVED ☐ DISAPPROVED DATE	
23. SUPERVISOR'S NAME AND GRADE (Print or Type)	24. DUTY PHONE	25. SUPERVISOR'S SIGNATURE

SECTION II *(To be completed by supervisor/unit commander to authorize advance or excess leave)*

26. LEAVE AVAILABLE TO ETS (From LES)	27. ADVANCE LEAVE REQUESTED (Block 9 minus 6)	28. EXCESS LEAVE REQUESTED (44-46) (Block 9 minus 26)	29. TOTAL LEAVE APPROVED

30. UNIT HEADQUARTERS	31. COMMANDER'S SIGNATURE/GRADE	32. AUTHORIZATION DATE	33. AUTHORITY FOR ADVANCE LEAVE OVER 30 DAYS

PRIVACY ACT STATEMENT

AUTHORIT *10 U.S.C., Chapter 40; 37 U.S.C., Chapter 9; EO 9397, November*
PRINCIPAL PURPOSES: *To authorize military leave, document the start and stop of such leave; record address and telephone number where you may be contacted in case of emergency during leave; and certify leave days chargeable to*
ROUTINE USES: *Information may be disclosed to the Department of Justice, and to federal, state, local or foreign law enforcement authorities for investigating or prosecuting a violation or potential violation of law; the American Red Cross for information concerning the needs of the member or dependents and relatives in emergency situations.*
DISCLOSURE: *Disclosure of SSN is voluntary. However, this form will not be processed without your SSN, since the Air Force identifies members by SSN for pay or leave purposes.*

GENERAL INSTRUCTIONS

(For emergency, reenlistment, convalescent, terminal, appellate review leave, and PTDY, see variations in AFM 177-373, Volume II, Ch 7.)

1. THIS FORM MUST BE TYPED OR COMPLETED IN INK.

2. BEFORE SEPARATING PARTS I, II, AND III, COMPLETE THE FOLLOWING BLOCKS:
- *a. Blocks 1 thru 5, 9, 12 thru 21, and 23 thru 25 are self-explanatory.*
- *b. Block 6, current Leave Balance. Verify that the member has enough leave balance to cover the period of leave requested. This may be done by checking the member's LES or the orderly room's leave balance listing. Complete 6a when member requests leave with a planned return date within 30 days of DOS.*
- *c. Block 7. This block will be completed, signed, and stamped by the appropriate medical authority if convalescent leave is recommended.*
- *d. Block 8. For PTDY, state the paragraph number of the applicable reason for PTDY as stated in AFR 35-26 and in Remarks area give abbreviated description of purpose of PTDY. (For example: base baseball team.)*
- *e. lock 10. Leave Authorization Number. Supervisor or designee obtains a leave authorization number from the unit orderly room immediately before signing a leave approval and forwarding Part I to AFO. Do not get leave number earlier than 14 days before effective date*
- *f. Block 11. First Day/Time of Leave Status. This is the earliest time a member can depart or sign up for space available transportation. If planned departure is on a non-duty day, enter the non-duty date and 0001 hours. If planned departure is on a duty day without performing the majority (more than 50%) of scheduled duty, enter the date and time when more than 50% of the scheduled duty will be completed. NOTE: Leave status is not necessarily chargeable leave. Date cannot be more than 1 day before the date in block 12. See also Part III, Instructions for Charging Leave.*
- *g. Block 22. For PTDY, use approval level required by AFR 35-26.*
- *h. Blocks 26-33. Complete only to authorize advance or excess leave. Blocks are self-explanatory except for blocks 27, 28, and 33.*
  - *(1) Advance Leave (Block 27). If the requested leave exceeds the current balance but does not exceed the balance to ETS, the leave is advance leave. Complete Blocks 26-27 and forward the form (all parts) to the unit commander for approval. If a member requesting leave has a cumulative advance balance of 30 days, comply with AFR 35-9*
  - *(2) Excess Leave (Block 28). If the requested leave exceeds the balance to ETS, the leave is excess leave. Complete Blocks 26 and 28 and forward the form (all parts) to the unit commander for approval.*
  - *(3) Authority for Advance Leave Over 30 Days (Block 33). Record message date/time group if approval was received by message.*

3. AFTER INITIALLY COMPLETING THIS FORM:
- *a. Separate Part I immediately after getting a leave authorization number and signing the form. forward to the AFO using normal distribution unless the leave is terminal/separation or involves excess or advance leave. forward these requests (all parts) to the unit for approval.*
- *b. Separate Part II and give to member.*
- *c. Hold Part III for completion after the member's return from leave. If member requests cancellation before any leave is taken, complete Section III of Part III and forward to your unit commander.*

4. INSTRUCTIONS FOR COMPLETING AND PROCESSING PART III ARE PRINTED ON PART III.
5. GUIDELINES FOR CHARGING LEAVE AND INSTRUCTIONS FOR LEAVE ADJUSTMENTS ARE PRINTED ON PART III.

AF IMT 988, 19910901, V4 PREVIOUS EDITION WILL BE USED. PART I - AFO COPY
SI085182121

Figure 1–6. AF Form 988, Leave Request/Authorization.

Patient dispositions

All patients eventually leave your unit on a disposition of some sort. The three types of patient dispositions include:

- Transfer.
- Subsisting elsewhere.
- Discharge from the medical facility.

Transfers

A transfer is the movement of a patient from one unit or facility to another. Patients in Air Force facilities may be transferred to another unit, military medical facility, Veterans Administration (VA) hospital, or civilian medical facility. Patients may also be transferred from one service to another with no physical movement involved. An *interservice* transfer usually occurs when the physician determines that the patient requires some sort of specialized care. For example, a doctor may decide that a medical patient requires surgery. The patient is transferred from the medical service to the surgical service. Interservice transfers require the approval from the chiefs of both services and must also be coordinated with the patient control clerk. If no physical movement is required, the transfer is made with an entry in AF Form 3066 and SF 509. AF Form 560 is also annotated to show the date of the transfer and name of the new service.

As long as the patient is not moved physically, your only responsibility for an interservice transfer is to change the status board to indicate the new service and new physician. After that, you simply follow the orders of the new physician.

The transfer of a patient from one unit to another requires the concurrence of the physicians in each inpatient unit or the authorization of the chiefs of the services involved. If the move is also an interservice transfer, both chiefs are involved as mentioned earlier. The move is also coordinated with the A&D clerk to make sure there is a bed available on the receiving unit.

The physician orders the transfer with a separate page of AF Form 3066. The carbon copy of the order is taken to the patient control clerk who records the information and forwards the copy to the pharmacy where it is used to establish and maintain the patient's drug regimen.

When the nurse receives the order to transfer the patient, he or she updates the inpatient record and notes the transfer on SF 509. Then he or she calls the receiving unit and gives that nurse a verbal report on the patient's condition. Between them, they coordinate the details of the transfer (time of transfer, means of transportation, etc.). The nurse also calls the pharmacy to inform them of the move.

You should help the patient collect all personal equipment, clothing, and valuables. Depending on the patient's condition, he or she walks or is transferred in a wheelchair or on a litter. You will also take the patient's records and belongings to the new unit and remove the locator card from the bed holder and take it, too. Be sure to notify the dietary department about the transfer so that the patient's tray goes to the right location. After the patient is gone, strip, clean, and remake the unit for a new admission.

If the patient needs a diagnostic or therapeutic procedure that can't be done at your facility, the physician may decide to transfer the person to another medical facility (military, VA, or civilian). The physician fills out part I of AF Form 230**,** Request for Patient Transfer, and forwards it to the chief of service for approval, who then sends the form to the patient administration office. Patient administration fills out part II of the form, makes the necessary arrangements for transportation, and if applicable, contacts the receiving hospital.

When the arrangements are complete, patient administration notifies the inpatient unit of the date, time, and manner of transportation. The physician completes AF Form 560 and SF 502, Medical Record—Narrative Summary (Clinical Resume). If the patient has been hospitalized less than 48 hours, the doctor may just write a final progress note on SF 509 instead of using SF 502. The nurse

completes the patient's record and makes a final note in SF 509 regarding the transfer. You will help collect the patient's possessions and take him or her to the departure point.

Aeromedical evacuation (transfers)

The transfer of a patient's clinical records and personal belongings is an important part of the aeromedical evacuation (AE) activity. These items must be prepared carefully for transfer by the originating medical facility.

Requesting patient transfer

Healthcare providers complete an Air Evacuation patient transfer request by completing the AF Form 3839, Patient Reporting Data Collection Sheet (fig. 1–7 and 1–8). Once completed, send the form to the AE section of the medical treatment facility.

PATIENT REPORTING DATA COLLECTION SHEET — Reports Control Symbol RCS:

ATTENTION REFERRING PHYSICIAN: AEROVAC patients travel at an aircraft cabin altitude of 8,000 to 10,000 feet. Please consider the effects of stresses of flight on this patient including barometric pressure changes, decreased partial pressure of oxygen, decreased humidity, temperature variations, noise, vibration, and fatigue. Complete shaded areas and Patient Preparation Checklist on reverse.

1. NAME (Last, First, Middle Initial)	2. SSN	3. PRECEDENCE	4. STATUS	5. GRADE	6. AGE	7. SEX	8. WEIGHT
High, Fly N.	234-56-7891		AD	0-5	52	Male ☒ Female	163

9. RDY DATE	10. DDS	11. PLACE OF RESIDENCE	12. SPEC CAT	13. MODE	14. REAS REG	15. DATE LAST VISIT
		Sheppard AFB, TX				20080702

16. CLASS	17. ACCEPT PHYSICIAN NAME AND PHONE NO.	18. AUTH NO.	19. APPT/SURG DATE	20. APPROVAL AUTHORITY
	Bones, Ican C. (210)671-0001			

21. CANC/INC	22. VALID	23. MTF ORIGINATION CODE	23. MTF ORIGINATION NAME	24. ICAO ORIGIN	25. MTF DESTINATION CODE	25. MTF DESTINATION NAME	26. ICAO DEST
		XXX	Sheppard AFB, TX		XXX	Wilford Hall, Lackland	

27. MED SPEC 1	28. DIAGNOSIS 1 CODE	28. DIAGNOSIS 1 DEFINITION
		Open Tib/Fib fracture Left leg

29. MED SPEC 2	30. DIAGNOSIS 2 CODE	30. DIAGNOSIS 2 DEFINITION

31. MED SPEC 3	32. DIAGNOSIS 3 CODE	32. DIAGNOSIS 3 DEFINITION

32A. PROCEDURE	CODE	TYPE	33. SPECIAL DIETS (If Yes, specify)	34. IV (If Yes, specify)
			☐ YES ☒ NO	☐ YES ☒ NO

35. O ₂ LPM (If yes, specify)	36. SUCT	37. NG TUBE	38. RESP	39. FOLEY	40. STRYKER	41. INCUB	42. TRACT
☒ NO ☐ YES	☒ NO ☐ YES	☒ NO ☐ YES	☒ NO ☐ YES	☐ NO ☒ YES	☒ NO ☐ YES	☒ NO ☐ YES	☐ NO ☐ YES

43. IV PUMP	44. CAST/LOC (If yes, specify)	45. TRACH	46. MONITOR	47. SUPPLEMENTAL INFO
☒ NO ☐ YES	☒ NO ☐ YES	☒ NO ☐ YES	☒ NO ☐ YES	

48. MAX ENRTE STOPS	49. MAX NUMBER RONS	50. ALT REST/MAX HT	51. MISSION NUMBERS	52. RON LOCATIONS
☐ NO ☐ YES	☐ NO ☐ YES	☐ NO ☐ YES		

53. INPATIENT	54. SPECIAL PROGRAMS	55. VA CODE	56. ADMIN/OVERSEAS	57. VAL BY/REAS HIGH PREC
☐ NO ☐ YES	☐ VA ☐ DRUG ☐ ALCOHOL ☐ WEIGHT ☐ NONE			

58. VITAL SIGNS TEMP	PULSE	RESPIRATION	BLOOD PRESSURE	59. HGB	60. HCT	61. ABG / DATE TAKEN	62. WBC	63. SI/VSI

64. MEDICATIONS ☐ NO ☐ YES (List all, even if self medicating)

65. HISTORY (Concise summary of most current diagnoses, treatment and prognoses. Also complete Patient Preparation Checklist on reverse. If additional space is needed, continue on reverse)

66. ATTEND PHYSICIAN (Print Name)	67. PHONE NO.	68. WARD/PHONE NO.	69. REPORTED BY	70. PHONE NO.	71. PATIENT BAGGAGE TYPE	TAG NO.	WEIGHT

ATTENDANT 1

74. NAME (Last, First, Middle Initial)	75. STATUS	76. GRADE	77. AGE	78. SEX	79. RELATIONSHIP TO PATIENT	BAGGAGE 80. TYPE	81. TAG NO.	82. WT
N/A								

ATTENDANT 2

83. NAME (Last, First, Middle Initial)	84. STATUS	85. GRADE	86. AGE	87. SEX	88. RELATIONSHIP TO PATIENT	BAGGAGE 89. TYPE	90. TAG NO.	91. WT

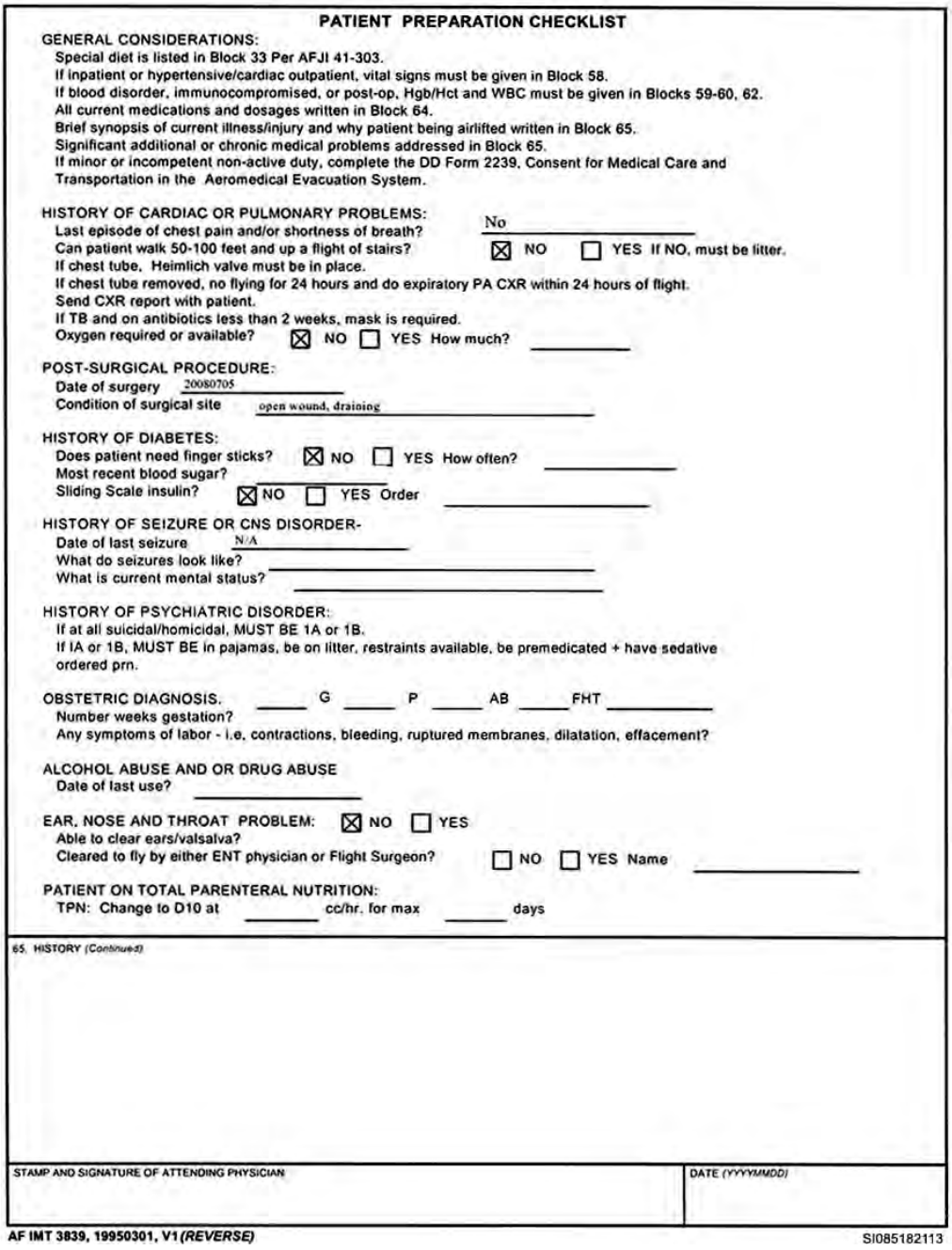
TRANSPORTATION

92. ORIG PHONE NO.	93. DEST PHONE NO.	94. ETA ORIG MTF DATE	94. ETA ORIG MTF TIME	95. ETA DEST MTF DATE	95. ETA DEST MTF TIME	96. AIRCRAFT ITINERARY

97. OTHER COMMENTS

AF IMT 3839, 19950301, V1 SI085182112

Figure 1–7. AF Form 3839, Patient Reporting Data Collection Sheet.



PATIENT PREPARATION CHECKLIST

GENERAL CONSIDERATIONS:
Special diet is listed in Block 33 Per AFJI 41-303.
If inpatient or hypertensive/cardiac outpatient, vital signs must be given in Block 58.
If blood disorder, immunocompromised, or post-op, Hgb/Hct and WBC must be given in Blocks 59-60, 62.
All current medications and dosages written in Block 64.
Brief synopsis of current illness/injury and why patient being airlifted written in Block 65.
Significant additional or chronic medical problems addressed in Block 65.
If minor or incompetent non-active duty, complete the DD Form 2239, Consent for Medical Care and Transportation in the Aeromedical Evacuation System.

HISTORY OF CARDIAC OR PULMONARY PROBLEMS:
Last episode of chest pain and/or shortness of breath? No
Can patient walk 50-100 feet and up a flight of stairs? ☒ NO ☐ YES If NO, must be litter.
If chest tube, Heimlich valve must be in place.
If chest tube removed, no flying for 24 hours and do expiratory PA CXR within 24 hours of flight.
Send CXR report with patient.
If TB and on antibiotics less than 2 weeks, mask is required.
Oxygen required or available? ☒ NO ☐ YES How much? _____

POST-SURGICAL PROCEDURE:
Date of surgery 20080705
Condition of surgical site open wound, draining

HISTORY OF DIABETES:
Does patient need finger sticks? ☒ NO ☐ YES How often? _____
Most recent blood sugar? _____
Sliding Scale insulin? ☒ NO ☐ YES Order _____

HISTORY OF SEIZURE OR CNS DISORDER-
Date of last seizure N/A
What do seizures look like? _____
What is current mental status? _____

HISTORY OF PSYCHIATRIC DISORDER:
If at all suicidal/homicidal, MUST BE 1A or 1B.
If IA or 1B, MUST BE in pajamas, be on litter, restraints available, be premedicated + have sedative ordered prn.

OBSTETRIC DIAGNOSIS. _____ G _____ P _____ AB _____ FHT _____
Number weeks gestation?
Any symptoms of labor - i.e, contractions, bleeding, ruptured membranes, dilatation, effacement?

ALCOHOL ABUSE AND OR DRUG ABUSE
Date of last use? _____

EAR, NOSE AND THROAT PROBLEM: ☒ NO ☐ YES
Able to clear ears/valsalva?
Cleared to fly by either ENT physician or Flight Surgeon? ☐ NO ☐ YES Name _____

PATIENT ON TOTAL PARENTERAL NUTRITION:
TPN: Change to D10 at _____ cc/hr. for max _____ days

65. HISTORY (Continued)

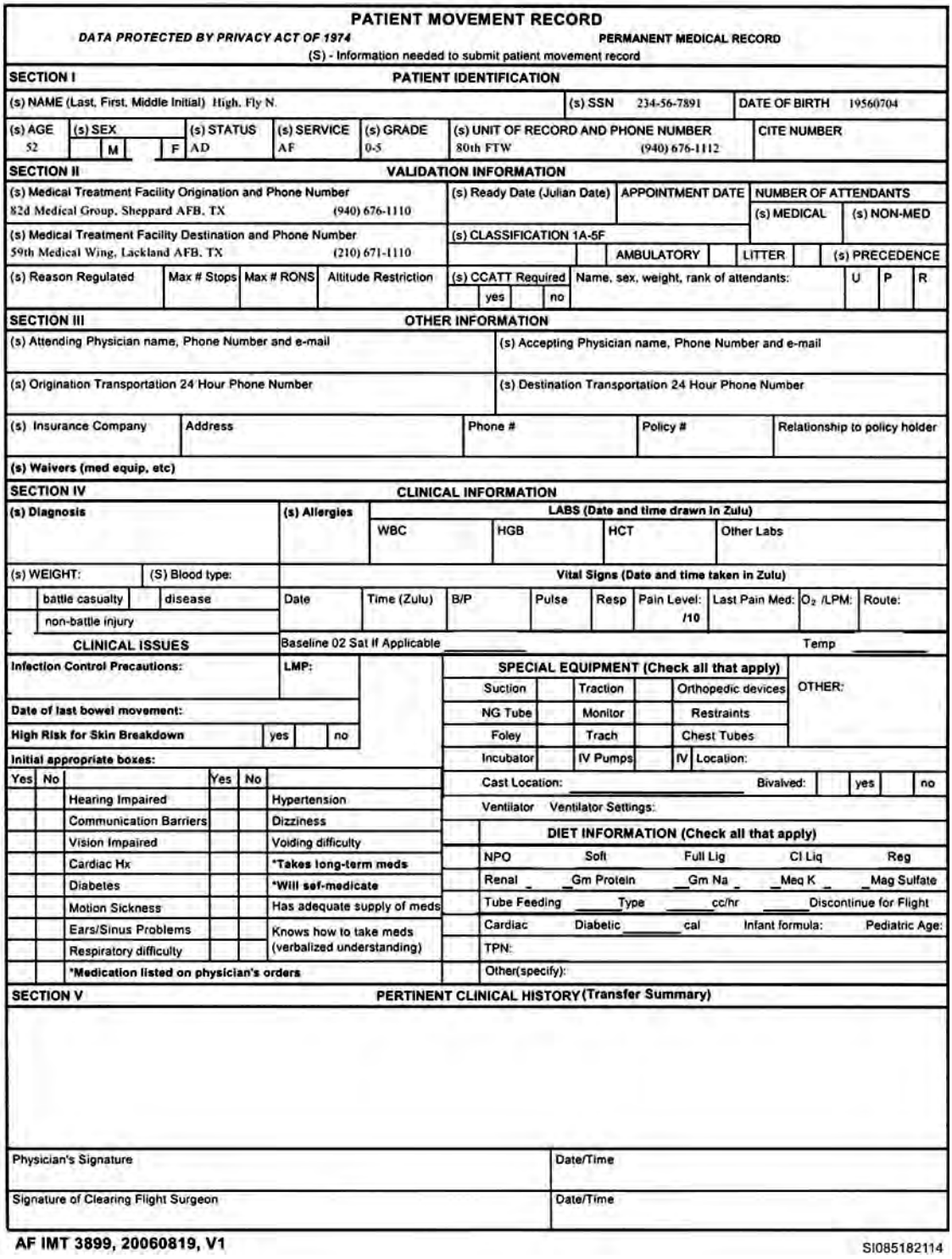
STAMP AND SIGNATURE OF ATTENDING PHYSICIAN | DATE (YYYYMMDD)

AF IMT 3839, 19950301, V1 (REVERSE) SI085182113

Figure 1–8. AF Form 3839, Patient Reporting Data Collection Sheet (Reverse).

Patient records

The AE clerk is responsible for the preparation of the patient's record for aeromedical evacuation. You may help assemble various parts of the patient's record. It should contain the patient's hospital records; x-ray films; military personnel record; DD Form 602, Patient Evacuation Tag; and DD Form 600, Patient's Baggage Tag. When you are responsible for transporting the patient to the flight line, you will turn over all these records to the flight nurse or the senior AE technician on the aircraft. The Patient Evacuation Tag, or AF Form 3899, Aeromedical Evacuation Patient Record (figs. 1–9 and 1–10) is initiated at the originating hospital and is used as the patient's chart during the entire flight.



PATIENT MOVEMENT RECORD

DATA PROTECTED BY PRIVACY ACT OF 1974 — PERMANENT MEDICAL RECORD

(S) - Information needed to submit patient movement record

SECTION I — PATIENT IDENTIFICATION

(s) NAME (Last, First, Middle Initial)	(s) SSN	DATE OF BIRTH
High, Fly N.	234-56-7891	19560704

(s) AGE	(s) SEX	(s) STATUS	(s) SERVICE	(s) GRADE	(s) UNIT OF RECORD AND PHONE NUMBER	CITE NUMBER
52	M / F	AD	AF	0-5	80th FTW (940) 676-1112	

SECTION II — VALIDATION INFORMATION

(s) Medical Treatment Facility Origination and Phone Number	(s) Ready Date (Julian Date)	APPOINTMENT DATE	NUMBER OF ATTENDANTS
82d Medical Group, Sheppard AFB, TX (940) 676-1110			(s) MEDICAL / (s) NON-MED
(s) Medical Treatment Facility Destination and Phone Number	(s) CLASSIFICATION 1A-5F		
59th Medical Wing, Lackland AFB, TX (210) 671-1110	AMBULATORY / LITTER / (s) PRECEDENCE		

(s) Reason Regulated	Max # Stops	Max # RONS	Altitude Restriction	(s) CCATT Required	Name, sex, weight, rank of attendants:	U	P	R
				yes / no				

SECTION III — OTHER INFORMATION

(s) Attending Physician name, Phone Number and e-mail	(s) Accepting Physician name, Phone Number and e-mail
(s) Origination Transportation 24 Hour Phone Number	(s) Destination Transportation 24 Hour Phone Number

(s) Insurance Company	Address	Phone #	Policy #	Relationship to policy holder

(s) Waivers (med equip, etc)

SECTION IV — CLINICAL INFORMATION

(s) Diagnosis	(s) Allergies	LABS (Date and time drawn in Zulu)			
		WBC	HGB	HCT	Other Labs

(s) WEIGHT: (S) Blood type:

battle casualty / disease / non-battle injury

Vital Signs (Date and time taken in Zulu)								
Date	Time (Zulu)	B/P	Pulse	Resp	Pain Level: /10	Last Pain Med:	O_2 /LPM:	Route:

Baseline 02 Sat if Applicable _____ Temp _____

CLINICAL ISSUES

Infection Control Precautions: LMP:

Date of last bowel movement:

High Risk for Skin Breakdown: yes / no

Initial appropriate boxes:

Yes	No		Yes	No	
		Hearing Impaired			Hypertension
		Communication Barriers			Dizziness
		Vision Impaired			Voiding difficulty
		Cardiac Hx			*Takes long-term meds
		Diabetes			*Will self-medicate
		Motion Sickness			Has adequate supply of meds
		Ears/Sinus Problems			Knows how to take meds (verbalized understanding)
		Respiratory difficulty			
		*Medication listed on physician's orders			

SPECIAL EQUIPMENT (Check all that apply)

Suction		Traction		Orthopedic devices		OTHER:
NG Tube		Monitor		Restraints		
Foley		Trach		Chest Tubes		
Incubator		IV Pumps		IV Location:		

Cast Location: _____ Bivalved: yes / no

Ventilator Ventilator Settings:

DIET INFORMATION (Check all that apply)

NPO Soft Full Lig Cl Liq Reg

Renal _ Gm Protein _ Gm Na _ Meq K _ Mag Sulfate

Tube Feeding _____ Type _____ cc/hr _____ Discontinue for Flight

Cardiac Diabetic _____ cal Infant formula: Pediatric Age:

TPN:

Other(specify):

SECTION V — PERTINENT CLINICAL HISTORY (Transfer Summary)

Physician's Signature	Date/Time
Signature of Clearing Flight Surgeon	Date/Time

AF IMT 3899, 20060819, V1

SI085182114

Figure 1–9. AF Form 3899, Aeromedical Evacuation Patient Record.

Remember that it delays the patient's treatment at the receiving hospital when part of the hospital record or x-ray films are lost during transfer. Be sure to pick up and deliver all of the patient's records whenever you are transporting a patient.

PATIENT MOVEMENT RECORD (continuation)

DATA PROTECTED BY PRIVACY ACT OF 1974 — PERMANENT MEDICAL RECORD

PATIENT MOVEMENT PHYSICIAN ORDERS (for continued care in the AE system and at enroute stops)

SECTION I. PATIENT IDENTIFICATION

1. NAME (Last, First, Middle Initial)	2. GRADE	3. SSN#
High, Fly N.	0-5	234-56-7891
4. ALLERGIES	**5. ORIGINATING MTF**	**6. DESTINATION MTF**
PCN	82 Medical Group	59th Medical Wing

SECTION II. MEDICATION ORDERS (Drugs and IVs)	SECTION III. OTHER ORDERS (Procedures, Treatment, V/S Frequency, ETC)
yes X no patient will self-medicate with the following medications:	

AF IMT 3899, 20060819, V1 *(REVERSE)* SI085182115

Figure 1–10. AF Form 3899, Aeromedical Evacuation Patient Record (Reverse).

Personal belongings

Each patient’s clothing and other personal belongings should be packed in a suitcase, duffel bag, flight bag, footlocker, or some similar container that can be stored easily in the aircraft baggage compartment. This baggage, which normally is limited to 66 pounds (lbs.), is not available to the patient during flight. Therefore, each patient should be instructed to carry a small kit or handbag containing personal items, such as shaving gear and toilet articles. These items will be needed if there are overnight stops or delays due to weather or mechanical problems. The weight of a handbag or kit

is included in the total authorized weight. In some instances, the commander of a medical facility may authorize up to 100 lbs. of baggage for an Armed Forces patient. When this excess allowance is authorized, it must be shown on the patient's orders. A DD Form 600 is filled out and attached to each piece of baggage that accompanies a patient aboard the aircraft.

Before a patient leaves the originating hospital, arrangements are made for the safeguarding of the patient's valuables (jewelry, watches, wallets, and money, etc.). Ordinarily, patients who are able to do so assume responsibility for their own valuables. But patients in classes 1A (severe psychiatric litter patient requiring sedation and restraint), 1B (psychiatric patient requiring sedation), and 2A (immobile litter patient) usually are not physically or mentally able to safeguard their property. In such cases, the designated custodian of patients' valuables receives the property, signs an itemized list, and forwards the items by registered mail to the destination hospital. If the patient has a large amount of money, it is usually converted into money orders or traveler's checks before it is mailed. The custodian of patients' valuables at the receiving hospital assumes responsibility for this property until it can be turned over to the patient or the patient's family.

Nursing measures

In addition to the administrative activities discussed above, there are a number of more specific nursing measures that must be considered by the nursing-care team prior to the patient's departure. Prominent among these nursing measures are the following:

1. Give preflight medications at exactly the time prescribed by the physician.
2. Mark each special medication to be sent with the patient. Indicate the name of the patient, name of the drug, strength of the drug, and administration directions.
3. Change dressings as near to the time of departure as possible.
4. Provide a 24-hour supply of dressings.
5. Give intravenous (IV) fluids as near to the time of departure as possible.
6. Send IV sets and fluids if they will be needed in flight.
7. Insert in-dwelling catheters before departure.
8. Provide an adequate supply of irrigating solution, if irrigations are required.
9. Send drainage bags and tubing, if urinary drainage is necessary.
10. Provide supports for the limbs of paralyzed patients.
11. Transport paraplegic patients on Stryker frames.
12. Provide equipment for patients in traction.
13. Bivalve (cut) casts that have been applied within 24 hours of departure time.
14. Search psychotic patients.
15. Make arrangements for diets.
16. Provide formulas for infants and baby food for young children.
17. Make sure that all patients with a diagnosis of active pulmonary tuberculosis are provided with facemasks and are transported on litters.

Subsisting elsewhere

Occasionally, a physician authorizes a patient to live outside the hospital while still receiving treatment. This status is called *subsisting elsewhere* or *subsisting out*. To authorize this status, the physician annotates his/her approval on an AF Form 3066 and forwards it with the patient's record to the disposition clerk. As soon as the record is received, the patient receives an AF Form 577 and clears the hospital. Keep the patient's record in the suspense file, pending final disposition action.

During the treatment period, the patient may live in bachelor/unaccompanied quarters or at home. As long as the treatments continue, records, reports, and hospital census list the patient as subsisting out.

During this period the patient's status remains "excused from duty." The physician must see the patient frequently to check progress. The subsisting-out period ends when the patient is either discharged to duty or readmitted to the hospital.

Your responsibilities for this type of disposition are the same as with a discharge. Unless the patient requires a treatment that is only done on your unit, you probably won't be involved in any further care for the patient.

Discharge from the medical facility

Discharge is the final departure of the patient from the inpatient unit. A patient is discharged when he or she is recovered sufficiently enough to be sent home or returned to duty. Several administrative procedures are necessary before a patient can leave the hospital. First, the physician must complete the patient's record and check it for accuracy. If official approval is required from the chief of service, the physician gets it before completing the record. The physician writes the final progress note on SF 509, fills out the disposition information on AF Form 560, and signs the form. The physician also dictates or writes a summary of the patient's care on SF 502, Medical Record—Narrative Summary. This summary should state the reason the patient was hospitalized, tests or procedures done, results or findings of the hospitalization, patient's condition on discharge, and instructions given to the patient and family. The instructions should discuss physical activity, medications, diet, and follow-up care.

NOTE: A final progress note in SF 509 may be substituted for the narrative summary for patients who have been hospitalized for less than 48 hours, normal newborn infants, and uncomplicated deliveries. The summary may be either dictated or handwritten for patients who have been hospitalized less than eight days but should be either typed or dictated for all other patients.

The nurse also reviews the patient's record for accuracy and completeness. He or she writes a discharge note that documents nursing observations of the patient's condition, any final treatments given, and any discharge instructions given. The discharge note states how the patient showed understanding (verbal response or practical demonstration) of the discharge instructions. The final entry in the progress notes is the time that the record was forwarded to the A&D office.

After the physician and nurse complete and verify the record, it may be your responsibility to combine all parts of the record and assemble the documents in the proper order. Arrange forms in numerical order with standard forms first, DD forms second, and AF forms last. You should file local and command forms beneath all others, sequenced according to local policy.

NOTE: AFI 41–210, *Tricare Operations and Patient Administration Functions,* provides a list of forms to be assembled after the patient is discharged; there are some exceptions to the sequence of these forms.

When you have fully assembled the record, place it in an envelope and send it to the disposition office. The disposition clerk reviews and consolidates the record. If necessary, he or she also arranges for the patient's transportation. When that is done, the clerk phones the inpatient unit to "OK" the patient's clearance and informs the unit personnel of any transportation arrangements that have been made.

When the unit personnel receive the call, they initiate the discharge process in the patient's electronic health record and an AF Form 577. They also may use pre-approved, area-specific discharge forms that summarizes nursing care during hospitalization, patient status at discharge or transfer, and activities, medications, and treatments indicated after discharge. The last place to be cleared will be the disposition clerk. If the patient is required to pay any hospitalization charges, he or she must clear the MSA office in person. Also, if the patient has stored any valuables, he or she must present a copy of AF Form 1052. When this is done, the patient reports to the disposition clerk with AF Form 577 and then departs the hospital. Active duty personnel are returned to duty or placed on convalescent leave, and nonmilitary patients are discharged from treatment.

There is also a certain amount of physical preparation that must be done for a discharge. The patient will give you a copy of DD Form 599 to obtain his or her clothing stored in the unit. Review the checklist with the patient to be sure all the clothing is there, and then have the individual sign the hard copy. Help the patient assemble all personal effects; make sure there is nothing left behind in a closet or bedside stand. In many facilities, it is routine to help gather the discharged patient's belongings and transport the person to the car in a wheelchair, if necessary. Though this may not be necessary in all cases, it is always good nursing practice to escort the patient to the car. It gives you an opportunity to say good-bye and helps prevent any accidents as the patient leaves.

When you return to the unit, prepare the discharged patient's area for the next admission. Remove and destroy the locator card, strip the linen from the bed, and remove any used equipment from the bedside stand. Your local policies dictate who is responsible for terminal cleaning of a patient's area. Once that is done, remake the bed (closed) and replace any equipment items that were used. Erase the patient's name and other information from the status board and notify the dietary department of the patient's departure.

202. Documenting nursing care

You should remember the number one rule about documentation, "If it wasn't documented, then it wasn't done!" It is just as important to document all of the patient's care in the inpatient record as it was in the outpatient record.

The patient's healthcare provider (physician, dentist, or CNM) is primarily responsible for maintaining and protecting the inpatient record while it is in the unit. The provider also is responsible for all record entries that reflect professional judgment or indicate specific orders regarding the patient's treatment. Your unit 4A shares this responsibility for record maintenance, care, and protection. If there is no 4A assigned to your unit, the unit charge nurse assumes this responsibility and will delegate certain aspects of it to you.

Inpatient medical records

The inpatient medical record is designed to capture all information pertaining to the care of a hospitalized (admitted) patient. AFI 41–210 contains information relating to prescribed forms for inclusion in the inpatient medical record. Some of these forms may be overprinted to facilitate the needs of the local facility. Medical personnel should refer to both the AFI and local policy when assembling and documenting the inpatient medical record.

Contents of the inpatient medical record

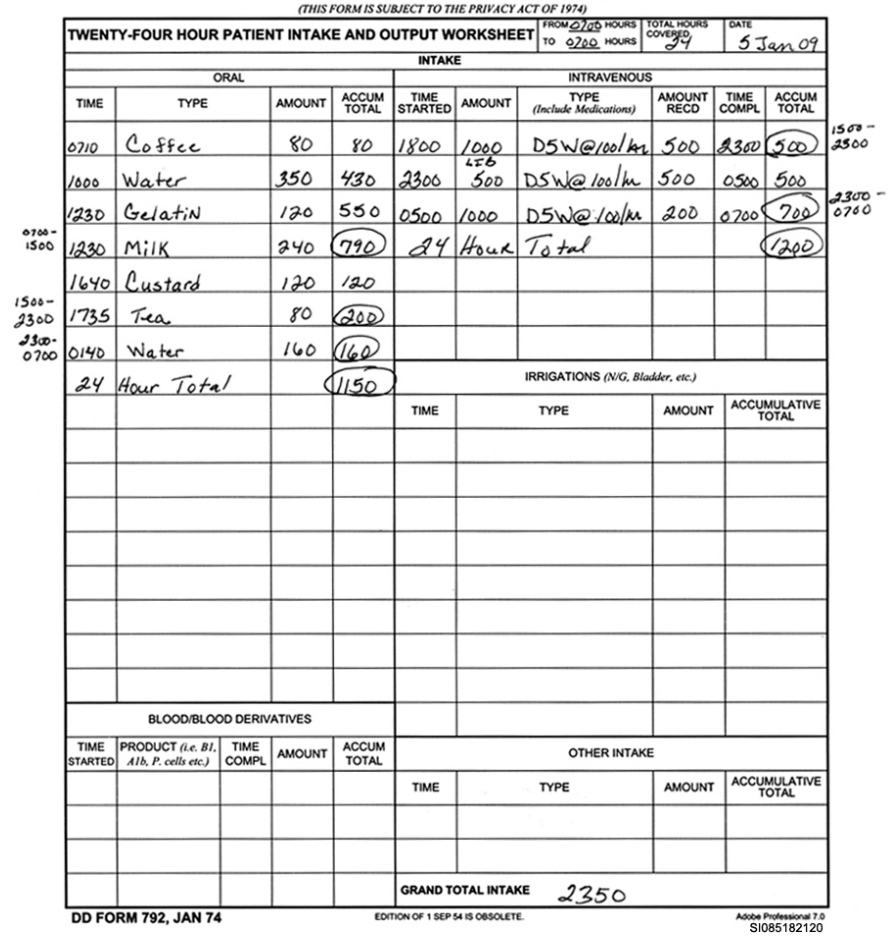
You may be responsible to assemble the record. (For the sake of simplicity and reality, we will assume there is no 4A assigned to your unit.) It is your responsibility to ensure that the patient's ID is either imprinted or written in the ID space on each form and to add additional forms as needed. You must also maintain the chart so that it presents a neat appearance. If a patient is hospitalized for an extended period and accumulates a lot of forms, you may have to remove some of the older forms and place them in a separate location. There are some standard forms in every record, while others are added when needed. Let's look at some of the more common forms and how to use them.

Many forms are available for inclusion in the inpatient record. Some forms are mandatory for use, while others are used only on an "as applicable" basis. In general, forms commonly seen in the inpatient medical record are used for the following purposes:

- Record of inpatient treatment.
- Admission authorization and treatment statement.
- Narrative summary of the medical record.
- Clinical history.
- Record of physical examination.

- Adult, pediatric, or neonatal admission note.
- Progress notes.
- Data record.
- Consent authorization.
- Laboratory test results.
- Radiology test results.
- Doctor's orders.
- Medication administration record.
- Patient-care plan.
- Record of vital signs.
- IV record.
- Record of intake and output (I&O).
- Treatment flow sheet.
- Personal property inventory.
- Discharge note.

All forms included in the inpatient record should be the original copy. Each form must include, at a minimum, the patient's name, hospital admission register number, Social Security number, and name of the treating facility.



(THIS FORM IS SUBJECT TO THE PRIVACY ACT OF 1974)

TWENTY-FOUR HOUR PATIENT INTAKE AND OUTPUT WORKSHEET — FROM 0700 HOURS TO 0700 HOURS — TOTAL HOURS COVERED 24 — DATE 5 Jan 09

INTAKE

ORAL

TIME	TYPE	AMOUNT	ACCUM TOTAL
0710	Coffee	80	80
1000	Water	350	430
1230	Gelatin	120	550
1230	Milk	240	790
1640	Custard	120	120
1735	Tea	80	200
0140	Water	160	160
24	Hour Total		1150

0700–1500 / 1500–2300 / 2300–0700

INTRAVENOUS

TIME STARTED	AMOUNT	TYPE (Include Medications)	AMOUNT RECD	TIME COMPL	ACCUM TOTAL
1800	1000	D5W@100/hr	500	2300	500
2300	500 LIB	D5W@100/hr	500	0500	500
0500	1000	D5W@100/hr	200	0700	700
24	Hour	Total			1700

1500–2300 / 2300–0700

IRRIGATIONS *(N/G, Bladder, etc.)*

TIME	TYPE	AMOUNT	ACCUMULATIVE TOTAL

BLOOD/BLOOD DERIVATIVES

TIME STARTED	PRODUCT (i.e. Bl, Alb, P. cells etc.)	TIME COMPL	AMOUNT	ACCUM TOTAL

OTHER INTAKE

TIME	TYPE	AMOUNT	ACCUMULATIVE TOTAL

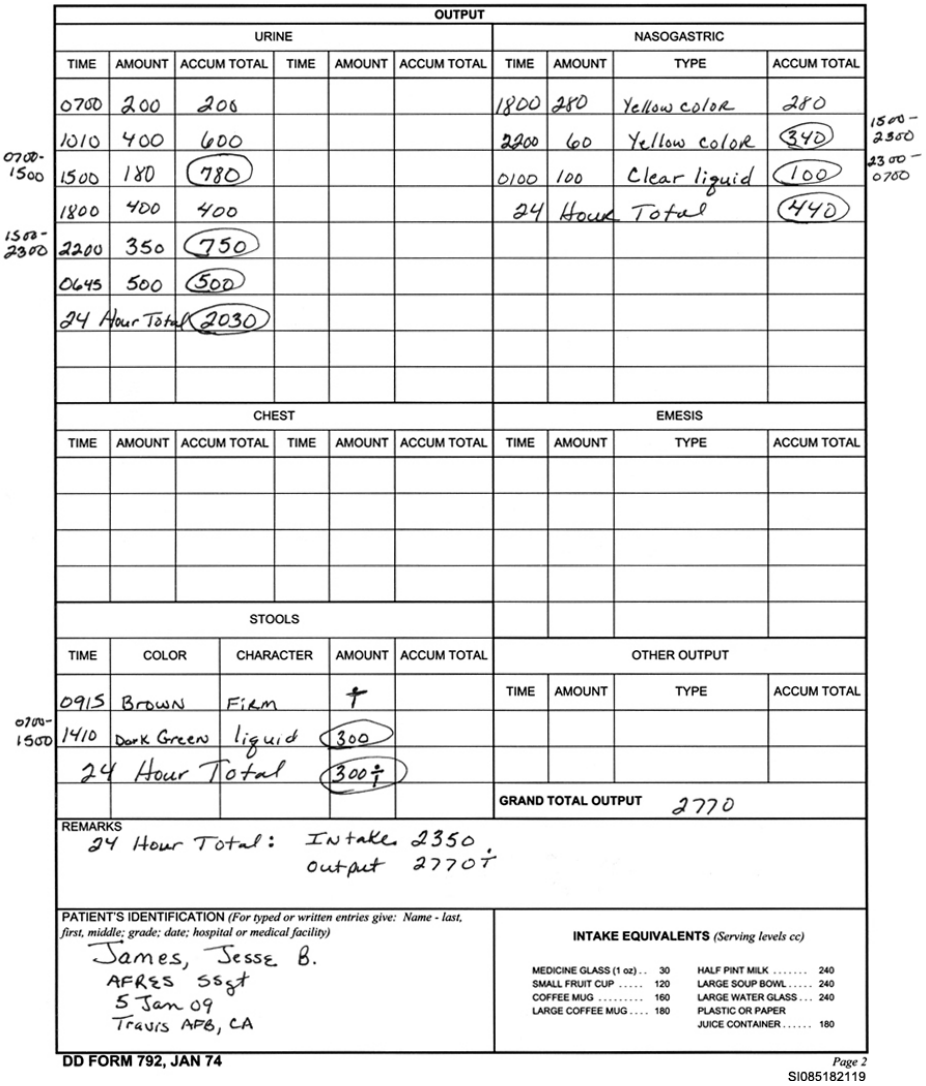
GRAND TOTAL INTAKE 2350

DD FORM 792, JAN 74 — EDITION OF 1 SEP 54 IS OBSOLETE. — Adobe Professional 7.0 SI085182120

Figure 1–11. DD Form 792, Twenty-Four Hour Intake and Output Flow Sheet.

Technician documentation

Two common forms that you will be responsible for completing on an inpatient unit are the DD Form 792, Nursing Service–Twenty-Four Hour Patient Intake and Output Worksheet (figs. 1–11 and 1–12) and the locally generated vital-signs spreadsheet. An explanation of each is given below. A doctor may also order weight and/or girth measurements at determined intervals for some patients.



OUTPUT

URINE

TIME	AMOUNT	ACCUM TOTAL	TIME	AMOUNT	ACCUM TOTAL
0700	200	200			
1010	400	600			
1500	180	780			
1800	400	400			
2200	350	750			
0645	500	500			
24 Hour Total		2030			

NASOGASTRIC

TIME	AMOUNT	TYPE	ACCUM TOTAL
1800	280	Yellow color	280
2200	60	Yellow color	340
0100	100	Clear liquid	100
24 Hour Total			440

CHEST

TIME	AMOUNT	ACCUM TOTAL	TIME	AMOUNT	ACCUM TOTAL

EMESIS

TIME	AMOUNT	TYPE	ACCUM TOTAL

STOOLS

TIME	COLOR	CHARACTER	AMOUNT	ACCUM TOTAL
0915	Brown	Firm	+	
1410	Dark Green	liquid	300	
24 Hour Total			300+	

OTHER OUTPUT

TIME	AMOUNT	TYPE	ACCUM TOTAL

GRAND TOTAL OUTPUT 2770

REMARKS
24 Hour Total: Intake 2350
Output 2770+

PATIENT'S IDENTIFICATION *(For typed or written entries give: Name - last, first, middle; grade; date; hospital or medical facility)*
James, Jesse B.
AFRES SSgt
5 Jan 09
Travis AFB, CA

INTAKE EQUIVALENTS *(Serving levels cc)*

MEDICINE GLASS (1 oz)	30	HALF PINT MILK	240
SMALL FRUIT CUP	120	LARGE SOUP BOWL	240
COFFEE MUG	160	LARGE WATER GLASS	240
LARGE COFFEE MUG	180	PLASTIC OR PAPER JUICE CONTAINER	180

0700–1500
1500–2300
1500–2300
2300–0700
0700–1500

DD FORM 792, JAN 74 Page 2
SI085182119

Figure 1–12. DD Form 792, Intake and Output Flow Sheet (Reverse).

Intake and output

For patients with certain diseases or injuries, or for those receiving IV fluid therapies, an I&O record is often ordered by the physician. This consists of keeping an accurate, complete record of all fluids taken into the body and all fluids that leave the body. The DD Form 792, or the form used in your facility commonly referred to as the I&O flow sheet, has two sides. The first side is used solely for recording items of intake. The reverse side of the form is used solely for recording items of output.

Recording intake

Once you determine how much fluid the patient received, record it on the front side of the I&O flow sheet. Examples of measurable intake are fluids taken by mouth (e.g., Jell-O, ice cream, soups, bouillon, and any liquid drinks) and IV fluids (e.g., blood products, hyperalimentation, and clear IV solutions).

Block	Explanation
Top Section	This area of the form indicates the start and stop time for the form. The date is filled in and the time is written in next to the word “from.” At the end of 24 hours, a time is placed next to the word “to” and 24 is put in the “total hours covered” block. If the patient is taken off I&O before 24 hours has gone by, then the actual number of hours covered would be written here.
Oral	This area of the form is for documenting fluids that have been taken orally. Some agencies also record nasogastric feedings in this area.
Type	Enter the type of fluid consumed (e.g., orange juice, milk, ice cream, etc.).
Amount	Enter the amount consumed for each item in milliliters (mL).
Accum Total	This block represents the accumulated total of oral intake. Each time an amount is entered, it is added to the preceding total. For the first entry on each shift, the accumulated total is the same as the figure entered in the amount box.
Blood/Blood Derivatives	This portion of the form is used for documenting intake of blood products.
Intravenous	This block of the form is used for documenting the intake of IV fluids.

Recording IV Intake	
Time Started	Time when the IV is initiated or when there is fluid remaining in the bag at shift change. When you first “hang” the solution, chart the IV by completing the “time started,” “amount,” and “type” boxes.
Amount	In this section, write in the milliliter amount of what was in the bag when the IV was started. It is also completed when there is fluid remaining in the bag after shift change.
Type	When the IV is first started or when there is fluid remaining in the bag at shift change, the following information should be entered: • Type—The name of the solution. • Rate per hour—When a physician orders an IV for a patient, the amount of fluid the patient is to receive each hour is specified. A typical order might be 5 percent Dextrose at 100 mL per hour. This would be written on the form as D5W@100/hr.
Medications	If medications were added to the IV fluid, both the IV bag and the form would reflect the amount and type of medication added. The nurse will be responsible for any IVs that have medication added to them.
Amount Recd	This block is not completed until the IV bag is changed, discontinued, or until a shift change occurs. You cannot fill in this block when the IV is first started because the patient has not received any IV solution. After changing the bag, discontinuing the IV, or at a shift change, take the amount the bag originally had in it and subtract what is left.
Time Completed	When the IV bag is changed, discontinued, or when shift change occurs, write the time in this block.

Block	Explanation
Accum Total	This block is used to keep a “running total” of the IV fluids received. For the first IV on a shift, the “Accum Total” is the same as the “Amount Recd” block. After that, the accumulated total is increased each time an amount is entered in the “amount recd” block. After the shift changes, the “Accum Total” begins over again.
Irrigations	This area of the form is used for documenting intake of fluids from an irrigation. Other Intake—This section is used to document an intake that does not fit logically in other areas of the form. An example of an item that would be charted here might be fluid taken in during peritoneal dialysis (a complicated procedure in which wastes are removed from the blood by running special fluids into the abdomen and then withdrawing them). Grand Total Intake: This area is completed at the end of 24 hours (or earlier if the patient is removed from I&O).

Block	Explanation
	1. Step #1—On the first open line in each section of the form that was used, write in the words “24 HOUR TOTAL” across the line, but leave the accumulated total block empty. 2. Step #2—Add up all of the circled shift change totals in the section. Enter the sum in the accumulated total box next to the words “24 hour total.” 3. Step #3—Circle the amount.
Time	Fill in the time you are making the entry. If you are charting a number of entries at the same time, do not use ditto marks. Enter the time using the “24-hour clock” for each entry.

Recording output

Once you have measured the amount of output, record it on the back side of the DD Form 792 or the form used in your facility. Examples of measurable output are urine, stool, emesis, wound drainage, and drainage from a nasogastric (NG) tube.

Sections on the Output Side	
Block	**Explanation**
Urine	Urine output is charted in this area. Notice that this section has two columns. When recording entries, you will complete the entire left-hand column before moving to the right-hand column.

Procedure	
Time	After you empty any urine output, write the time in this block. Urine drainage bags are usually emptied at shift change. Of course, they would also be emptied earlier if they become full. Urinals and bedpans are emptied immediately after they are used.
Amount	Enter the amount (in mL) for each entry.
Accum Total	This block is used in the same way that was outlined earlier. For the first entry on a shift, the accumulated total would be the same as the amount.
Shift Change	The shift changes are recorded exactly as they were shown earlier. Finally, circle the amount in the accumulated total.
Denoting abnormalities	There is no box provided for describing the nature of the urine output, so if you wish to make a comment, you would write it in the “remarks” section of the form. When using the remarks area, include the time you are making the entry. For example, if at 0900 you emptied a urinal, and you notice that the urine had blood in it, you would write: 0900–blood noted in urine.
Chest	This block is used for chest tube drainage. A chest tube is a tube that is surgically implanted in the pleural space surrounding the lungs.
Stools	This area is used for recording liquid or solid bowel movement output. Solid stool symbols are documented as: • i = 1 solid bowel movements (BM). • ii = 2 solid BMs. • iii = 3 solid BMs. These symbols are merely adaptations of roman numerals. When you are required to add a liquid stool and a solid stool together, combine the milliliter amount with the symbol (e.g., 250/i).
Nasogastric	Used for charting any output that occurs through a nasogastric tube. The last sections of the form are recorded in an identical manner; however, you should not confuse NG output with emesis output. NG output results when fluids are removed from the stomach by way of an NG tube. Emesis output is the product obtained when a patient vomits. Document amount in milliliters.

Procedure	
Emesis	Any emesis output would be recorded in this area of the form. For NG and emesis output, include such things as the color and the presence of mucous, blood, or other abnormalities. Review the following information for an understanding of the significance of various observations: • Bile colored—Yellowish-green; possible bitter odor. • Clear—Primarily water. • Coffee grounds—Particles that resemble coffee grounds indicate partially digested blood. • Blood tinged—Rusty color with possible streaks of fresh blood; indicates possible gastric bleeding. • Blood—Completely bright or dark red; indicates possible uncontrolled bleeding in the upper gastrointestinal (GI) tract. Considered a true emergency. • Bile or clear coloration with mucous—Fairly normal due to the interior of the GI tract being lined with a mucous membrane. • Undigested food—Used almost solely for emesis output; characterized by particles of food in a liquid base.
Other Output	Any output that does not logically fit into other areas of the form is charted here. An example of other output might be wound drainage that has been collected in a container. You can include color or quality here as well. (Small amounts of wound drainage, such as that found on a dressing, are not charted.)
Grand Total Output	This area is completed at the end of 24 hours (or earlier if the patient is taken off I&O).
Remarks	The "remarks" area can be used for a number of purposes. Often the patient's diagnosis is written here. It can also be used to give a more detailed description of a type of fluid output.

Documenting a shift change

The flow sheet generally runs for 24 hours, so we must have a method of showing how much fluid the patient received on each shift. This is accomplished by circling the last accumulated total for that shift. Once a shift change has been documented, begin the accumulated total over again. Completed forms will be filed in the patient's inpatient record.

Vital signs

Documenting vital signs is as important as taking them! Remember, if it hasn't been documented, it hasn't been done. By now, you have been taking vitals and recording them on a daily basis; therefore, simply review the form used in your facility for the proper recording of these signs.

Body weight

For an accurate body weight measurement, the individual must be weighed on scales that are calibrated properly. The frequency for calibration varies, depending on the manufacturer's recommendations and current AF guidance. The individual's weight is determined with his or her shoes off and dressed in any standard duty uniform. Have the individual remove all contents from pockets and any extraneous equipment or outer clothing. When reading the measurement, stand either directly in front of or behind the scale. Reading the scale from either side rather than straight on reduces accuracy. Subtract 3 lbs. for clothing and record the result to the nearest quarter pound. As you know, many medications are calculated and administered based on the patient's weight in kilograms (kg); therefore, you must be able to convert pounds to kilograms. When converting pounds to kilograms, remember, 1 kg = 2.2 lbs.

Measurement of girth

The measurement of girth is the distance around something. In some cases, you may be asked to measure the girth of an abdomen. Other girth measurements include the chest, upper arms, waist, hips, thighs, calves, or ankles. Most of the time, these measurements are taken for a health assessment

of the patient. The abdominal girth may be taken daily for patients with cirrhosis of the liver or when internal bleeding may be suspected. To measure a girth, place a tape measure around the body part to be measured, take the measurement in inches or centimeters, then record.

It is extremely important that these forms are documented accurately and on time. They are also a useful visual aid of the status of your patients. Take it upon yourself to become competent and accurate when performing these vital measurements! Your patient's life depends on it.

Documenting in the patient record

The Chief Nurse is responsible to ensure guidelines are in place for documenting patient contacts and care and must comply with standards that are published by the American Nurses Association (ANA) and The Joint Commission (TJC) or the Accreditation Association for Ambulatory Health Care (AAAHC). At a minimum, documentation should include: patient assessment, care provided, the patient's response to the care rendered, and patient and family education. Further information of administration of medical records can be found in AFI 41–210. While medical facilities are authorized to develop local overprints to document nursing care, all forms must be approved by the facilities' medical records and form approval committee.

When documenting in a patient's record, you must use reproducible black or blue-black ink. If you make an error, you can correct it by simply lining through the incorrect information, write the correct information next to the lined-through information, and then initial and write the date you made the correction. Do NOT scribble or make multiple lines through the error. There should not be any lines between entries.

There are several authorized systems to documenting patient care. You may already be familiar with the subjective, objective, assessment, plan, and prevention (SOAPP) format. SOAPP is primarily used to document outpatient visits. It is listed here as refresher and so you can see the difference in terms used for inpatient and outpatient documentation.

SOAPP stands for the following:

Letter	Meaning	Explanation
S	Subjective information	This is information either stated by the patient or significant other pertaining to the patient's condition.
O	Objective information	Information that is observed by the healthcare worker. Objective data includes such things as vital signs, a description of the patient's illness or injury, and observable behavior.
A	Assessment	Is a preliminary conclusion about the problem. This conclusion is derived from the subjective and objective information already gathered.
P	Plan	Is the nursing activities or intervention that will be used to assist in resolving the problem. The plan must be a clear, concise description that specifies exactly what, when, and how the activity should be done. Plans can be diagnostic, therapeutic, or educational in nature.
P	Prevention	Counsel patients (including providing printed media) on health and wellness/preventive medicine topics, based on identified health and occupational risks, and the patient's desire to change associated beliefs and behaviors.

Having described the SOAPP note, it's important to stress that this method does *not* give anyone other than the licensed provider the legal right to diagnose. It does, however, show how all members of the team are able to work together in an effort to provide optimum care for the patient.

Documenting nursing assessments

If you recall information that you learned in technical school and in previous career development course (CDC) volumes, you should understand how to make an assessment of a patient. You begin

your assessment as soon as you see your patient. You should observe any outward physical signs, such as limping or facial expressions (do they look happy or scared, or is their face a grimace of pain?). You should also note the general condition of the patient. Do they look clean and well-kept or do they look like they have been living on the street for a month?

Documenting interventions/procedures

The physician uses AF Form 3066 to transmit written orders for the patient's care and treatment to the nursing personnel. It is also used to establish and maintain a drug profile on the patient and to order unit doses of medication. The physician must write and sign *all* orders for patient treatment and care. When the physician writes an order, he or she will pull back the plastic cover, exposing a red metal tab on the back of the patient's chart to indicate that there is a new order. In an emergency situation, a registered nurse can accept a verbal or telephone order. In such a case, the nurse writes the order in the appropriate space on AF Form 3066 and signs the physician's name followed by his or her own signature. Verbal orders must be countersigned by the physician within 24 hours.

It is the nurse's responsibility to carry out these orders, although you may actually perform the task. The nurse writes "noted," to indicate that the orders have been carried out and the time and date and signs the column next to the physician's signature. The nurse also writes the abbreviation "REQ" next to any diet orders to indicate that the diet has been requested, and "SMO" (slip made out) next to any orders for consults, lab tests, or x-rays. The nurse annotates the orders and recovers the red tab. On a busy unit with 30 or 40 patients, it is very easy to overlook a chart with a red tab exposed. If you see such a chart in the rack, do not hesitate to pull it and check it to see if the orders have been noted. If they haven't, call it to the nurse's attention immediately. You are part of a team that should be concerned for each other, as well as for the patient.

Document patient education

Regardless of which system your facility uses, ensure that you follow a few important steps:

1. Confirm that you have the correct patient's chart or paperwork. Be especially careful if you have personnel or family members with similar names. A good practice is to verify the patient's name, and then check the Social Security number to ensure you have the correct patient information.
2. Write in black or blue-black ink. You should never use a pencil as the information being documented in considered a legal document. You must ensure the information cannot be erased or changed without using the proper process (lining through an error).
3. Ensure others can understand what you wrote. Your writing must be legible.
4. Sign the entry and place the completed paperwork in the patient's chart. Digitally sign electronic records.

Preoperative documentation

The surgical checklist is one of the most important documents you'll use when assigned to transport patients to the OR. If you use this form properly, you'll avoid delaying surgery by ensuring all ordered preparations are completed and all requested documents and test results are transported to the OR with the patient.

Purpose

When preparing a patient for transport to the OR, you will assist the nurse with checking the patient's chart. You will use a locally devised surgical checklist to ensure all ordered procedures prior to surgery have been completed. Figure 1–13 is an example of the information you will likely find on a surgical checklist even though the figure in the example is no longer available. Many facilities use a pre- and postoperative checklist. It is a helpful tool used to remind personnel of, and to document completion of, the routine procedures involved in pre- and postoperative patient preparation and care. By using the surgical checklist properly, you ensure all required forms, reports, and consent

statements are included in the patient's chart. The checklist also shows which preparatory procedures have been done and which ones do not apply.

PATIENT'S IDENTIFICATION
005136
Ellard, Vicky L.
MSgt 123-45-6789
81st Medical Group
Keesler AFB Ms

SURGICAL CHECKLIST

UNIT/ROOM/BED
4-B /424 /B

INSTRUCTIONS: INITIAL OR MARK N/A IF NOT APPLICABLE

CLINICAL RECORDS

SF 515 - TISSUE EXAMINATION		PRE-OP COUNSELING TO PATIENT	JM
SF 516 - OPERATION REPORT		A. M. CARE/PREP	JM
SF 517 - ANESTHESIA	✓	VALUABLES AND JEWELRY REMOVED	JM
SF 518 - BLOOD TRANSFUSION _____ UNITS		HAIRPINS, MAKEUP, NAILPOLISH REMOVED	JM
SF 522 - OPERATIVE PERMIT *(Signed and Witnessed)*	✓	DENTURES/BRIDGE REMOVED	NA
SF 509 - PROGRESS NOTE *(Contains physician's informed consent)*		CONTACT LENSES/GLASSES, GLASS EYE, HAIRPIECE, PROSTHESIS REMOVED	JM
BLOOD TRANSFUSION CONSENT		VOIDED *(Specify time)* @ 0730	JM
MEDICATION ADMINISTRATION RECORD			
IV FLOW SHEET		ENEMA *(if ordered)*	NA
HISTORY AND PHYSICAL	✓	ID/ALLERGY BAND(S) ON NON-OPERATIVE ARM (LEGIBLE)	JM
SF 511 - T.P.R. GRAPHIC	✓		
NURSE NOTES	✓	INPATIENT IDENT PLATE ON CHART TO OR	JM
DOCTORS ORDERS	✓		
X-RAY *(ONLY the required)*		NPO SINCE: Midnight	JM
REPORTS			
FILMS	✓	PRE-OP MEDICATION *(Specify kind and time administered)*	
LABORATORY REPORTS *(ONLY the required)*		NO ( ) YES (✓) *(see Medication Record)*	
HEMATOLOGY	✓		
URINE	✓		
EKG	✓		
(Prior to pre-op medication)		CATHETER IN PLACE	

T	P	R	BP	WT	YES	NO	CLAMPED	TO DRAINAGE
98°	72	18	120/80	140		✓		

KNOWN ALLERGIES
None

COMMENTS

DATE AND TIME RELEASED TO OR:
12 Jan 08 0800hrs

SIGNATURE OF NURSE RELEASING PATIENT TO OPERATING ROOM
Jane Nurse

DD FORM 1924, OCT 93 *(EF-V1)* *(PerFORM PRO)* PREVIOUS EDITIONS ARE OBSOLETE. SI955113022

Figure 1–13. Example of a Surgical Checklist.

Location and use

The surgical checklist is attached to the front cover of each surgical patient's chart. It is best used exactly as the title indicates—as a checklist. As each item on the surgical checklist is completed, the person who completes the task initials the block next to the item. If a listed item does not apply, "N/A" or "none" is written in the initials block. If the item should be but cannot be completed, the initials block is left blank, and the reason noted in the "Comments" section (or next to the item if space allows). For example, if the patient does not have dentures, "none" is written in the initials block. If the patient wears dentures but absolutely refuses to take them out, the initials block is left blank, and "patient refuses" is written next to "Dentures/Bridge Removed."

When you check the chart before transporting a patient to surgery and you notice an item not initialed, ask the unit nurse about it; he or she should complete it or document the reason for not doing so. Unless the OR supervisor or designee says otherwise, do not transport any patient until all items are either completed or properly documented on the checklist.

Checklist items

Items listed on the surgical checklist can be grouped into two categories—clinical records and patient-care procedures. The most commonly used forms and procedures are listed below.

Clinical records

A list of clinical records (forms) normally included in the patient's chart before transport to the OR is found on the left side of the surgical checklist. The patient ID section of each record should be complete; usually it is stamped with the patient ID card. Local policy dictates the exact forms and number required in each chart—some of these forms may be replaced by computer forms. The records, as they are listed on the checklist, include:

SF 515, Medical Record—Tissue Examination

At least two blank SF 515 forms should be located in the front (top) section of the patient's chart. These forms are filled out by the OR (also known as the circulating) nurse and surgeon to record all tissue specimens removed from the patient and then sent to pathology with the specimens.

SF 516, Medical Record—Operation Report

If this form is used in your facility, three copies of it should also be in the front of the chart. This form is completed by the circulating nurse to document significant facts related to the operative procedure. SF 516 serves as a summary of the operation.

Optional form (OF) 517, Medical Record—Anesthesia

Two copies of this form should be included with the operation report and tissue exam. This form is completed by the anesthetist to document the administration of anesthesia. OF 517 is a summary of the patient's vital signs and anesthetic agents used. In some hospitals, the anesthesia record is completed by the circulating nurse for procedures performed under local infiltration with no anesthetist present.

SF 518, Medical Record—Blood or Blood Component Transfusion

This form is NOT usually in the patient's chart before surgery. If the surgeon does not order blood, "N/A" is written on the checklist. If the surgeon orders blood, three copies of SF 518 are prepared for each unit of blood requested. The number of units ordered is written on the surgical checklist, and then the SFs 518 are sent to the blood bank. The blood bank technician uses these forms to document the typing and crossmatching of the units of blood. The SFs 518 are kept with each unit of blood until it is actually transfused. The transfusion is also documented on the same SFs 518; then the completed copies are placed in the chart. We discuss blood transfusion later in this volume.

NOTE: The number of units listed on the surgical checklist should correspond to the number listed on the surgery schedule; report any discrepancy to the nurse or anesthetist.

OF 522, Medical Record—Request for Administration of Anesthesia and Performance of Operations and Other Procedures (signed and witnessed)

This form is usually called simply "op permit." We have already discussed this form in detail, but we emphasize the importance of this consent. Remember, you must ensure the accuracy and completeness of this form. The patient must know exactly what is involved and agree to the procedure.

Ensure the op permit is signed and witnessed correctly. The time and date the consent was given should also be noted. Many hospitals establish a specific timeframe for consent (i.e., local policy may consider a consent form more than 24 hours old invalid). Check the description of the surgical procedure and the ID of the patient against the rest of the information in the chart (progress notes) and with the information on the surgery schedule. Report any discrepancy to the unit and the OR nurses.

SF 509, Medical Record—Progress Note (contains physician's informed consent)

The progress notes are usually in the middle of the chart, marked by an index tab. The main thing you check is the surgeon's written informed-consent statement. Verify it matches the op permit.

Blood transfusion consent

If the surgeon anticipates a blood transfusion during the procedure, he or she must obtain specific permission from the patient. This consent is usually documented on AF 1225, Informed Consent for Blood Transfusion. Many physicians routinely obtain this consent in case of emergency, so it may be in the patient's chart even if no blood has been ordered.

Medication Administration Record (MAR)

Any time a patient is administered a medication, it must be recorded. AF 3069, Medication Administration Record (MAR), and AF 3068, PRN Medication Administration Record, are usually used for this documentation. These forms are usually kept with the medications in the nurses' station, but when a patient is transported to surgery, the medication record(s) should be in the chart. Check the medication record for documentation of the preoperative medication.

IV flow sheet

If the patient has an IV line, all IV fluid administrations are recorded, usually on AF Form 3067, Intravenous Record. This record should also be in the chart, if applicable.

History and physical

The examining physician (usually the surgeon) documents the patient's history on SF 504, Medical Clinical Record—History, Part 1, and SF 505, Medical Record—History, Parts 2 and 3. The record of the patient's physical examination is recorded on SF 506, Clinical Record—Physical Examination. Ensure these records are in the chart.

Vital-signs spreadsheet

The vital-signs spreadsheet is used by nursing personnel to document vital signs (temperature, pulse, respiration, and blood pressure) during the patient's hospital stay. This form is not used to document vital signs during or immediately after surgery. The anesthesia and recovery room records are used for this purpose.

Nurse notes

Nursing notes are documented using SF 509. In most hospitals, before the patient is transferred to the OR, the unit nurse records:

1. The date and time the patient is transported to the OR.
2. The transport device used.
3. Safety methods or devices (side rails, safety straps, etc.) in place.
4. Name and rank of the transporting technician.

Some hospitals require the transporting technician to make these entries.

Doctor's orders

Doctor's orders are usually written on AF Form 3066, Doctor's Orders, or on the electronic version, AF Form 3066–1, Doctor's Orders. Items on this form that concern the surgery staff are the:

1. Surgeon's orders regarding preoperative skin preparation.
2. Preoperative medication order.
3. Surgeon's orders for preoperative patient care.
4. Postoperative orders that govern the care provided in the recovery room.

Each order is signed-off by the nurse as it is carried out.

X-ray films and reports

Most of the time x-ray films and the radiologist's reports the surgeon wants available in the OR are brought to the OR the night before the scheduled operation. Sometimes the films are at the nurses' station on the patient-care unit. Always check with unit personnel for any films that should accompany the patient to the OR. Many radiology reports are computer generated.

Laboratory reports (only the required)

As the block says, only the lab reports requested or required by the surgeon are filed in the patient's chart. Most of these are computer generated, but the forms mentioned in the previous discussion are still valid.

Electrocardiogram (ECG/EKG)

An ECG report should be in the charts of all patients over 40 years old and may be included for younger patients if heart disease or ailment is suspected. The report is recorded on OF 520, Electrocardiographic Record, and consists of ECG printouts and a cardiologist or internist report of interpretation.

Patient-care procedures

The procedures listed on the right side of the checklist should be done and documented by nursing unit personnel before the patient is transported to surgery. These procedures listed on the checklist include:

Preop counseling to patient

This refers to the counseling that nurses on the unit provide to the patients regarding preoperative and postoperative regimens on the unit and not in the OR or recovery room.

NOTE: The perioperative nursing record is used to record the OR nurse's preoperative counseling.

AM care and prep

This includes all the procedures we discussed previously, including vital signs, the antiseptic shower, encouraging the patient to attempt a bowel movement, hair removal (if ordered), antiembolism stocking application, and donning the pajama top backwards.

Valuables and jewelry removed

The patient is not normally allowed to wear any jewelry to the OR. The exception is a wedding ring, if it cannot be easily removed. Most hospitals allow the patient to wear a wedding ring *if it is taped in place*. If a patient is having hand or arm surgery, the ring *must* be removed even if it involves cutting it off. One arm will be operated on; the other will have an IV. If the ring is left in place, swelling of the patient's fingers may cause it to act as a tourniquet. Be sure to ask the patient if he or she has any body piercings as those must be removed prior to surgery as well.

Valuables and jewelry are usually left with a family member. If no family is available, or if the patient prefers, most hospitals have a safe or vault to safeguard patient valuables. These items should be inventoried and handled IAW local policy.

Hairpins, makeup, nail polish removed

Hairpins are removed because they are a potential safety hazard in the OR. They may become loose and injure the patient's eyes, ears, nose, or mouth. They can also puncture drapes and contaminate the field, or they can find their way into a wound (particularly if the patient is scheduled for surgery of the head and neck). All makeup (especially lipstick and fingernail polish) is removed so the patient's color can be monitored to assess circulation. Makeup and nail polish are also removed to prevent flakes or chips that may contaminate the field.

Dentures and bridges removed

Normally false teeth, full dentures, and partial plates are removed before transporting the patient to surgery. The main reason for this is to allow medical personnel to maintain a patient's airway during anesthesia administration, postoperative recovery, or cardio-respiratory emergency. Also, they are very expensive pieces of the patient's personal property. You do not want to risk losing or damaging them.

NOTE: Some anesthetists request patients retain their dentures to help maintain the airway.

Contact lenses/glasses, glass eye, hairpiece, prosthesis removed

All of these items should be removed, not only for safety reasons, but because they are the patient's personal property and should be protected from damage or loss.

Voiding

All patients are encouraged to void (urinate) the morning of surgery, preferably just before they are transported to the surgical suite. The exception would be for patients who have an indwelling urinary catheter in place. The time the patient voids or the Foley bag drained should be noted on the checklist.

Enemas

If an enema is ordered, record the time it is administered. Most patients are not given enemas prior to surgery. This is usually reserved for patients scheduled for major abdominal surgery, gastrointestinal, perianal, or perineal surgery.

ID/allergy band(s) on nonoperative arm

This is a "biggy!" The information on the ID band must EXACTLY match:

1. The information on the patient's ID stamp plate.
2. The consent form and the other records in the chart.
3. The name plate on the patient's bed.
4. The information on the surgery schedule or the pickup slip you get from the OR.
5. The name that the patient tells you (full name).

Any discrepancy between the information on the ID band and other references—even if it is something simple like a middle initial—must be brought to the attention of the unit nurse and corrected immediately.

If the patient has known allergies, an allergy band is placed on the same arm as the ID band. To check if the patient has allergies, look at the "Known Allergies" block or "History and Physical" section on the checklist.

There is a lot more documentation and paperwork involved in preparing the patient for surgery. Some of it is covered in other areas of this course, and some you'll learn on the job. We have covered the most important pieces of paper used to identify and prepare the surgical patient.

The following chart is an example of what a surgical checklist might include.

Block	Explanation	Nurse Initials
Inpatient ID plate on chart to OR	This is usually a small, rectangular, plastic credit-card plate with raised letters. This plate contains ID, blood type, religious preference, and other background information on the patient and is used to stamp all the forms found in the chart. It must accompany the patient to and from the OR.	
NPO since	The time the patient was placed on nothing by mouth (NPO) is written in this block.	
Preoperative medication	The unit nurse gives the patient's "preop meds" per the doctor's orders and then checks the "Yes" block and annotates the kind of medication and the time given.	
Catheter in place	Most patients do not have a catheter in place before surgery. On the rare occasion a patient does, the "Yes" block should be checked, and the block indicating whether it is clamped or connected to a drainage bag should be checked. The location, type, and size catheter should be listed on the checklist. Any urine (or other drainage) should be emptied and recorded before transfer to surgery.	
T, P, R, BP, and WT	These abbreviations stand for temperature, pulse, respiration, blood pressure, and weight. The last set of vital signs, taken just before the preoperative medication is given, is recorded here.	
Known allergies	This block lists any allergies the patient identifies. The allergies listed are not limited to medications; if the patient declares sensitivity to any substance (soaps, drugs, foods, etc.); it should be listed on the checklist. If the patient claims no allergies, "NKDA," which stands for no known declared allergies, is usually written in the block.	
Comments	The "Comments" block is used to explain any checklist item not completed or to provide additional information regarding an item.	
Date and time released to OR	This block is self-explanatory. The unit nurse usually completes this just before signing the checklist; if not, ensure you note the date and time.	
Signature of nurse releasing patient to OR or ward	This block is self-explanatory—but make sure this block is signed!	

203. Planning, implementing, and evaluating nursing care

Planning is the key by which nursing activities resolve nursing diagnoses. This might sound simple, but the process is just a little more complex. For these nursing activities to be effective, they must be systematically planned, implemented, and evaluated. These three actions make up the last three objectives of the nursing process.

Planning

Did you ever try to do some complex task without a plan of attack? If you did, the chances are you had a major mess on your hands. The same reasoning applies to nursing activities. For example, the nurse (and occasionally you, too) collects all the data related to a patient's condition, carefully analyzes it, and arrives at a series of problems and related nursing diagnoses. What would you do next? Which problem and diagnosis would you take care of first? What results would you expect from the patient? Keep in mind that your answers should be centered on patient needs. How do you do it? What sort of objectives and deadlines should you have? These are just a few of the questions that come up in doing nursing care. If you have a plan, you can answer these questions and provide much more effective care.

As with everything else, we use a system as a guide to plan nursing care. Following are the steps used to plan nursing care:

- Set your priorities.

- Establish goals.
- State the desired objectives or outcomes in terms of patient behavior.
- Select nursing activities that meet these goals.

Priorities

Prioritizing our actions means deciding what to do first. Patients usually have more than one problem and more than one nursing diagnosis. Since we obviously can't take care of everything at the same time, we must establish some type of priority. We do this very simply. The most life-threatening problems (choking, bleeding, etc.) are labeled "most urgent" or "high priority" and are handled first. Problems that are least threatening are labeled "least urgent" or "low priority" and are handled last. All other problems are ranked somewhere in between, according to the amount of threat they pose to the patient's welfare and, to some extent, comfort. If the patient has more than one life-threatening problem, get help and do your best.

Do not forget to discuss these priorities with the patient. Your idea of importance may differ totally from the patient's. Our main goal is to help the patient reach the highest possible level of health. A patient who is involved with, agrees to, and participates in a care plan always does better than one who is not consulted and resists the plan.

Goals

A *goal* is defined as "the end result toward which an activity is directed." In terms of patient care, a *client goal* is a realistic and measurable statement of the expected change in patient behavior or condition. For example, a patient who has just had a stroke may have a nursing diagnosis of "self-care deficit related to impaired physical mobility of the right side." For such a patient, a realistic and measurable goal would be, "Patient will demonstrate ability to feed self and, with minimal assistance, sit up and prepare own tray." This goal is measurable—you can see the patient eat. It is also realistic. A stroke victim needs help with certain parts of this task for a long period of time.

You should establish both long- and short-term goals. Short-term goals usually are achieved while the patient is still in the hospital. A long-term goal might not be achieved for months or even years, depending on the specific problem and goal. A good long-term goal for a stroke victim would be, "Patient will perform all aspects of daily living without assistance within one year." In addition to providing guidelines for nursing personnel, goals give the patient a concrete objective to strive for. In some instances, the long-term goal is so far in the future that the patient feels it is unattainable. To keep the patient motivated, it is useful to also develop some intermediate goals.

When you develop goals, you *must* include the person who is most concerned—the patient—in your planning. We cannot stress this point enough! Goals involve you only in terms of certain activities you do. But they involve all aspects of the patient's life. As we mentioned earlier, an enthusiastic, involved patient does much better than an uninvolved, frequently antagonistic one. It is also a good idea to include the family in your goal setting. Many patients, especially those with chronic disorders, continue to need extensive care after they are discharged. To ensure continuity of care, the family must know what is going on.

Objectives

Objectives are day-to-day activities that the patient must do to reach the goal. They are sometimes referred to as "outcome criteria" and are specified in terms of patient behavior. For example, an objective for your stroke victim would be, "Patient will sit up with assistance within 24 hours." It describes what the patient will do (sit up) and also specifies a timeframe (24 hours). Objectives act as step-by-step guidelines for both the patient and nursing personnel. Patients are motivated to do objectives because they feel that if they do so, the final goal may be possible after all.

Like goals, objectives must be realistic and measurable. Objectives are measurable if you specify them in terms of patient behavior. They are realistic if you carefully consider the patient's abilities and the

difficulty of the task before setting your deadlines. Remember, a patient is encouraged if he or she attains an objective ahead of schedule and totally demotivated if he or she fails to meet an objective.

Nursing activities

The last step in planning patient care is to decide what nursing activities or *interventions* will most effectively help the patient reach goals. In other words, "What are you going to do?"

Nursing skills have come a long way since the Dark Ages when the most effective things the nurse could do was to feed, bathe, and let the patient sleep. Now, we have an almost unlimited number of therapeutic procedures at our fingertips. What we have to do is select the procedure or procedures that best help the patient. There are certain criteria or questions to consider before making your choice:

- What type of activity was used to treat this type of problem in the past? How successful was it? Do you have the necessary skills to do this activity?
- Is the activity patient-centered? Does it take into consideration all aspects of the patient? Most of all, will the patient agree to it? (This question can be answered immediately if you work with the patient when you plan.)
- Is the activity realistic? Activities that are prohibited by your unit policies or that you lack the resources to perform are not realistic.
- How do the other healthcare providers feel about your plan? Chances are, some of them have more experience and can suggest another way.

After you consider all the alternatives, you probably will still have a list of activities. Now, it is just a matter of deciding which activity or activities will produce the desired result. Again, include the patient in this aspect of planning whenever possible.

As you may have noticed, we've covered a lot of material in developing our plan. Normally, you should document these steps as you go so that you don't forget anything. We will discuss this documentation when we talk about communication between nursing personnel in the next section. But now let us turn our attention to how to implement or carry out the activities that you chose.

Implementing

You are finally ready to do something for the patient! How do you begin? If you were a nurse, you would coordinate the procedure and delegate different parts, but, since you are assigned the responsibility of performing the task, you should first get organized. Find out what you have to do, and if you don't know how to do it, get help. Be sure to wash your hands. A good rule to follow is to wash your hands before, during, and after every procedure! Collect any equipment or supplies you need to do the procedure. As the patient arrives, do the following:

1. Greet the patient.
2. Check his or her ID to be sure you have the right patient.
3. Explain what you are going to do, and do the procedure.
4. Observe the patient closely to see how he or she reacts to the procedure.
5. When you are sure that the patient is comfortable, clean up any mess you've made.
6. Wash your hands.
7. Report your actions and observations to the nurse.

And that's about all there is to it; just follow those steps.

Evaluating

Evaluating is even simpler than implementing. It involves observing the patient to see if the nursing activity achieved the desired results. Since you took the time to establish goals and objectives, you know exactly what the results should be. If the patient achieved his or her objective, report to the nurse and continue to the next objective. If the patient were unsuccessful, try to find out why and

work out a better plan. The nursing process is a continuous cycle. Evaluation leads back to assessment, and the process starts over.

We've spent a lot of time discussing what the nurse does in the nursing process. It is true that normally the nurse is responsible for the formal assessment and planning activities. However, there is no reason you cannot do these things informally. In fact, doing so greatly enhances both your knowledge and skills. You have ample opportunity to talk to the patient and review other sources of data concerning him or her. You should be able to make up your own problem list, and very probably, you will come up with ideas the nurse hasn't.

Self-Test Questions

After you complete these questions, you may check your answers at the end of the unit.

201. Patient admissions and dispositions

1. Which healthcare providers found in AF medical facilities are authorized to both treat and admit patients?

2. Who is responsible for notifying the inpatient unit that a routine patient is being admitted?

3. What is the basic difference between a routine admission and a direct or newborn admission?

4. What two factors determine where the patient goes after finishing with the A&D office?

5. When are patients who are *not* eligible under the DEERS program treated/admitted to AF medical facilities?

6. What are two advantages of preadmissions?

7. When should you begin to assemble the inpatient record?

8. Briefly describe your responsibilities for the inpatient record when there is no 4A assigned.

9. What items should you bring to the bedside of a newly admitted patient?

10. Normally, what admission procedures are done by the admissions nurse and technician?

11. How should you greet a patient when he or she first arrives on your unit?

12. Where should you place the call bell?

13. What information should you cover when orienting the patient and family to your unit?

14. What aspects of the inpatient unit routines should you explain to the patient?

15. What two methods are used in inpatient units to help monitor the location of patients?

16. What is the purpose of a patient pass?

17. Who is the approval authority for patient passes?

18. What is the purpose of convalescent leave?

19. What is an interservice transfer, and when does one usually occur?

20. Who approves a medical facility transfer?

21. Who is responsible for the preparation of the patient’s records for an aeromedical evacuation?

22. What is the weight limit for the patient’s baggage during aeromedical evacuation?

23. How are paraplegic patients transferred during aeromedical evacuation?

24. Name three types of patient dispositions.

25. What information is included in the nurse's discharge note?

26. What Air Force instruction provides a list of forms to be assembled after the discharge of a patient?

27. What is the last office to be cleared by a patient when discharged?

202. Documenting nursing care

1. What information must be on a patient's inpatient record?

2. What form is used to record I&O?

3. What information would you document on the I & O flowsheet when starting an IV on a patient?

4. How many pounds are in one kilogram?

5. What type of patient may have daily abdominal girth measurements?

6. Who is responsible for ensuring documentation guidelines are in place and followed?

7. How do you correct an error in a patient's record?

8. What does SOAPP stand for?

9. Who can diagnose a patient?

10. What form does a provider use to document orders on a patient admitted to the hospital?

11. What are two uses for AF Form 3066?

12. How does the nurse indicate that the physician's orders have been carried out?

13. What form or paperwork would you place on the front of a chart for a patient scheduled for surgery?

14. What are the two categories normally found on a surgical checklist?

15. What is the OF 522 used for?

16. What should you do with a patient's labs and x-rays the morning of surgery?

17. What actions should you take if your patient is wearing jewelry and he or she is to go to surgery?

18. What specific action would you take if the above patient was scheduled for hand or arm surgery?

19. What do you do if there is a discrepancy between the patient's ID band and his or her surgical paperwork?

203. Planning, implementing, and evaluating nursing care

1. What are nursing activities designed to do?

2. What are the four steps you use when you plan nursing care?

3. How are patient problems and diagnoses prioritized?

4. Briefly define a goal in terms of patient care.

5. Who should you consult with when you set priorities and establish goals?

6. How do objectives relate to goals?

7. What questions should you consider before selecting a nursing activity?

8. Briefly describe the steps you should follow to implement a nursing activity.

9. What should you do if the nursing activity is unsuccessful?

1–2. Pre and Postoperative Care

Did you ever think about the preparations prior to surgery that are carried out by the surgeon, by other units in the hospital, and by the patients themselves? Unless you can understand the physical and emotional strain that precedes the operation, you can never have real empathy for the patient. Too often, you may forget that the patient is not just a gallbladder or hysterectomy in room 228. Keeping in mind the holistic approach to healthcare, patients are a complex mixture of physical and mental qualities that are often bound up with various social, economic, and religious influences. If you try to repair a patient's physical defects without considering the whole person, you are doing only part of your job. Let's take a look at some of the activities that precede the operation. After surgery, the immediate care of the patient is provided by recovery room personnel. As an aerospace medical service journeyman, you may be tasked with working in a recovery room. Therefore, this section includes information on recovery room procedures as well as some information on wound care and heat and cold treatments.

204. Providing support for the admitted patient

Three major goals during the preoperative period are to prepare the patient mentally, spiritually, and physically for his or her operation. This lesson focuses primarily on the mental and physical preparation of the patient. In most cases, the spiritual preparation is a very private matter. Asking if the patient would like to speak with a chaplain prior to surgery can fulfill the spiritual preparation of the patient. While this lesson focuses on the preoperative patient, the same principles of care apply to the nonsurgical patient. Consider the type of support you may need to give to a patient who has terminal cancer or has a nonoperable illness. Let's go on to discuss the psychological aspects of preoperative care.

Psychological care

There is usually not much time to reveal the psychological effects of illness and pending surgery on the patient. These must be learned, if at all, through conversation with the patient, the patient's family, or personal experience. Being a patient yourself is the surest way to develop insight into the problems faced by surgical patients. Since that is not always possible, keep in mind what the patient has gone through up until admission for surgery.

When surgical intervention is needed, fear and anxiety may interfere with the patient's response to surgery. The patient may be frightened regarding the outcome of the surgery, diagnosis of cancer, fear of death, or fear of a change in body image. Before surgery, patients do not know what to expect or what is expected of them. Good preoperative teaching is a way to help relieve most of the patient's concerns.

Preoperative patient education is designed to help the patient understand what he or she is about to experience so that he or she can participate intelligently and recover more effectively from the surgery and anesthesia. As an aerospace medical service journeyman, you may teach most of the bedside activities that are required upon the patient's return from surgery, such as turning, coughing, deep breathing, diaphragmatic breathing, incentive spirometry, and foot and leg exercises. Before we go into your teaching responsibilities, let's study the spiritual preparation and physiological care needed prior to surgery.

Spiritual preparation

Many times a patient wishes to talk with a member of the clergy or the base chaplain. This visit, as well as that of friends or relatives, often occupies the patient during the preoperative evening. After visiting hours, when alone, many patients begin to worry and ponder the events of the next day. For this reason, most surgeons order some form of medication that helps the patient relax and sleep soundly. Sometimes a friendly smile and having someone to listen to them can greatly relieve a patient's anxiety. As a medical technician, you will have many opportunities to talk with and provide care and treatment to patients who are admitted. Your kindness, caring attitude, and professionalism will make a significant impact on the patient's perceived quality of care and treatment, so remember your customer service skills.

Physiological care

A member of the nursing staff usually admits the patient and completes a total assessment of the patient's health status. The patient's temperature, pulse, respiration (TPR), blood pressure, and weight are checked and recorded. The patient may be placed on a special diet. Fluid intake may be limited or restricted, and special treatments and medications may be administered. Any such treatments or medications are usually given to prepare the body for surgery. For instance, in cases where abdominal surgery is anticipated, it is important to have the GI tract as empty as possible. This requires the use of laxatives, enemas, and a liquid diet or NPO, which means no food or drink by mouth.

If the patient has a medical condition in addition to a surgical problem, it may require special consideration. For example, if the patient has high blood pressure or diabetes, it may be necessary to regulate these with medication before it is safe to perform surgery. In some cases, patients are in such poor physical condition that blood transfusions or IV fluids must be given before they can tolerate surgery.

Since many hospitals require certain routine x-rays and laboratory tests on all surgical patients, the patient will probably go to the radiology department. An x-ray of the chest is taken so that any possible lung disease is ruled out. This is particularly important if general anesthesia will be given, because any lung problem can present respiratory difficulties after a patient is anesthetized. If the physician ordered other x-ray studies, they are carried out when the patient goes to that department for the chest film.

Of course, in some instances, radiology studies must be preceded by special preparation, such as laxatives, enemas, and dyes injected or swallowed. The preoperative procedure can sometimes take several days or may have been completed if the patient completed the preadmission process. Laboratory tests may require fasting or some other preliminary step that increases the preoperative stay of the patient. Even if further diagnostic tests are not ordered, there are the routine lab studies, such as a complete blood count (CBC) and urinalysis that are normally done prior to surgery. Studying the red and white blood cells and platelets help the surgeon determine a patient's physical condition. The urinalysis gives the surgeon further information about the blood as well as the functioning of the kidneys. If a blood transfusion is needed during surgery, the laboratory technician also collects enough blood from the patient for a type and crossmatch.

Sometime during the afternoon or evening hours, the day before surgery, the anesthesiologist or anesthetist visits the patient. This encounter gives patients a chance to meet members of the OR team. They can ask questions about the anesthetic and let the anesthetist know whether they have any

allergies. This is an excellent time for surgery personnel to get to know the patient. The rapport built up at this time can be very beneficial in alleviating the fears of patients when they enter the surgical suite. Patients appreciate seeing the familiar face of someone who knows them and their problem.

205. Preoperative functions

Prior to surgery, you will be busy helping collect information and preparing the patient for the surgical procedure. Proper planning helps insure a successful operation.

The evening preceding surgery

By this time, the patient may begin to wonder if there is any end to the preparatory routines. If the surgeon, a resident, or an intern hasn't taken a history and done a physical examination for the hospital records, these must be done. The evening before surgery, patients are informed about certain precautions they must follow in their diet. Patients usually shower or bathe using an antiseptic soap, such as povidone-iodine (Betadine), to reduce the number of microorganisms on their skin. Be sure the patient does NOT have an iodine allergy! If ordered, an enema is administered to cleanse and empty the bowel. This decreases the risk of peritonitis (infection of the abdominal cavity) if the lower intestinal tract is opened and prevents the patient from having accidental BMs during the procedure. The surgical patient is NPO after midnight, which means no food or drink from midnight until after the surgical procedure is finished. This reduces the chances of vomiting and aspirating emesis into the lungs. The patient or a responsible relative, if the patient is a minor dependent, must sign an operative consent that is dated and witnessed. The date should not be too far in advance of the date of the surgery; refer to local policy for the exact time frame. As discussed before, the information in it should be written in lay terms that are understandable and thoroughly explained to the patient. At bedtime, the nurse usually administers a sedative (sleeping pill) to help the patient relax and fall asleep. (Pediatric patients are usually not given a sedative the night before surgery.)

Skin preparation

Rarely, some doctors or local policy may require the patient to have his or her hair removed from the incision site prior to showering. If the operative site must be shaved, hospital policy and the surgeon's preference dictate the time and place. Hospital policy also determines whether the surgery technician or ward personnel carry out this procedure. However, a member of the surgical team is normally responsible for completing any required shave immediately before the surgical procedure. This is normally completed in the surgical suite. Ensure you know the doctor's orders on this subject as incorrect actions could delay or cancel the surgery. Preparing the skin for surgery involves cleaning, disinfecting, and hair removal. Skin preparation is important in reducing the chance of infection for the patient. It is also important to remember that the shaving process can be traumatic for the patient. Patients are not normally accustomed to having their body shaved, and they may be very self-conscious about having a stranger perform this task. If you are required to perform a preoperative shave, approach the patient by introducing yourself and explaining what you are going to do. Shave the patient in a treatment room or other area where there is privacy and a spotlight is available. You should follow the orders of your surgeons and OR supervisor in the method of hair removal (shaving, clipping, or using a depilatory [a hair removal cream]), extent of the area to be shaved, and use of soaps or detergents. Avoid nicking or scratching the patient as any open place in the skin can become a nest for the growth of bacteria. Such bacterial growth occurring so near the operative site increases the danger of infection being carried into the incision. Use a new razor, prep the skin with a warm cloth, and use shaving cream to keep from scraping the skin. Pull the skin gently but firmly away from the direction you will be shaving. Gently pull the razor in the direction of the hair growth in slow, smooth strokes. Be very careful of prominent bony areas, such as the knee (fig. 1–14). Figure 1–15 demonstrates normal sites to shave for some specific surgeries. Remember that the shaves will most likely be completed in the OR, but you should have an idea of what to expect when the patient is returned after surgery.

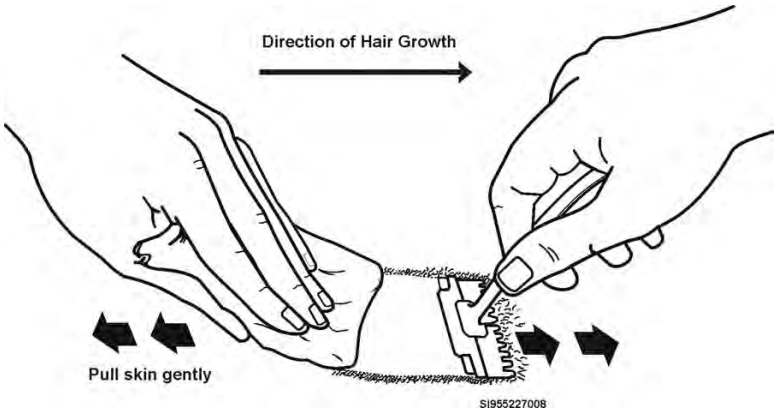


Figure 1–14. Shaving a patient.

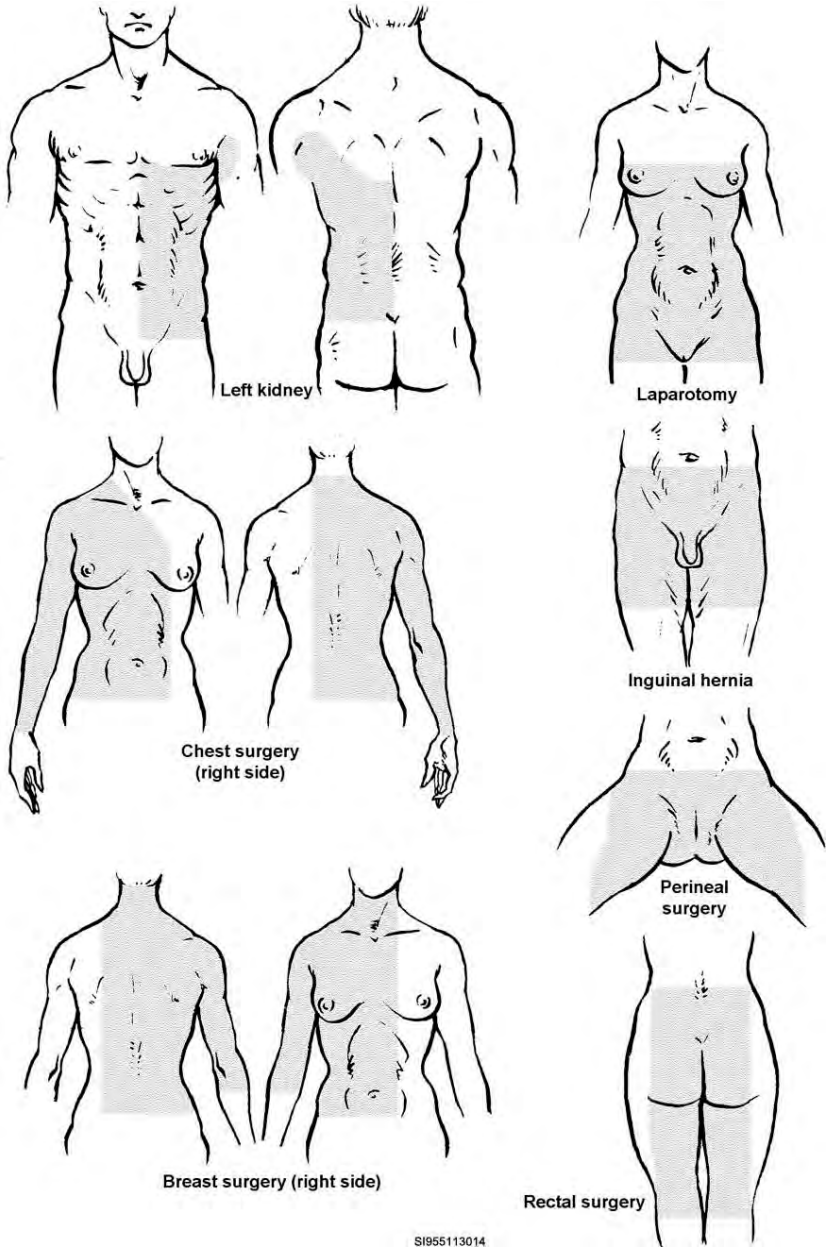


Figure 1–15. Shaving sites.

After the operative site is shaved, the patient is often asked to shower with a detergent. This process may be repeated in the evening or early hours of the day of surgery. The washing away of soil and dead skin lowers the possibility of infection, allowing the detergent to form a coating that continues to inhibit further bacterial growth.

Day of surgery

On the morning of surgery, the patient is awakened and vital signs are taken. Patients are normally asked to shower and brush their teeth. Any abnormality must be reported to the surgeon as soon as possible so the surgeon can decide whether to cancel the surgical procedure. In some hospitals, patients are asked not to wear pajama pants to surgery so that the conductive leg strap on the operating table can be placed in direct contact with the skin. The adult patient usually dons a clean hospital gown or pajama top secured only at the neck. This facilitates easy removal to place electrodes and perform the skin "prep" once the patient is in the OR. (The pediatric patient may remain in his or her own pajamas until after anesthesia induction.) Nylon and wool should not be worn because they produce static electricity. Female patients should not wear any hairpins or wigs. As a reminder, colored fingernail polish is removed so the anesthetist can check the color of the nail beds to determine whether the patient is being properly oxygenated. Prosthetics, such as artificial limbs, dentures, or contact lenses, are also removed and turned over to a relative or the patient's nursing staff. Be sure to check the orders in case the anesthetist prefers the dentures to be left in. Tight-fitting dentures can aid jaw support, but a loose bridge or denture can slip and obstruct the breathing process. Remember to have the patient remove all jewelry. A wedding ring may be an exception, so check the orders. If the wedding ring is allowed to be left on, you will normally tape it down so it does not accidentally slip off. Sometimes, surgeons order special procedures, such as insertion of a catheter into the bladder, or insertion of an NG tube. Urinary catheters are placed to keep the bladder empty during abdominal surgery. Not only can a bladder become overly distended during a long procedure, it might obstruct the view of other structures. In any case, a patient should always go to surgery with an empty bladder. If a catheter is not inserted, the patient should urinate just before leaving the room. The provider may also ask for the patient to attempt a BM prior to surgery as well. Another antiseptic shower or bath may be ordered to further reduce the level of transient and resident bacteria. The insertion of an NG tube may be ordered before some abdominal operations to aid in the continuous removal of gas and fluid from the GI tract during and after surgery. Apply elastic *antiembolism* stockings, if ordered.

These procedures may be done before the patient is taken to the OR or after the patient is anesthetized in the OR, so be sure to check the orders and have the patient properly prepared.

The nursing-unit staff ensures completion of all procedures listed on the surgical checklist, normally kept on the front of the patient's chart. A last set of vital signs is taken and recorded; then, the preoperative medication is administered at the specified time, or "on call" if the surgeon isn't sure when the OR will be ready for a particular patient. Very often, the premedication is given in two parts. The choice of drugs depends on the patient's age, weight, physical condition, the type of operation to be performed, and the anesthetic agent to be used. Premedication is usually given to sedate, dry mucous secretions, reduce the patient's ability to feel pain, and sometimes to reduce the tendency to vomit following anesthesia. If these drugs are administered at the proper time, they enhance the effect of anesthesia and often reduce the amount of anesthetic agent needed.

After the premed is given, the nurse pulls up the *bedside rails and they remain up* until the surgical technician arrives to transport the patient to the surgical suite. The unit nurse reviews, checks off, and initials all completed items on the surgical checklist. When OR personnel arrive in the nursing unit to pick up a patient, they tell the nurse the name of the patient. Someone from the nursing unit accompanies the OR technician to the patient's bedside for a last minute preoperative check. After greeting the patient, the OR technician checks the patient's ID bracelet and makes sure the patient is properly dressed and prepared. If you accompany the OR member at this time, you will assist with these last-minute details. The nurse or female attendant checks female patients for the completion of

procedures of a personal nature, such as the prepping and emptying of the patient's bladder. If the patient has any type of drainage tube, you should ask the nurse whether it is to be clamped or attached to a drainage bag. The patient's chart and any x-ray films (or other large diagnostic test reports) needed in the OR are given to the OR technician to take with the patient. Assist the patient in moving from bed to stretcher, or recovery room bed, if these are used. Raise siderails and fasten litter straps securely around the patient's body. The nurse records makes a notation of the time the patient leaves for the OR on the nurse's notes just before the chart is given to the OR member.

Ambulatory surgery units

Many facilities have an ambulatory or "same day" surgery unit that is staffed with nurses and medical technicians. They generally work very closely with the surgical services staff and are often in a co-located area. Same day surgery is becoming the most common type of surgery you will see in the Air Force and is performed on a same-day, outpatient basis. Patients are not admitted to the hospital for an overnight stay, unless necessary and ordered by a physician. The medical history, physical, lab work, and other tests are done before the day of surgery. The patient reports to the same day surgical center (SDSC) at a designated time, preoperative preparations are completed, and the procedure is performed. After surgery, the patient is recovered, observed until stable, and then released from the hospital. Ambulatory surgery was originally used for minor procedures, such as myringotomy, odontectomy (tooth removal), and cystoscopy, on low-risk patients. This type of surgery is becoming more prevalent and popular as medical facilities and practitioners try to control costs, and the operations performed are more complex. Many facilities now use ambulatory surgery for relatively major procedures, such as arthroscopic ligament repair, laparoscopic cholecystectomy, and nasal or sinus surgery. Some healthcare professionals estimate as much as 60 percent of all surgery will be performed on an ambulatory basis in the future.

Elastic stockings

Elastic stockings, also called antiembolism stockings, are worn by most surgery patients to help prevent thrombi (blood clot) formation. Antiembolism stockings are very tight from the toes to the thigh. This helps provide support to the veins and their valves, something like a girdle around the abdomen, thus, preventing the pooling of blood in the legs (venous stasis). These stockings come in knee lengths, thigh highs or full length. Measuring for elastic stockings (antiemboli hose) is also a function of the medical service technician. Depending on the brand product used in your facility, follow the manufacturer or local operating instructions (OI) for proper measurement technique. In most cases, the legs are measured in length, depending on the style to be used, and in circumference of the calf muscle.

Figure 1–16. Applying elastic stockings.

Apply the stockings in the morning before the patient gets out of bed. Ensure the feet are clean and dry. It is helpful to apply a powder or cornstarch to help minimize friction when applying the stockings. It is sometimes quite a challenge to apply the stockings. One way to pull them on is to gather the stockings from the top down, insert the foot, and pull the stockings up while stretching them outward (fig. 1–16). Listed below are some easy steps to follow:

1. Collect all supplies needed (elastic stockings), measuring tape, and powder.
2. Check the doctor's orders for the type of stockings to be applied.
3. Measure the patient's leg length and circumference for the size of stocking ordered (knee high, thigh high or full length). Ensure you have the correct size.
4. Ensure patient's legs are clean and dry, then apply a light coating of powder to each leg.

5. Place your hand in the stocking and turn it inside out down to the heel. This will make it easier to slip the stocking on the foot without causing the patient discomfort.
6. Stretch the heel of the stocking open and fit it over the patient's foot. Ensure the stocking fits smoothly, without wrinkles that could damage the skin.
7. Grasp the top of the stocking and fit it over the ankle and calf. If using thigh high or full length, gradually pull the stocking up and ensure it is smooth as you pull it up the leg.

NOTE: Do not pull knee highs over the knee or fold the top of the stocking down as it can impair circulation. You should also instruct your patient not to cross his or her legs as it can cause pressure points and hinder circulation.

Antiembolism stockings should be removed on each shift to check the condition of the skin, especially over bony prominences. Stockings that are too tight may cause the skin to break down. Soiled stocking should be washed and dried or replaced with a new pair. Unless approved by a provider, stockings should not be off the patient for more than 30 minutes at any time.

206. Postoperative care in the recovery room and the unit or ward

As an aerospace medical service journeyman, you receive the patient from surgery personnel, and you are the first person to make an assessment of the patient's condition. Like a primary survey during emergency care, you are the most important link between the physician and the patient. To fully understand your role in postop patient assessment, you need to understand what happens to the patient between the time surgery is complete and the patient is returned to your unit. Once the patient is stable, he or she will be transferred back to your unit. You must be prepared to look for adverse reactions or complications from surgery, and you will continue to monitor and assess the patient in the same manner the surgical personnel did. The following information will help prepare you to take care of your patients once they return to your care.

Patient assessments

As soon as the patient is wheeled into the recovery room, baseline vital signs are taken. A recovery room contains all the necessary equipment required to resuscitate a patient, if a life-threatening situation should occur. Cardiac monitors, suction equipment, and emergency drugs are all easily accessible to the patient's bedside. Safety precautions are also an important part of postoperative care. If the patient remains on the gurney, the side rails must be up, and the two safety straps must be secure. With all of this in mind, remember, care provided during this immediate postoperative period is aimed at prevention and detection of postoperative complications.

Remember, vital signs reflect the functioning of the essential life-supporting circulatory and respiratory systems. As long as the vital-sign readings remain stable or approach a more normal level, there is usually no cause for alarm. However, when you notice a sudden radical change, or a gradual movement of rates toward abnormal levels, it is important to check the signs at closer intervals and always inform your nurse and/or physician. Your baseline assessment includes:

1. Blood pressure—A blood pressure reading tells whether the blood is flowing through the vessels with enough force to reach all areas of the body. A change in this force is caused, among other things, by a lowered volume of blood or inadequate pumping action of the heart. When a patient has just returned from the OR and you notice that his or her blood pressure begins to drop, consider several possibilities:
   - Is the patient losing blood from a severed blood vessel?
   - Are drugs or the anesthetic agent depressing the action of the heart?
   - Is the patient in shock?
2. Rhythm and rate of heartbeat—When the body tries to compensate for a reduced volume of blood in the circulation, the heart beats faster, thus sending the heart rate up, but each beat is

harder to detect because less blood is pressing against the vessel walls. This phenomenon produces a “thready” pulse.

3. Rate and depth of respirations—Respiratory rate can increase because of signals sent out by the brain when its cells are not receiving enough oxygen. Keep in mind that many medications used for anesthesia directly depress the respiratory system, resulting in the inability of the patient to breathe on his or her own. This is why the anesthetist must often “bag” the patient by forcing air into the lungs from the breathing (ombre) bag attached to the gas machine. Sometimes this process is carried out automatically by a ventilator. In some cases, a ventilator is used in the recovery room to assist patients whose chest muscles are not contracting properly or patients who are too depressed to take the deep breaths that fully expand the lungs. In addition to the relaxation produced in chest muscles, general anesthesia can also affect the muscles that control the jaw. When these muscles are relaxed, the lower jaw drops and the tongue falls back in the throat, obstructing the air passage. For this reason, the anesthetist inserts an airway into the mouth after an endotracheal tube is removed. The patient’s lower jaw can be supported by the anesthetist’s hand, or the anesthetist can turn the patient’s head to one side so the lower jaw won’t drop. By maintaining one of these head positions and by a careful suctioning of any foreign body, mucus, vomitus, or blood from the throat, you can usually prevent respiratory obstruction. An open airway is always a necessity, even when oxygen is given because all the oxygen on earth is of no value to a person if the route to the lungs is blocked. Oxygen therapy may be prescribed by the surgeon or anesthetist at the time a patient is brought to the recovery room, or the need for it may develop later. Depression caused by the anesthetic agent or drugs, hemorrhage, shock, or a combination of these, as well as the operative procedure and many other factors can produce hypoxia. By increasing the amount of oxygen taken in with each breath, the body’s needs are supplied until the causative agent or condition either wears off or is corrected.
4. Cardiorespiratory emergencies—Recovery room and unit personnel must be familiar with the treatment of cardiorespiratory emergencies. Intubation material, tracheostomy tray, cardiac arrest tray, defibrillator, pacemaker, and ECG/EKG machine should be easily available. Not only must you locate and set up these items but recognize the symptoms of cardiorespiratory problems and know the initial steps of treatment. For instance, if you suddenly discover that a patient’s vital signs have disappeared, notify anyone who is nearby; then start administering artificial respiration and external cardiac massage. When other team members arrive, stand by and assist them with the form of treatment decided upon by the physician.
5. Temperature and color of the skin—Body temperature and capillary refill are direct indicators of shock. If the patient exhibits cold, clammy, and pale skin, this needs to be reported to the nurse or physician immediately.
6. Patient’s level of consciousness (LOC)—To determine the LOC, ask the patient questions. A common practice is to ask his or her name, date, and where he or she is (location). This is considered a fair test of orientation.

You also need to check the IV for proper solution and flow rate, drainage of urine, wound drainage tubes, or any other special equipment. Check the dressing that was applied in surgery for apparent bleeding. It is also important to maintain the patient’s comfort. The administration of pain medication is sometimes necessary in the recovery room. All of the following checks are performed every 15 minutes. Once vital signs are stable and responsiveness has returned, the anesthetist discharges the patient to a nursing unit.

Special precautions

Safety measures must be observed in the recovery room to protect patients from falls or injuries. Patients in the recovery room are able to control many body functions and may actually be capable of inflicting self-harm because of disorientation during the recovery process. If patients had a spinal anesthetic, they may be able to move about just enough to place themselves in a position where they

could fall. It is important that spinal patients have siderails in place, and careful checks kept on their vital signs. Blood pressure can drop because of the anesthetic drug used or because of lowered spinal pressure, and patients can suddenly go into shock. Do *not* ignore patients just because they seem to feel well and can talk to you. This is also true of patients with regional blocks. They usually remain in the recovery room until vital signs are stable and cleared by a physician for transfer. Patients may be transferred to inpatient unit before sensation has returned to anesthetized area but will be monitored closely for return of full neurovascular function.

The precautions always observed in the presence of oxygen must be practiced when oxygen therapy is used in the recovery room. This means, of course, that no open flames are allowed. Since smoking is not permitted in the hospital, there should be little need to remind you of this fact, but oxygen tanks should be handled and stored with the same careful consideration used in other areas of the hospital. Septic cases (patient suffering from septicemia) brought to the recovery room should be handled just as any isolation cases throughout the hospital. In many hospitals, however, these patients are returned directly to their units, so there is no danger of the sepsis being transferred to the fresh wounds of the surgical patients. Such cross-contamination is particularly serious for a patient whose body defenses were already lowered by a surgical procedure.

Often, a cancer patient is returned to the recovery room with some form of radioisotope inserted into his or her body. These isotopes can destroy cancer cells, but the invisible rays can be harmful to healthy cells as well. This is why the seeds, needles, tubes, or other applicators are sent to the OR in lead containers. Since the rays can pass through the human body, a patient receiving such treatment must be isolated from other patients. Some facilities recover the patient on the unit or ward in a private room, if an isolation room is not available in the surgical recovery area. If you work with these patients, carry out whatever safety precautions were set up in your hospital to prevent overexposure to radiation.

The patient's room

In most cases, the room preparations are made as soon as the patient leaves for surgery. The bed is left in a high position, and a surgical bed is prepared (fig. 1–17). Special equipment needed includes vital-sign equipment, emesis basin, waterproof bed protector, I&O sheet, vital-sign record, oxygen regulator, and a suction regulator. Any other special equipment is reported to the nurse prior to transfer from the recovery room. There will normally be a crash cart with emergency supplies on or near a surgical ward in the event that a patient suffers postoperative complications.

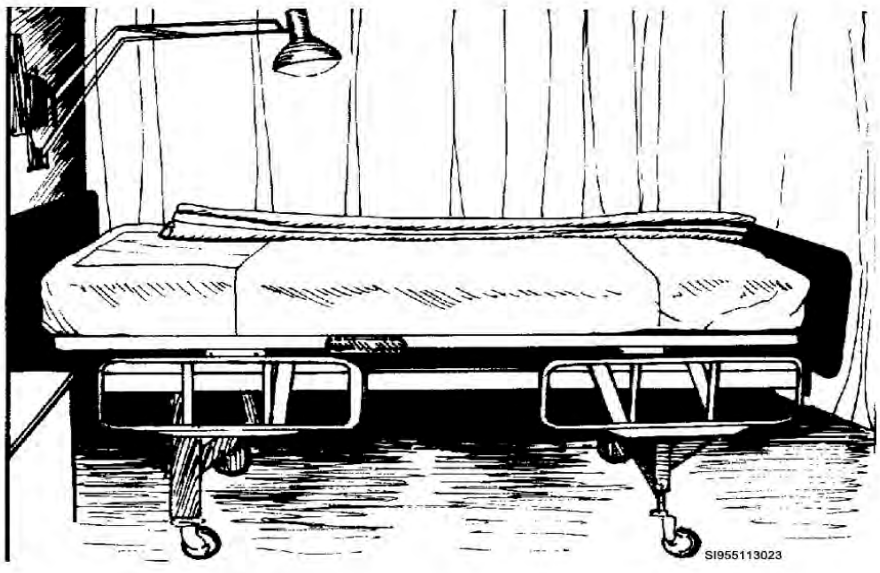


Figure 1–17. Surgical bed.

Receiving the patient

The aerospace medical service journeyman is often the first person to receive the patient from surgery personnel. You first assist the patient to move from the OR stretcher onto the bed. Once the patient is in bed, vital signs are taken and recorded. Other observations are made, such as amount and type of IV solution infusing and patient skin temperature and color; observe the dressing for bleeding, and check any drainage bags and tubes. Once your assessment is made, raise the siderails and ensure the call light is within the patient's reach. Ensure the nurse is informed of the patient's return to the unit as he or she must make an assessment and document the patient's chart. Report your findings to the nurse and allow the family to see the patient. Vital signs and checks are continued according to the physician's orders. You will continue the care that was provided for the patient while he or she was in the recovery room. It is important that you watch postoperative patients very carefully, especially in the first 24 hours after surgery. For example, you may take the vitals every 15 mins x 30 mins, then every 30 mins x 1 hour, and so forth until stable. Consistently check patient's record for updated physician's orders.

Your observations

Continually observe the patient for complications related to the surgery or anesthesia. Many patients will complain of pain, so notify the nurse immediately to administer the ordered pain medication. Now is when the preoperative teaching comes into play. The patient needs to turn, cough, and deep breathe every two hours. They are required to use the spirometry unit and perform leg exercises. You also need to keep a close watch on the patient's urinary output, observing all intakes and comparing it to the output. Observe dressings for bleeding, any drains placed inside the wound, and closely monitor for abnormal amounts of bleeding. Usually, the next morning, the physician removes the pressure dressing that was applied in surgery. Once this is done, sterile dressing changes are performed every day by a member of the patient's nursing staff.

Neurologic checks

There will be times where a neurologic check will be necessary. A neurologic (or neuro) check is merely an abbreviated form of a neurologic examination. This check is performed at regular intervals on patients who may have a head injury, brain surgery, certain medications, anesthesia, or procedures. You should remember this from your emergency medical technician (EMT) training, but bottom line is that any patient with a risk of increasing intracranial pressure should have neurological checks performed.

Neuro exams can be conducted on patients in any state from conscious to unconscious. The particular exams will be tailored to meet the specific needs. The first step is to establish appropriate responsiveness, such as opening the eyes to being able to answer questions like person, place, and time. You will be assessing the patient's mental orientation. Once the person can tell you his or her name, the month or year, and a question, such as who the current president of the United States is, you will know that your patient is alert and oriented appropriately. Depending on the situation, this can take a few minutes to days. If the patient was alert and oriented initially and suddenly stops answering or responding appropriately, immediately tell the nurse as this may be a sign that there is a problem.

You will likely examine the patient's pupils using the PERRLA method. PERRLA is an acronym used to record normal findings, which represent, *Pupils Equal*, *Round*, *Reactive to Light*, and *Accommodation.* The pupil size is measured in normal light conditions; they should be round and equal in size. A flashlight or penlight is used to check constricture of the pupils. The pupils should constrict quickly and simultaneously when stimulated with the light. Both pupils should get smaller when either eye is stimulated with light. This is known as consensual reflex. Also, pupils will constrict when viewing near objects and dilate while viewing far objects. This is called accommodation.

Eye muscles are also tested by evaluating extraocular movements (EOM) by having the patient follow a finger or object as it is moved over six different positions. The eyes should move together in a coordinated manner. Irregular movement or absence of movement may indicate cranial nerve damage or a neurologic problem.

A muscle strength test is completed by asking the patient to squeeze your fingers and push his or her extremities against your hands. You will evaluate the degree of strength and equality of strength on both sides. Keep in mind that you would not ask a patient who just had a broken leg repaired to push the injured leg against your hand. Again, refer to the provider's orders to see what tests need to be completed.

Vital signs are normally taken at the same time neuro checks are accomplished because diseases and intracranial pressure can change vital signs. However, changes in vital signs, such as falling blood pressure, is normally considered a late sign and it is possible that circulation to the brain has already been impaired.

Determining the body's oxygen saturation

A noninvasive method commonly used today to rapidly determine pulse and oxygen profusion is the pulse oximetry/O_2 saturation machine (fig. 1–18).

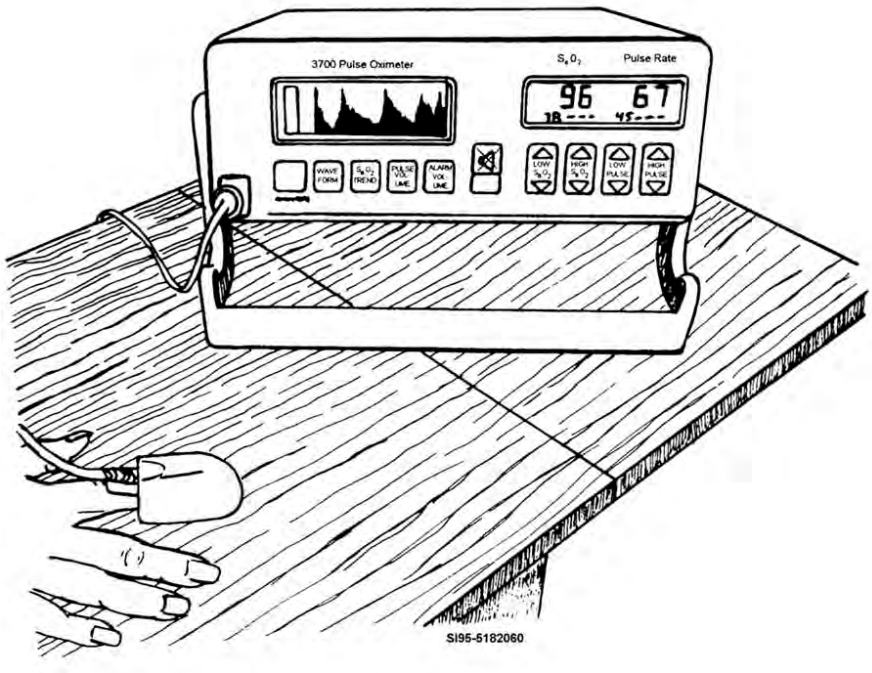


Figure 1–18. Pulse oximetry/O2 saturation machine.

The oximetry machine measures arterial hemoglobin oxygen saturation by passing red and infrared light through a pulsating vascular bed, such as a fingertip, earlobe, toe, or even the bridge of the nose. By constantly calculating the difference between the light picked up by the oxygenated and deoxygenated cells, the SaO_2 is determined and displayed as a digital value. It is important to remember that the pulse oximetry can give you a false high reading with patients who are suffering from carbon monoxide poisoning. The patient's cherry red appearance also causes his or her cells to appear red, which will cause the oximetry reading to be high.

To use the oximetry machine, ensure the patient's skin is clean and dry. Apply the sensor to the fingertip, and ensure the light source and photodetector are in direct alignment and flush with the patient's skin. It is important that the skin is intact (i.e., there are no cuts). The sensor is then attached to the oximeter, which is plugged into a power source. If the oximeter has an alarm, turn it on. Continue to monitor the patient's SaO_2 as directed by the physician. Normal SaO_2 saturation is between 95–99 percent. Immediate action may be required if saturation falls below 95 percent. Notify the nurse and/or physician immediately if there is any change from the patient's normal oxygen saturation or if the saturation level falls below 95 percent.

Promoting circulation with pneumatic stockings

You should remember that we discussed the use of antiembolic stockings a little earlier in this unit. However, there is another device that assists with the circulation of venous blood from the lower extremities that is frequently used in the OR and often used on the postsurgical patient as well. This device is known as a pneumatic stocking or sequential pneumatic compression device. The sequential pneumatic compression device/stocking utilizes an inflatable, double-walled leg wrap that uses alternating compression and relaxation to reduce the risk of deep vein clotting in the legs. This device is most often used on high-risk patients who are undergoing general anesthesia. The leg wraps, usually made of vinyl or woven fabric, may be used over antiembolic stockings. The patient's thigh or calf must be measured for a correct fit. When applied, the foot is not wrapped but left visible. Proper selection and fitting are crucial for effective compression. The leg wraps are applied externally prior to the start of the surgical procedure. Sometimes it is applied before the patient goes to the OR, and other times it is applied after the patient is transferred to the OR table. Some physician's will write orders requiring all nonambulatory patients to wear sequential pneumatic compression devices at all times. If applying over elastic stockings, make sure that the elastic is smooth and without wrinkles, or skin damage may occur. The sleeve of the pneumatic stocking should fit snug but not tightly. There is generally a round opening for the knee, and the internal bladder device is placed smoothly along the back of the calf for knee-high devices and smoothly along both the back of the calf and thigh for full-length stockings. There are many different versions of pneumatic stockings; some only cover lower legs below the knee.

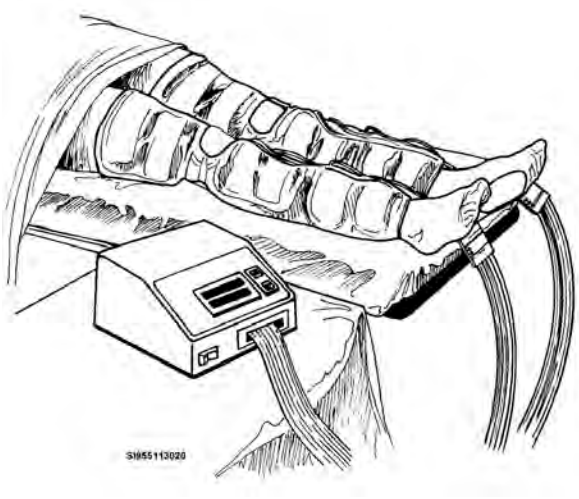


Figure 1–19. Pulse oximetry/O2 saturation machine.

Once applied, the leg-wrap tubing is attached to the compression device. A motorized pump sequentially inflates the leg wraps at the ankles, then at the calves, then at the thighs for full-leg compression (fig. 1–19). During this wave-like action, pressure is applied intermittently and empties the blood from deep leg veins. This action prevents venous stasis and accumulation of clotting factors in the deep veins. It is important for the pump to be started before anesthesia is given because general anesthesia reduces venous return and causes vasodilation. If applying the device prior to the patient being taken to the OR, this gives you the opportunity to ensure the machine and leg wrappings are functioning properly. *Always check the doctor's orders to verify the correct pressure setting.*

Sometimes the surgeon will request that the device be left on the patient postoperatively; if this occurs, the device is usually transported to the postanesthesia-care unit and the nursing-care unit with the patient. It is not uncommon for the surgeon to continue the use of sequential compression for 24 hours postoperatively. Following an abdominal, hip, or neurosurgical procedure, the surgeon may also use it until the patient is fully ambulatory. Once the patient returns to your unit, you and the nurse will check the operation of the pump and inspect the leg wraps and tubing at frequent intervals. Additionally, the type of device, pressure and cycle setting, start time, and time discontinued must be documented on the inpatient record.

Postoperative exercises

In many hospitals, surgical patients are introduced to certain postoperative exercises before surgery. This is particularly true of the turning, coughing, and deep-breathing exercises (TC&DB) they are expected to practice to prevent hypostatic pneumonia following anesthesia. Other common postoperative exercises are diaphragmatic breathing and leg and foot exercises. Explain the

importance of turning, or changing positions, every two hours to the patient. This is vital to improving circulation and relieving pressure areas.

Breathing exercise

The chief objective of breathing exercises is to increase or develop the expiratory phase of breathing and to develop the muscles concerned with respiration. Deep-breathing exercises also maintain and cleanse the airway, improve vital capacity, and help to prevent such conditions as atelectasis and postoperative pneumonia. Blow bottles and incentive spirometry (fig. 1–20) are often used in the postoperative or prolonged bed-rest exercise program. The incentive spirometer is an excellent tool for preventing postoperative pneumonia and atelectasis. The incentive spirometer is a piece of equipment that encourages total sustained inhalation of the patient. To use the spirometer, the patient should be in a sitting position. Explain to the patient to first exhale fully, place the mouthpiece in his or her mouth, inhale slowly until the desired goal is reached, hold for three seconds, then relax and slowly exhale. Only one per minute should be performed, allowing the patient to relax. Explain to the patient that the spirometer should be attempted at least 10 times each hour while awake.

Figure 1–20. Incentive spirometry.

Coughing promotes the removal of chest secretions and prevents pneumonia or other possible airway obstructions. Teach the patient to cough by interlacing his or her fingers over a pillow (fig. 1–21), which is placed over the incision site. Ask the patient to lean forward in a Fowler's position, inhale with his or her mouth slightly open, and let out three or four sharp hacks. Then, inhale deeply again and give one or two sharp coughs. Have tissues readily available, or a suctioning apparatus, if needed.

Figure 1–21. Coughing.

Figure 1–22. Diaphragmatic or deep breathing.

Diaphragmatic or deep breathing is also a useful tool in preventing postoperative complications. Deep breathing (fig. 1–22) is accomplished by inhaling deeply, holding for a five count, then exhaling through pursed lips to a count of 12 to 15. Repeat this 15 times, resting between each set of five.

Leg and foot exercises

Other important preoperative teaching includes leg and foot exercises. Leg and foot exercises can be performed in bed and are very important for maintaining circulation and muscle tone. Tell the patient to practice these exercises prior to surgery:

1. While lying on your back, bend your knee and raise your foot, hold it for a few seconds, and then lower (fig. 1–23A).
2. Lie on your side and move your legs as if riding a bike.
3. Make circles with your big toe (fig. 1–23B).

Have the patient perform these exercises five times every three to five hours or as the physician ordered.

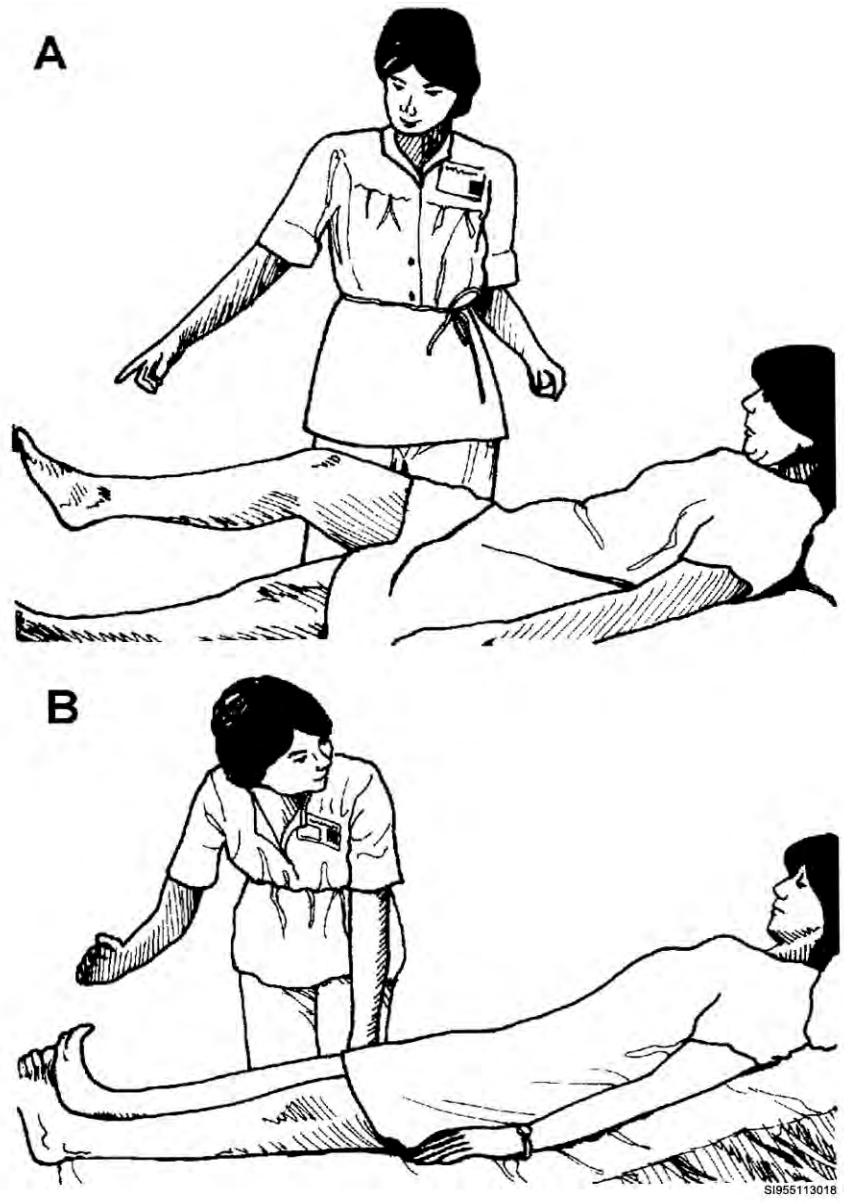


Figure 1–23. Leg exercises: View A. Leg raises; View B. Big toe circles.

207. Blood transfusion therapy

A transfusion is the IV administration of whole blood or blood products. This procedure restores lost blood volume or treats a variety of conditions, such as shock, anemia, and infections. Transfusion therapy is very common in medical facilities—statistics show that almost 5 percent of all hospitalized patients receive one or more transfusions during their stay. With those odds, there is a good possibility that you will be involved in transfusion therapy sometime during your career.

Your responsibilities

Although medical science has come a long way since the first attempts at transfusion, it is still a very dangerous procedure. Because of the life-threatening complications associated with transfusions, your responsibilities are very different from routine IV therapy. For example, with the possible exception of a wartime or disaster scenario, you probably won't actually initiate a transfusion. That is the responsibility of a registered nurse (military or civilian) who does so only on the orders of a physician. Your responsibilities probably will include filling out the paperwork—SF Form 518, Blood or Blood Component Transfusion—and picking up the blood units from the laboratory. You certainly will be responsible for monitoring patients during the transfusion and identifying and reacting to any adverse reactions that may occur. Other responsibilities may include assisting the nurse who initiates the transfusion, acting as a witness when he or she verifies the patient's identification, and checking the blood to ensure that it is not expired and is going to the correct patient. You also may verify the patient's identification when the lab technician draws the blood sample for the type and cross match, or you and the nurse may be responsible for blood sampling prior to the transfusion. However, your main duty as an aerospace medical technician journeyman will be obtaining vital signs during the transfusion, ensuring that the patient stays stable.

The most common causes of adverse reactions to transfusion therapy are not correctly identifying the patient, blood unit, or both. Since you commonly fill out the identification portion of SF Form 518 and act as a witness when the patient is identified, you are in a position to eliminate or reduce these errors. To do this and be able to recognize adverse reactions when they occur, you should know how blood is identified, how it is administered, what equipment is used, and the signs and symptoms of adverse reactions.

Types of blood products

There are a variety of blood products available for a variety of purposes—whole blood, packed cells, platelets, plasma, and plasma derivatives. Generally speaking, the purpose and the product will be closely related (e.g., whole blood is given to replace blood loss, and platelets are given to help with clotting). To help you understand why the different types of transfusions are ordered, we briefly discuss the different blood products and indications for their use.

Whole blood

Whole blood is blood as it is drawn from a donor (plus an anticoagulant). Whole blood is used to treat patients who have had a massive blood loss, resulting in a need for both the oxygen-carrying capabilities of the red cells as well as the volume expansion of plasma. Whole blood is available in units containing 450 cubic centimeters (cc) of blood and 60 to 70 cc of preservative and/or anticoagulant. At one time, whole blood was the most common product used in transfusion therapy, but changes in technology have enabled medical personnel to break down blood into its basic components. By doing so, many patients can be treated from a single unit. The risk of complications, such as a transfusion reaction or circulatory overload, is reduced because patients receive only what they need.

Packed cells

Packed cells, or packed red cells as they are more accurately called, are erythrocytes that are separated from plasma by centrifugation or sedimentation. Because packed cells increase the oxygen-carrying capacity of the blood without increasing its volume, they are useful in the treatment of

diseases affecting erythrocyte production or destruction. In many ways, packed cells are safer than whole blood. Since there is less volume transfused (i.e., they are available in 225 cc units), the risk of circulatory overload is decreased. At the same time, the risk of transfusion reaction is decreased because fewer antibodies are transfused.

Platelets

Platelets or thrombocytes are cell fragments involved in the clotting process. They are prepared by centrifuging whole blood units or by apheresis. A certain amount of blood is withdrawn from a donor and separated into components. The desired component is removed and the unit is reinfused into the donor. Platelets are available in 30 cc units. These units usually contain the platelets, some leukocytes and erythrocytes, and a small amount of plasma. The proportion of platelets to other components varies with the preparation technique used. Platelets are transfused to increase the recipient's platelet concentration and treat clotting disorders, such as hemophilia and thrombocytopenia.

Plasma

Plasma is the liquid portion of the blood prepared by removing the other components. It is used as a volume expander or to treat clotting-factor deficiencies and reverse the effects of anticoagulants. Plasma is available in 225 cc units as pooled plasma, fresh frozen plasma, and single-donor plasma. Pooled plasma is seldom used as a volume expander because it increases the risk of viral infections. IV solutions, such as Ringer's lactate or blood-volume expanders, are safer for that purpose.

Plasma derivatives

Plasma derivatives are specific proteins that have been removed from the plasma for concentrated administration. They include cryoprecipitate, coagulation factors VIII and IX, albumin, and gamma globulin. The cryoprecipitate and coagulation factors are used to treat various forms of hemophilia and specific clotting-factor disorders. Albumin is used as a blood-volume expander in the treatment of hypovolemia and shock. The gamma globulin is used to provide specific and nonspecific immunity to a variety of disorders (e.g., tetanus, herpes zoster, hepatitis B, etc.).

In addition to these components, leukocytes (e.g., neutrophils or granulocytes) can be separated from the blood to treat sepsis, infections that are unresponsive to antibiotics, or specific disorders, such as neutropenia or granulocytopenia. Blood or blood products also can be prepared in special manners to achieve different effects and reduce transfusion complications. For example, washed red cells are prepared by adding and removing normal saline. This depletes the leukocytes and plasma and reduces the possibility of febrile and incompatibility reactions. Irradiated blood products have been exposed to a radiation source to decrease the ability of the donor lymphocytes to engraft and divide. Other special preparations include prewarmed blood products and microaggregate filtered blood. Blood products are warmed to reduce the possibility of arrhythmias during massive rapid transfusions, for exchange transfusions in infants, and patients with cold agglutinin disease. Microaggregate filters are used to remove aggregated leukocytes and platelets during whole-blood transfusions and to reduce the possibility of febrile reactions.

Collection and storage of blood

You probably won't be involved in blood collection unless you help out as a Red Cross volunteer or in a similar capacity, but you should be knowledgeable in the subject so that you can reassure your patients. Also, knowing the procedures and precautions helps you understand the importance of the precautions you take. In many cases, blood is obtained from sources such as the Red Cross, which are outside the medical facility. If there is a donor center in the facility, it is staffed by laboratory personnel who work in the blood bank. Blood is collected from a variety of different sources, including from the patient in the case of autotransfusion. Most commonly, it comes from donors.

During the collection process, every precaution is taken to ensure that the blood is as healthy as possible. Prospective donors are carefully screened to ensure that they do not have heart, liver, kidney, or lung disease; a history of cancer, jaundice, tuberculosis, allergy; or a transmissible disease (e.g., AIDS,

syphilis, or hepatitis). Also, donors cannot donate blood if they did so within the last three months, have been pregnant recently, or had major or dental surgery. They must not be taking medications other than birth control pills or an occasional aspirin or recently received blood, immunizations, or vaccinations. Finally, donors are also excluded if they are taking narcotics or other illicit drugs or recently undergone ear piercing, tattooing, or a similar procedure. In addition to all this, donors are given a brief physical, and blood samples are drawn to test for various substances and disease organisms.

When blood is collected, it is drained into a sterile container and mixed with an anticoagulant solution. Depending on the particular type of anticoagulant used, blood has a storage life of either 21 or 35 days. The identification process begins at this point. The donor's ABO and Rh types are identified and clearly marked on the container label. The label also contains the expiration date, test results for hepatitis, HIV, and syphilis, the name and address of the blood bank that collected the unit, the type of blood product (e.g., whole blood, platelets, etc.), and the donor number of the individual who gave the blood.

After blood is collected, it is stored in a special refrigerated unit in a blood bank. This unit should have both audible and visible alarms that trigger when the unit malfunctions; it also should have some means of circulating the air and verifying the operating temperature. The temperature must be maintained at a constant 33.8 to 42.8° Fahrenheit (F) (1 to 6° Celsius [C]) and checked at least every four hours. In many cases, blood is broken down into its component parts (e.g., platelets, plasma, packed cells, etc.) soon after it is collected. In such instances, storage procedures vary from component to component. Whole blood and packed cells are stored in a unit, as previously described. Platelets are usually maintained at room temperature but should be given within 6 hours of harvesting. Some facilities allow as much as a 24-hour delay. Plasma, on the other hand, is stored in a freezer as fresh frozen plasma after it is separated from other components. The operating temperature of the freezer should be below 4°F (–20°C). This freezer should have the same visible and audible alarm system, as does the refrigerated unit. Once the plasma is thawed for transfusion, it cannot be refrozen. It can be stored temporarily in the refrigerated unit, but it must be transfused within 6 hours—some authorities say 24 hours—of thawing.

Blood and blood components should be kept as close as possible to their storage temperature until they are administered. Many OIs specify a maximum of 30 minutes delay between the time the blood is picked up at the blood bank and the transfusion is begun. If blood is in an insulated container that maintains the temperature below 50°F (10°C), this timeframe can be extended 15–30 minutes. Your unit refrigerator is NOT acceptable for storage of blood or blood components. The temperature of such units is not sufficiently controlled to allow for safe storage. The best way to handle the storage problem is also the most obvious—don't pick up the blood until you and the nurse are ready to administer it!

Compatibility testing

The first step in the actual transfusion process is compatibility testing. The physician usually initiates the procedure by signing an SF Form 518 and designating the time and type of transfusion. If the doctor writes the order in the AF Form 3066, Doctor's Orders, the nurse can sign the SF Form 518 for the doctor. You may be responsible for filling out the ID section of the SF Form 518, although in some facilities the nurse may be responsible for this task.

If you fill out the form, *ensure* you do so accurately and completely. As we said, misidentification is one of the primary causes of adverse reactions to blood. Complete the form in triplicate and have the nurse or doctor sign in section I. Include the recipient's full name, room, bed, hospital ID number, date of the request, name of physician, and type of test desired (i.e., type and cross match), date and time the unit is desired, and number and type of units desired. Normally, a separate SF Form 518 is initiated for each unit. Depending on the urgency, the form is either sent to the lab, or the lab is called to have a technician draw a blood sample for the type and cross match. Depending on the shift, you and the nurse may draw the blood sample. In a life-or-death situation, a physician may skip the type and cross match.

Type and cross match

The type and cross match are laboratory tests to ensure that the donor's blood is compatible with the patient's (recipient's) blood. Once the lab receives a request or is notified, a technician comes to the unit to draw a sample of the patient's blood. This sample should be drawn from a fresh site and not from an existing IV or heparin lock. In some facilities, a heparin lock may be used if it is thoroughly flushed and the first 5 cc of blood discarded. Usually, it is easier to draw a fresh sample than go through all this.

When the lab tech draws the blood, he or she must label the specimen container and sign section I of the SF Form 518 before leaving the patient's bedside. The information on the container label must be taken directly from the patient's ID band to include the facility, patient's full name and ID number, date and time the blood was drawn, and signature of the person who drew the blood. The patient also should sign the SF Form 518, verifying that his or her blood was drawn. If the patient is incapable of signing, an authorized person, such as the next of kin or the nurse, should sign verifying the patient's ID and the fact that blood was drawn. In some facilities, you may act as a witness and sign the form. If you do, check the information with the patient's ID band. Do not blindly assume that the information is accurate.

Blood typing

Typing determines the recipient's ABO and Rh blood types. Placing the recipient's red cells in tubes containing anti-A and anti-B serum is how ABO typing is done. Agglutination in either or both of the tubes indicates that the patient has the antigen that the particular serum is specific against (e.g., agglutination in both tubes indicates that the patient has both A and B antigens, meaning he or she has type AB blood). Combining the patient's serum with known type A and B erythrocytes—in separate tubes of course—confirms the forward typing. If the previous example was accurate, that patient's serum does not react with either type of cell. This process is called reverse or back typing.

Rh typing is done in a similar manner. The recipient's erythrocytes are placed in a tube containing a high-protein, anti-D serum. If the cells agglutinate, the patient is Rh positive. If not, the patient is Rh negative.

Cross matching

Once the recipient's blood is typed, it is cross matched against the same type donor blood. This determines the actual donor-recipient compatibility. A sample of the recipient's plasma is incubated with a sample of the donor's erythrocytes and observed for signs of incompatibility. If there is no reaction, the blood types are compatible. There is no guarantee that a reaction will not occur. If the recipient and donor are incompatible, the donor's cells either agglutinate or are hemolysized. The cross match requires one to two hours to perform. In emergency situations, an abbreviated cross match can be done using erythrocytes from the recipient and plasma from the donor. If there is absolutely no time for cross matching of blood, the physician must sign a "release for O-blood." If the physician does not want to sign a release for O-blood and does not have time for a full cross match, he or she can write an order for blood that is of the same blood type as the patient's. This is referred to as "type-specific."

Equipment and procedures to perform transfusion therapy

After all of this background information, the actual administration of the blood or blood product is a relatively simple procedure. The procedures are very much like the IV procedures discussed earlier, except that a registered nurse actually initiates the transfusion.

When the nurse is ready for the transfusion unit, he or she calls the blood bank to authorize you to pick up the blood. Remember, there should not be more than 30 minutes between the time you pick up the blood and the time the transfusion is started. Don't pick up the blood until the nurse is actually ready for it. When you go to the blood bank, you must verify the patient's name, Social Security number, blood type, and ID number; donor unit number; and any other applicable information in the blood bank ledger on the unit container and on the SF Form 518 before you take the unit out. Once you verify the information, sign the ledger and take the blood product and two copies of the SF Form 518 back to your unit. Before you leave the lab, check the expiration date on the blood unit and check the unit for abnormal cloudiness, clots, air, or colors.

When you return to the unit, the nurse again examines the transfusion unit for unusual color, clots, and so forth and rechecks the expiration date. He or she also compares the unit with the doctor's orders to ensure that the correct product has been supplied. The nurse then takes the unit and the SF Form 518 to the patient's bedside to complete the ID process. The nurse verbally asks the patient's name and compares the information on the patient's ID band with the SF Form 518 and the unit itself. Information that must be verified includes the facility; patient's name, ID number, and blood type; donor number; and expiration date. If you are acting as a witness, you'll verify all of this information. If all of the information is correct, the nurse signs in section II of the SF Form 518 and you cosign. If there is any discrepancy, the unit is not transfused until the discrepancy is resolved.

Before the transfusion is actually started, take a set of baseline vital signs on the patient. You'll probably also assemble the equipment the nurse needs to initiate the transfusion. This should include a blood transfusion set with an in-line filter (fig. 1–24), an 18-gauge or larger over-the-needle catheter, tape, dressing material, antiseptic solution, and antiseptic ointment. The filter is needed to filter out the clots and aggregates of leukocytes and platelets. If the blood product is whole blood or red cells, the nurse may use an in-line microaggregate filter. This type of filter should not be used for transfusion of platelets or granulocytes because the pores are too small for the cells to pass through. The transfusion set may be either straight-line or "Y" type. If Y-type tubing (fig. 1–25) is used, the unit attached to the other port must be 0.9 normal saline. Any other solution causes agglutination or hemolysis (breakdown of cells). By the same token, medications should NEVER be added to the blood container or administered through the same tubing.

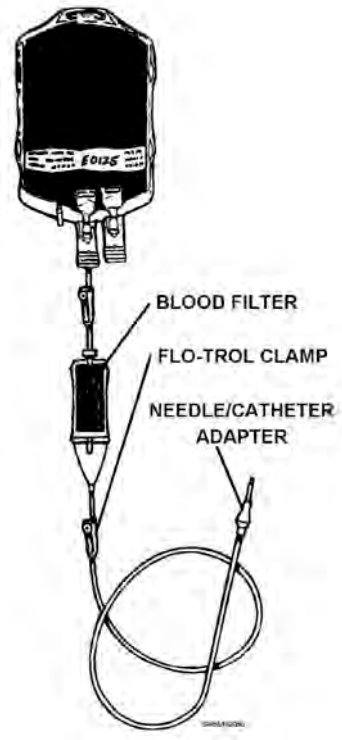


Figure 1–24. Straight-line transfusion set with filter.

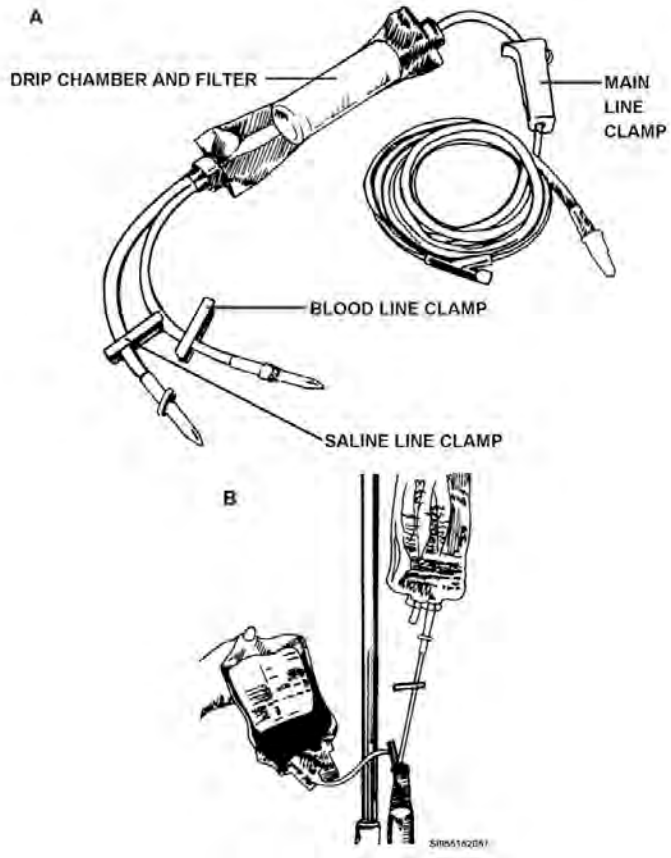


Figure 1–25. A: "Y" type blood transfusion set; B: Setup of "Y" tubing.

If the nurse has not done so already, he or she will perform a venipuncture to initiate the transfusion.

NOTE: It is always a good idea to start the IV prior to going to the lab to pick up the blood. You'll assist by positioning the patient and doing whatever else is necessary. The nurse primes the tubing, cleans the site, applies the tourniquet, and starts the transfusion as described earlier.

Before the blood unit is connected to the tubing, it should be inverted gently to mix the red cells. The venipuncture itself should be started with an 18-gauge or larger needle to prevent erythrocyte damage and allow for an adequate flow rate. The vein must be large enough to accommodate the needle. Usually, the cephalic vein is preferred because of its size and accessibility.

Once the transfusion is initiated, allow it to run slowly for the first 15–30 minutes; then observe the patient closely for any adverse reactions. If there are no signs of overloading or adverse reactions, you can increase the flow rate. The normal flow rate is usually between 80 and 100 drops per minute. Too rapid a flow rate causes overloading and other adverse reactions. However, that is not normally a problem because blood is too thick to flow fast unless there is some outside force applied. A blood pump may be used if the patient is receiving large amounts of blood in a hurry. If such a device—either mechanical or electronic—is used, monitor the patient closely for signs of circulatory overload. If using a pump, ensure that it is made for the use of blood administration. Pumps are designed to handle the components of blood and ensure that blood flow is adequate and consistent. Don't use a pump unless you are certain it is designed to handle blood products. In some emergency situations, blood products may be required at a rapid rate. In this case, the provider may order a pressure bag to be used. You should not use a blood pressure cuff or any other pressure device unless it is specifically authorized for blood transfusions. Other pressure sources can apply irregular pressure on the bag and cause it to split the bag along the seams and may also damage the blood products. Following are some essential steps and information on using a pressure bag. This process can also be used if a bag of IV fluids is to be given at a rapid rate as well.

1. Set up and regulate the infusion pressure bag.
2. Verify doctor's order.
3. Wash hands and gather all necessary equipment.
4. **NOTE:** At this point, the nurse should hang the blood product.
5. Place the bag through the bottom of the pressure infuser and hang the bag on the IV pole.
6. Place release valve in the "OFF" position to begin and pump the infuser cuff to 300 millimeters of mercury (mm/Hg) or according to the doctor's order. However, IV bags will not withstand pressure greater that 300 mm/Hg.
7. Monitor fluids as they are infused and continuously check the cuff pressure to ensure it stays inflated at the required set amount of pressure.
8. When infusion is completed (or in the case of an adverse reaction), close the roller clamp and open infuser release valve to expel any residual air in the cuff.
9. Notify the nurse and document the procedure. Blood-product bag and tubing should be removed with the transfusion is complete. Verify the doctor's orders.

Normally, blood is administered at the temperature it is received from the lab. However, if the patient is receiving a massive transfusion, you may use a blood warmer to minimize patient reactions. If you are using an electric model, it should be equipped with a visible thermometer and an audible alarm to indicate excessive warming. Also, it should be preset so that the temperature does not rise above 98.6 °F (37°C). If electronic devices are not available, you can warm the blood by placing the tubing in a pan of warm water. Again, be sure that the water temperature does not exceed 98.6°F.

When the transfusion is completed, the nurse will fill out section II of SF Form 518. He or she also documents the information in the patient's chart to include the type and amount of blood product; time the transfusion was started and time it ended; names of the individuals starting, witnessing, and discontinuing the transfusion; and any patient reactions that occurred.

Monitoring the patient

Transfusions are extremely risky procedures associated with numerous adverse reactions. The patient should be monitored closely both during and after the transfusion. In addition to the baseline vital signs, check the vital signs at start of transfusion x1, every 5 minutes x3, every 30 min x2, every 1 hour until transfusion is complete, x1 upon completion of transfusion, and x1 1 hour after transfusion. If the patient has a reaction, stop the transfusion immediately, but maintain an open line (0.9 normal saline) for emergency medications. Immediately notify the doctor and nurse, and initiate emergency resuscitative measures as needed. Any remaining blood or blood product should be sent to the lab immediately along with the administration set for laboratory analysis.

Transfusion complications can be divided into two major groups: (1) immediate transfusion reaction seen within 48 hours of blood administration, and (2) delayed transfusion reactions and transmission of disease. Specific reactions include allergic reactions, febrile reactions, septic reactions, hemolytic reactions, circulatory overload, and air embolism.

Allergic reactions

These reactions are the result of sensitivity to one of the plasma proteins or to a donor antibody. The reactions may be indicated by anything from a simple rash, itching, and hives to respiratory congestion, pulmonary edema, and anaphylaxis. If the patient exhibits severe symptoms, stop the transfusion immediately and be prepared to administer emergency drugs (e.g., epinephrine, Benadryl) and perform emergency resuscitation. If the only sign of allergic response is a mild rash, you may continue the transfusion at a slow rate, but you should monitor the patient continuously. Let the nurse decide which course of action to take.

Febrile, nonhemolytic reactions

These are usually caused by hypersensitivity to the donor white cells, platelets, or plasma proteins. Signs and symptoms include sudden chills, fever, headache, flushing, and anxiety. Stop the transfusion immediately if any of these symptoms occur, and send the remaining blood, tubing, and a blood and urine specimen to the lab for analysis. Continue to monitor the patient's temperature at least every half hour and give antipyretics as directed by the doctor.

Septic reactions

These reactions are caused by transfusion of contaminated blood or blood products. Sudden chills, high fever, vomiting, diarrhea, and severe hypotension are manifestations. Again, if any of these symptoms occur, stop the transfusion and send the blood and tubing back to the lab, along with cultures of the patient's blood. Administer antibiotics and other medications as directed by the doctor. As we discussed with other infectious reactions, the best treatment is prevention. In many cases, reducing or limiting the time that blood stands at room temperature will prevent septic reactions. You should inspect the blood carefully for bubbles, clotting, or abnormal color before beginning the transfusion, and complete the transfusion within four hours. By carefully adhering to these aseptic techniques and changing the tubing after every administration or every other administration (determined by local policy), you greatly limit the possibility of septic reactions.

Hemolytic reactions

These reactions are caused by transfusion of incompatible blood products. Either the recipient's plasma antibodies attach to the donor cells and cause hemolysis, or the donor antibodies attach to the recipient cells and cause hemolysis. In either case, the symptoms include chills, fever, low-back pain, constricting chest pain, flushing, and feeling of head fullness, oppressive feeling, tachycardia, tachypnea, hypotension, vascular collapse, hemoglobinuria, hemoglobinemia, bleeding, and acute renal failure. Immediate action is required to save the patient's life. Stop the transfusion, but keep the line open. Notify the physician and blood bank. Collect urine and blood samples and maintain the blood pressure with fluids and medications as directed. Insert a catheter and maintain hourly outputs.

The patient's chances are greatly increased if the indications are detected early by constant monitoring and a slow, initial flow rate that we mentioned earlier.

Circulatory overload

Too much fluid in the system causes this reaction. The excess fluid backs up into the pulmonary vessels, causing decreased lung compliance. Circulatory overload is indicated by a rise in venous pressure, distended neck veins, dyspnea, coughing, and rales (i.e., crackling sensation at the base of the lungs). Stop the transfusion, place the patient in a sitting position, and administer oxygen, diuretics, and other medications as ordered.

Air embolism

Although unlikely, there is a greater possibility for an air embolism during a transfusion. It may occur when units are changed or when the patient is transported while the transfusion is in progress. Indications include cyanosis (i.e., bluish discoloration of the skin) and circulatory collapse. If an air embolism does occur, place the patient on his or her left side with the head in a dependent position and administer 100 percent oxygen.

Delayed hemolytic reactions

These reactions may occur days or months after a transfusion. As previously mentioned, they include disease transmission and other reactions (e.g., delayed hemolytic reaction, graft-versus-host disease, and hemosiderosis).

The *diseases* that may be transmitted through *contaminated blood transfusions* include hepatitis, malaria, AIDS, and syphilis. Again, the best treatment is prevention. A careful screening program and minimal use of whole blood is the best approach.

A *delayed hemolytic reaction* occurs when red cells are destroyed by an antibody that was not detected during the cross match. Indications of this reaction include fever, jaundice, and a decreased hematocrit. There is no acute treatment for a delayed hemolytic reaction unless the patient goes into shock, and then it is managed as with an immediate hemolytic reaction. Performing the cross match within 48 hours of the transfusion may prevent such delayed reactions.

Graft-versus-host reactions occur when transfused donor lymphocytes engraft and multiply in the bone marrow of an immunodeficient recipient. Signs and symptoms may include a mild, red maculopapular rash, ulcerations, contractures, mucosal degeneration, and hepatosplenomegaly. Administer medications and solutions as directed.

Hemosiderosis or iron overload is caused by deposits of iron in the patient's heart, endocrine organs, liver, spleen, skin, and other major organs from multiple, long-term transfusions. Diabetes, decreased thyroid function, arrhythmias, and congestive heart failure characterize this condition. Treatment is generally symptomatic per doctor's orders.

208. Detecting and managing postoperative complications

As in all areas of patient care, complications may arise in the postoperative unit. This section covers some of the more likely problems you may encounter and provides a few ways to appropriately handle the situations.

Many of the complications that can occur in the postanesthesia patients are the same as the ones that can occur during anesthesia administration in the OR. For instance, the patient may hemorrhage and go into hypovolemic shock, a respiratory obstruction can occur for a number of reasons, or the patient may have an allergic reaction to one of the anesthetic agents or adjunct drugs administered before, during, or after the operation. In addition, cardiac arrhythmias can develop unexpectedly and lead to a cardiorespiratory arrest, and the patient can have a transfusion reaction when an attempt is made to infuse whole blood. We've covered many of these complications in the previous unit, so we now

confine our discussion to some that normally only occur postoperatively. The first problem is inherent to surgery—postoperative pain.

Pain management

Pain relief is an important part of quality postoperative care. Not only is pain uncomfortable, but it can cause respiratory problems, cardiovascular problems, nausea and vomiting, patient agitation or delirium, and other conditions that can interfere with postoperative recovery. When patients tell you they are in pain—they ARE in pain! Pain is personal and subjective; no matter how minor an operation or how small an incision, different patients experience and tolerate varying degrees of pain. Pain management must be tailored to fit the individual reactions and needs of each patient. Typical areas and causes of postoperative pain include:

- Skin and subcutaneous pain from the incision.
- Deeper tissue pain from manipulation, retraction, electrocautery, and so forth.
- Airway/respiratory tract pain from drying agents, endotracheal tubes, NG tubes, oral or nasal airways, and mask pressure.
- Localized pain and stiffness from pressure or immobilization resulting from the surgical position.
- IV site pain from the needle or catheter insertion, infiltration, or internal pressure.

Pain management sometimes begins before the patient enters the recovery room after surgery is completed. When patients have upper abdominal or thoracic surgery, surgeons may administer a field block by injecting a long-duration local anesthetic agent (such as Marcaine) in the tissue surrounding the incision. This blocks incisional pain during the first few hours after surgery, and allows the patients to stabilize and recover from the effects of the general anesthetic before having to cope with the postoperative pain. Patients having extensive knee or hip surgery may have a continuous epidural catheter placed for postoperative administration of local anesthetics or narcotics.

Narcotics, such as morphine or fentanyl, are sometimes prescribed as analgesics during the immediate postoperative period if the patient's pain is severe. Narcotics are carefully controlled and effects are monitored because they can depress the respiratory system. If narcotics are ordered, they are usually injected intramuscularly or intravenously; sometimes they are "piggy-backed" or spliced into the IV. Conscious patients may be given oral, nonnarcotic analgesics, such as aspirin, acetaminophen, or ibuprofen, for pain relief. Guidance on administration of medication is provided in the CFETP and locally developed policy. Do not give medications unless you have been trained, the training has been documented, and local policy authorizes technicians to administer medication. Some medication and routes of administration may not be authorized to be administered by technicians. Ensure you abide by all policy and guidelines for protection of the patient and yourself. There are other avenues that you can assist the patient with pain control.

Actions you can take to help prevent or reduce a patient's pain include:

1. Ease patient's fears and anxieties by keeping him or her informed of progress, causes of different sensations, what you are doing, and why you are doing it. Provide as much reassurance as possible during the recovery period.
2. Ensure patient is positioned as comfortably as possible without putting stress or pressure on the incision or compromising respiration.
3. "Splinting" incision sites as the patient takes deep breaths or coughs.
4. Assisting with monitoring transcutaneous electrical nerve stimulation (TENS) devices to help relieve acute incisional pain. These battery-operated devices send a mild electrical current through electrodes placed on the skin near the incision site. The current is adjusted until the patient feels a mild tingling or vibrating sensation over the area of application. Transcutaneous nerve stimulators are usually used in conjunction with analgesics and can significantly reduce the dosages of the drugs required to effectively relieve pain.

5. Provide patient with ice and/or heat pack to ease pain.

In addition to managing the patient's pain, the nursing staff must constantly be aware of and ready to treat other postoperative complications. One of these is emergence delirium.

Emergence delirium

Most general anesthesia patients have a calm, placid recovery, but some emerge in an agitated or excited state. They can be extremely restless, cry or moan incessantly, babble incoherently, and be extremely disoriented. In extreme cases, patients may scream, shout, or thrash violently as if in a rage. This extreme irrational behavior is known as emergence delirium. While this usually takes place in the recovery room immediately following surgery, nursing personnel must also be aware of this complication to quickly identify and treat the symptoms should it take place on the postop unit.

Emergence delirium occurs most often in healthy patients and frequently in children. Some of the factors or causes that can contribute to emergence delirium are:

- Hypoxemia is the number one cause and is the first suspect when patients show signs of postoperative excitement or delirium.
- Drugs, especially barbiturates and scopolamine, may contribute, particularly when coupled with fear.
- Patients who are afraid of cancer, disfigurement, or are claustrophobic preoperatively should be watched closely.

Other conditions that can contribute to the development of emergence delirium include:

- Poorly managed postoperative pain
- Cramping of muscles and joints after immobilization during long surgical procedures, or
- Full bladder causing discomfort or pain.

When a patient shows signs of delirium, the first thing nursing personnel do is check the airway and administer oxygen to treat hypoxia and, then, ensure patient and staff safety by using restraining devices and siderails. In some cases, the patient's arms and legs must be restrained to prevent injury and prevent dislodging of catheters, drains, or IV lines. Refer to your local policy for guidance on the use of restraining measures. Blood oxygen levels should be checked by a pulse oximeter or with arterial blood gas samples to confirm or rule out hypoxia. If hypoxia is ruled out, the delirium is treated by relieving the source if possible. Changing the patient's position is sometimes all it takes to quiet him or her. Children may be calmed by being held by their parents. Drugs, such as physostigmine, may be given to reverse the effects of scopolamine, a catheter may be inserted to drain the bladder, or tranquilizers, such as diazepam, may be injected to calm patient fears. If all else fails, administration of a narcotic agent, such as morphine, may settle the patient down. Narcotics are almost never used on children, and nursing staff must watch very closely for signs of respiratory depression and hypotension when they are used. Narcotics can also cause postanesthesia complications such as those discussed next—nausea and vomiting.

Nausea and vomiting

Postoperative nausea and vomiting can greatly increase recovery time and create serious problems for the patient. Vomiting increases the risk of airway obstruction and aspiration. The violent retching and muscle spasms associated with vomiting can cause abdominal muscle cramps and lead to wound disruption. Extended nausea or vomiting can lead to dehydration and electrolyte imbalance.

Nausea and vomiting are caused by stimulation of the vomiting center in the medulla of the brain, frequently triggered by foreign materials, such as gas, blood, or mucus in the stomach or other portions of the GI tract. Narcotics can directly stimulate the vomiting center. It may be influenced by certain anesthetic agents that sensitize the balance control center and cause dizziness. Severe postoperative pain has also been linked to nausea and vomiting. Rough handling of the patient during

transportation and frequent position changes in the recovery room are two main causes of nausea and vomiting in the surgical patient.

Women are historically more prone to nausea and vomiting than men. Drugs, such as meperidine, (Demerol) used for premedication and inhalation anesthetic agents also increase the risk. “Masked” patients are more susceptible to nausea than those who are intubated, probably because of higher levels of gases having inadvertently been pumped into the stomach during positive-pressure ventilation. Other groups of patients who are likely to vomit include patients who become hypotensive during surgery, undergo major abdominal surgery, have a history of motion sickness, and have been given large dosages of a medication reversing agent, such as naloxone (Narcan).

A simple treatment that often helps reduce nausea is to place a cool, wet washcloth or hand towel on the patient’s forehead and reassure him or her. Because a nauseated patient may vomit, always remain close by with an emesis basin. If severe nausea persists, the surgeon or anesthetist may order an antinausea drug.

If the patient vomits, immediately turn his or her head to one side and lower the head of the bed to reduce chances of aspiration. If the patient cannot clear the vomitus, oral suctioning is indicated. As soon as the vomiting episode is over, administer oxygen and evaluate breath sounds with the stethoscope.

If aspiration is suspected, immediately notify the nurse. The surgeon and anesthetist should also be notified as soon as you have stabilized the patient or call them immediately if the nursing staff cannot stabilize the patient. If the airway is obstructed by aspiration, lower the head of the bed, turn the patient’s head to the side, try to remove the obstruction by finger sweep or oropharyngeal suctioning, and send someone for a doctor or anesthetist. Ideally, a professional staff is available to take immediate charge of this emergency situation.

Just as anesthesia administration can affect the vomiting center of the brain, it can also affect the brain’s body temperature regulating area.

Extreme body temperature fluctuation

The systems that normally regulate the body’s temperature are impaired during the anesthesia administration, and the patient’s temperature may be lowered (hypothermia) or raised (hyperthermia) significantly.

The patient’s core body temperature may drop 10°F (6°C) or more, especially if the surrounding room temperature is low and the patient is an infant, small child, or elderly patient. This hypothermia can be compounded by infusion of cold IV solutions and the use of insufficiently warmed wound irrigation. The lowered body temperature intensifies the depressant effects of the anesthetic agents—slowing respiration and causing the patient to shiver uncontrollably. This is a double insult to the respiratory system. Not only is the patient’s breathing slowed, which lowers his or her intake of oxygen, but the muscle activity caused by the shivering may quadruple oxygen use. This combination significantly lowers the amount of oxygen in the blood and can result in hypoxia and, eventually, cardiorespiratory failure.

Treatment includes gradual rewarming of the patient with warm blankets and avoiding sudden movement to prevent large volumes of cool blood in the extremities (particularly the legs) from returning suddenly to the heart. Oxygen is administered to increase the oxygen levels in the blood, sedatives can be administered to reduce shivering, and other medications can be administered to stimulate the respiratory centers in the brain.

Postoperative hyperthermia, or fever, can be caused by many factors including infection, drug reactions, pre-existing diseases, and malignant hyperthermia. Unless hyperthermia is extremely severe, treatment is not usually initiated in the recovery room. The main treatment for excessively high body temperatures is rapid cooling of the body. This can be done by wiping or wrapping the skin with towels saturated in cold, sterile saline, internal irrigation of body cavities and orifices with cold saline, packing the body in ice, or placing the patient on a cooling blanket.

Fluid and electrolyte imbalances

Patients most vulnerable to problems associated with fluid and electrolyte imbalances include infants, elderly patients, and patients with severe, chronic diseases, such as diabetes mellitus or heart disease. Surgical patients who have received large amounts of mannitol (an osmotic diuretic) and patients with severe hypertension who take diuretics to lower blood pressure are also very susceptible to fluid and electrolyte imbalances.

Most of the problems result from excessive fluid loss from the body, especially for patients who receive diuretics. Dehydration can be accelerated and compounded by hemorrhaging during surgery. When severe dehydration occurs, the patient's blood pressure falls and the heart rate increases (tachycardia). If left untreated, seizures, coma, and death follow. The basic treatment for severe dehydration is massive infusion of IV fluids and close monitoring of serum electrolytes.

Sometimes patients are given too much fluid intravenously. This can result in a fluid overload characterized by a frothy, pink sputum, obvious respiratory distress (due to the fluid buildup in the lungs), elevated central venous pressures (CVP), and a "fluffy" looking chest X-ray. If left untreated, this condition can result in congestive heart failure. Treatment for fluid overload involves intubating the patient and providing positive-pressure ventilation while administrating a diuretic, such as furosemide (Lasix), and opioids, such as morphine.

Other complications

Other postoperative complications include shock, hemorrhage, hypoxia, and problems associated with particular surgical procedures. Continuously observe, monitor, and report any abnormal signs or symptoms, regardless of how minor they appear. Some of the common conditions and symptoms are listed in the following table. This is only a partial list, and symptoms listed in a regional area may pertain to other areas as well.

Postoperative Complication	Description
Shock	Low blood pressure (systolic below 90); cold, moist skin; ashen, pale skin; rapid, thready pulse; rapid, shallow respiration; cyanosis of lips; subnormal temperature.
Hemorrhage	Bleeding; rapid pulse; increasing pulse rate with falling pulse pressure; rapid, deep sighing respirations; cold, moist, pale skin; restlessness; apprehension; low blood pressure; pallor of lips and mucous membranes; thirst.
Hypoxia	Rapid, difficult respiration; restlessness; marked air hunger; rapid, thready pulse; apprehension; cyanosis; yawning; blurring vision.
Abdominal surgery	Distention; tenderness; bleeding or excessive drainage; bright red blood in drainage; vomiting; continued hiccups; cramping abdominal pain; blood-tinged urine; patient complaint, "Something let go."
Neurological surgery	Weak, spontaneous movements; weakness or paralysis of side or extremity; unequal pupils or a fixed pupil; convulsions; rapid rise in blood pressure with decrease in pulse rate and respiration; labored respiration; restlessness; headache; edema; pallor; drowsiness after patient reaction; difficult speech; lessened reaction to stimuli (such as pin prick); agitation; personality change.
Thoracic or cardiac surgery	Rapid respiration; tachycardia; cyanosis; restlessness; distended neck veins; low blood pressure; subcutaneous emphysema (escape of air from pleural space into tissues); crepitus (crackling or grating sound when touching swollen tissue); abnormal movement of chest wall; splinting of chest; sudden increase in volume of drainage; difficult respiration; swelling; bloody drainage in chest evacuation container; patient apprehension.
Orthopedic surgery	Pain in casted extremity; difficult respiration due to tight body cast; excessive bleeding; extremity swelling, coldness, paleness, blanching, cyanosis, tingling, or numbness; localized burning pain; loss of sensation; sudden, severe chest pain; reddened skin areas; inability to extend fingers accompanied with pain.

Postoperative Complication	Description
Urological surgery	Excessive bleeding or drainage; bright red drainage or clots; sudden drop in blood pressure; spasms of bladder; extreme desire to urinate; overly distended bladder; inability to void; nausea and vomiting; lethargy; abdominal distention; oliguria (reduced urine output); edema; hematoma.
Eye surgery	Nausea; vomiting; restlessness; disorientation; apprehension; bleeding or excessive discharge; persistent or increasingly severe pain.
Ear surgery	Facial paralysis; impairment or loss of hearing; elevated temperature; headache; stiff neck; dizziness; vomiting.
Nose surgery	Respiratory distress; restlessness; sudden elevation of temperature; excessive or projectile vomiting; headache; stiff neck; edema; bleeding; hematoma; severe pain; subcutaneous emphysema; frequent swallowing and belching.
Throat or neck surgery	Bleeding; difficult, sighing, or noisy respiration; repeated swallowing; edema; nausea and vomiting; increasing restlessness; emphysema; patient complains of tightness or pressure of operative site; muscular twitching; spasms of hands and feet; tachycardia; high temperature; loss of voice.

Preventing airway obstruction

As you know, general anesthesia can not only cause relaxation of respiratory muscles—diaphragm, intercostals, and abdominal—it can also affect the muscles that control the jaws. When these muscles relax, the lower jaw drops and the tongue falls back in the throat and obstructs the airway. To prevent this, anesthetists may insert an oral or nasal airway after extubation. Relaxation of the patient's neck muscles can also cause airway obstruction if proper neck alignment is not maintained during the immediate postoperative period. Patients will normally have all airway adjuncts removed when they are returned to the nursing unit. However, there are specific units, such as intensive care units (ICU), which will have patients who are intubated or have an airway adjunct. You should know how to identify patients that need an airway placed and how to care for patients who have airway adjuncts left in place. How do you tell if a patient's airway is obstructed or partially obstructed? Follow the guidelines we discussed above. Look for the rhythmic, symmetrical rise and fall of the chest; listen for unusual breathing sounds, such as gurgling, wheezing, or high-pitched crowing; and feel for exhaled breaths by placing a hand in front of the patient's mouth and nose.

Airway obstruction by the tongue, mucous secretions, or posture causes most of the respiratory problems. The simplest way to prevent this is by turning the patient's head to the side and hyperextending the chin. This not only keeps the tongue and jaw from falling back but also reduces chances of aspiration of mucus and vomitus into the trachea and lungs. Two other techniques used in critical instances of airway obstruction are the ones you learned in basic life support (BLS)—the head tilt/chin lift or the head tilt/jaw thrust. Preventing postural obstruction usually involves a simple adjustment of the patient's neck alignment, so the head and neck are in a straight line with the spine. Special attention must be given to the neck alignment of unconscious infants and small children because their tracheas are softer than adults and more susceptible to collapse when their heads are hyperextended or hyperflexed.

Another measure that helps prevent possible airway obstruction is to leave an oral or nasal airway in position until the patient regains sufficient reflex responses to spit or pull the airway out. If you see a patient gagging, choking, or trying to push the airway out with the tongue, remove it. Do not let the patient continue to gag on an oral airway; otherwise, he or she may suddenly vomit and aspirate the emesis. Then you'll have a major respiratory complication on your hands!

One action frequently required to maintain an open airway in the postoperative patient is suctioning of the nose, mouth, and trachea.

Suctioning procedures

Suction is used to remove any mucous, blood, or other secretions from a patient's nose, mouth, throat, and trachea before they are aspirated into the deeper breathing passages. Proper technique is essential to effectively remove secretions, prevent harm to the patient, and minimize risk of infection.

Oropharyngeal and nasopharyngeal suctioning

Suctioning the mouth, nose, and throat are relatively simple procedures, but you still need preparation and training to perform them safely. Since you will most often be required to suction out a patient's mouth and throat (oropharynx), we'll cover this technique first. The steps for oropharyngeal suctioning are:

Oropharyngeal Suctioning (Also to be used with nasopharyngeal suctioning.)	
Steps	**Explanations**
Assemble all equipment and supplies.	Most inpatient units have wall-mounted suction; make sure the device is properly assembled and working. Ensure the connecting tubing between the suction apparatus and suction tip is long enough and all connections are tight. Gather a basin of sterile saline, surgical or examination gloves, and a variety of suction catheters. Use a size 14, 16, or 18 French (Fr.) catheter to suction adults and an 8 Fr. for infants or small children.
Wash your hands thoroughly, dry them, and don gloves.	The gloves do not have to be sterile since oropharyngeal suctioning is considered a clean procedure rather than a sterile one.
Place the patient in a semisitting position whenever possible.	This makes it easier for the patient to breath and cough and also allows gravity to help with the catheter insertion. In an emergency, if large amounts of vomit, blood, or secretions totally fill the patient's mouth and throat, immediately turn the patient's head to the side and have someone help you lower the head of the bed. Quick action is needed in this situation to ensure the majority of the fluid drains out of the patient's mouth by gravity and is not aspirated into the lungs. Keep the patient in this position while you suction out the mouth and nose.
Explain the procedure to the patient, even if he or she appears unconscious.	This reduces the patient's apprehension and helps gain his or her cooperation during the procedure. (Just think how you would feel if someone tried to stick a long, skinny tube in your mouth without telling you why!)
Turn on and regulate the suction device.	Block (occlude) the tubing to obtain maximum vacuum, then regulate the pressure to 60 to 100 mm/Hg for infants or 100 to 120 mm/Hg for children. Higher levels may be used for adults.
Suck a small amount of saline out of the basin.	This ensures the suction device is functioning properly and lubricates the inside and outside of the catheter. Lubricating the outside prevents the catheter from sticking to the membranes in the mouth and throat; wetting the inside reduces the chances of secretions clogging it.
Gently insert the catheter into the patient's mouth, threading it along the roof of the mouth towards the trachea.	Do NOT apply suction as you are threading the catheter into the patient's mouth. Applying suction as the catheter is introduced would remove oxygen and could cause trauma to the mucosal tissues. If the patient gags, back the catheter out slightly.
Block the catheter's suction control port with your finger and apply suction as you slowly and gently withdraw the catheter using a twisting motion.	Rotating the catheter as it is withdrawn helps clean secretions in a complete circle around the catheter tip. Do not apply suction for more than 10–15 seconds at a time as you will reduce oxygen to the patient's lungs and trachea.
Listen to chest and breathing sounds.	Determine the effectiveness of suctioning; use a stethoscope, if necessary.
Repeat as necessary to clear the airway.	Allow the patient to rest and breathe humidified oxygen for 2–3 minutes between applications. Aspirate a small amount of saline through the catheter before each suctioning.

Oropharyngeal Suctioning (Also to be used with nasopharyngeal suctioning.)	
Steps	**Explanations**
Assess respiration after suctioning.	Document the patient's record, the time, nature, and amount of secretions removed by suctioning. Don't forget to add this to the I&O form.
Offer the patient a damp sponge or lemon-glycerin swab.	Assist in cleaning the patient's lips and mouth after and between suctioning.

The preparation and technique required for nasopharyngeal suctioning are the same as those for oropharyngeal suctioning, except:

Nasopharyngeal Suctioning (Use these steps in addition to the ones above.)	
Steps	**Explanations**
Position the patient's head.	He or she should be looking straight ahead and the tip of the nose should be slightly elevated.
Measure the catheter length required for insertion.	Estimate how much of the catheter needs to be inserted to reach the pharynx by holding the catheter next to the patient's face and noting the distance between the tip of the nose and the external ear opening.
Insert the catheter along the floor of the nostril—either one.	If you meet resistance, do not force the catheter. Back it off and try inserting it at another angle or in the other nostril. Suction the nasopharynx using the techniques previously described. If both nostrils are open with no obstructions, alternate nostrils between suctioning. Administer oxygen between and after suctioning.

NOTE: Sometimes it may be necessary to perform intratracheal suctioning to remove deeper secretions.

Intratracheal suctioning

This type of suctioning is a bit trickier and requires strict aseptic technique to prevent introduction of potential pathogens deep into the patient's respiratory passages. The nurse or anesthetist performs this type of suctioning, but you should learn the technique in case of emergency. Once trained, you may be tasked to routinely monitor and suction a patient who has a tracheotomy or upper respiratory problem. Never attempt tracheal suctioning unless you have been properly trained and certified to do it. The steps are as follows:

Intratracheal Suctioning	
Steps	**Explanations**
Prepare supplies and equipment.	This time, obtain a *sterile* basin for holding the sterile saline solution. Select a catheter that will not occlude the trachea, endotracheal tube, or tracheostomy tube, usually a 14 or 16 Fr. suction catheter. Leave the suction catheter in the peel-back wrapper to preserve sterility; open it just enough to connect it.
Talk to the patient.	Inform the patient of the procedure about to take place to reduce his or her apprehension.
Ensure the patient has been properly ventilated before suctioning.	Deep suctioning removes much of the oxygen from the patient's lungs and can lead to cardiac arrhythmias. If the patient is conscious, ask him or her to take four or five deep breaths while breathing humidified oxygen. If the patient is unconscious, hyperventilate with an Ambu bag. If the patient has an endotracheal tube in place, ensure the lungs are fully inflated with the Ambu bag or other mechanical respiratory assistance device several times prior to suctioning.
Don sterile gloves using the open glove method.	Do not touch anything other than the sterile catheter.
Unwrap catheter.	Remove the catheter from the wrapper using aseptic technique.

Intratracheal Suctioning	
Steps	**Explanations**
Insert the catheter.	Insert the catheter through the endotracheal tube or tracheostomy tube, if in place, or insert it along the roof of the mouth or floor of a nostril until it reaches the larynx. Gently grasp and retract the patient's tongue with a sponge to make the glottis open and move in line with the trachea (if the patient is conscious, say "stick out your tongue!"). Monitor breath sounds and air movement through the suction port on the connector as you slowly advance the catheter. When you reach the front of the larynx, breath sound loudness will increase and you will feel more air movement through the suction port. If breath sounds decrease or the patient starts to gag, the catheter is probably touching the lower part of the pharynx (hypopharynx) near the esophagus; draw the catheter back and retry. When the tip of the catheter enters the larynx, the patient usually coughs suddenly. When this occurs, wait for the patient's next breath, and advance the catheter during the breath.
Apply intermittent suction.	Once the catheter is in the trachea, apply intermittent suction by alternately opening and closing the suction control port on the catheter connector with your thumb.
Remove the catheter.	Slowly remove the catheter using the same technique we described before.
Resuction as needed.	If resuctioning is necessary, make sure the patient is hyperventilated before inserting the catheter. Also, make sure you don a new set of sterile gloves and use a new sterile catheter.
Assess respiration after suctioning.	Document the procedure as previously described.

Anytime suctioning is performed, closely monitor the patient's vital signs. Whenever possible, take a complete set of vital signs immediately before and after each suctioning procedure to make sure the patient is stable.

Never ignore a patient's complaint, no matter how insignificant it appears. Small problems can grow into very big problems when left unattended. There are numerous other complications and symptoms that occur in postanesthesia patients. We do not expect you to memorize all of them or know how to treat each one—that's the doctor's job. Your main job is to learn enough to help detect a postoperative problem before it mushrooms into a life-threatening situation. To do this, you must master the techniques used for taking and recording vital signs and be able to readily identify abnormal reactions and vital-sign fluctuations. ALWAYS notify nurse and/or physician with any abnormal or fluctuating vital signs.

Self-Test Questions

After you complete these questions, you may check your answers at the end of the unit.

204. Providing support for the admitted patient

1. What are the three major goals during the preoperative period?

2. What two emotions can interfere with the patient's response to surgery?

3. What nursing intervention can help to relieve most of the patient's concerns prior to surgery?

4. When do patients begin to worry about surgery?

5. What does the provider often do to help a patient relax and sleep prior the night before surgery?

6. What can you, the medical technician, do to comfort a patient concerned about his or her surgery?

7. What bedside activities normally take place the day or night before surgery?

8. What is the primary purpose for treatment and medications given to a preoperative patient?

9. Why is a chest x-ray taken prior to surgery?

10. What routine labs are frequently completed the day before surgery?

11. What is the purpose of a preop urinalysis?

205. Preoperative functions

1. What preoperative action do most patients perform the evening before surgery?

2. What is involved in preparing the skin for surgery?

3. What may happen if the skin is scratched or nicked near the surgical site prior to surgery?

4. What preparation normally differs in a pediatric patient from an adult?

5. What action must be taken once the premed is given?

6. What are some typical procedures performed in SDSCs?

7. What are the normal steps for applying elastic stockings?

206. Postoperative care in the recovery room and on the unit or ward

1. What is the goal of care provided during the immediate postoperative period?

2. What three possibilities should you suspect if the blood pressure of a postoperative patient begins to drop?

3. List three signs of shock.

4. How do you determine the patient's LOC?

5. List several items needed in the patient's room prior to his or her return from the recovery room.

6. What observations must you make upon the initial assessment of the postoperative patient?

7. On what types of patients can you conduct a neurological exam?

8. What does PERRLA stand for?

9. What is the purpose of using a pulse oximetry/oxygen saturation device?

10. When are pneumatic stockings normally used?

11. What are three important postoperative exercises?

207. Blood transfusion therapy

1. What is a transfusion?

2. How is plasma supplied?

3. What is whole blood mixed with after it is collected from a donor?

4. What is the first step in the actual transfusion process?

5. Once a transfusion is initiated, how long should it run slowly?

208. Detecting and managing postoperative complications

1. Besides being uncomfortable, pain causes other problems. List three.

2. Cite three areas that typically cause postoperative pain.

3. List three ways immediate postoperative pain is managed with medication.

4. What is emergence delirium?

5. Cite five factors or causes that can contribute to emergence delirium.

6. List at least four actions nursing personnel can take when a patient exhibits signs of emergence delirium?

7. Specify five side effects of a patient vomiting.

8. What are two *main* causes of nausea and vomiting in the surgical patient?

9. What is one of the easiest and most effective treatments for a patient experiencing nausea?

10. List the five steps you take if a patient vomits after surgery.

11. Briefly describe the effects hypothermia can have on a patient.

12. What is the main treatment for excessively high body temperatures?

13. Briefly describe the effects severe dehydration can have on the body.

14. What is the basic treatment for severe dehydration?

15. What signs can a patient with extreme fluid overload exhibit?

16. What measures are included in the treatment for fluid overload?

17. What are the three main causes of airway obstruction after surgery?

18. How long is an oral airway left in a patient's mouth following surgery?

19. What size suction catheters are normally used on adult patients?

20. Why do you aspirate a small amount of saline into a suction catheter before and between uses?

21. Why is it important to avoid applying suction to a suction catheter during insertion?

22. When performing oropharyngeal suctioning, what is the *maximum* length of time you apply suction?

23. Before performing nasopharyngeal suctioning, how can you approximate the length of catheter that needs to be inserted to reach the pharynx?

24. Why is strict aseptic technique required for intratracheal suctioning?

25. What do you do to ensure a conscious patient is well-ventilated prior to suctioning out the trachea?

26. When performing intratracheal suctioning, how can you determine when the catheter is properly positioned in front of the larynx?

Answers to Self-Test Questions

201

1. Military and civilian physicians, dentists, and CNM.
2. The physician, or physician's designated representative.
3. The order in which the various procedures are carried out.
4. Condition of the patient and policy of the facility.
5. Only under emergency circumstances.
6. Cuts down on patient waiting time and frustration.
7. When the unit is first notified that a new patient is coming or a scheduled patient arrives.
8. You should know what paperwork is required and how to properly label the chart and papers.
9. Pajamas or gown, slippers, towel, washcloth, bath basin, emesis basin, water pitcher, cup, and if needed, a urine specimen cup and an IV pole.
10. Nursing medical history, patient evaluation, vital signs, and height and weight.
11. In a friendly manner.
12. Attach it to the bed within the patient's reach.
13. Explain the unit's policies on visitation, use of day rooms, unit sign-in and out procedures, fire safety and evacuation procedures, patient passes, physical layout of the unit, and so forth.
14. Anything that affects the patient, including times for meals, vital signs, AM and PM care, and lights out.
15. Patient status boards and sign-out registers.
16. It allows a patient to depart from the medical facility for a short period of time, usually 24 and 48 hours.
17. The patient's physician.
18. It is nonchargeable leave for the minimal time required to meet medical needs for recuperation.
19. A transference from one service to another with no physical movement involved; it occurs when the physician determines that the patient requires some sort of specialized care.
20. Chief of service.
21. The AE clerk.
22. 66 lbs.
23. On a Stryker frame.
24. Transfer, subsisting elsewhere, and discharge.
25. Observations of the patient's condition, any final treatments, and discharge instructions.
26. AFI 41–210.
27. Disposition clerk.

202

1. Each form must include, at a minimum, the patient's name, hospital admission register number, Social Security number, and name of the treating facility.
2. DD form 792.
3. Time started, amount of fluid in the IV bag, type of fluid, rate per hour, medications.
4. 2.2 lbs.
5. Patients with cirrhosis of the liver or when internal bleeding is suspected.
6. The Chief Nurse.
7. Make corrections by simply lining through the incorrect information, write the correct information next to the lined through information, and then initial and write the date you made the correction.
8. Subjective information, objective information, assessment, plan, prevention (counseling or education).
9. The licensed provider.
10. AF Form 3066, Doctor's Orders.
11. Transmit written orders for the patient's care and treatment to the nursing personnel and establish and maintain a drug profile on the patient.
12. The nurse writes "noted" to indicate that the orders have been carried out and the time and the date and signs the column next to the physician's signature.
13. The locally devised surgical checklist.
14. Clinical records and patient-care procedures.
15. To document the patient's consent for a specific procedure.
16. Check to see if there are any labs or x-rays that need to accompany the patient to surgery.
17. Ask the patient to remove his or her jewelry and leave with a family member or have the valuables placed in a safe or vault if there is no family member to leave them with.
18. All jewelry on both arms or hands must be removed, including a wedding ring, even if it has to be cut off.
19. It must be brought to the attention of the unit nurse and corrected immediately.

203

1. Resolve nursing diagnoses.
2. (1) Set priorities.
   (2) Establish goals.
   (3) State objectives or outcomes.
   (4) Select nursing activities.
3. According to the most life-threatening problems.
4. A realistic and measurable statement of the expected change in patient behavior or condition.
5. The patient.
6. Objectives are the day-to-day activities that the patient must do to reach a goal.
7. What type of activity was used to treat this sort of problem in the past? How successful was it? Do you have the necessary skills to do the activity? Is the activity patient-centered? Does it take into consideration all aspects of the patient? Most of all, will the patient agree to it? Is the activity realistic? How do the other healthcare providers feel about your plan?
8. Organize and find out what you have to do. Wash your hands and collect your equipment. Greet the patient, check his or her ID, explain what you are going to do, and do the procedure. Observe the patient. Clean up (wash hands) and report your actions and observations to the nurse.
9. Try to find out what went wrong and develop a better plan.

204

1. To prepare the patient mentally, spiritually, and physically for his or her operation.
2. Fear and anxiety.
3. Good preoperative teaching.

4. After visiting hours are over and the patient is alone.
5. He or she will normally order medications to help the patient relax and sleep.
6. Be friendly, caring, professional and be a good listener for the patient.
7. Teaching the patient activities that will be required once he or she returns from surgery. Examples are turning, coughing, deep breathing, diaphragmatic breathing, incentive spirometry, and leg and foot exercises.
8. To prepare the patient's body for surgery.
9. To rule out any possible lung disease.
10. A CBC and urinalysis.
11. It gives the surgeon information about the blood and function of the kidneys.

205

1. Shower or bathe using an antiseptic soap, such as povidone-iodine (Betadine), to reduce the number of microorganisms on the skin.
2. Cleaning, disinfecting, and hair removal.
3. The chance for bacterial growth near the operative site increases the danger of infection being carried into the incision.
4. Pediatric patients will normally remain in their own pajamas until anesthesia is given. Adult patients change into a clean hospital gown or pajama top.
5. Bed siderails must be pulled up and remain up.
6. Myringotomy, odontectomy and cystoscopy.
7. (1) Collect supplies,
   (2) Check doctor's orders,
   (3) Measure leg length and circumference,
   (4) Clean and dry the legs,
   (5) Turn the stocking inside out down to the heel,
   (6) Stretch the stocking over the heel and rest of the foot,
   (7) Pull the stocking over the ankle (calf and thigh [if using thigh highs]), and ensure the stocking fits smoothly and without wrinkles.

206

1. Look for adverse reactions or complications from surgery.
2. Loss of blood, drug effect, or shock.
3. Cold, clammy, and pale skin.
4. Ask the patient his or her name, date, and location.
5. Vital-sign equipment, emesis basin, waterproof bed protector, I&O sheet, vital-sign record, oxygen regulator, and suction regulator.
6. Amount and type of IV solution infusing, patient skin temperature and color, observe the dressing for bleeding, and check any drainage bags and tubes.
7. Conscious and unconscious.
8. Pupils Equal, Round, Reactive to Light, and Accommodation.
9. It is a noninvasive method used to rapidly determine the pulse and oxygen profusion of a patient.
10. High-risk patients who are undergoing general anesthesia.
11. TC&DB, incentive spirometer, and leg and foot exercises.

207

1. The IV administration of whole blood or blood products.
2. In 225 cc units as pooled, fresh frozen, or single-donor plasma.
3. An anticoagulant.

4. Compatibility testing.
5. For the first 15–30 minutes.

208

1. Any three of the following:
   (1) Respiratory problems.
   (2) Cardiovascular problems.
   (3) Nausea and vomiting.
   (4) Patient agitation or delirium.
2. Any three of the following:
   (1) Skin and subcutaneous pain from the incision.
   (2) Deeper tissue pain from manipulation, retraction, electrocautery, etc.
   (3) Airway/respiratory tract pain from drying agents, endotracheal tubes, NG tubes, oral or nasal airways, and mask pressure.
   (4) Localized pain from pressure or immobilization resulting from the surgical position.
   (5) IV site pain from the needle or catheter insertion, infiltration, or internal pressure.
3. Any three of the following:
   (1) By injecting a long-duration, local anesthetic agent into the tissue surrounding the incision just before wound closure.
   (2) Using a continuous epidural catheter placed for postoperative administration of local anesthetics or narcotics.
   (3) Injecting narcotics intramuscularly or intravenously.
   (4) Giving patients nonnarcotic analgesics, such as aspirin, ibuprofen, or acetaminophen.
4. A form of extreme irrational behavior exhibited by a patient emerging from a general anesthetic, characterized by screaming, shouting, and violent thrashing as if in a rage.
5. Any five of the following:
   (1) Hypoxemia.
   (2) Administration of drugs, especially barbiturates and scopolamine.
   (3) Fear of cancer.
   (4) Fear of disfigurement.
   (5) Preoperative claustrophobia.
   (6) Poorly managed postoperative pain.
   (7) Cramping of muscles and joints caused by extended immobilization.
   (8) A full bladder.
6. Any four of the following:
   (l) Check the airway and administer oxygen to treat hypoxia.
   (2) Ensure patient and staff safety by using restraining devices and siderails.
   (3) Check blood oxygen levels with a pulse oximeter or with arterial blood gas samples to confirm or rule out hypoxia.
   (4) Change the patient’s position.
   (5) Children may be calmed by being held by their parents.
   (6) Drugs, such as physostigmine, may be given to reverse the effects of scopolamine.
   (7) Catheter may be inserted to drain the bladder.
   (8) Tranquilizers, such as diazepam, may be injected to calm patient fears.
   (9) Narcotic agents, such as morphine, may settle the patient down.
7. Any five of the following:
   (l) Increases recovery time.

(2) Increases the risk of airway obstruction.
(3) Increases risk of aspiration.
(4) Causes abdominal muscle cramps.
(5) May lead to wound disruption.
(6) Extended nausea or vomiting may lead to dehydration and electrolyte imbalance.

8. Rough handling of the patient during transportation and frequent position changes in the recovery room.
9. Place a cool, wet washcloth or hand towel on the patient's forehead and offer reassurance.
10. (1) Immediately turn the patient's head to one side.
(2) Lower the head of the bed.
(3) Suction vomitus out of the mouth if the patient cannot clear it.
(4) Administer oxygen.
(5) Auscultate (listen to) the patient's breath sounds on both sides of the chest.
11. It may intensify the depressant effects of anesthetic agents, slowing respiration and causing the patient to shiver uncontrollably making him or her use oxygen more rapidly. The net result is a significant lowering of the amount of oxygen in the blood.
12. Rapid cooling of the body, both internally and externally.
13. The patient's blood pressure falls; the heart rate increases; seizures can occur; the patient eventually lapses into a coma and dies.
14. Massive infusion of IV fluids and close monitoring of electrolytes.
15. Frothy, pink sputum; obvious respiratory distress; elevated CVP; and a fluffy- looking X-ray.
16. Intubating the patient; positive-pressure ventilation; administration of a diuretic; and administration of furosemide and opioids, such as morphine.
17. (1) The tongue.
(2) Mucous secretions.
(3) By posture.
18. Until the patient reacts and regains sufficient reflex responses to spit or pull the airway out. If he or she is choking on it, then, you remove it to prevent vomiting.
19. 14, 16, and 18 Fr.
20. To ensure that the suction device is working properly and to lubricate the inside and outside of the catheter.
21. To prevent the removal of oxygen from the patient's respiratory tract and to prevent the catheter from causing trauma to delicate tissues.
22. 15 seconds.
23. By holding the catheter alongside the patient's face and measuring the distance between the tip of the nose and the external ear opening.
24. To prevent introduction of potential pathogens deep into the patient's respiratory tract.
25. Ask the patient to take four or five deep breaths while breathing humidified oxygen.
26. By listening for an increased loudness of breath sounds and by feeling more air coming from the open suction port at the base of the catheter.

Complete the unit review exercises before going to the next unit.

Unit Review Exercises

Note to Student: Consider all choices carefully, select the *best* answer to each question, and *circle* the corresponding letter. When you have completed all unit review exercises, transfer your answers to the Field-Scoring Answer Sheet.

Do not return your answer sheet to the Air Force Career Development Academy (AFCDA).

1. (201) Which individual is *not* authorized to see and treat patients?
   a. Dentists.
   b. Registered Nurses.
   c. Physician Assistants (PA).
   d. Certified Nurse Midwives (CNM).

2. (201) What considerations determine the steps in the routine admission process?
   a. Patient's condition and the cost of admission per day.
   b. Facility policy and the patient's distance from home.
   c. Patient's condition and the facility policy.
   d. Facility policy and patient's request.

3. (201) What would be the responsibility of the medical technician during a routine patient admission to a nursing unit?
   a. Evaluate patient.
   b. Obtain patient's history.
   c. Transcribe doctor's orders.
   d. Obtain patient's vital signs, height, and weight.

4. (201) Which statement allows a patient to depart from the medical facility for a short period of time, usually between 24 and 48 hours?
   a. Pass.
   b. Discharge.
   c. Subsisting elsewhere.
   d. Absent without leave (AWOL).

5. (201) How many pounds of baggage are allowed for a patient being aeromedically evacuated to another facility?
   a. 56.
   b. 66.
   c. 76.
   d. 10.

6. (201) A patient who is authorized to live outside the hospital while still receiving treatment is considered
   a. on pass.
   b. subsisting out.
   c. on convalescent leave.
   d. discharged and an outpatient.

7. (202) If an inpatient chart with doctor's orders for vital signs every four hours was blank for the day, you would assume the
   a. patient was likely off the unit having tests completed.
   b. patient is doing well and no problems were noted.
   c. doctor probably changed the orders verbally.
   d. vital signs were not completed.

8. (202) What is the proper method of annotating shift change totals on the DD Form 792, Intake and Output Worksheet?
   a. No documentation is required at shift change.
   b. Document all totals in the *Remarks* section.
   c. Document in the Grand Total block.
   d. Circle the last accumulated total.

9. (203) Which nursing activity is the *main* aspect of resolving nursing diagnoses?
   a. Planning.
   b. Assessing.
   c. Evaluating.
   d. Implementing.

10. (203) Relative to the nursing process, what is a client goal?
    a. An observable change in patient behavior.
    b. A measurable change in the patient's condition.
    c. A realistic and measurable statement of the end results of care planning.
    d. A realistic and measurable statement of the expected change in patient behavior.

11. (204) What is a way to help relieve *most* of the patient's concerns prior to surgery?
    a. Sedation.
    b. Back massage.
    c. Oxygen therapy.
    d. Preoperative teaching.

12. (204) What has a significant impact on the patient's perceived quality of care and treatment?
    a. Credentials of the surgeon.
    b. Availability of a base chaplain.
    c. Professionalism and caring attitude of the staff.
    d. Number of nurses and technicians on staff.

13. (205) What is the *best* reason for preping the skin prior to surgery?
    a. Reduces the chance of infection.
    b. Prevents contamination of the operating room (OR).
    c. Allows for proper suturing of the incision.
    d. Reduces pain when the surgical dressing is removed.

14. (205) Without provider approval, what is the *maximum* number of minutes antiembolism stockings may be removed?
    a. 15.
    b. 30.
    c. 45.
    d. 60.

15. (206) What precaution is taken for a postoperative patient who received a radioisotope implant?
    a. Isolation is necessary.
    b. No precautions are necessary.
    c. A lead apron is placed over the patient.
    d. Lead aprons are placed on other recovery patients.

16. (206) Which position is the bed placed in preparation *to receive* a postoperative surgical patient?
    a. Low.
    b. High.
    c. Fowler's.
    d. Trendelenburg.

17. (206) Which exercise is *not* commonly used for postoperative patients?
    a. Standing hamstring stretches.
    b. Turn, cough and deep breath (TC&DB).
    c. Diaphragmatic breathing.
    d. Circles with the big toe.

18. (207) Which form is used to document a patient's blood transfusion?
    a. Standard Form 518.
    b. Standard Form 3066.
    c. AF Form 2019.
    d. AF Form 3066.

19. (207) How is whole blood normally supplied?
    a. 100 cc units.
    b. 250 cc units.
    c. 450 cc units.
    d. 500 cc units.

20. (207) What is the guideline for the *maximum* minutes of time from pick up to the transfusion start of blood products?
    a. 20.
    b. 30.
    c. 60.
    d. 90.

21. (207) If a patient you are monitoring is receiving a blood transfusion and you notice distended neck veins and dyspnea. What should you do first?
    a. Continue to monitor; this is a normal side effect.
    b. Place the patient on his or her left side.
    c. Administer 100 percent oxygen.
    d. Stop the transfusion.

22. (208) Which pain management method *must* be closely monitored because it can result in a depressed respiratory system?
    a. Application of transcutaneous electrical nerve stimulation (TENS) devices.
    b. Injection of long duration local anesthetic into the incisional area.
    c. Administration of oral analgesics.
    d. Administration of narcotics.

23. (208) Ideally, in what position is a patient placed before performing oropharyngeal suctioning?
    a. Modified lateral.
    b. Trendelenberg.
    c. Semisitting.
    d. Supine.

Please read the unit menu for unit 2 and continue ➔

Unit 2. Care of the Young and Elderly

ORTHOPEDIC disorders are those which affect any part of the musculoskeletal system, which includes bones, joints, muscles, tendons, ligaments, and cartilages. Orthopedic disorders include defects, diseases, congenital defects, and trauma. No age is immune to these conditions. Even newborn infants are sometimes affected with dislocated hips and clubfoot. There are also automobile accident victims; many disabled for life. There are the geriatric patients who fall and fracture their hips. Sporting activities also take their toll in orthopedic disorders. Many promising athletes are forced to give up their sport while they are still young because of orthopedic injuries.

2–1. Orthopedic Disorders

This section examines some of the common orthopedic disorders, the patient's problems and needs, and special nursing principles. The goal in caring for orthopedic patients is to help restore body function and rehabilitate the patient. Some patients require surgery and immobilization to correct their condition, while others may require rest and reeducation.

209. Categories of orthopedic disorder

Orthopedic problems can result from a number of factors: congenital problems, infectious disease, trauma, and inflammatory disease. This lesson examines each of these categories.

Congenital deformities

There are many congenital deformities that affect bones, joints, and muscles. These conditions exist from the time of birth, but it may be years before they are noticed. Some of the more common congenital deformities are clubfoot, wryneck, and hip dislocation.

Infectious diseases

The most common cause of infectious disease in the musculoskeletal system is when pathogenic bacteria enter injuries, such as gunshot wounds or compound fractures. Musculoskeletal disorders may also result from infections elsewhere in the body. Acute osteomyelitis is an example of a disorder caused by a pyogenic organism being carried to the bone. Chronic osteomyelitis may recur throughout life. Osteomyelitis is extremely painful, so be very careful when moving the affected part. When the affected part must be moved, splint it with pillows. Tuberculosis of the bone is another infectious disease that may affect any bone or joint. The causative organism is the tubercle bacillus. Pott's disease (tuberculosis of the spine) is the most common form of bone and joint tuberculosis.

Traumatic injuries

Injuries to the musculoskeletal system are responsible for a large number of military personnel being hospitalized. Some of the less severe injuries, sprains, strains, and contusions are cared for by the outpatient clinic. Contusions are the most common of the injuries to the musculoskeletal system. Fractures are the result of some violent, external force. A fracture that results from disease, such as metastatic cancer of the bone, is called a pathologic fracture. An injury common for victims of automobile accidents in which a rear-end collision occurred is whiplash. Most whiplash injuries are not serious, but occasionally, a compression fracture of the cervical vertebrae does result from this injury. Symptoms of a fracture are pain, swelling, and discoloration. Movement intensifies these symptoms.

Inflammatory disease

Briefly discussed next are two common inflammatory problems associated with the skeletal system: arthritis and bursitis.

Arthritis

Arthritis means inflammation of a joint. There are many types of arthritis, but the most common are rheumatoid arthritis, rheumatoid spondylitis (inflammation of the vertebrae), and osteoarthritis (degenerative joint disease). Rheumatoid is the most severe of these and leads to serious crippling. Exercise is important for the arthritic patient. It keeps the muscles toned and prevents contractures and deformities. Schedule the patient's exercise to alternate with rest periods. Arthritic problems are usually treated with rest, heat, and analgesics (aspirin).

Bursitis

Although bursitis is not listed with the arthritic problems, it does present similar symptoms. In acute bursitis, the bursae become inflamed, and if the inflammation extends over a long period of time, it may result in chronic bursitis. The subdeltoid region is the most common location of inflammation in bursitis. Bursitis can be treated with hydrocortisone injections, analgesics, or surgery.

Miscellaneous problems

Some of the other problems you see associated with the skeletal system include degenerative problems, such as osteoarthritis, and vitamin "D" deficiencies that cause osteomalacia.

210. Common aspects of orthopedic disorders

While caring for the orthopedic patient, keep in mind some of the common problems associated with orthopedic care. Pain being a very subjective problem is very common among orthopedic patients. The possibility of deformity and psychological problems are two other common aspects related to orthopedics that are discussed.

Pain

Each orthopedic disorder manifests its own particular type of pain. Be aware of some specific factors about pain and the way a patient may describe the pain to you.

Sharp pain may be from a bone infection with muscle spasm or pressure on sensory nerves, while soreness and aching are probably due to muscular pain. An increasing pain may indicate the progression of an infectious process or malignant tumor, but one that increases with activity probably indicates joint strain. Pain that is worse in bad weather and felt in more than one part of the body may be caused by arthritis, while pain that radiates from the spine may indicate a rupture of an intervertebral disc and pressure on the nerve root. When your patient complains of pain, your task is to assess the pain and report your findings to the charge nurse or physician. The following questions will help with your assessment:

1. What activities precipitated the pain?
2. Is the body in proper alignment?
3. Is there pressure from traction splints, casts, or other appliances?
4. How does the patient describe the pain?
5. Can the patient localize the pain?
6. Does it radiate?
7. What relieves the pain?
8. What makes it worse?

One way to help you assess the patient's pain is to use a pain scale. Ask the patient, "On a scale of 0 to 10, 0 representing the absence of all pain, and 10 your worst pain, give me a number that best describes your pain." This scale works well with children who have a difficult time using descriptive adjectives.

There may be many actions you can take to relieve the patient's pain. As you assess the patient's body alignment, reposition the patient, if necessary. Support the painful parts under the joints. Move the patient slowly and steadily; avoid bumping the bed. Apply heat to relieve muscle spasms; apply cold to relieve pain in inflammatory conditions.

Deformity

In many orthopedic conditions, regardless of type, the patient faces deformity that may be temporary or permanent and either partial or grotesque. Contracture deformities are caused by disease and limitation of motion, whereas pain and muscle spasms produce a limitation of motion. Inflammation limits joint motion and causes fibrous tissue to form, producing fibrous or bony ankylosis (abnormal rigidity of joint).

Again, you need to assess the circumstances surrounding the deformity. Find out when the deformity was noted. Was the onset accompanied by injury? Is the deformity increasing or decreasing? Is paralysis present? If so:

1. What were the time and mode of the onset?
2. Are there sensory disturbances?
3. Where is the paralysis located?
4. Are there trophic changes?
5. Are there any disturbances in control of the bladder or bowel?

After reporting your findings to the charge nurse or physician, position the patient IAW the principles of good body mechanics. Avoid, however, semirecumbent positions for prolonged periods; such a position promotes flexion deformities of the hip. Encourage and assist the patient to perform passive and active exercises to maintain and improve muscle strength, maintain and restore optimal joint function, prevent deformities, stimulate circulation, and build endurance.

Joint stiffness and edema

Joint stiffness and orthopedic problems usually go hand in hand. With painful movement the patient tends to limit his or her activity, therefore, leading to further stiffness of the joint. Edema also

accompanies orthopedic disorders. The following are some important questions to ask the patient related to joint stiffness and edema:

1. How long has the joint been stiff?
2. What helps to relieve the stiffness?
3. How do exercise and temperature changes affect the stiffness?
4. Do your bones make noise (crepitus) during movement?
5. How long has the swelling been present?
6. Does the swelling go away with limited use?
7. Has there been any redness or heat associated with the swelling?

Psychosocial problems

Psychosocial problems may develop from long periods of disability. Patients tend to become depressed when mobility is restricted and improve when the treatment program is modified to permit some movement. As orthopedic patients begin the rehabilitative process, they require a great deal of reassurance and encouragement. Praise patients for their efforts and accomplishments. Keep patients busy with constructive activities; action absorbs anxiety. An active program of exercise and occupational therapy promotes a feeling of well-being and independence.

Self-Test Questions

After you complete these questions, you may check your answers at the end of the unit.

209. Categories of orthopedic disorder

1. List three factors that can result in an orthopedic problem.

2. What is a fracture that results from disease called?

3. List three symptoms of a fracture.

4. Why is exercise important to the patient with arthritis?

210. Common aspects of orthopedic disorders

1. What condition is indicated if a patient complains of pain that increases with activity?

2. What actions should you take when your patient complains of pain?

3. How does inflammation affect movement of body parts?

4. What information should you obtain regarding deformity?

5. What does the term *crepitus* mean?

2–2. General Nursing Procedures for Orthopedic Patients

Orthopedic disorders include injuries and congenital deformities of bones, joints, tendons, cartilage, ligaments, nerves, and muscles. These disorders can be managed with external manipulation and casting, surgical procedures and traction, medications, physical therapy (PT), heat and cold therapy, and rehabilitation techniques, or any combination of these. In this section, you'll study a few examples of general management techniques.

211. Management of bone and joint injuries

The first level of care of bone and joint injuries consists of adequate transportation and splinting to prevent further damage to soft tissues by bone fragments. When surgery is indicated, most surgeons like to operate as soon as possible, before infection can become established. The general preoperative preparation is the same as that of soft-tissue injuries and includes the earliest possible administration of antibiotics. Protective splints should *not* be removed until after anesthesia is started. Following surgery for bone injuries, complete immobilization of an extremity by correct splintage is necessary to ensure early wound healing. Delay in initial surgery of soft-tissue wounds, complicated by bone injuries, necessitates additional treatment of the infected wound.

Fractures

A fracture is a break in the continuity of a bone. The bone fragments may not be separated, and often the bone may only be cracked. Fractures are generally classified as open or closed. A closed fracture is a break in a bone without a break in the exterior surface of the skin. An open fracture is a break in a bone that connects with a wound in the exterior surface of the skin. A bone fragment may protrude through the skin, or there may be a wound channel (such as that produced by a bullet or shell fragment) that extends from the surface of the skin to the break in the bone. This is the type of fracture most commonly seen in battle casualties.

The time it takes broken bones to heal varies. Healing is determined by the following:

- Extent of the injury.
- Location of the fracture.
- Age of the patient.
- Size of the bone.
- Circulation to the area.

A fracture in a small child heals much faster than a fracture in an older patient. The type of injury or disease largely determines the method of treatment and type of nursing care needed. Regardless of whether the fracture is open or closed, immobilization and support are the principal treatments involved. Immobilization is usually maintained by traction or plaster cast.

You need to become familiar with the important terms in the following paragraph; they all pertain to the management of fractures.

Reduction

The term *reduction* in layman's terms means *setting the bone.* For a broken bone to heal properly, it must be placed back into a normal anatomical position. Reduction can be either *closed* or *open.*

Closed reduction refers to the setting of the bone by manipulation and manual traction. Then a cast or splint is applied to maintain alignment while healing takes place. Open reduction refers to a surgical procedure to set, align, and stabilize the fracture. During open reduction, *internal fixation* may be necessary to align bone fragments. Internal fixation may require the use of metal pins, wires, screws, plates, nails, or rods to hold bone fragments in alignment until healing can take place. *External fixation* is another form of reduction used for the management of open, complicated fractures with severe soft-tissue damage. With external fixation, pins attached to bone protrude through the skin and are attached to an external metal frame. With external fixation, the wound may be left open to heal.

Pin care

Pin care is indicated for patients in skeletal traction with an external fixation device. It is very important to prevent infection and should be performed two to three times daily. If there is a local policy on pin care, be sure to follow that guidance. Here are some general rules and steps to follow:

1. Use sterile procedure. Gather all required supplies before beginning. You will normally need:
   (a) Sterile gloves.
   (b) Sterile, cotton-tipped applicators.
   (c) Sterile cup.
   (d) Sterile 4 x 4s.
   (e) Antimicrobial agent.
2. Prescribed cleaning agent. Generally hydrogen peroxide, but mild soap and water or sterile water and normal saline can be used to soften and remove crusty drainage.
3. Check doctor’s orders and the position of the patient.
4. Prior to cleaning, check pin and the site surrounding the pin. The pin should be immobile, clean, and dry. Assess for any areas of potential infection (heat, redness, pain, drainage).
5. Open the applicator sticks and sterile gauze. Open the cleansing agent and pour into the sterile cup.
6. Don sterile gloves. Soak the cotton-tipped applicators by pouring the solution over them or dipping the sticks into the solution.
7. Cleanse the area by starting at the insertion area and outward, away from the pin site. Cleanse pin sites with sterile, cotton-tipped applicators soaked in hydrogen peroxide or prescribed agent. Remove the crusts using meticulous sterile technique. The crusts must be removed to allow drainage and to prevent infection. Use a new applicator for each pin site.
8. Examine all the bony prominences for signs of any pressure areas or abrasions.
9. According to the physician’s orders, apply an antimicrobial agent around the pin sites.
10. According to the physician’s orders, loosely dress the site with a separate gauze sponges.
11. Report any questionable finding to the nurse or provider immediately.

Plaster of Paris cast

Plaster of Paris is a form of gypsum or calcium sulfate. It is embedded in a crinoline bandage. When the plaster bandage is soaked in water and wrapped around the part of the body to be immobilized, it hardens into a stone-like consistency. Plaster of Paris casts are used to immobilize parts of the body in the treatment of fractures, dislocations, skeletal deformities, and certain types of joint disorders.

Types of casts

Casts are usually applied by the physician or orthopedic technician. This is usually done in a cast room, but due to the severity of some injuries, the patient may have to be casted on the nursing unit or in the ER. The majority of casts are applied to the extremities to immobilize one or more joints. The type of cast used will depend on the fracture site. Figures 2–1 through 2–4 illustrate some common types of casts known as circular or cylinder casts because they encircle (or form a cylinder around)

the extremity. A *short arm cast* is shown in figure 2–1; it is applied from below the elbow to the knuckles and used primarily for wrist fractures. A *long arm cast* (fig. 2–2) is applied from above the elbow to the knuckles and used for fractures of the elbow or forearm. A *short leg cast*, shown in figure 2–3, is applied from below the knee to the toes and used for fractures of the foot and ankle; this cast is reinforced and modified to create a walking cast in some instances. A *long leg cast* (fig. 2–4) is applied from the groin to the toes and used for fractures of the tibia, fibula, and ankle; it may be modified to stop at the ankle for immobilization of the knee.

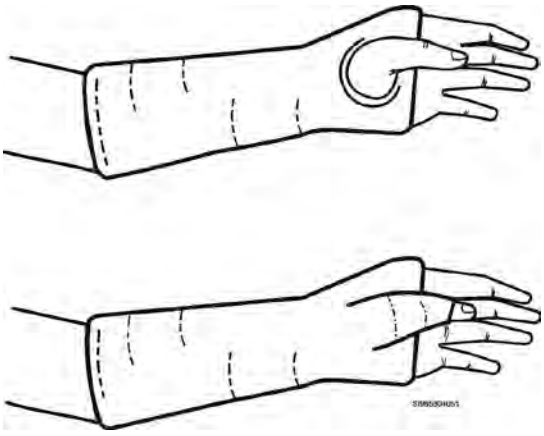


Figure 2–1. Short arm and thumb spica casts.

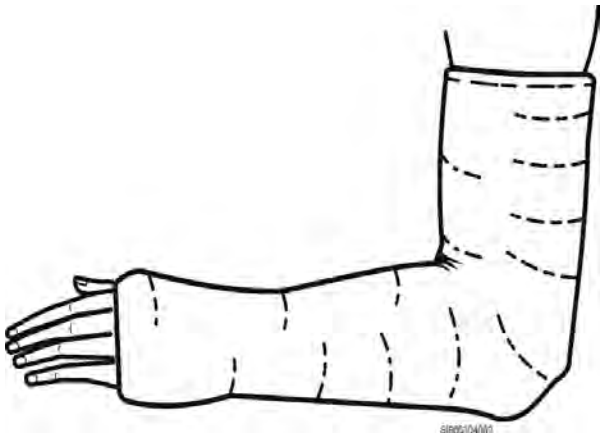


Figure 2–2. Long arm cast.

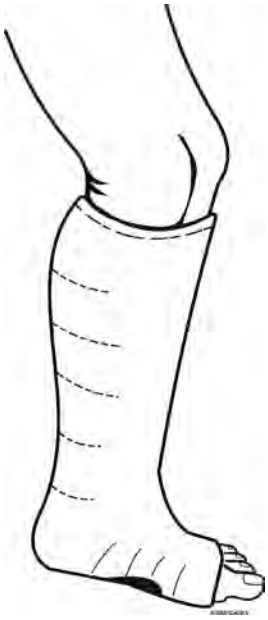


Figure 2–3. Short leg cast.

Figure 2–4. Long leg cast.

Spica casts are shown in figures 2–1, 2–5, and 2–6. They are used to immobilize different parts of the body. Use a *thumb spica* (fig. 2–1) for injuries involving the thumb and joints around the thumb. A *shoulder spica* (fig. 2–5) is used for injuries around the shoulder or humerus requiring complete immobilization of the arm. A *hip spica* (fig. 2–6) is used for fractures of the femoral shaft or to immobilize the pelvis and hip joint; a double-hip spica (not illustrated) can immobilize both hip joints. *Splints* do not completely encircle the affected limb; they are generally made from long strips of plaster bandage, applied to a soft padded dressing, and then wrapped with an ace bandage. Splints

are often used immediately postoperatively so the amount of swelling can be directly observed; a cast may be applied when swelling has begun to subside.

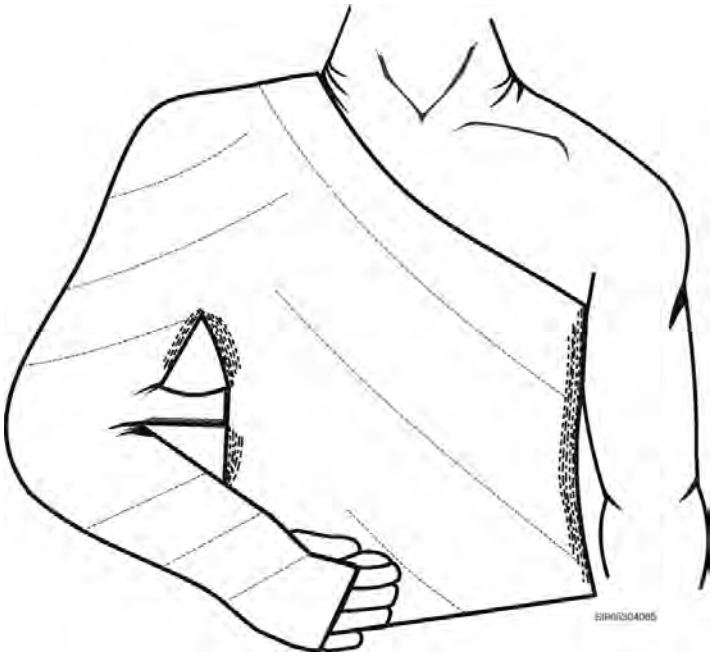


Figure 2–5. Shoulder spica cast.

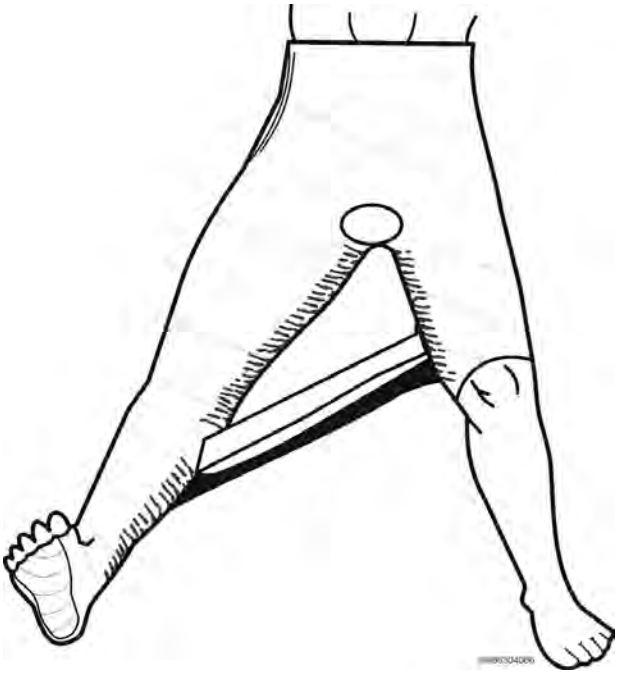


Figure 2–6. Hip spica cast.

The usual equipment needed includes buckets of tepid water, large bandage scissors, stockinet or sheet wadding, felt padding, and rolls of plaster bandage of the desired width. The part of the body to be encased in Plaster of Paris must be clean, dry, and protected with stockinet or sheet wadding. Bony prominences must be further protected with felt pads or a like material to lessen the possibility of pressure sores. The cast must be applied with caution. Excess pressure exerted in one place will distort it. Use the palms of your hands to hold, lift, or move a wet cast. Avoid using your fingers, as

they cause depressions, which in turn cause pressure areas. Holding the cast while it is being applied is very tiring, but it is necessary if the patient is to have a comfortable and acceptable cast.

After any cast is applied, allow it to dry. Although it hardens in a matter of minutes, it may take 24–48 hours to dry completely. During this time, it must be supported and handled with care. Support the entire length of the cast on plastic or rubber-covered pillows and expose it to the air for drying. Do *not* attempt quick drying with heating lamps and cradles unless ordered by the physician. The cast may dry on the outside, but the patient may be burned by the moist heat generated inside the cast.

Once a cast is applied, observe the area closely. Look for circulatory impairment and pressure on body tissues, especially over bony parts. If the cast is on an extremity, inspect the fingers or toes of the encased extremity. Look for signs of blueness, swelling, or coldness. Are patients able to wiggle their toes or fingers, and do they complain of numbness or excessive pain? If the cast is on the body, is there pressure anywhere—on the chest, buttocks, back, or stomach? Are patients having trouble breathing? If the patients are children, are they unduly irritable? Don't pass off any patient's complaint. Any abnormal finding must be reported to the physician or nurse. If you are ever in doubt about any condition, report it. Occasionally, when casts are too tight, they must be cut on each side with the cut extending from one end of the cast to the other. This procedure (fig. 2–7) is called *bivalving*.

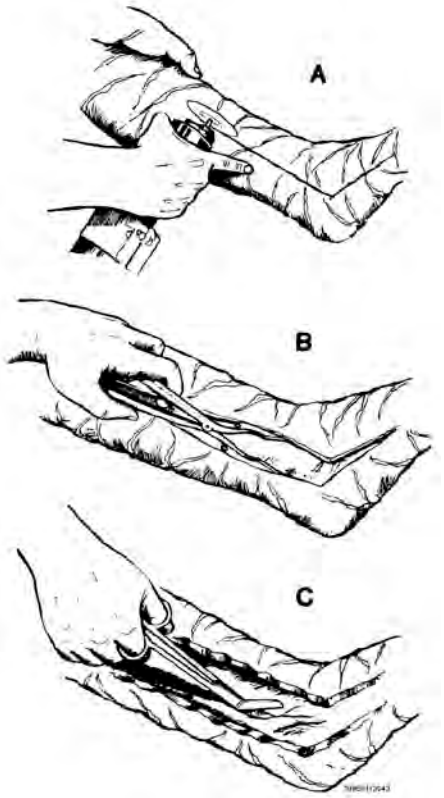


Figure 2–7. Bivalving a cast.

Give special care and close daily inspection to the skin of a patient in a cast or traction. Be alert for possible pressure sores. Using a log-rolling technique, turn patients in spica casts every four hours after the cast has dried. Feel and look for skin irritations at the edges of the cast. This irritation can be prevented or alleviated by padding the edges of the cast with adhesive strips or stockinet (fig. 2–8). This procedure is called "*petaling*" the edges of the cast. Protect the edges of the cast from moisture by lining it with plastic that is secured with tape. It isn't necessary to line all the edges, but you should line edges around the perineal area that are subject to frequent moisture and cleaning. To make elimination needs simpler, a fracture bedpan is used for cast patients. Patients usually itch under the cast site. Do not permit them to poke a coat hanger, ruler, or other foreign object down into the cast. It could cause a small scratch that can easily become infected. Smell the cast for offensive odor; this is often an indication of an infection. However, keep in mind that casting material will generally begin to have an unpleasant smell due to normal body sweating and an inability to wash the site for a period of time. If the patient complains about pain or a foul smell, or you note an odor, inform the provider. He or she may want to remove the cast to inspect the skin and have a new cast applied. Patients who are bedbound in body casts need to be turned several times a day. Casts must also be kept dry. One that is continuously damp or allowed to get wet becomes soft and ineffective as a support.

Figure 2–8. Petaling a cast.

Casts are removed with an electric cast saw. It is noisy and, at first, frightening for most patients. Therefore, explain the operation of the cast saw *before* you remove the cast. The saw is a vibrator type that oscillates at a high rate of speed and cuts through any hard, stationary object; when it reaches the padding over the skin or any soft object that moves, it is no longer effective for cutting. Be careful, however, because pressure exerted against the saw may cause it to tear the skin.

After a cast is removed, the skin is usually dry and scaly. Gently wash the area with soap and water. The patient may complain of soreness and weakness for several days after the cast is removed. The muscles are weak and have lost the support of the cast.

Fracture bedpan

The fracture bedpan is specially designed for patients in body casts and traction who are unable to lift themselves off the bed. Unlike the standard bedpan, the wide part of the fracture pan is the front, and the narrow, shallow end is the back and is slid up under the patient's buttocks.

Even under the most ideal circumstances, it is difficult to maintain your balance while sitting on this device. Be very careful since this type of bedpan is very shallow and is easily spilled. Remember this when you put a patient on a bedpan. Make sure that he or she is as secure as possible and remain close at hand in case you are needed.

Traction considerations

Traction is defined as one force pulling against another and classified as either skin or skeletal. There are many types of traction devices used to reduce and immobilize fractures, prevent and correct deformities, and reduce muscle spasms. Skeletal traction (fig. 2–9) is applied directly to the bones by tongs, pins, or wires and connected to weights and pulleys. Used for the reduction and maintenance of fractures, it is used mostly in reducing fractures of long bones. Skin traction is applied to the skin by heavy adhesive tape, moleskin, or halters connected to weights and pulleys. It is mainly used to relieve pain from muscle spasms and to correct mild deformities. Keep in mind that traction application in the United States is well standardized. In deployed settings, North Atlantic Treaty Organization (NATO) litters and cots are normally used and they are not made for traction devices. Pay close attention to the provider's directions in these situations as they often have to be creative to devise a traction system that will work well for the patient. Below are some of the commonly used types of traction:

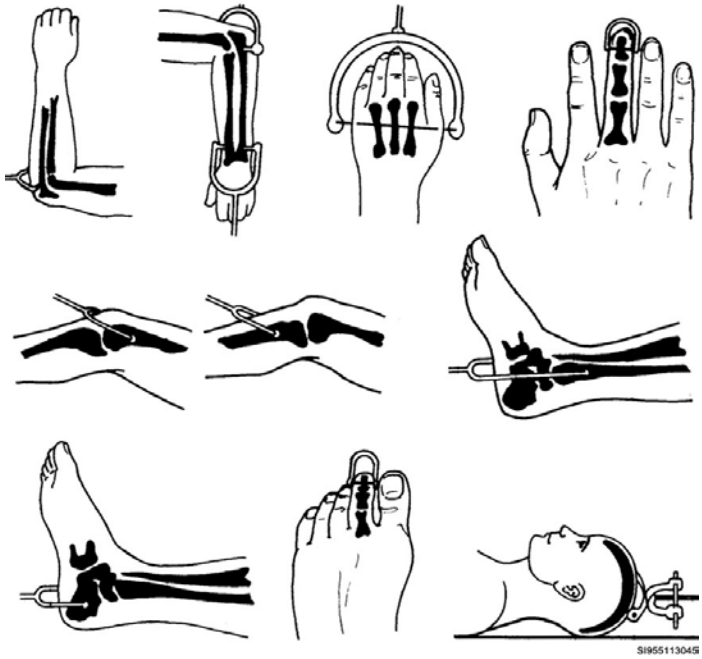


Figure 2–9. Skeletal traction.

1. Buck's extension. This is skin traction applied to the leg (fig. 2–10) as temporary treatment for fractures of the upper portion of the shaft or neck of the femur.
2. Russell's traction. Skin traction for treating some fractures of the shaft and neck of the femur or hip. May also be used to treat specific types of knee injuries or contractures (fig. 2–11).

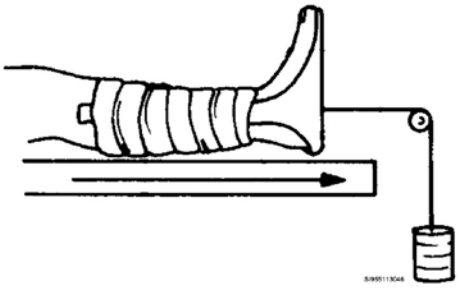


Figure 2–10. Buck's traction.

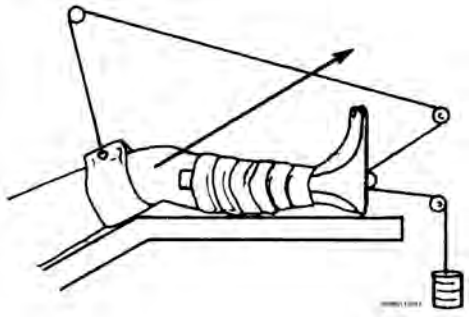


Figure 2–11. Russell's traction.

3. Lateral arm traction. This is skin traction used for fractures of the shaft of the humerus and injuries in or around the shoulder girdle.
4. Head halter traction. Traction (usually by using the halter) for cervical spine disorders, such as stabilization of spinal fractures or injuries, muscle contractures, or muscles spasms.

Preparing for skeletal or skin traction

In preparing the patient's bed for any type of traction, attach a Balkan frame (fig. 2–12) to the bed. This frame is used for the placement of pulleys. An overhead trapeze can also be attached to the Balkan frame to encourage self-help on the part of the patient. The mattress should have a bed board placed under it unless it is made of hard-foam rubber or cotton. A soft mattress lets the devices and the patient sink down into the bed, causing the traction to become ineffective.

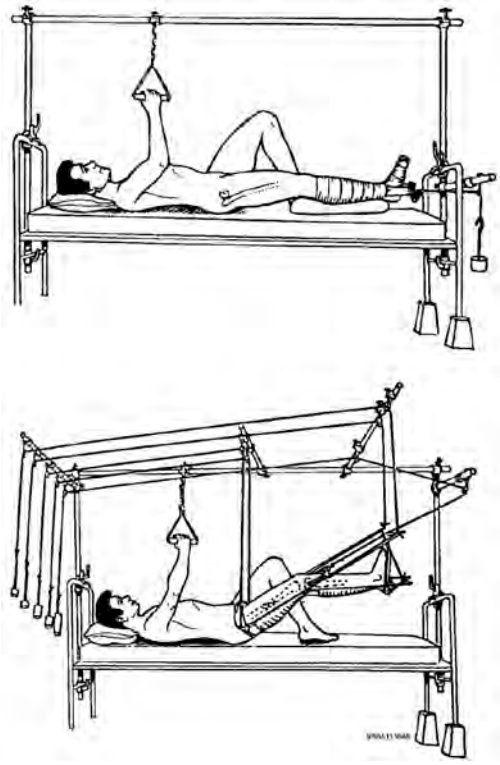


Figure 2–12. Balkan frame with trapeze.

Maintaining traction

There are several factors to remember when caring for the patient in traction. First, the angle of traction (alignment) must be maintained at all times. Never remove any weights or let them rest on the bed or in a chair. This defeats the purpose of the traction by eliminating the pull or force that is maintained by the weights. All ropes should be in the pulley grooves and properly aligned. The hazards of immobility apply to all patients who are in traction as they have limited positions due to the traction device. Use care when maneuvering around the bed to avoid accidentally catching or tripping over the weights or pulleys.

Skeletal traction

Skeletal traction is applied by using wires, pins, and tongs that are placed through bones by an orthopedic surgeon under aseptic technique. Skeletal traction is most commonly used for treating femur, humerus, tibia, and cervical spine fractures. Be sure to watch for infection of pin tracts on patients with this type of traction.

Skin traction

Skin traction is performed by applying light force that pulls on tape or a special device, such as a boot, cervical halter, or pelvic belt. Skin traction is most often used as a temporary control of muscle spasms and pain prior to surgery for hip and femur fractures. Skin traction can also be used for pelvic and cervical traction to treat back disorders or injuries. Skin traction is also an option in the treatment of fractures in children instead of skeletal traction. A patient in skin traction requires close observation of the condition of the skin. Ensure the tape is not allowed to bunch up or wrinkle. This wrinkling may cause irritation to the skin or cause the traction device to slip. Encourage the patient to do bed exercises unless exercise is contraindicated. Pay close attention to the condition of the skin that is under the traction as well as other pressure points; report any abnormal findings immediately.

Cervical traction is accomplished through skin traction with a head halter or through skeletal traction by using tongs or a halo apparatus. Cervical spine injuries are managed by immobilization, early reduction, and stabilization of the vertebral column. This is accomplished through the use of skeletal tongs or a halo-vest device. As you learned in EMT training, correct alignment and positioning of the spinal column is of utmost importance for patients with spinal trauma. The same principles apply to the patient who requires cervical traction. Patients with cervical tongs will have holes drilled in their skull, and the tongs will be fixed to or screwed to the skull (depending on the type of tong device). Care for the tongs is essentially the same as pin care. A halo-vest device has four pins that are fixed to the skull with a halo ring and connected to a removable vest by a metal frame. Both of these devices may be connected to bed traction, but the halo-vest is used for patients who are able to be mobile. Ensure you inspect the skin under a vest device, especially for patients who are using this device while connected to bed traction. There are two primary means of positioning a patient in cervical traction, supine or prone. Careful control of cervical alignment throughout the process of positioning is a priority. Safe positioning is reliant on stable head control with tongs or other devices. In most cases, patients who require in-hospital cervical traction will be in a bed designed specifically for this use.

Orthopedic appliances

Many types of appliances are used in the care and treatment of orthopedic disorders. Included are the following:

- Elastic wraps.
- Splints.
- Artificial limbs.
- Orthopedic beds.
- Crutches.

Elastic wraps

These are used frequently with musculoskeletal injuries to provide added support and reduce swelling. When applying elastic wraps, start with the most distal part of the extremity. Using a figure eight or spiral-reverse wrap (fig. 2–13), continue wrapping the extremity with firm, even pressure, and two-thirds overlap of the previous turn. When completed, secure the elastic wrap with tape or the clips provided. Ensure circulation is present in the fingers or toes. Check for the presence of coldness, cyanosis, or a tingling sensation, and if any are present, remove the bandage and report your assessment to the nurse or physician.

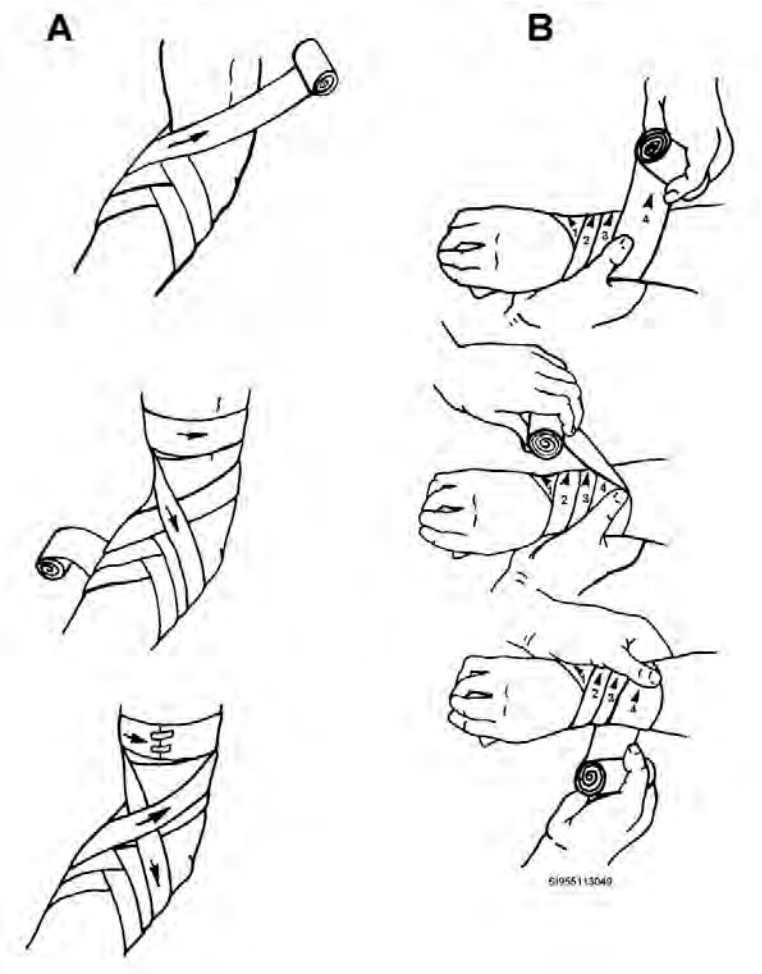


Figure 2–13. A, Figure eight; B, spiral-reverse wrap.

Splints

Splints are most often used to immobilize and support extremities in emergencies. They may be made from almost any material, such as wooden boards, wire ladders, towels, pillows, heavy cardboard, or newspaper. Permanent splints are usually made of aluminum. They come in assorted sizes and are made to fit almost any part of the body. Splinting is discussed more thoroughly in the volume covering emergency care.

Artificial limbs

Artificial limbs are used after the amputation of an extremity. They are fitted only at special orthopedic care centers. They are made from plastic and lightweight metal and wood.

Crutches

Crutches serve as legs for indefinite periods of time for many patients with lower extremity disorders. They enable the patient who would ordinarily be confined to bed to be ambulated. The patient must be taught how to use crutches properly. Weight must be borne on the palms of the hands, never under the arm. Crutches can be adjusted to the individual patient.

According to the injury or diagnosis, different types of crutch walking (gaits) may be taught. No loose rugs, chairs, wet spots, or other obstacles to safety should be left near the patient. Highly polished floors must be avoided.

Orthopedic beds

There are several types of special orthopedic beds or turning frames used in the care and treatment of the orthopedic patient. Among them are the Stryker frame, Foster frame, and CircOlectric bed. Each of these beds or frames are designed to permit changing the patient's position and, at the same time, support the fractured or injured part. These beds and frames are especially useful for the patient with a back injury.

212. Caring for the amputee

An amputation is the surgical removal of all or part of an extremity. The need for amputation is usually due to trauma or disease to the limb. In the civilian setting, most upper limb amputations are due to trauma, while lower limb amputations are due to disease. In a wartime situation, the number of amputations of lower extremities, due to trauma, significantly increases. This increase in lower extremity trauma is attributed primarily to improvised explosive devices (IED) or other explosion injuries. When caring for the amputee, keep in mind the psychological and social impact this surgery has on the patient. The nursing team's goal is to help the patient attain the highest possible level of independence. In today's world, with the many prosthetic devices available, full recovery and independence can be attained.

Psychological and social impact

The patient's psychological impact can be lessened by good preoperative preparation. The patient must be prepared for the grieving process that will occur postoperatively. After an amputation, due to the disruption in body image, the patient may *grieve* for the limb as if a death had occurred. This brings about depression, which is normal. The patient should also be aware of the possibility of *phantom limb pain* or *phantom limb sensations.* Phantom limb pain is mostly experienced by the patient who was experiencing pain prior to surgery. This pain can be described as a feeling of coldness, cramping, shooting, burning, or crushing pain. Phantom limb sensations are described as a feeling of aching, tingling, or itching in the missing limb. Ensuring the patient is aware of these potential problems prior to surgery certainly helps the person through this traumatic experience.

Postoperative care

Prevention of hemorrhage, infection, and contractures are immediate postoperative goals. The postoperative bandage must be closely monitored for excessive bleeding. Also monitor the patient's vital signs for any indications of shock or hemorrhage. It is a *must* to have a tourniquet available for emergencies. The prevention of contractures of the hip, stump, or knee is also important. The development of contractures can delay rehabilitation. With a physician's order, range-of-motion (ROM) exercises are usually performed three times daily to prevent contractures. The potential for infection is also an immediate concern. Some of the signs to be aware of are increased pain at the site, redness and tenderness, increased swelling, and purulent drainage. Report any of these signs immediately to the nurse or physician. See figure 2–14 for the proper method of wrapping a stump of an above-the-knee amputation.

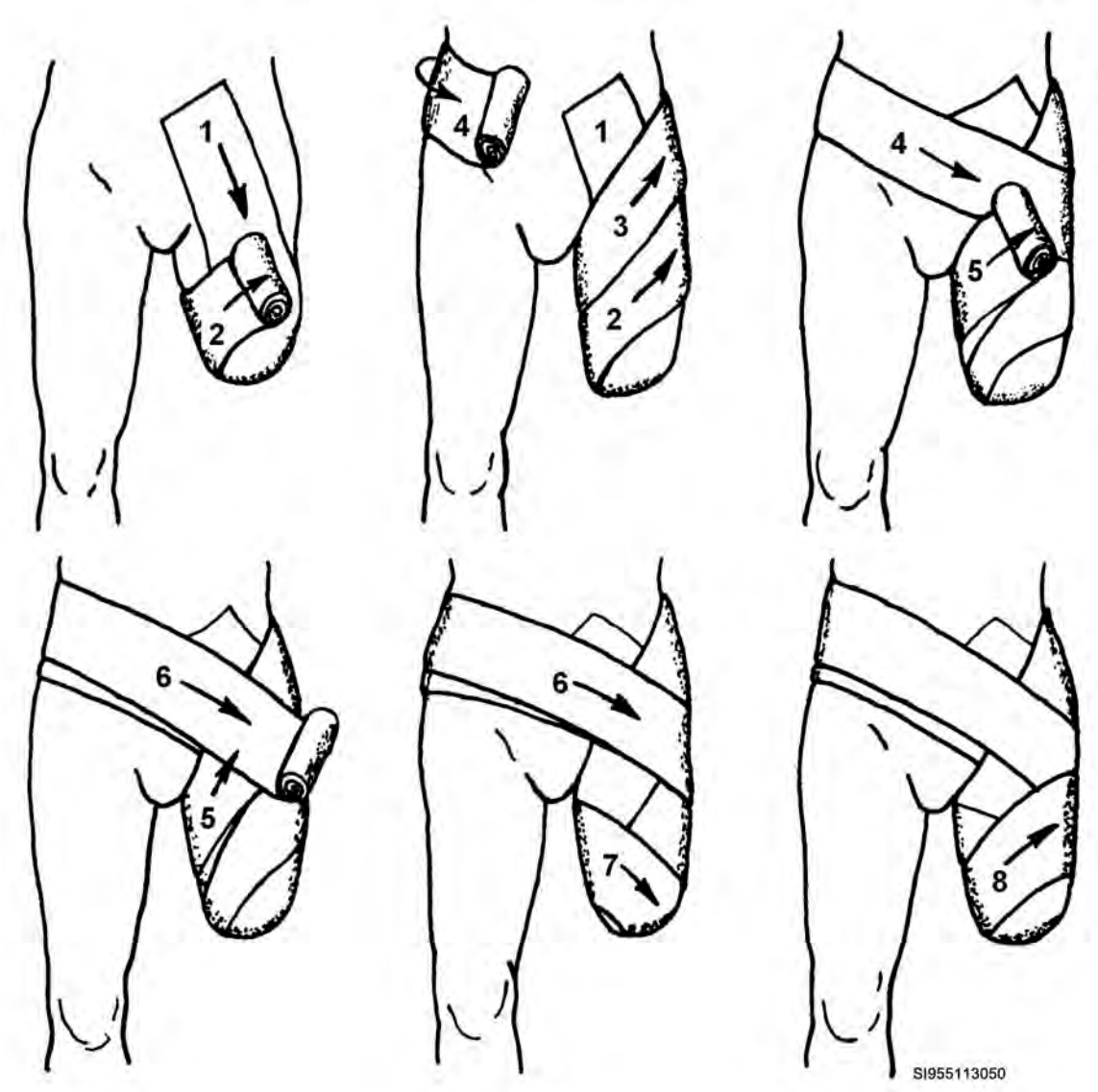


Figure 2–14. Wrapping a stump.

Rehabilitation

During the recovery stages, rehabilitation begins immediately. The physician determines if the patient is to have an *immediate* prosthetic fitting or a *delayed* prosthetic fitting. With the immediate fitting, the patient will hopefully have less edema of the stump and be encouraged to ambulate early. A delayed fitting is usually chosen by the physician to ensure that healing has occurred without further complications. Full recovery of the patient may not be seen during the initial postoperative period. It may take months of rehabilitation for the patient to gain his or her full independence.

213. Caring for the paralyzed patient

Paralysis is the loss of sensation and/or the ability to move a part of the body. The causes of paralysis include trauma, spinal cord tumors, disease, infections, and congenital defects. There are also different types of paralysis (fig. 2–15). *Quadriplegia* is paralysis of the legs, trunk, and arms. *Hemiplegia* is paralysis of one side of the body. *Paraplegia* is paralysis of the lower trunk and legs. Each individual patient, whether paralyzed due to spinal cord trauma or cerebral vascular accident (CVA), will have a unique care plan. We can only touch on the subject within this text.

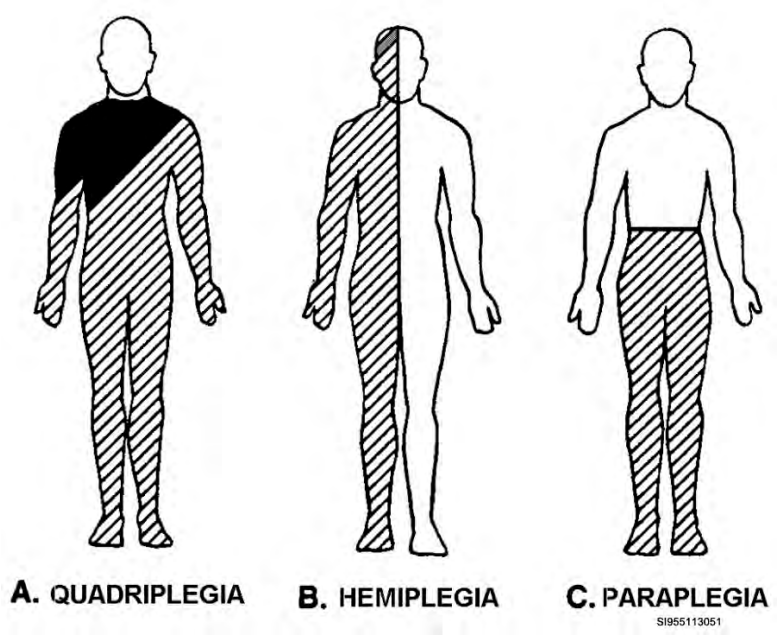


Figure 2–15. Types of paralysis: A, quadriplegia, B, hemiplegia, C, paraplegia.

Spinal cord injury

With spinal cord trauma, as you learned in your "Emergency Medical Technician Course," death can result from improper transportation techniques. Complete immobilization and proper alignment of a patient with suspected spinal cord injury is imperative. Once in the ER, the patient receives a complete neurological examination and x-rays to determine the extent of injury. You must carefully monitor respiratory, cardiac, and GI functioning during this crucial period. During the first 48 hours after injury, swelling can increase the risk of complications. The patient is then placed in skeletal traction by a surgeon to immobilize the cervical spine and reduce the fracture. Once skeletal traction is applied, the patient is placed on a special bed to help prevent pressure sores, cardiorespiratory complications, muscle atrophy, and urinary complications. One such bed is the Stryker frame. Turning must be accomplished slowly to prevent cardiac arrest due to a vagal response.

Rehabilitation is a lifelong process for a patient with a spinal cord injury. The physiological and psychological rehabilitation is complicated and complex. Many of the physiological functions of daily living, such as bladder and bowel control, must be relearned. Psychologically, a mourning process is experienced until the adjustment period is reached.

Cerebral vascular accident

CVA, or *stroke*, is a term used to describe the rapid onset of neurological deficits that result in difficulty with thought processes and sensory and motor disability. Physiologically, a stroke can occur due to ischemia or hemorrhage in the brain. The side of the brain in which the ischemia or hemorrhage occurred determines which side of the body is affected (fig. 2–16). During the acute stage of the stroke, the primary goal is to sustain life. Monitor the airway to ensure it remains patent. Have airway and suction equipment readily available. In some cases, an airway may be used to hold the tongue in place and to maintain the airway. Increases in intracranial pressure can also occur after a stroke. Monitor neurological functioning closely and report any abnormal findings to the nurse or physician immediately. Neurological checks that need to be made are level of consciousness, pupil reactions, hand-grip strength, and foot strength. Vital signs need to be monitored as well. I&O measurements are an important indicator of fluid retention. Fluid retention or overload can cause swelling in the brain and further neurological damage.

After the acute stage of the stroke, special nursing measures must be taken to increase mobility and prevent contractures and further deformities. Some of the equipment used includes footboards, wrist splints, trochanter rolls (used to prevent external hip rotation), and hand rolls. Proper body alignment is important to prevent deformity. Physical therapy is started and is important in helping the patient gain mobility. Rehabilitation for the stroke patient is also a life-long process. Helping the patient achieve as much independence as possible is one goal of rehabilitation. Other problems that the patient must learn to compensate for are communication (aphasia), altered thought processes, bladder control, and coping with sensory deficits. The patient needs support from the nursing staff, family, and friends during this stressful time. As with spinal cord trauma, a grieving period is usually experienced by the stroke patient.

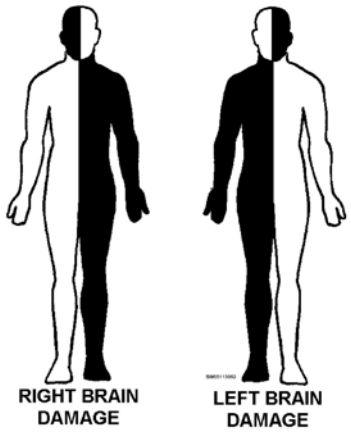


Figure 2–16. Effects of a stroke.

Self-Test Questions

After you complete these questions, you may check your answers at the end of the unit.

211. Management of bone and joint injuries

1. What is the first level of care provided for injuries of the joint?

2. What five factors determine the length of time required for a fracture to heal?

3. Define the term *reduction*.

4. How is closed reduction performed?

5. Define open reduction.

6. What equipment is needed to apply a Plaster of Paris cast?

7. What skin preparation should you complete prior to applying a plaster cast?

8. How much time is required for complete drying of a cast?

9. What do you look for when you are inspecting extremities that have been casted?

10. What type of orthopedic patient requires special skin care?

11. How do you detect an infection on a body area that is inside a cast?

12. How should you treat the skin after a cast is removed?

13. Match each type of traction listed in column B with the phrase in column A that best describes it. Items in column B may be used only once.

Column A	*Column B*
____ (1) Skin traction used for fractures of the shaft of the humerus.	a. Buck's extension.
____ (2) Skin traction applied to the leg as temporary treatment for fractures of the upper portion of the shaft of the femur.	b. Russell's traction.
____ (3) Traction for cervical spine disorders.	c. Lateral arm traction.
____ (4) Skin traction for treating some fractures of the shaft and neck of the femur.	d. Head halter traction.

14. What is the purpose of a Balkan frame?

15. Match each orthopedic appliance listed in column B with the statement in column A that best describes it. Items in column B may be used only once.

Column A	*Column B*
___ (1) Used after the amputation of an extremity.	a. Splints.
___ (2) These include the Stryker frame and the CircOlectric.	b. Artificial limbs.
___ (3) Serve as legs for an indefinite period of time.	c. Orthopedic beds.
___ (4) Most often used to support and immobilize extremities during emergencies.	d. Crutches.

212. Caring for the amputee

1. What is an amputation and why is it usually done?

2. What is the nursing team's goal for the patient with an amputation?

3. Define phantom limb pain.

4. Define phantom limb sensations.

5. What are the immediate postoperative goals for the amputee?

213. Caring for the paralyzed patient

1. What is paralysis?

2. List five causes of paralysis.

3. What body functions must be monitored carefully for the first 48 hours after a spinal cord injury?

4. Why are patients who have been placed in skeletal traction to immobilize the spine placed on a special bed such as a Stryker frame?

5. What are the two physiological causes of a stroke?

6. What is the primary goal during the acute stage of a stroke?

7. What neurological checks need to be done frequently on a stroke patient?

2–3. Care of the Young and Elderly

Care of the very young or elderly requires special attention. Many times treatments, drug administration, and assistance required vary from the normal adult patient. This unit discusses care of the pediatric and geriatric patient.

214. Problems and needs related to the pediatric patient

How children cope with their illness depends greatly on the significance of individual stressors that include separation, loss of control, bodily injury, and pain. Of course, how each child copes depends greatly on his or her developmental stage. Let's briefly look at each of these stressors, how they affect most children, and what you can do to help minimize them.

Separation

For children from middle infancy throughout the preschool years, separation anxiety is a major stressor. Separation anxiety can be divided into three phases:

1. Protest phase—Consists of crying, screaming, and refusing attention from anyone.
2. Despair phase—Child stops crying and is grieving or mourning being left alone.
3. Detachment phase—There is an apparent acceptance of the separation from the parent.

Both the protest and despair phases are normal, but when the detachment phase is carried out for abnormally long lengths of time, it can become abnormal. When caring for the young, be aware of these phases and realize that the child is not just being a “bad child” but that these are typical reactions to separation from a loved one.

To minimize separation, the ideal situation would be “rooming-in” where the parent can stay with the child 24 hours a day. When separation is avoided, this seems to give the child the ability to cope with the other stressors involved with hospitalization. If the parent must leave, you should stay with the child, providing physical support even if the child is rejecting your comfort. Once again, realize this is normal. Parents should never sneak out; this only creates more problems. The child soon realizes that leaving also constitutes the parent’s return. You can also ask the parents to leave a favorite home article with the child, such as a stuffed animal, blanket, or toy. This article may provide the child with comfort and reassurance that the parent will surely return for the article. To help minimize separation for an older child, family pictures, a radio, or even a favorite pair of pajamas can help.

Loss of control

Physical restrictions, altered routines, and dependency can create a sense of “loss of control” for a child. This is made obvious when a toddler meets an obstacle and throws a temper tantrum. Restraining children on their backs and limiting their movement is usually met with resistance.

To provide a child with a sense of control, establish daily rituals and routines. These rituals include eating, sleeping, bathing, toileting, and playing. Of course, hospitalization can disrupt these needed routines. Older children can also be affected by this loss of control due to rigid hospital schedules and rules.

To minimize the child’s loss of control, keep physical restrictions to a minimum. This is done by first gaining the child’s cooperation. For infants and children, once again, rooming-in can help prevent having to use restraints. Parents can remain with the child during most procedures that prevent the use of undue restraint. If restraining is necessary, periodic removal is necessary to allow supervised freedom.

As for altered routines, the admission history provides the necessary guidelines for nursing personnel to help maintain as much of the child’s routine as possible. Keep in mind, when a child loses his or her sense of control, regression is a normal, adaptive mechanism. In some cases, *time structuring* can help provide the child with some control. This involves preparation of a schedule by the child, nurse, and family of the daily activities that are written down and left with the child. Of course, the older child who can tell time benefits most from time structuring.

Fear of bodily injury

Any child that is beyond the infant stage will normally fear bodily injury either from mutilation, bodily intrusion, body image change, disability, or death. Although their fears differ greatly from infancy through adolescence, as a medic taking care of children, you must realize that these fears are real to children at any age. A toddler may react as intensely to a painless procedure as he or she does to a painful one. This may be due to the previously mentioned stressors of separation from parent, restraint, or their parent’s reactions to the situation. Preschoolers, although their concept of body integrity is limited, are very vulnerable to threats of bodily injury. For example, they fear their insides may leak out because of an injection.

As the child matures, fear of bodily harm increases. Due to developing cognitive abilities, school-age children are more aware of health and illness concepts than the younger child. The school-age child fears disability, uncertain recovery, and death rather than pain. As for the adolescent, his or her appearance is of the utmost of importance; therefore, the fear of change in bodily image is of great concern.

What can we do as medics to help alleviate these fears? Preparing the child for the procedure helps decrease perceived fears. It is also very important to use a language appropriate for the child’s age.

Maintaining parental contact and quickly performing procedures are also beneficial. The use of Band-Aids and bandages also helps decrease the child's fear of bleeding or the leaking out of his or her insides.

Pain

Reactions to pain vary from infancy through adolescence. Infant facial expressions are indicators of pain. For example; an open mouth, eyes tightly closed, and flaring nostrils are the most typical, along with loud crying. Toddlers and preschoolers react very emotionally to pain. Behaviors include grimacing; clenching of teeth and lips; and aggressiveness to include kicking, biting, and hitting. The school-age child has learned passive methods of dealing with pain, such as clenching fists or teeth, and attempting to act brave. This age group also has the ability to verbally communicate the location, intensity, and description of their pain. The adolescent displays self-control during painful situations. Most adolescents in pain demonstrate limited movement, excessive quietness, or irritability.

As the primary care giver, your assessment of the child's pain is important to the comfort and well-being of the child. According to Whaley and Wong, "Health professionals, including nurses, tend to underestimate the existence of pain in children." Some reasons children are undertreated include the difficulty of assessing pain, especially in the very young. Let's study some methods to help you assess your pediatric patient's pain.

Here are some suggestions to help enable you to better make an assessment of your pediatric patient's pain. First, ask the child questions regarding his or her pain, such as "Do you have a boo-boo?" or "Do you have an owie?" Ask the child to show you where it (pain) hurts. The child may even be able to show you using a doll as to where the pain is located. Another useful method is the use of a pain scale (fig. 2–17). This scale consists of six cartoon faces ranging from a very happy, smiling face for "no pain", to increasingly less happy faces, to final sad, tearful face for "worst pain." Using the "Faces scale," ask the child to point to the face that describes how he or she feels.

PAIN SCALE/DESCRIPTION	INSTRUCTIONS	RECOMMENDED AGE
Faces Scale* (Wong and Baker, 1988) Consists of six cartoon faces ranging from very happy, smiling face for "no pain" to increasingly less happy faces to final sad, tearful face for "worst pain"	Explain to child that each face is for a person who feels happy because there is no pain (hurt) or sad because there is some or a lot of pain. Face 0 is very happy because there is no hurt. Face 1 hurts just a little bit. Face 2 hurts a little more. Face 3 hurts even more. Face 4 hurts a whole lot, but Face 5 hurts as much as you can imagine, although you don't have to be crying to feel this bad. Ask child to choose face that best describes own pain.	Children as young as 3 years

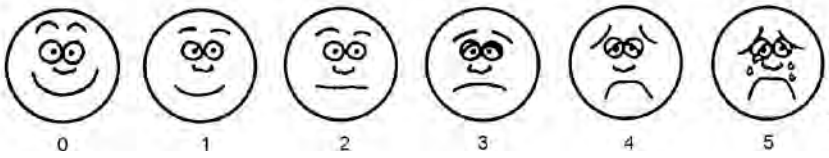


Figure 2–17. Faces scale.

Another important observation you can make is the child's behavior. You must report physiologic changes to the nurse. Physiological changes include the following:

- Pulse.
- Respiratory rates.
- Blood pressures.

It is also important to involve the parents; the child may not want to tell you if and when he or she is in pain. Once you determine that the child is in pain, report all your observations to the nurse for prompt action.

215. Pediatric and elderly care

There are various treatments seen primarily in the pediatric arena. Pediatric vital signs, bathing and feeding, sponging for fever, restraints, lumbar punctures, tympanography, and the immunization schedule are discussed next.

Pediatric vital signs

As with adults, vital signs are important physiologic measurements that indicate the proper functioning of the body. When taking infant vital signs, respirations are counted first. This is because taking the pulse and temperature may disturb and irritate the infant, causing the infant to cry. Next, take the pulse and the temperature last. Vital signs, discussed next, only highlight the differences between adult measurements versus pediatric measurements.

Respirations

Respirations are counted for a full minute, closely observing the diaphragm or abdomen. See the following chart for normal respiratory rates for children.

Normal Child Respiratory Rates	
Age	**Respirations(per minute)**
Newborn	30–80
Infant (1 year)	20–40
Child (3 years)	20–30
Adolescent	16–20

Pulse

Until a child reaches the age of two, apical rates are auscultated over the apex of the heart. The apical rate is taken for one full minute to ensure accuracy. If the child is crying, annotate your observations in the patient's record.

Normal Heart Rates for Infants and Children		
Age	**Resting beats/min (awake)**	**Resting beats/min (sleeping)**
Newborn	100–180	80–160
1 week to 3 months	100–220	80–200
3 months to 2 years	80–150	70–120
2 years to 10 years	70–110	60–90
10 years to adult	55–90	50–90

Temperature

As discussed in a previous unit, temperature can be taken at various body sites. For temperature assessment, choose the easiest and safest method for the child. For example, oral temperatures should only be taken on children after five or six years of age. Younger children may bite the thermometer (very dangerous if using a glass thermometer) or may not be able to keep the thermometer under their tongue.

Rectal temperatures are frightening for most children. Rectal temperatures are *not* taken on newborns (possible rectal perforation), anyone who has had rectal surgery, or children receiving chemotherapy that affects the mucosa. To take a rectal temperature, place the child in a supine, prone or side-lying position. Place a lubricated, rounded bulb thermometer approximately one inch into the rectum. Four minutes is the usual time limit for an accurate reading if using a mercury thermometer. Electronic thermometers are widely used now and are much faster than the older thermometers.

Axillary temperatures are usually the easiest method of temperature assessment for children. Length of time used for axillary temps is five minutes unless you are using an electronic thermometer.

Most hospitals use various electronic equipment for taking temperatures. These methods are quick, easy, and the least frightening for the child.

Blood pressure

To accurately measure the blood pressure of a pediatric patient, the most important factor is selection of an appropriately sized cuff. A cuff that is too small causes high readings in children as well as adults. If the correct size is not available, it is better to use a cuff that is a little oversized than one that is undersized. You should always make the effort to find the correct size blood pressure cuff for the patient, but if the correct size is not available, ensure that you document the size cuff that you used. This will aid providers in the assessment and follow up of the patient. The technique for taking a blood pressure is the same as it is for an adult. The main difference is in preparing the child for the procedure. You must explain each step of the procedure, especially for the preschool-age child and above. There are many different ways to explain to the child how a cuff will feel. For example, explain that the cuff will feel tight, or the cuff is going to give your arm a hug. There are many other ways to interact with your patient in a way that is fun and less likely to scare the child. Some examples include phrases like, “Let’s see how strong your muscle is,” or “Let’s watch the hand on the dial.” You should also use a pediatric stethoscope that helps you hear blood pressure sounds in young children and infants. See the following chart as a reference to blood pressures in children.

Quick Reference Guide for Blood Pressure in Children	
Use the following formula to approximate the average systolic blood pressure for children:	Use the following formula to approximate the average diastolic blood pressure for children:
1 to 7 years: age in years + 90	1 to 5 years: 57
8 to 18 years: (2 x age in years) + 83	6 to 18 years: age in years + 52

Bathing

In most cases, infants and children can be given a tub bath on the unit unless, of course, their condition dictates otherwise. When bathing an infant, safety should be your top priority. **NEVER LEAVE INFANTS OR SMALL CHILDREN UNATTENDED IN A BATH TUB!!!**

To bathe an infant, hold the infant with one hand securely supporting the head and neck. This leaves your other hand free to wash the infant’s body (fig. 2–18). Children who can sit alone need to be closely supervised and given assistance with bathing details. Areas that need more attention are the ears, between skin folds, the neck, back, and genital area. It is also suggested that a towel or nonslip pad be placed on the bottom of the tub to prevent slipping.

Figure 2–18. Bathing an infant.

Children who are critically ill or debilitated may need bed baths. For infants and children, a simple towel method can be used. Take two towels and immerse them in a diluted soap solution and wring damp. With the child in a supine position on a dry towel, place one damp towel on top of the child and gently clean the body, then dry the child. Place the child in a prone position, place the second damp towel over the body, gently clean, and then dry the child.

Feeding

A sick child, in most cases, has a decrease in appetite (anorexia). Therefore, allowing the child to determine his or her own need for food is suggested. Forcing a child to eat can only cause nausea and vomiting. A primary concern during episodes of nausea, vomiting, and diarrhea is dehydration. One intervention is to offer small amounts of flavored fluids at frequent intervals. Some other well-tolerated foods include gelatin, diluted clear soups, carbonated drinks, Popsicles, dry toast, crackers, and hard candy. Although these foods are not nutritious, they provide necessary fluids and calories. The following are some suggestions to encourage a child to improve eating habits:

1. Encourage parents to be present at mealtime.
2. Using a dietary history, provide a child's favorite food or drink.
3. Offer nutritious snacks.
4. Provide praise for what the child eats; do not punish a child for not eating.
5. Allow parents to bring food from home.

After the child has eaten, record food intake and any behavior associated with eating well or not eating well.

Temperature elevations

There are two causes of temperature elevations in children, fever and hyperthermia. Fever is a common symptom of illness in the child. Hyperthermia is caused by external conditions, such as heat stroke, aspirin toxicity, or hyperthyroidism.

Fever can be reduced by the administration of an antipyretic agent or environmental intervention. Environmental intervention includes the use of less clothing, exposing the skin to air, cooling the air, circulation of room air, and cool moist compresses to the skin.

The main goal with hyperthermia is lowering the body's core temperature. Therefore, cooling measures are the primary source of relief. Antipyretic medication is generally not used to treat hyperthermia. In fact, it may cause more harm than good if the patient is dehydrated, which is a common additional factor to hyperthermia, caused by environmental conditions, such as heat stroke. There are various methods used to reduce hyperthermia, such as commercial cooling blankets and mattresses, cool applications applied in a tub or bed, and tepid baths.

Tepid bath

To give a tepid bath, start with warm water and add cool water until a water temperature of 98.6°F (37°C) is reached. This allows the child to be accustomed slowly to the change in temperature of the water. With the child in the tub of tepid water, squeeze water from the washcloth or sprayer bottle over the back and chest. Keep the child in the bath for 20–30 minutes.

Sponge bath

If the child is too sick to be placed into a bath tub, a sponge bath can have the same effect. With the child in bed, place cool washcloths or towels in the axilla and groin areas. Also, place a cool washcloth on the forehead. Sponge off each extremity separately, keeping the others covered to prevent shivering. Shivering is rapid muscle contractions that produce more heat, therefore, defeating the purpose of the sponge bath. Give the sponge bath for 30 minutes.

Regardless of the method you are using, do NOT allow the patient to shiver. Shivering is caused by muscles twitching and contractions and will INCREASE body temperature. If the child starts to shiver, cover the skin with a light cloth to limit the amount of skin exposed to air. If the patient is in a bath, you may need to warm the water slightly. If in doubt, remove the patient from the water, cover with a lightweight cloth or towel, and notify the provider for further instructions.

Pediatric restraints

The use of restraints with children is necessary to ensure safety, facilitate exams, or to carry out procedures. Restraints are *never* used as a substitute for observation or as a punishment measure. Various methods are used to restrain children or infants. Next, some rules regarding the use of restraints and a few of the more commonly seen methods of restraint are discussed.

Rules

Always give the child and parents an explanation as to why the restraint is necessary. Parents also need to know how to remove and reapply the restraint. Restraints must always be checked every one to two hours. During this check make sure the restraint is functioning as it should by not cutting off circulation, sensation, or skin integrity. It is also important to check and see if it is still secure. Remove the restraint every two hours; use alternative methods as much as possible. Alternatives to restraints include distraction techniques, holding the child for short periods, or placing him or her in a high chair near the nurses' station.

Mechanical restraints

Two of the most common types of restraints used with pediatric patients are the jacket and elbow restraint.

Jacket restraint

A jacket restraint, also used with adults, is used to prevent the child from climbing out of bed or chairs. The jacket is put on so the long ties are in the back. The long ties are then fastened under the bed or crib where the child cannot reach them.

Elbow restraint

The elbow restraint is used to prevent the child from reaching his or her face or head or to prevent the child from scratching (fig. 2–19). The elbow restraint is designed to fit comfortably from under the arm to the wrist. Tongue depressors are placed in the pockets; the restraint is then wrapped around the child's arm and secured to the t-shirt sleeve to prevent slipping.

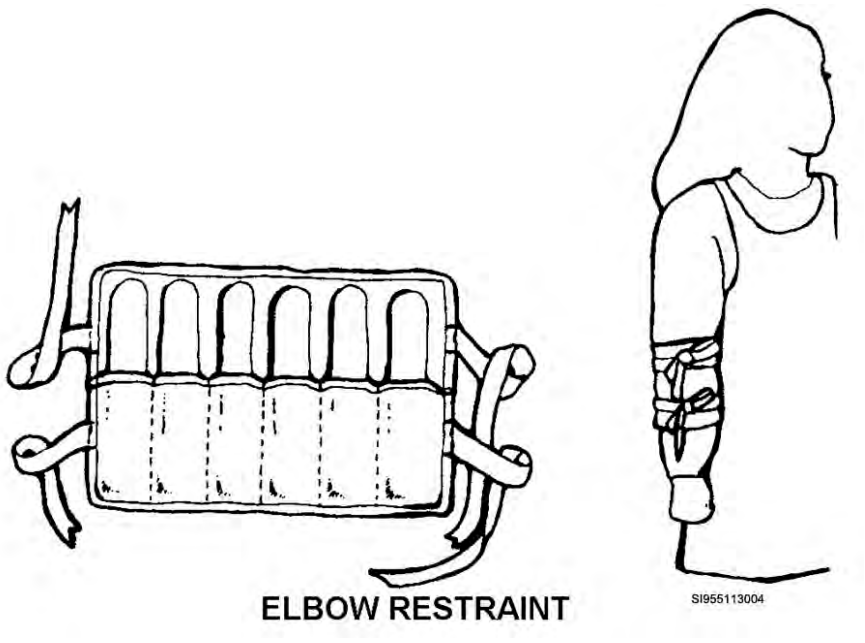


Figure 2–19. Elbow restraint.

216. Nursing care of the elderly

You already know the importance of meeting these needs for the average patient, but let's reexamine them and see how they apply to the geriatric patient.

Nursing care related to the aging patient

The term *geriatrics* refers to the study of aging and its physiological and pathological effects on mankind. Because age influences nursing needs, it must be considered when planning patient care. However, there are few diseases limited to any given age. Diseases are not necessarily a part of the aging process, although they are frequently associated with it. Diseases can even become less frequent after maturity. However, a group of chronic and degenerative disorders usually becomes increasingly common. Caring for the elderly patient is basically different only in that you are working with older patients. The objectives of nursing care are the same for all patients regardless of age.

While working with the elderly patient, much of your time is spent meeting problems and needs. Each patient, regardless of age and diagnosis, has needs related to his or her physical and emotional welfare. Study each patient carefully so that you can plan for that patient's individual care. Physical changes that occur with age may make it necessary to alter or adapt nursing care techniques, treatments, and procedures.

Physical needs

Among the physical needs of the geriatric patient are the following:

- Personal hygiene.
- Rest and sleep.
- Elimination.
- Nutrition.
- Exercise.

Personal hygiene

Personal hygiene is an important aspect of nursing care. However, it becomes more important when you care for the geriatric patient. Aging brings with it atrophy of the skin. Tissue nourishment is diminished and the skin becomes dry. It loses it elasticity, presents a wrinkled appearance, and is far more susceptible to infection. Daily skin care, frequent position changes, and a bed free of wrinkles help keep the skin intact and free of infection and bed sores; such care also stimulates circulation. However, keep in mind that the skin of older patients is thin, delicate, and sensitive to trauma. Use a mild or superfatted soap, if available, and a mild lotion for back rubs. Do not use alcohol because it tends to further dry the skin.

Oral hygiene

The mouth acts like a freeway for bacteria to enter the body. Failure to clean it permits bacteria to grow and may result in a severe mouth infection. Frequent cleaning removes food particles; thus reducing the growth media for bacteria, and it also refreshes the patient and stimulates the appetite.

Hair and nails

Care of the hair and nails are also an essential part of personal hygiene. Neatly combed, brushed, or trimmed hair contributes to the appearance and morale of the older patient. Unless the nails are properly trimmed and cleaned, they become brittle, thicken, and eventually curl inward against the flesh to exert pressure on the nail beds. This also opens a pathway for pathogens to enter the body and can cause pain for the patient.

Shampoos

The frequency of shampoos depends on the patient. Some patients can go a few days, and some need their hair washed daily; it depends on their activity level and the amount of sebum their hair secretes.

How the hair is washed also depends on the activity level ordered by the physician or the strength of the patient. If the patient is confined to bed, a washing trough and bucket can be brought to the bed—the procedure you learned in technical school. Other methods include placing the patient on a stretcher and taking him or her to the sink or taking the patient to the sink in a wheelchair.

When assisting a patient with a shampoo, you'll need to wet the hair first, apply a small amount of shampoo, and massage the shampoo into the scalp. Use only your finger pads and not your fingernails. You don't want to cause scratches on the scalp. Rinse the hair well, being careful to remove all shampoo. Comb and dry thoroughly.

Shaving

You may also be required to shave the male patient. To avoid cutting the patient, many facilities only use electric razors. Check the razor to be sure that it is clean and the cord is not frayed. Shave the patient, being careful not to get too close to the skin, causing skin irritation.

If you use a razor blade, be sure you have a new blade. Apply a warm, moist towel to the face for a few moments, then soften the hair with shaving cream or lotion. Pull the skin taut and shave in the direction of hair growth. Do not try to get too close. When you finish, rinse and dry the patient's face. Apply aftershave or cologne as desired by the patient.

Rest and sleep

Rest and sleep are essential, although older people seem to need less sleep. They seldom sleep soundly throughout the night, and early rising is a common practice. Some patients may not sleep well because they "nap" during the day. To some the midday nap is a necessity, while to others it is a habit. The physician will advise you as to whether you should try to keep the patient interested or busy in some hobby or activity throughout the day so as to increase the need for sleep during the night.

Rest is just as important as sleep. The older the patient gets, the more rest and relaxation are needed. Rest is one way in which the body replenishes energy. In fact, rest is a basic treatment for many illnesses. However, rest is possible only when the patient is free of physical discomfort and mental disturbances. There are several ways to help the patient achieve both mental and physical rest. To help eliminate much of the patient's worry and fear, explain treatments, examinations, and procedures. Physical rest is greatly enhanced by making the patient comfortable. Routine procedures, such as a back rub, clean linen, and oral hygiene contribute to physical rest. Other aids to rest include proper elimination and protection from excess noise.

Elimination

A lack of proper exercise, reduced muscle tone in the GI tract, and less roughage and fluid in the diet can contribute to some difficulty in regular bowel eliminations. Other contributing factors leading to constipation include excitement, pain, and a lack of privacy. Fecal impaction is a complication of untreated constipation.

In caring for the patient, you must pay special attention to elimination habits. Observe the frequency of bowel movements, amount, color, and presence of blood, mucus, pus, or undigested food. Report any discomfort, excess straining, presence of flatus, or any other marked changes in normal bowel habits. Remember, malignancies of the lower bowel may be discovered because of your observations and reports.

Nutrition

A well-balanced diet is essential to all age groups. Good nutrition promotes a healthier body, provides energy, and helps the body resist illnesses. The nutritional needs of the geriatric patient are much the same as those of any other age group. However, as activity decreases, the body's need for calories also decreases, and the energy requirements of the body diminish. Still, a person must have certain amounts of specified foods each day to maintain a proper state of nutrition.

The appetite of an elderly patient must also receive your attention. Remember, several factors influence the patient's nutritional status. The patient may not eat because of a dislike for certain foods, the way they are prepared, or the environment in which they are served. Or, the patient may have a diminished appetite due to less body activity. Probably the greatest stimulant (or deterrent) to the appetite of the elderly patient is the way in which the meal is served. Serving an attractive meal with consideration for the individual likes and dislikes and catering to the patient's personal customs does wonders for the appetite. Small and frequent feedings may also be helpful and necessary.

Exercise

Exercise is a normal activity. It improves the functioning of the different parts of the body and improves posture. However, for the elderly patient, exercise must be regulated by the physician. The physician prescribes the type of exercise that is beneficial and within the limits of the patient's physical capacity. The exercises depend on the patient's particular disease or disorder. Any special exercise program will probably be supervised by a physical therapist. However, teaching good posture and instructing the patient in deep-breathing exercises is part of the daily nursing care given any patient. Your team leader and the nursing-care plan will guide you in the type, amount, and frequency of any exercise program.

Emotional needs

You know that all patients, regardless of their age or diagnosis, exhibit emotional needs that must be cared for. All patients show varying degrees of fear, anxiety, apprehension, and tension. The greatest cause for these characteristics is the uncertainty of the future or the prognosis of the disorder. Illness is a personal experience, and the degree of reaction depends upon past experiences, cultural background, and economic status. Each patient reacts differently and must necessarily be considered separately and individually.

To satisfactorily meet emotional needs, first know something about the patient. The chart and medical records contain vital information for your use. Other information is obtained from your relationship with the patient. Observe the patient, noting facial expressions, tone of voice, and gestures. Attentive listening and skillful questioning often uncover many of the patient's anxieties and concerns.

Create an environment that allows self-expression. A smile, a helpful word, and an explanation—all tend to increase the patient's confidence. Show respect for each patient. Address each patient by last name and title. Acquaint patients with the hospital routine and prepare them for what to expect; it's the unknown that causes much anxiety and fear. Encourage each patient to participate in some degree of self-care. Most patients enjoy doing so, and when they can participate in procedures, such as coughing, muscle exercises, and so forth, they feel that they are contributing to their own recovery.

We discussed some of the physical and emotional needs of the elderly patient. As our population continues to grow older, care of the elderly will be an important priority to our society.

217. Special limitations and problems

We've just covered areas primarily relating to the elderly. This section covers a variety of conditions that can be associated with any age group. You will note, however, that many of these conditions seem to be more associated with the older generation.

Immunodeficiency disorder

An immunodeficiency disorder describes any condition that weakens the body's ability to fight off infection. This disorder can be present at birth, such as severe combined immunodeficiency. It may also be acquired, such as acquired immunodeficiency syndrome (AIDS). A person who has one of these disorders is prone to develop infections. These infections often become severe. The disorder may be genetic or acquired. AIDS, for example, is caused by a virus that can be spread by transfusion of contaminated blood, sexually, or by using contaminated needles. The risk of acquiring AIDS following blood transfusion has decreased due to routine testing of all blood products.

Signs and symptoms

The symptoms present depend on the type of immunodeficiency disorder. The one thing all such disorders have in common is frequent infections. These infections may occur anywhere in the body. A history of repeated or unusual infections suggests one of these disorders. A healthcare provider may do various tests, including blood tests and special x-rays, to search for a cause of a weakened immune system.

Treatment

Aggressive antibiotic treatment is needed to control most infections. There may be no treatment for the underlying disorder, though. Most of these disorders are long-term problems. Repeated treatment for infection and monitoring are needed.

Visually impaired

The nursing care provided nonseeing patients is mostly common sense. Knock on their door, address them by their name, tell them your name, and that you are their caregiver. Explain to them why you are there, and never touch them before they know you are present. When orientating them to their room, if they are walking, take them around the room describing where chairs, beds, doors, bedside table, restroom, and where their personal belongings are kept. If they are bedridden, show them how to find the call light.

When walking with a visually impaired patient, place his or her hand in the crook of your arm, walk slightly ahead of him or her in an unhurried pace, and describe where you are going (fig. 2–20). Inform him or her of narrow hallways, doors, tables, chairs, steps, or inclines.

Another important aspect of the care of the visually impaired is providing for their psychological needs. Accomplish this by taking the time to stop and talk with the patient. Provide diversional activities such as radio, Braille books, talking books, visitors, and television to help pass the time. It is also important to mention the day of the week, date, and time of day when talking to the patient.

Figure 2–20. Assisting the visually impaired to walk.

Hearing impaired

Communication can be a major concern when caring for the hearing impaired patient. If the patient can read lips, face the person as directly as possible when speaking. Do not chew gum, smoke, or

have candy in your mouth when talking. Speak slowly and distinctly. If there is any doubt about the patient understanding your directions, write down your instructions on paper. If the patient signs, you may have to call for an interpreter.

Audiometry

Audiometry is the measurement of hearing. The patient is placed in a booth with headphones on and instructed to press a handheld button upon first hearing the tones or sounds. Six frequencies are tested ranging from 500 to 6,000 cycles per second (cps) hertz (Hz). Most people hear at 1,000 cycles. The loudness or strength of a tone is referred to as a decibel (dB). Decibels used in audiometry range from –10 dB (softest) to 100 dB. Normal speech is usually spoken at 60 dBs.

Tympanography

Tympanography is the measurement of eardrum movement or mobility. In most cases, pressure on both sides of the eardrum are equal, which permits the drum to move freely. When there is fluid buildup in the middle ear due to ear infections or common colds, hearing is less acute. To perform this test, a soft-rubber ear plug is inserted into the external ear canal producing an airtight seal. A machine called an impedance meter is used to read the pressures and movement of the eardrum.

Dialytic therapy

Kidney dialysis is a procedure used to relieve the symptoms of renal failure. There are two types:

1. Peritoneal.
2. Hemodialysis.

Peritoneal dialysis is performed by instilling a special solution called a dialysate into the patient's peritoneal cavity (abdomen) via a special catheter. The dialysate is instilled and allowed to remain within the peritoneal cavity for an exchange period, and then drained. The length of this process and number of exchanges per day are specified by the patient's prescription. Hemodialysis is a process by which the patient's blood is diverted via a shunt, dialyzer, or artificial kidney, which removes impurities, and recirculates the blood back into the patient.

Most patients receive dialysis on an outpatient basis. As a medic, your involvement is before or after treatment. Some of the aspects of the dialysis patient that you need to be aware of are the signs and symptoms of uremia, shunt care and protection, prevention of infections, and the patient's dietary restrictions.

Signs and symptoms of uremia

Uremia is a term that means "excess urea and other waste products in the blood." This occurs due to a loss of kidney function. It can be sudden or take days to occur. Signs and symptoms include oliguria, which is a urine output of less than 400 mL, fluid and electrolyte imbalances, anorexia, nausea, vomiting, diarrhea or constipation, stomatitis, memory loss, tremors, convulsions, and eventually coma.

Shunt care and protection

The arteriovenous shunt needs meticulous care and protection. Cleanse the area around the shunt and change the dressing with each dialysis treatment or as necessary to prevent infection. If the patient has an external cannula or shunt (fig. 2–21), do not use scissors around the dressing site; this prevents any accidental cutting of the shunt. Be prepared for emergency measures. Place clips or clamps on the dressing in case of accidental separation of the cannula or shunt. Observe the shunt area for redness, swelling, or drainage. Monitor the patient for fever or chills. It is important to teach the patient not to sleep on the arm with the shunt or permit anyone to take blood pressures or blood from the arm. Do *not* give medications or infusions into the arm with the shunt.

Prevention of infection

Instruct the patient to avoid people with infections. Be careful to maintain sterile aseptic technique when changing the shunt dressing.

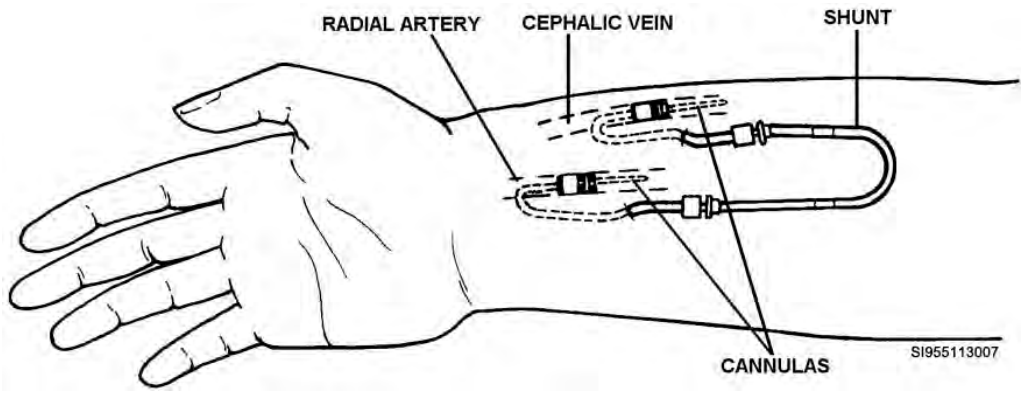


Figure 2–21. External arteriovenous shunt.

Dietary restrictions

The patient may suffer from anorexia due to nausea, vomiting, or stomatitis. With the dialytic patient, small, frequent meals may be necessary for the patient to obtain the necessary nutrition. The patient usually receives a 2,000-to 2,500-calorie-a-day diet that is low in protein. Some patients have sodium and potassium restrictions that are individually modified.

Diabetic

Diabetic patients may require care directly for their diabetes or it may be a disease that you need to be aware of when caring for a patient in your clinic or admitted to a ward. It is estimated that one of the most common, treated emergencies is due to diabetes and that approximately 3 percent of the population has diagnosed or undiagnosed diabetes mellitus. Diabetic emergencies usually arise from patients who are noncompliant with their diets and insulin management or due to children whose control of their disease is unstable.

Diabetic emergencies

If you recall, diabetes mellitus is a disease in which the pancreas does not release enough insulin or none at all. Without insulin, glucose cannot enter the cells. No matter how much the patient eats, the glucose circulates in the blood system unable to be absorbed. Keep in mind; insulin is the key that unlocks the cellular door that allows the glucose to enter. There are two types of emergencies related to diabetes—hypoglycemia and hyperglycemia.

Hypoglycemia

The most common type of diabetic emergency is hypoglycemia, which means “low blood sugar.” This condition is caused by the following: too much insulin or not enough glucose. This can happen if the patient has not eaten enough food, has overexerted himself or herself through exercise, has an illness producing a fever, and vomiting.

Hyperglycemia

Hyperglycemia, which means too much glucose in the blood, is also a diabetic emergency. This situation occurs due to *not enough* insulin in the circulating blood stream. It can happen because the patient forgot to take his or her insulin, did not take enough insulin, overate, or has an infection that upset his or her insulin/glucose balance. The following chart helps keep the signs, symptoms, and treatments for these two emergencies separated.

DIABETIC EMERGENCIES		
Signs & Symptoms	**Hypoglycemia**	**Hyperglycemia**
Onset	Rapid.	Slow.

DIABETIC EMERGENCIES		
Signs & Symptoms	**Hypoglycemia**	**Hyperglycemia**
Skin	Cold, clammy skin.	Warm, red, dry skin.
Breath	Normal.	Sweet or fruity (acetone) odor. Rapid, deep respirations.
Other	Elevated pulse rate, altered mental status, combativeness, seizures, hunger, may appear intoxicated.	Dry mouth, intense thirst, abdominal pain, and vomiting.
Treatment	In field; administer oral glucose if patient can swallow.	In field; administer oral glucose if patient can swallow.

Treatment

Distinguishing between hyperglycemia and hypoglycemia is not necessary in the field. Therefore, the treatment for both is the same. Glucose for everyone is the rule. Giving glucose helps the hypoglycemic patient by getting needed sugar into the bloodstream and to the brain. Although the hyperglycemic patient already has too much sugar in his or her blood, the extra dose of glucose does not have time to cause damage in the short time before her or she reaches the hospital and is diagnosed. Once admitted or in a medical facility, a provider will direct the treatment for a patient experiencing a diabetic emergency.

Special precautions

Working in a clinic or on an inpatient unit, you will likely encounter patients with diabetes. There are two basic categories of diabetes:

1. Insulin dependent (Type I). This form of diabetes is most common in children and young adults and has a sudden onset. The pancreas does not produce insulin and normally requires daily insulin injections.
2. Noninsulin dependent (Type II). This form of diabetes usually develops after age 40 and is hereditary. The pancreas secretes some insulin, but the amount secreted is not sufficient to meet the body's needs. It can generally be treated and controlled with diet and exercise. Patients with this form of diabetes are often overweight—another reason to stay fit to fight!

Another type of diabetes is gestational diabetes. As the name depicts, it develops in some women during pregnancy and normally goes away after the baby is born. However, women who experience gestational diabetes are at risk for Type II later in life.

Effects of diabetes

Uncontrolled diabetes can cause many problems including but not limited to:

1. Retinal changes leading to blindness.
2. Kidney disease.
3. Nerve damage.
4. Circulatory disorders such as:
   (a) Stroke.
   (b) Heart attack.
   (c) Slow wound healing.
   (d) Hypertension.

Nursing interventions

Caring for patients with diabetes can be a challenge. Many patients refuse to make the required lifestyle changes or may be in denial that they have a medical problem. A priority for Type I diabetics is to regulate their insulin levels. You may be assisting with this process by taking frequent blood

sugars and monitoring the patient. You may also be involved in assisting the patient with his or her diet; be aware that the patient may express concerns over diet changes. Someone from nutritional medicine may be requested to speak to the patient. A very important part of your job will be to inspect the condition of the patient's skin surface, especially pressure points and the feet on a daily basis for admitted patients and routinely for clinical patients. Because of circulatory and healing problems, diabetic patients must be monitored closely for bruises and wound healing. It is very easy for a diabetic to have an injury or wound without knowing it, and they are at high risk for dangerous infections of the lower extremities; severe cases often lead to amputations of the toes, foot, or limb. Monitoring of body weight and blood glucose levels on a routine basis is also common for admitted patients.

Report any problems promptly and be ready to listen and provide emotional support, especially for young adults who may not understand why they have the disease and are afraid of how it will impact their life.

Foot care

As discussed above, care and observation of the feet of diabetic patients are extremely important. The feet should be cleaned at least daily or according to the provider's orders. You should first look for any damaged skin (report if found) and then press on with hygiene care. Foot care, to include nail care, is explained; however, technicians should not perform nail trimming/care due to the high risk of complications. Most providers will perform nail care themselves because of the high risk. Here are a few tips so you know what to expect when you assist:

1. Technician can perform foot care at bath time or by the patient with hygiene routine.
2. Nail care includes regular trimming cleaning and cuticle care.
3. Wash feet in warm water; do not soak—this could cause drying.
4. Push cuticles back gently on fingernails with plastic applicator to prevent hangnails.
5. Clip the nail straight across to prevent hangnails.
6. Toenails are clipped straight across prevents ingrown nails.
7. Toenails of a diabetic or one with circulatory disease should not generally be clipped by a technician.
8. Toenail clippings of a diabetic or one with circulatory disease requires a doctor's order and performed by a nurse or physician.

Cancer

Primarily affecting the elderly, cancer is a group of diseases characterized by the rapid growth of abnormal cells. If these abnormal cells continue to grow without treatment, they spread (metastasize), invading vital organs, eventually leading to death. It is important to remember, many cancers can be cured if discovered early and treated promptly. Cancer can start in any body organ and treatment varies accordingly. We will not discuss cause or prevention but focus on the types of treatment used today: surgery, chemotherapy, radiation, and immunotherapy.

Surgery

The oldest form of treatment for cancer, surgery, is still the preferred for most cancers. Once an accurate diagnosis is made, surgery, if elected by the physician and patient, is done to remove tumors and areas of regional disease.

Chemotherapy

Chemotherapy is the use of chemical agents to destroy cancer cells. Most of the agents used destroy neoplastic cells by somehow affecting their deoxyribonucleic acid (DNA). The various drugs used can destroy the rapidly producing cancer cell at various times in its reproductive cycle. Of course, other normal cells of the body are also being destroyed. This is the main reason for the side effects of hair loss, bone marrow depression, nausea and vomiting, mucositis, and sterility.

Most chemotherapeutic agents can be given to the patient by the oral, IV, or intramuscular routes. If the IV route is used, the nurse has the primary responsibility of hanging and monitoring this medication. As an aerospace medical service journeyman, you can help make the patient comfortable and report possible problems to the nurse. One very serious problem when the IV route is used is *extravasation.* Extravasation is the leakage of chemotherapy from the vein into the surrounding tissues during infusion. This can cause tissue damage or necrosis if this infiltration occurs. If extravasation occurs, stop the infusion immediately and notify the nurse.

Radiation therapy

Radiation therapy is another method used to kill cancer cells. The radiation causes damage to the DNA, thereby preventing the cell's ability to grow and divide. Chemotherapy may also be used along with radiation in the treatment of cancer.

Immunotherapy

A relatively new form of treatment for cancer, immunotherapy is the manipulation of the immune system to fight cancer cells. One example of immunotherapy is the use of interferon.

Electrosensitive patients

Electrical oversensitivity or electrical hypersensitivity is a fairly new phenomenon with the first cases and discussions coming to public knowledge in the early 1970s.

Normally the first signs of electrical sensitivity are experienced as minor irritations when exposed to electrical impulse-emitting equipment, such as cardiac monitors, computers, televisions, and so forth. One of the most frequent symptoms is a warm or burning sensation in the face similar to strong sunburn. The main thing for you, the aerospace medical service journeyman, is to be aware of this potential event, especially if your patient is attached to a cardiac monitor, pulse oximeter, or any other required device. If you suspect that your patient is electrosensitive, notify the physician.

Transfer of special-limitation patients

There will be times that you will be responsible for transferring a special-needs patient. He or she may have a variety of equipment to include a cardiac monitor, oxygen, IV lines, drainage system, or an immobilization device. Your patient may have one, two, or all items attached at once, and it is your job to ensure the safety of the patient as well as yourself during the many steps of this process. The table below will walk you through this event.

Step	Action
1	Notify gaining unit of transfer.
2	Secure stretcher and all equipment required and ensure the following: a. Oxygen tank and regulator functionality. b. Oxygen tank has adequate capacity for transfer. c. Oxygen tank placed in carrier. If a carrier is not available, secure tank next to the patient. d. Ensure IV lines, drainage tubes, immobilization devices, and monitor cables are secure. e. Connect the patient to the portable monitor. f. Ensure ventilator and hoses are secured. Ensure hoses are not compressed or kinked.
3	Check all lines and tubing connections before moving patient to prevent accidental disconnection.
4	Transfer patient to stretcher, put up siderails, and apply safety straps.
5	Recheck all lines and tubing connections.
6	Secure monitor to stretcher with safety straps.
7	Turn on portable oxygen tank, flush, and set to proper L/min.
8	Disconnect fixed oxygen tubing from fixed source and attach to portable tank. Humidifier may or may not be used or prepare ventilator to be moved with the patient. Either secure to stretcher or prepare to move with the stretcher.

Step	Action
9	Shut off fixed oxygen system. Make sure patient has oxygen on a portable system.
10	Transfer patient to gaining unit with monitor and all lines connected and functioning.
11	Make sure to get a one-for-one exchange for equipment (i.e., an IV pump for an IV pump).

Terminally ill patients

The terminally ill patient has many needs that are basically the same as those of other patients: spiritual, psychological, cultural, economic, and physical. What differs in these patients may best be expressed as the urgency to resolve the majority of these needs within a limited timeframe.

People view death from their individual and cultural value perspectives. An individual's personal perception of death often affects his or her moral and religious attitude toward it. Many people find the courage and strength to face death through religious beliefs. These patients and their families often seek support from representatives of their religious faith. In some cases, patients who previously could not identify with a religious belief may indicate a desire to talk with a spiritual representative. There are also patients who throughout the whole dying experience neither desire nor need spiritual support and assistance. In all these cases, it is the responsibility of the healthcare provider to be attentive and perceptive to the needs and provide the required support personnel. Since you are the healthcare provider at the patient's bedside, an understanding of the psychological stages of the dying process can be beneficial.

Psychological stages of the dying process

According to studies conducted by Kübler-Ross, a person facing death goes through five emotional stages:

1. Denial.
2. Anger.
3. Bargaining.
4. Depression.
5. Acceptance.

These stages may not occur in sequence. The stages may overlap or appear to be mixed. The patient may seem to go back and forth emotionally through the different stages.

First stage—denial

Denial is the first stage of dying. Denial allows hope to exist. When a person is informed that he or she is going to die, the person is shocked and feels that this cannot be happening to him or her. The person may request a second or third opinion from other physicians, change physicians, or demand more tests hoping to prove the physician made a mistake in the diagnosis.

Sometimes the patient accepts the fact of death, but the family remains in denial. This, in turn, delays the patient from expressing his or her own concerns. The period of denial is usually short-lived because the person begins to worry about unfinished business—personal matters that need to be taken care of such as what will happen to the family and how will the family manage financially.

Second stage—anger

During the anger stage, the patient begins to feel rage, resentment, and envy. The patient will say things like "Why not someone else? Why me?" This stage is very hard on the family because the patient is subject to outbursts of anger that may be directed at family members at any time. Also, nothing seems to please the patient during this stage. It is necessary for the patient to express this anger and sense of helplessness to move along to the next stage, bargaining.

Third stage—bargaining

During the bargaining stage, the patient hopes that death can be delayed or postponed, or he or she may wish for a few days without physical discomfort or pain. Bargaining usually involves making some type of deal with the physician, nurse, or God. Examples of bargaining are: “If I can live long enough to see my daughter graduate from college, I’ll be ready to die,” or “If I can live a little while longer, I will dedicate my life to God.”

Fourth stage—depression

During the depression stage, the patient realizes that death is inevitable. Defense mechanisms no longer work, and anguish and sadness occur. The patient may cry a lot, which, in turn, brings support from the family. After the patient gets over the depression, he or she quietly goes into the final stage, acceptance.

Fifth stage—acceptance

The final stage of dying, acceptance, is when the patient no longer feels angry or depressed about his or her situation. The patient often wants to be left alone, may take naps more frequently, and usually prefers more nonverbal than verbal support from family members. The patient begins to prepare for the “final” journey during this stage. It is like getting plenty of rest before you take a big trip.

An element of uncertainty and helplessness is almost always present when death occurs. Assessment and respect for the patient’s individual and cultural value system are of key importance in planning the care of the dying. As healthcare personnel, we often approach a dying patient with some feelings of uncertainty, helplessness, and anxiety. We feel helpless in being unable to perform tasks that keep the patient alive; uncertain that we are doing all we can do to either make the patient as comfortable as possible or to postpone or prevent death altogether. We feel anxious about how to communicate effectively with patients, the family, and even among ourselves. This is a normal response since any discussion about death carries a high emotional risk for the patient as well as the healthcare provider. Nevertheless, communicating can provide both strength and comfort to all if done with sensitivity and dignity, which are the essence of all healthcare services.

Postmortem care

Postmortem care is the care given after the patient is deceased. It involves certain procedures that are carried out after the physician pronounces the patient dead. The patient is not legally dead until the physician makes a physical determination of the fact. Therefore, any treatment or nursing procedure should not stop until the physician makes his assessment and pronounces the patient as “dead.” Local hospital policy may differ as to the exact way the body is prepared. For this reason, check your local hospital directives on the procedures for postmortem care.

Preparing the body

After the physician pronounces death, place the body in a natural, straight, recumbent position with the head and shoulders slightly elevated. Close the eyelids and, if any dentures were removed, replace them. Remove any drainage tubes or clamps along with any soiled bandages or dressings; then bathe the body. The family may now want to view the body before it is taken to the morgue.

A postmortem kit is available in most facilities. This kit contains a shroud, death tags, gauze, and padding for the perianal region. After you clean the body, place it on the shroud. Your kit may contain a special gauze wrap for the jaw; close the patient’s mouth and tie up the chin, or place a rolled towel under the jaw. Place a linen protector under the buttocks or use the padding provided in the kit to place in the perianal region. Properly fill out the death tags; place one on the great right toe, the second on the left wrist. Wrap the body in the shroud and place the third death tag on the outside of the shroud.

The body is now ready to be transported to the morgue. You may want to clear the hallway of visitors, and close the doors of the other patient’s rooms prior to transporting the patient.

Non-English speaking

When you perform patient care, it's possible to greet someone who does not speak English during medical appointments. If this occurs, there are protocols available to handle communication with patients. The following guidelines describes basic facts and principles in effectively handling non-English–speaking patients.

Guidelines

Language barrier can affect timely treatment of illness or injuries. Awareness of current patient population is essential to utilizing existing facility protocols. Here are a few facts in the table below that pertain to different communication languages among various nations of origin.

Nations of Origin	Language
Asia, China, Hawaii, Philippines, Korea, Japan, Southwest Asia	National language, dialects.
Africa, West Indian Islands, Haiti, Jamaica	National dialect, Pidgin, Creole, Spanish, French.
Europe	National language, English use common.
American Indian	Tribal.
Hispanic countries	Spanish or Portuguese.

To properly assess if there is a language barrier due to cultural differences, use these principles:

- Determine which language the patient speaks at home.
- Determine whether the patient has a name preference.
- Be an active listener.
- Be comfortable with silence.
- Ensure that the interpreter is available, if needed.
- Speak slowly and clearly and repeat information if asked.
- Provide written materials in the patient's preferred language.
- Explain the rationale for asking questions.
- Address the patient formally, unless told otherwise.
- Avoid rushing the patient.
- Observe the use of touch among family members.
- Allow the patient and family members the opportunity to decide where they want to sit for comfort.

Traumatic Brain Injury

Another patient population that has special concerns involves Airmen, Sailors, Marines, or Soldiers who have experienced a traumatic event involving an insult to the brain (not degenerative or congenital) caused by an external force. This type of injury, traumatic brain injury (TBI), has the following characteristics:

- May or may not produce diminished or altered state of consciousness.
- Results in the impairment of cognitive abilities or physical functioning.
- Can result in the disturbance of behavior or emotional functioning.
- Impairments are temporary or permanent and cause disability or psychosocial maladjustments.

TBI is classified according to severity as listed in the following table and description below.

Four classifications of TBIs

1. Mild, moderate, or severe—According to clinical presentation with the most influential factors being loss and alteration of consciousness and duration of post-traumatic amnesia as outlined below:

Severity	GCS	AOC	LOC	PTA
Mild	13–15	<24 hours	0–30 min.	<24 hours
Moderate	9–12	>24 hours	>30 min. <24 hours	>24 hours <7 days
Severe	3–8	>24 hours	>24 hours	> 7 days

2. High or low velocity—According to trauma (high = motor vehicle accident (MVA), low = blow from a blunt object).
3. Local or diffuse:
    a. Local—Hemorrhage, contusion, or laceration.
    b. Coup-contrecoup—Bouncing of brain impacting the cranium in two or more locations.
    c. Diffuse axonal injury—Shearing of axons as brain moves about in cranium. Related to high-velocity trauma and result is more severe symptoms; seen predominately with injuries involving the brain rotating upon impact with the cranium.
4. Closed or open—Infection concerns with open TBIs.

TBI signs & symptoms are determined by severity.

Mild (concussion)

- Possible LOC, alteration of consciousness (AOC), and/or post-traumatic amnesia (PTA), headache, irritability, fatigue, dizziness, confusion, ringing in ear.

Moderate to severe

- The above symptoms usually to a greater degree.
- LOC, AOC, and PTA.
- Nausea and vomiting (repeated).
- Slurred speech.
- Incoordination.
- Seizures or convulsions.

Physical impairments

- Motor deficits (tone changes, hemiparesis/paraparesis, ataxia, and dysphagia).
- Sensory processing impairments.
- Proprioception.
- Cranial nerve related—Sight, hearing, vestibular, touch, taste and smell.
- Lack of proprioception and vestibular input can result in dizziness.
- Sleep disturbances—Common symptom of all TBI severities. May affect the presentation of other symptoms.
- Continuance of headaches.

Cognition impairments

- AOC (comatose, sleepy, delirious, delayed/slow response).
- Memory deficits.
- Orientation deficits.
- Attention-span deficits.
- Perseveration (repeated task or word).
- Communication impairments (expressive or receptive aphasia).
- Impaired safety awareness.
- Behavioral or mental health impairments (depression, anxiety, personality changes, aggression, acting out, and social and sexual inappropriateness).

For outpatient scope of practice, TBI treatment involves following the USAF Aerospace Medical Technician 4N0 Emergency Medical Services (EMS) protocols. During inpatient care, follow local protocols that pertain to clinic/hospital policies.

Post-Traumatic Stress Disorder

Post-traumatic stress, by definition, not only affects veterans but a wide variety of the patient population. Most of which account for veterans returning from a war zone who either self-identify or later become aware of problems associated with military conflicts. Proper awareness of its symptoms not only helps the affected population but also helps improve patient outcomes. Below are some basic facts about post-traumatic stress disorder (PTSD) and how you can recognize the symptoms.

Combat exposure

It appears that the new Iraq War entails more stereotypical exposure to warfare experiences, such as firing a weapon, being fired on (by enemy or potential friendly fire), witnessing injury and death, and going on special missions and patrols that involve such experiences, than the ground war offensive of the Persian Gulf War, which lasted three days. Clinicians who have extensive experience treating veterans of other wars, particularly Vietnam, Korea, and World War II, should be aware of the bias this may bring to bear when evaluating the significance or impact of experiences in modern warfare. Namely, clinicians need to be careful not to minimize reports of light or minimal exposure to combat. They should bear in mind that in civilian life, for example, a person could suffer from chronic PTSD as a result of a single, isolated life-threat experience (such as a physical assault or MVA).

Aftermath of battle

Veterans of the new Iraq War will no doubt report exposure to the consequences of combat; including observing or handling the remains of civilians, enemy soldiers, US and allied personnel, or animals; dealing with prisoners of war (POW); and observing other consequences of combat, such as devastated communities and homeless refugees. Veterans may have been involved in removing dead bodies after battle. They may have seen homes or villages destroyed, or they may have been exposed to the sight, sound, or smell of dying men and women. These experiences may be intensely demoralizing for some. It also is likely that memories of the aftermath of war (e.g., civilians dead or suffering) are particularly disturbing and salient.

Difficult living and working environment

These low-magnitude stressors are events or circumstances representing repeated or day-to-day irritations and pressures related to life in the war zone. These personal discomforts or deprivations may include the lack of desirable food, lack of privacy, poor living arrangements, uncomfortable climate, cultural difficulties, boredom, inadequate equipment, and long workdays. These conditions are obviously nontraumatizing, but they tax available coping resources, which may contribute to post-traumatic outcomes.

Below is a list of PTSD screens, that is, brief questionnaires that may identify people who are more likely to have PTSD. A positive response to the screen does not necessarily indicate that a patient has PTSD. However, a positive response does indicate that a patient may have PTSD or trauma-related problems, and further investigation of trauma symptoms by a mental health professional may be warranted.

Description

The four-item screen was designed for use in primary care and other medical settings and is currently used to screen for PTSD in veterans at the VA. The screen includes an introductory sentence to cue respondents to traumatic events. The screen does not include a list of potentially traumatic events.

In your life, have you ever had any experience that was so frightening, horrible, or upsetting that, in the past month, you:

Have had nightmares about it or thought about it when you did not want to?

YES / NO

Tried hard not to think about it or went out of your way to avoid situations that reminded you of it?

YES / NO

Were constantly on guard, watchful, or easily startled?

YES / NO

Felt numb or detached from others, activities, or your surroundings?

YES / NO

Current research suggests that the results of the questionnaire should be considered "positive" if a patient answers "yes" to any three items. Those screening positive should then be assessed with a structured interview for PTSD.

Given that a full-range of psychological responses may be seen, and given that multiple symptoms (and comorbid disorders) may be present, one challenge to the clinician during the assessment process is to prioritize targets of potential treatment. A few general rules of thumb can be helpful:

- First, one must immediately attend to symptoms that may require emergency intervention, such as significant suicidal or homicidal ideation, hopelessness, self-injurious behavior, and/or acute psychotic symptoms.
- Second, it is useful to address symptoms that are most disruptive to the veteran, which should be evidenced by a careful assessment of psychosocial functioning.
- Finally, the best way to develop a treatment plan for a veteran with diverse complaints is to develop a case formulation to functionally explain the potential relationship between the symptoms in order to develop a comprehensive treatment plan. Substance abuse, disordered eating, and avoidance of trauma-related cues may all represent attempts to avoid thoughts, feelings, and images of trauma-related experiences. Thus, developing an intervention that focuses on avoidance behavior per se, rather than on specific and diverse symptoms of avoidance, may be a more effective treatment strategy.

Self-Test Questions

After you complete these questions, you may check your answers at the end of the unit.

214. Problems and needs related to the pediatric patient

1. List four stressors that influence the way children cope with hospitalization.

2. Name the three phases of separation anxiety.

3. What ideal situation helps a child cope with separation anxiety?

4. What can cause a child to feel a sense of “loss of control”?

5. What are the four signs that indicate an infant may be experiencing pain?

6. Which age group will most likely act very emotionally to pain?

215. Pediatric and elderly care

1. Which of the vital signs is taken first for pediatric patients? Why?

2. How is the pulse taken on children less than two years of age?

3. Which method of temperature assessment is the easiest for children?

4. What important factor of blood pressure assessment is essential to obtaining accurate results?

5. How can you prevent slipping in the bath tub?

6. What nursing intervention can help to prevent dehydration when a child has anorexia?

7. What are two causes of temperature elevations in children, and what is the difference between the two?

8. What type of medication is given to reduce a fever?

9. When the patient has hyperthermia, what can be done to help lower the body's core temperature?

10. What is the target temperature of a tepid bath?

11. How long is a tepid bath given?

12. Why don't you want a child with a temperature elevation to shiver?

13. What are three reasons for the use of restraints?

14. How often are restraints checked?

15. What type of restraint is used to prevent the child from reaching his or her face or head or to prevent the child from scratching?

216. Nursing care of the elderly

1. What are five physical needs of a geriatric patient?

2. What should not be used for a backrub on an elderly patient?

3. What are the benefits the patient receives from frequent oral hygiene?

4. What are three reasons an elderly patient might have difficulty with regular bowel eliminations?

5. What is probably the greatest stimulant to the appetite of an elderly patient?

6. What is probably the greatest cause of fear and anxiety in an elderly patient?

217. Special limitations and problems

1. Where do you place yourself when walking with a blind patient?

2. What is the difference between Type I and Type II diabetes?

3. List four common complications of uncontrolled diabetes.

4. Why is foot care important to diabetic patients?

5. What are the four types of cancer treatment?

6. List five emotional stages of death and dying.

7. When is a patient considered deceased, and prior to this, how does this affect any treatment?

8. Once a patient is pronounced as deceased, how should the body be placed?

9. What symptoms indicate possible mild TBI?

10. Of the four item PTSD questionnaire, how many positive responses would indicate the need for a structured PTSD interview?

11. What are the first symptoms that should be attended to for a potential PTSD patient?

2–4. Care of the Mental Health Patient

Over the past century, psychiatric mental healthcare and nursing have truly evolved. In earlier times, the mentally ill patient was usually placed in an institution that provided custodial care. Today, many mental health problems can be treated on an outpatient basis. When working with a mentally ill person, you must keep in mind that this individual has thoughts, emotions, and reactions just as other human beings do. When people come into a hospital with any illness, they bring with them all of their being. Treat patients as individuals and take every aspect of their personality into consideration. Out

of this concept of the patient as a “total personality” comes the concept of “total care.” The patient’s mental health is one area you must consider to provide total care for patients with all types of illness.

No one single person can provide the total care necessary for the patient’s recovery. Just as the football team must work smoothly together to win, so must the psychiatric nursing team cooperate fully to return the patient to society. As an aerospace medical service journeyman, normally, you do not work directly with mentally ill patients. There is a separate Air Force specialty for technicians assigned to this service. Still, many small Air Force facilities do not have mental health personnel or mental health units; so the patient is admitted to a regular nursing unit where you work.

You have an important place on the team. Care of the nursing unit and protection of the patient are not all of your responsibilities. You really are the “eyes and ears” of the nurses and physicians, since you are with the patients 8–12 hours a day. With a knowledge of mental healthcare, you can observe and report behavior more accurately. Most important of all, with this basic knowledge of human behavior, you can treat all people with greater understanding.

The basis for all human behavior lies in personality development. To understand human behavior, you need to know something about the factors that influence personality development. You will also study some psychiatric terms, nursing approaches to certain behavior, meeting needs of the mental health patient, and ways to protect yourself from aggressive patients.

218. Factors that influence personality development

Frequently, you hear that someone has a “nice” personality, a “nasty” personality, “very little” personality, or even “no” personality. Everyone has personality, which, in its technical sense, is the sum total of all that a person is, feels, and does consciously and unconsciously. Behavior, then, is an expression of personality.

Hereditary factors

Total patient care means giving treatment based upon your understanding of all the factors that go into the formation of personality. Hereditary factors play a part. Whether people are born short or tall or homely or pretty can have some effect upon their feelings about themselves. How an individual feels about themselves (self-perception) also has an impact on their perception of the world and their perception of how the world views them. An example of this might be a beautiful woman who has negative feelings about herself and, therefore, views herself as ugly or inferior and believes that the world sees her the same way.

Environmental factors

Environmental factors continuously influence personality development. A person does not inherit the habit of drinking, moodiness, bad temper, extreme neatness, and other personality characteristics. Instead, others in the person’s environment have some of these characteristics or opposing characteristics. By a process of imitation or of rebellion, the person develops these characteristics. Environmental factors include all of the outside influences and conditions that affect a person’s life and development. The parents a person has, the people a person meets, the house a person lives in—all are part of the environment that shapes that person.

Developmental factors

In working with patients, you may meet one whose history is similar to your own, yet your personality is not at all similar to the patient’s. Why did certain things develop in the patient and not in you? Consider the patient’s experiences during the stages of growth and development; they were different from yours. Personality develops through five stages before a person reaches adult life. The individual’s experiences during these successive states are the developmental factors that determine an adult’s personality.

219. Psychiatric terms

Even though you may not work directly with mental or personality disorders, it is still a good idea to know the meaning of associated terms. It's helpful to know what the physician and nurse are talking about when they tell you that the patient is paranoid. With this in mind, familiarize yourself with the following table of psychiatric terms.

Psychiatric Terms	
Term	**Definition**
Adjustment disorder	A *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Revised* (DSM-IV-R) category for maladaptive response to stressors that affects normal functioning or may be in excess of the normal, predicted response to the stressor. Would not meet the criteria for any specific mental disorder and should be separated from an uncomplicated bereavement response.
Aggression	Often hostile actions used to advance oneself, usually inseparable from emotional associations.
Anxiety	A complex, emotional state of tension or uneasiness, the cause of which is not recognized. Anxiety can range from mild, moderate, severe, extreme, to panic.
Combative	Inclined to fight.
Compulsion	An irresistible urge to perform apparently meaningless actions; for example, the urge to step on each crack in the sidewalk.
Conflict	A state of indecision that arises when an individual is confronted by alternatives of action or by contradictory ideas or ideals.
Delusion	A false belief, an idea without basis, that can't be changed by any amount of evidence or reasoning. May be focused as delusions of being controlled, of grandeur, of persecution, or concern over body image or functioning.
Depression	When describing a mood, depression refers to feelings of sadness, despair, and discouragement. Depression to a varying degree is normal; when severe functional impairment is present, depression is often referred to as a major or psychotic depression.
Flight of ideas	The rapid changing from one idea to another without reaching a goal or specific point.
Functional disorder	A physical condition of emotional origin without known alteration or physical change in the body tissue.
Hallucination	A false sensory perception occurring without external stimulus. It may occur in any of the five senses.
Mania	A mood disorder identified by feelings of elation and well-being, flight of ideas, and physical overactivity.
Neuroses (psychoneuroses)	Functional disorders in which there is no gross disorganization of personality or loss of contact with reality.
Neurotic	Pertaining to or affected with neurosis.
Obsession	An idea that persists in the mind of an individual, is uninfluenced by logic or reasoning, and cannot be voluntarily dismissed.
Paranoid	Having delusions or strong feelings of persecution or grandeur. Paranoid patients may think someone is after them, such as the Communists, homosexuals, or a gang. Their delusions may be supported by, or revealed through, hallucinations.
Phobia	A fixed morbid fear of an object or a situation.
Psychoses	Major mental disorders that exhibit extensive disorganization of the personality and loss of contact with reality.
Psychotic	Pertaining to or caused by a psychosis.
Regression	A defense mechanism in which the individual attempts to solve problems by reverting to behavior appropriate to a less mature level of development.
Schizophrenia	A psychotic disorder characterized by disorientation and disorganized patterns of thinking.
Stupor	Partial or almost complete unconsciousness, a state of reduced responsiveness.

220. Nursing approaches to various behavior

Disorders and syndromes are grouped into categories based on their shared characteristics, traits, or established criteria. The classification system used is the DSM-IV-R, which allows mental health providers to communicate more clearly among themselves and to provide standard care. This classification system is further broken down into five axes:

1. Axis I. Clinical syndromes and V codes (problems not attributable to mental disorders).
2. Axis II. Developmental and personality disorders.
3. Axis III. Physical disorders and conditions.
4. Axis IV. Severity of psychosocial stressors.
5. Axis V. Evaluates the client's (patient) psychological, social, and occupational functioning. This information is evaluated by a *global assessment of functioning scale.*

As mentioned, disorders and syndromes are grouped into categories based on shared characteristics. Patients who have mental or personality disorders exhibit certain patterns of behavior. Some patients are depressed; others are withdrawn, aggressive, suspicious, or anxious. Let's examine the basic guidelines or approaches in nursing care that are considered to be more therapeutic with specific types of behavior.

Aggression

Aggression is a forceful, inappropriate, nonadaptive verbal or physical action used by a patient to attain personal goals. Aggression is classified as mild, moderate, severe, extreme, or violent. Following are ways to respond to aggression:

- Distract these patients and try to channel their energy into safe, nonstimulating outlets. Writing and noncompetitive sports are recommended ways to express aggression in a sociably acceptable manner.
- Be firm but kind.
- Do *not* retaliate to their verbal abuses.
- Set limits as to the number of times something can be done, and have others back up these limits.
- Be sincere.
- Provide tranquil surroundings. Control noise and bright colors (sensory inputs).
- When you try to enforce orders, approach the patients alone, but let them see you are supported by a number of other people.

Anxiety

Anxious patients have fears or uneasy feelings of unknown cause. They may be apprehensive and tense and often become fatigued very suddenly. Hospitalization for patients with anxiety is usually helpful, for it often removes them from stress. The following are ways to respond to anxiety:

- Create a secure environment. Be consistent. Have empathy.
- Contact the patient frequently.
- Assign simple tasks.
- Direct conversation away from the patient.
- Praise the patient for all accomplishments.
- Allow the patient to help care for other patients, such as running errands.
- Listen with an attitude of acceptance and do not ignore his or her symptoms.
- Be calm and have a nondemanding approach for this patient.

Depression

Depression is morbid sadness, dejection, or melancholy. Patients who are depressed usually feel guilty, sinful, inadequate, and sometimes worthless. Methods to work with them are as follows:

- Your approach to these patients should not be directed toward trying to comfort them. This makes them feel more worthless and guilty.
- Be matter of fact, but listen to them, be nonjudgmental, and supportive.
- Keep them busy with simple tasks that won't make them feel inadequate.
- Allow them sufficient time to eat, dress, and work. If they are rushed, this may add to their feelings of inadequacy.
- Do not act overly cheerful or enthusiastic. This increases their depression.
- Visit them frequently. Use a warm, sincere manner.
- Be firm but friendly in requiring these patients to perform such tasks as personal hygiene.
- Watch for suicidal tendencies.

Suspicion

Suspicious patients view their environment as hostile and threatening. They misinterpret the actions of others and harbor feelings of persecution.

- Be factual; approach the patient in a low-keyed manner.
- Be concise; do not elaborate in your explanations, follow through with what is said.
- Be warm and friendly.
- Be sincere.
- Do not whisper in the patient's presence.
- Do not glance at the patient while you are talking to someone else.
- Limit the number of staff members who interact with the patients.
- Respect the patient's need for privacy and space.

Withdrawal

Withdrawn patients have retreated from people and the world of reality. These patients feel unloved, unneeded, inferior, and usually hurt. They have usually experienced a traumatic incident that makes them fearful of trusting people or of becoming emotionally involved with anyone or anything. They need an emotional tie but are fearful of trying again. Ways to work with them are:

- Have frequent contact, but do not be too aggressive as this frightens them into further withdrawal.
- Be truthful and consistent in order to gain their trust.
- Increase interaction with the patients slowly.
- Assign them simple tasks that are within their capability.
- Give sincere praise for their accomplishments. False praise causes loss of trust and further withdrawal.

221. Physical, personal, and emotional needs of mentally ill patients

Specific physical needs must be met in caring for the patients with mental disorders. Mentally ill patients require close supervision of bathing, oral hygiene, and care of their hair and nails. They may not be able to care for themselves, or they may feel that personal hygiene is a useless job and that they have more important things to do. Receiving adequate nourishment, too, is often a problem. Encourage them to eat a well-balanced diet. They may refuse to eat for reasons that are symptoms of their illness, such as delusions, hallucinations, or suicidal intent. It is also your responsibility to keep

an accurate check on each patient's elimination pattern. Encourage regular bowel and bladder habits. Encourage the oral intake of fruit juice and water frequently.

Meeting personal needs

Personal needs are one's own private needs. Homesick patients have a personal need to call or visit their parents. Patients who are short of money may worry about paying their debts; freedom from financial worry is their personal need.

Cultural and social needs are often based on custom, art, and the belief of a particular community or population. A patient's strong like or dislike for certain types of music or food is a reflection of cultural needs. The need to conform to society, to communicate, and be accepted by society are social needs. Rap sessions help to fulfill social needs.

Meeting emotional needs

The following emotional needs are the same for each of us:

- Security.
- Self-esteem.
- Recognition.
- Love.
- Affection.

Your basic emotional needs and mine are the same as our patients. Some people, for one reason or another, have no sense of security or lack self-esteem; others receive very little recognition, love, and affection in their lives. As a result, these people may be more susceptible to stresses than others. While we all have the same emotional needs, our patients may not be able to adequately fulfill theirs as you and I can. Keep these ideas in mind as you work with these patients.

Meeting rehabilitation needs

The rehabilitational process should begin as soon as possible after the patient is admitted. Remember that the aim of total patient care is to return the patient to duty. When this is not possible, it is our aim to return these patients to civilian life as well equipped as possible to take their place as useful members of society. Specific needs occurring during rehabilitation are determined by the severity of the patient's illness.

A major problem is the attitude of society toward patients with mental illness. Some patients are fearful and ashamed that others will learn of their mental problems. They worry about completing the employment form that asks, "Have you or any member of your family ever been treated for a mental disorder?" Primarily, rehabilitational needs involve strengthening the patients' defenses so they can adjust to the demands of their environments.

222. Protective measures and rehabilitative treatment for mentally ill patients

While you are caring for psychiatric patients, keep them under close observation at all times. Keep in mind that you are observing behavior. Careful observation and accurate reporting of the patient's behavior are important responsibilities of the aerospace medical service journeyman. Here are the ABCs of reporting. Observe and report on:

- Appearance of the patient.
- Behavior of the patient.
- Conversation of the patient.

Do not use a technical term that you think fits the patient's case. Report exactly how the patient appears, exactly what the patient does, and, as far as possible, the exact words the patient uses. Be objective.

Restraining devices

Use restraints only to protect the patients or others from harm, to give certain necessary treatment, or to restrain them from traveling when their condition and the conditions of travel make restraints necessary. When patients are uncooperative, something must be done to or for them for their protection and those around them. Approach them with an attitude that you are there to help. Don't rush in and grab; give the patients another chance to cooperate of their own free will. When patients see a number of technicians surrounding them, they may decide not to fight. If you grab a patient, he or she will probably be forced to fight since he or she won't have much time to make any other decision. Be sure to tell the patient why your actions are necessary. If the patient still refuses to cooperate, move quickly so that no one is harmed. Release the patient again as quickly as you can. Do all you can to keep from hurting the patient. A patient normally expects you to harm him or her, so do not prove him or her right.

There are any number of holds you can use to physically restrain an uncooperative patient. Since you are not a mental health technician or a professional wrestler, we won't attempt to teach them all to you. Simply use common sense, protect yourself, and *get help*! Don't attempt to restrain a patient by yourself, unless there is absolutely no other option.

Figure 2–22 illustrates one example of a hold you can use to restrict a patient's movements. As you can see, the technician is positioned so that the patient can't bite, kick, scratch, or otherwise mutilate the technician. With a patient who is very resistive, it may be necessary to walk the patient backwards (fig. 2–23). This is accomplished with two technicians, one on each side. Be careful that the patient does not fall. You will learn other techniques from technicians who have more experience.

Figure 2–22. Restraining holds.

Figure 2–23. Walking the patient backwards.

There are a wide variety of devices that can be used to restrain a patient's movements. The most commonly used restraints are the "soft" and "hard" wrist restraints (fig. 2–24). The type of restraint used is determined by the condition of the patient and the purpose for the restraint. The mitt restraint (fig. 2–25) is used to keep the patient from harming him or herself or trying to pull out IV tubing or catheters. The wrist and four-point or full restraints (figs. 2–26 and 2–27) are used to restrict the movements of combative or otherwise potentially dangerous patients. You will gain knowledge and skill as you work with different patients and restraints.

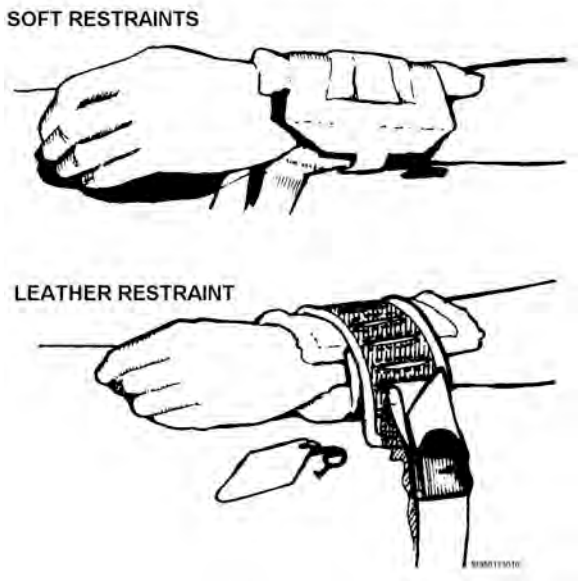


Figure 2–24. Hard and soft restraints.

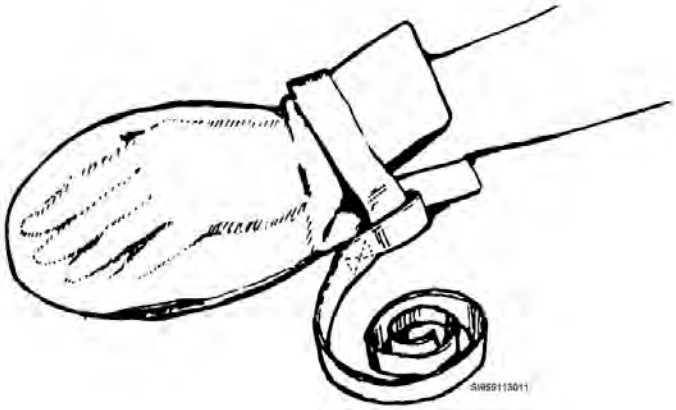


Figure 2–25. Mitt restraint.

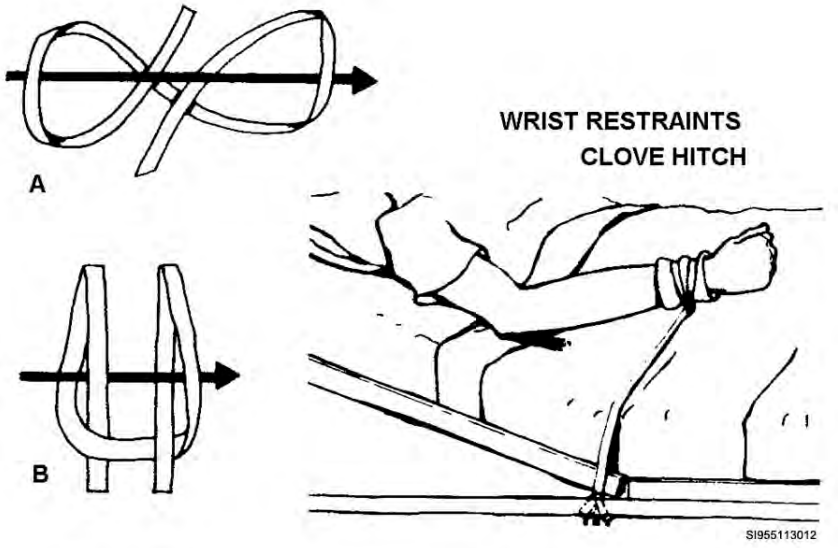


Figure 2–26. Wrist/clove hitch restraint.

Figure 2–27. Full restraint.

The use of restraints on a ward or unit is usually an indicator of the kind of care that the patients are getting. Usually, the better the care, the less frequently restraints are used. Use restraints only as a last resort, and never let the patients get the impression that the restraints are being used as punishment. No patient should be restrained and forgotten. See that the patient has food and fluids, is taken to the latrine at regular intervals, and showers regularly. See and speak to the patients often, so they know that they are not forgotten. A patient in full restraints must be checked on every 15 minutes. Remove the restraints as soon as the physician feels their removal is advisable.

Emergency measures

You know the general emergency measures used for patients who have a physical illness. When mentally ill patients develop a physical ailment, they should also receive treatment appropriate for their physical condition as well as their mental condition. Hemorrhage, asphyxiation, and poisoning can occur in the mentally ill patient as a result of an accident, but these conditions can be self-inflicted by an individual who is out of touch with reality. Part of your care for these patients is to prevent suicide attempts, and you must be ready to deal with such attempts if they occur. You must also be prepared to handle another reaction of mentally ill patients—the tendency to run away. When these patients leave the nursing unit or the hospital without permission, the event is sometimes called an elopement. Don't confuse this with the elopement that precedes some marriages. This word was adopted to avoid the expression "escape" with its implication of imprisonment.

Following elopement

Imagine that you and a nurse are assigned to night duty in a small unit for mentally ill patients. The nurse accompanied a patient to the bathroom and you are alone with the other patients. As you are making rounds, you notice one of the patients dart out the back exit. What do you do? Take these steps:

1. Telephone for help. Do not leave the other patients. Note the direction in which the patient is heading. Be able to describe the patient's appearance.
2. If two technicians or nurses are present, one should remain on the unit while the other follows the departing patient.

Do not reprimand these patients when they return to the ward. Remember, they are not responsible for such actions. Greet the patients in a friendly, sincere manner. Do not question them about their actions. Offer them a bath, refreshments, and rest.

Suicidal or self-abusive

You must be particularly mindful of the tendency toward suicide on the part of some mentally ill patients. Sharp objects, drugs, and other obviously dangerous items should never be left in the room with these patients. They may hide such things or use something that appears to be harmless in their attempts to commit suicide. If you discover a patient has tried to commit suicide, it is necessary to repair the physical damage as well as overcome any antagonistic tendencies on the part of the patient. This is particularly true if the patient is still conscious.

Follow this course of action for patients who have tried to hang themselves:

1. Relieve the pressure.
2. Start resuscitative procedures.
3. Send for help.

If you find that a patient cannot be aroused, assume the patient has taken some type of drug or poison, and take these steps:

1. Start resuscitative procedures.
2. Notify the physician.
3. Try to locate the type and amount of drug or poison, if possible.

Slashing the wrists or the throat is another method of suicide. When you find a patient is bleeding:

1. Stop the bleeding with pressure or a tourniquet.
2. Send for help.
3. Treat the patient for shock, if necessary.

Patient safety

In caring for mentally ill patients, it is essential to protect them from injuring themselves, other patients, and working personnel. All means by which patients can injure themselves must be considered. Search patients for dangerous objects they could use to injure themselves. Many suicidal attempts are made on impulse and without warning. Some patients may even try to hang themselves with an electric cord, a bed sheet, or items of clothing. It is your responsibility to be alert at all times, to recognize any potentially dangerous item or situation, and, if possible, to remove the danger. By all means, report any dangerous situation immediately.

Treatment

At one time, treatment of mentally ill patients was geared mainly toward removing them from society and placing them in an environment where they would not pose a danger to themselves or others. The use of restraints and straightjackets was the rule rather than the exception. We now know that mental disorders can be alleviated or even cured if they are recognized and treated early. Treatment is highly selective and the physician determines the individual process even though many aspects are carried out or contributed to by nursing personnel.

Medical treatment for the mentally ill usually takes two general forms:

1. Psychotherapy and psychopharmacology, with adjunct occupational and recreational therapy.
2. Electroconvulsive therapy.

Psychotherapy

Psychotherapy can be used on an individual or group basis. By the use of hypnosis and psychoanalysis, disturbed patients are able to see through their problems. Eventually, they can rid themselves of the conflicts that caused their symptoms. Tranquilizing drugs seem to decrease anxiety and disturbed behavior and allow the patients to be more receptive to psychotherapy. Recreational and occupational therapies also contribute to the patient's feelings of accomplishment and general well-being.

Psychopharmacology

Many types of mental illness are now treated on an outpatient basis. Sometimes, patients spend the night in the hospital and go to their regular jobs during the day. The use of tranquilizing drugs has made it possible for these patients to cope with the many aspects of living. Whatever the method of treatment, it is your responsibility to accept each patient as an individual who has specific needs and who want to be treated like an ordinary human being. Your attitude toward these patients is your most important contribution. Follow the suggestions given in this volume, abide by the physician's specific orders for each patient, and treat each patient as you would want to be treated under similar circumstances.

Electroconvulsive therapy

Electroconvulsive therapy (ECT) is used in selected cases when milder forms of treatment have failed. The reason ECT is effective is not completely understood. Some experts theorize that the convulsion produced causes changes in the brain. Another assumption is that the convulsion untangles the web of confusion and conflict. In either event, sometimes there is improvement in the patient's condition. With the development of other less invasive treatments, the use of ECT has declined.

It is particularly important that you be especially careful in observing and reporting the activities of mentally ill patients. Note appearance, responsiveness, cooperativeness, speech, sociability, conversation, complaints, appetite, elimination, and movements or lack of movement. The reaction of patients to their relatives and to other visitors can also be an important indicator of their condition. These are the signs and symptoms of mental illness; the physician needs them in diagnosing and planning a course of treatment.

Self-Test Questions

After you complete these questions, you may check your answers at the end of the unit.

218. Factors that influence personality development

1. How can height and weight influence a person's personality?

2. What are environmental factors?

3. How do environmental factors influence personality development?

219. Psychiatric terms

1. Match each term listed in column B with its best definition in column A. Items in column B may be used only once.

Column A	*Column B*
____ (1) A state identified by feelings of elation and well-being, flight of ideas, and physical overactivity.	a. Anxiety.
____ (2) A fixed morbid fear of an object or a situation.	b. Conflict.
____ (3) A state of indecision that arises when an individual is confronted by alternatives of action or by contradictory ideas or ideals.	c. Hallucination.
____ (4) Pertaining to or affected with a neurosis.	d. Mania.
____ (5) A complex emotional state of tension or uneasiness, the cause of which is not recognized.	e. Neurotic.
____ (6) Pertaining to or caused by psychosis.	f. Phobia.
____ (7) A false sensory perception occurring without external stimulus.	g. Psychotic.

2. What is schizophrenia?

3. What is a stupor?

220. Nursing approaches to various behavior

1. Match the types of behavior listed in column B with the term or phrase that best relates to it in column A. Each item in column B may be used more than once.

Column A	*Column B*
____ (1) Physically or verbally active.	a. Depression.
____ (2) Be consistent; assign simple tasks that won't make them feel inadequate.	b. Withdrawn.
____ (3) Feels unloved, unneeded, or unwanted.	c. Aggressive.
____ (4) Be factual, concise, and sincere with this patient.	d. Suspicious.
____ (5) This patient usually feels guilty, sinful, and worthless.	e. Anxious.
____ (6) This patient has a fear of unknown causes.	
____ (7) Try to channel patient energy into safe, nonstimulating outlets.	
____ (8) This patient may be suicidal.	
____ (9) The environment is seen as being hostile and threatening.	
____ (10) False praise will cause loss of trust and increase this patient's condition.	

2. How should you react to a patient who becomes verbally or physically abusive?

221. Physical, personal, and emotional needs of mentally ill patients

1. What type of person needs security, self-esteem, recognition, love, and affection?

2. What kind of individuals are more susceptible to stresses than others?

3. What should be the goal of rehabilitational needs for patients with mental disorders?

222. Protective measures and rehabilitative treatment for mentally ill patients

1. What are the ABCs of observing and reporting the patient's condition?

2. How exact should your reports about the patient be?

3. What are the basic purposes of patient restraints?

4. How does the frequent use of restraints reflect the quality of nursing care?

5. When should restraints be removed?

6. What word is used to indicate that a mentally ill patient left the nursing unit without permission?

7. What actions should you take if you discover a patient has taken a poison and the patient is unconscious?

8. What type of treatment is used when milder forms of treatment have failed?

2–5. Miscellaneous Mental Disorders

Mental disorders include a range of problems to include abuse of family members and substance abuse. Although the Family Advocacy Program in the Air Force is the office that takes care of abuse cases within families, you, as a medic, may be the first in touch with this type of patient. The abuse of drugs and alcohol in the military service has been an area of primary concern for many years. Habitual drug abuse has been unsuccessfully treated in terms of rehabilitation and is recognized as not cost-effective to the military in terms of maintaining personnel who have this problem. Alcoholics, on the other hand, have responded very favorably to rehabilitation efforts. The Air Force has one of the most successful programs of alcoholism rehabilitation available. The next two lessons are written, not with the intent to teach you all you need to know, but to only present you with some facts related to these two subjects and to give you information as to how to deal with the initial stages of both.

223. Care of the abused person

Family Advocacy in the Air Force includes child abuse, child neglect, spouse abuse, and exceptional family members who have special needs. Child abuse and neglect are issues that tug at the “heart strings” of almost everyone. It is important for you to be in touch with your own feelings about family violence and monitor your response to the Family Advocacy patient and family. Most people are horrified that a child could be abused or neglected or that a spouse could be beaten. The most common initial response is to be angry with the abuser. To work effectively, respond not only to the injured child with sympathy but also to the abusing parents or spouse abuser with empathy. Be courteous, caring, and supportive to all our patients, regardless of how they come to be our patients.

Child abuse and neglect

Child abuse includes physical injury, sexual maltreatment, emotional maltreatment, deprivation of necessities, or combinations of all in which the child’s welfare is harmed or threatened. Child abuse is as old as mankind. It has no boundaries; it is found at all socioeconomic levels, including all ranks in the military, all nationalities, and all religious groups. It would surprise you to find that most abusers are model Airmen, NCOs, or officers who are conscientious and hard-working individuals. In most cases parents abuse their children because they know of no other way to cope with the situation at hand. These parents often lack the skills and abilities necessary to provide emotionally for themselves. Therefore, they have trouble coping with anger, fear, or frustrations and react instead with violence. Most of the abusive parents love their children and simply do not realize this type of treatment is not sociably acceptable. It is only in recent years that states enacted laws to protect children from abuse and neglect.

The following are categories or examples of child abuse:

- Physical abuse examples—Beating, burning, scalding, throwing, or dropping the child.
- Emotional abuse examples—Overly harsh parents; very critical parents; parents who demand excessive academic, athletic, or social performance from their child.
- Sexual abuse examples—Fondling, touching of genitals, exploitation of children, oral, anal, or vaginal penetration.
- Physical neglect examples—Failure to provide the necessities, such as food, clothing, shelter, and supervision.
- Emotional neglect examples—Withholding physical and verbal contact, lack of interest in the child's success and failures, and failure to provide necessary guidance and praise.

Your initial contact with the abused or neglected child may be in the ER or on the ward or unit where care is to be provided. *Remember, it is the law that all suspected cases of child abuse must be reported.* There are many signs of child abuse including the following:

- Information obtained from family members about the accident conflicts.
- Delay in seeking medical care.
- Parent has an apparent lack of concern or excessive concern about the child's condition.
- Parent is critical of the child and blames the child for being careless.
- Cause of accident conflicts with the developmental age of the child.
- Child does not respond to pain, is fearful about being touched, and has a lack of separation anxiety.
- Physical evidence, such as burns, bruises, rashes, or sores.
- Child is listless, depressed, or unresponsive.
- Child may be aggressive or impulsive.

As your patient, the child is now in a protected environment. While in the hospital, you are caring for the child's injuries and mental health. Abused and neglected children tend not to trust others. You have to show consistency in your care. Showing acceptance and tenderness toward the child is very important.

Child sex abuse

One subject that is extremely difficult to understand is child sexual abuse. It is estimated that 125,000–500,000 children are sexually abused each year. The media has sanctioned coming "out of the closet" about child abuse and neglect, but there are still many prohibitions to discussing and dealing with child sexual abuse in our culture. Our own attitudes are one of the most significant barriers to medical personnel successfully working with child sexual abuse. Child sexual abuse includes touching behavior; attitudes; nontouching behavior, such as pornography; exposing of the adult to the child; or voyeuristic activity with the child's body. Experts in the field describe three degrees of sexual abuse:

1. Starting with the least traumatic, third-degree sexual abuse consists of nudity, disrobing, genital exposure, observation of the child in a state of undress, intimate kissing of a child, fondling, and pornography.
2. The second degree of sexual abuse consists of masturbation, both in front of the child and between child and adult, fellatio (oral contact with the penis), and cunnilingus (oral contact with the female genitalia).
3. First-degree sexual abuse involves digital penetration or penile penetration of the vagina or anus or "dry intercourse." The latter term is a slang expression that describes an interaction where the adult rubs his penis against the child's genital-rectal area, inner thighs, or buttocks.

When dealing with children, it is important to remember that children generally do not lie about sexual abuse. If they are exhibiting sexual behavior that is beyond their expected developmental stage, they learned it somewhere. When a client discloses sexual abuse, we must respond with a nonjudgmental attitude. It must always be explained to the child that the abuse was not his or her fault; the adult (abuser) is always the person responsible for the sexual abuse of the child.

As a medic, your introduction to this patient may be in the ER or on the ward or unit where medical care is needed or given. Care provided to these children includes those discussed in the section on abused and neglected children. However, be aware that the sexually abused child may exhibit signs of post-traumatic stress.

Spouse abuse

Spouse abuse occurs in all economic categories, races, and religions. It is a fact that both men and women abuse their spouses. Although *no* one has the right to abuse his or her spouse, this physically and demeaning type of violence occurs in the best of families. The abuse usually occurs time after time, in a predictable cycle. This cycle is precipitated by a build-up of tension and stress within the family. Stress and abuse have a definite correlation. Especially in a military environment; stress is caused by a change in assignment, family separation, financial pressure, cultural difference, and living overseas. After the build-up stage of stress or tension, the abuse begins. The third stage is often referred to as the “honeymoon stage” or “loving phase.” The abuser usually feels very sorry for his or her actions and insists that it will never happen again. Medical technicians first meet the victim of spouse abuse in the ER. He or she is often afraid to divulge the truth as to how the injury occurred. The abused almost always feels that the abuse is his or her fault; he or she displays feelings of failure, helplessness, and powerlessness. Returning to the home situation, the abused feels he or she can improve personally to satisfy the spouse and that the abuse will not happen again. With abuse being a learned behavior, it always happens again unless the abuser receives help.

Abusers received inadequate love and support from their parents. They were constantly criticized and belittled. Their parents placed high demands upon them as children either academically or athletically, and they received harsh punishments when not attaining the required potential. When interacting with others, abusers display distrust, isolate themselves from others, will not ask for help in a crisis, and do not offer anyone else help. Personality characteristics include a poor self-image, immaturity, use of drugs or alcohol to help handle difficulties, and a lack of confidence in handling stressful situations. To resolve or break the cycle of abuse, as mentioned, abusers need counseling. Along with medical treatment, the abused also needs therapy.

Your facility has a set protocol for handing cases of child abuse, neglect, sexual abuse, and spouse abuse. Ensure that you know what to do if a family violence case happens on your shift. Another important factor to keep in mind is the family’s privacy. Sound ethical, moral, and professional standards are needed when dealing with this controversial subject.

224. Care of the substance abuser

The use of alcohol and drugs creates a major problem when it is associated with military duty. The military’s need for continuous readiness and reliable adaptability for contingency missions is gravely threatened if personnel are unavailable or only marginally effective due to *psychoactive substance abuse*. Of course, we not only take care of the active duty member; we care for the dependents of active duty members. This alone can be a detriment to the readiness of our personnel. When a family member is the substance abuser, the active duty member also suffers.

The use of drugs and alcohol has the potential to wreck lives. The results of its use are devastating; broken families, increased medical costs, accidents, performance unreliability and incompetence, lost work time, and even death. Unfortunately, most abusers do not recognize that they have a problem and never seek help until one or more of the resulting factors affect their lives.

AF policy

Drug abuse constitutes the illegal, wrongful or improper use, possession, sale, transfer, or introduction on a military installation of any controlled substance or intoxicating substance (other than alcohol) that is inhaled, injected, consumed, or introduced into the body in any manner, to alter mood or function. AF policy states that all personnel are expected to refrain from substance abuse and maintain AF standards of behavior, performance, and discipline consistent with the *Uniform Code of Military Justice*, public law, and AF publications. The illegal or improper use of drugs by an AF member is a serious breach of discipline, is not compatible with service in the Air Force, and automatically places the member's continued service in jeopardy. Such conduct is not tolerated and can lead to criminal prosecution and discharge under other than honorable conditions. The Air Force provides treatment when indicated, tries to restore to duty drug abusers identified for retention, and assists those being discharged in their transition to civilian life.

As an aerospace medical service journeyman, your encounter with a substance abuser may be in the ER or patient-care unit after intoxication or overdose and/or drug withdrawal, which constitutes a medical emergency. Caring for the individual requires knowledge of the abused substance; signs of symptoms are drug specific. Let's discuss some of the classifications of drugs along with signs and symptoms associated with use.

Classification	Signs	Symptoms	Abused drugs
Stimulants	Tachycardia Rapid breathing Dilated pupils Diaphoresis Hyperactivity	Euphoria Excitement Anorexia	Amphetamines Cocaine
Depressants	Sluggish Lack of coordination Slurred speech Pulse and breathing slow	Sleepy	Barbiturates Tranquilizers Valium Librium
Hallucinogens	Rapid pulse Dilated pupils Flushed face Aggressiveness Tremors	Patient sees and hears things Time disorientation Anxiety Speech rambling	LSD PCP (angel dust)
Narcotics	Reduced pulse and respiratory rate Pupil constriction Coma Diaphoresis	Euphoria Sleepiness Anxiety	Codeine Demerol Heroin Morphine Opium
Alcohol	Alcohol on breath Slurred speech Flushed face Poor coordination Confusion Altered levels of consciousness or unconsciousness	Blurred vision Hallucinations Lack of memory	

The immediate patient care provided to the substance abuser is to provide the proper care to sustain life. Carefully monitor the patient's pulse and respiratory rate; be aware that respiratory arrest can occur with narcotic intoxication and overdose. Start an IV line and draw blood to determine glucose, alcohol, sodium, potassium, creatinine, blood urea nitrogen, and hematocrit levels. The physician also orders a CBC and a drug screen. Inspect the patient for other visible injuries, such as fractures or head injuries. Also monitor the patient for seizures and vomiting. Suction equipment needs to be readily assessable. In some cases the patient may resist medical care and need to be restrained. If restraint is used, prone positions are used to avoid the possibility of aspiration. After the acute stage of substance abuse, rehabilitation is recommended. The first goal for successful rehabilitation is for the patient to

accept the need for change; secondly, assist the patient to stop the abuse; and third to attain sobriety. Rehabilitation programs in the Air Force are maintained by the mental health division of the medical corp.

Self-Test Questions

After you complete these questions, you may check your answers at the end of the unit.

223. Care of the abused person

1. In most cases, why do parents abuse their children?

2. Describe how you would care for an abused child who does not trust anyone.

3. Describe third-degree child sexual abuse.

4. When a child discloses that he or she was sexually abused, what type of attitude should you, as a medic, display?

5. Describe the cycle of spouse abuse.

6. What type of behavior can you expect of a person who abuses his or her spouse?

224. Care of the substance abuser

1. Why is substance abuse behavior not compatible with military duty?

2. Describe the AF policy on substance abuse.

3. Match the classification of drugs in column B with the signs and symptoms associated with each in column A.

Column A	*Column B*
____ (1) Slurred speech, flushed face, poor coordination, confusion, and altered LOC.	a. Depressant.
____ (2) Tachycardia, rapid breathing, dilated pupils, diaphoresis, excitement, euphoria, and anorexia.	b. Stimulant.
____ (3) Sluggish, lack of coordination, slurred speech, pulse and breathing slow, sleepiness.	c. Hallucinogen.
____ (4) Rapid pulse, dilated pupils, flushed face, aggressiveness, tremors, patient sees and hears things.	d. Narcotic.
____ (5) Reduced pulse and respiratory rate, pupil constriction, coma, diaphoresis, euphoria, sleepiness, and anxiety.	e. Alcohol.

4. Why do you never restrain a patient who is drug or alcohol intoxicated in a supine position?

5. List three goals of successful rehabilitation for substance abusers.

Answers to Self-Test Questions

209

1. Congenital problems, infectious disease, and trauma.
2. Pathologic fracture.
3. Pain, swelling, and discoloration.
4. It keeps the muscles toned and prevents contractures and deformities.

210

1. Joint strain.
2. Assess the pain and report your findings to the nurse or physician.
3. It limits joint motion and causes fibrous tissue to form, producing fibrous or bony ankylosis.
4. Time and mode of onset, sensory disturbances, location of the paralysis, trophic changes, and disturbances in bowel and bladder control.
5. Noise heard when bones are moved.

211

1. Adequate transportation and splinting to prevent further damage to soft tissues by bone fragments.
2. Extent of the injury, location of the fracture, the age of the patient, the size of the bone, and the circulation to the area.
3. To set the bone.
4. By manipulation and manual traction.
5. A surgical procedure to set, align, and stabilize a fracture.
6. Bucket of tepid water, large bandage scissors, stockinet or sheet wadding, felt padding, and rolls of plaster bandage of the desired width.
7. Clean, dry, and protect the skin with stockinet or sheet wadding.
8. 24–48 hours.

9. Circulatory impairment and pressure on body tissues, especially over bony parts.
10. One who is in a cast or traction.
11. By the odor.
12. Wash it gently with soap and water.
13. (1) c.
    (2) a.
    (3) d.
    (4) b.
14. To attach various pulleys for traction devices and a trapeze bar to assist patients in helping themselves as much as possible.
15. (1) b.
    (2) c.
    (3) d.
    (4) a.

212

1. The surgical removal of all or part of an extremity. The need for amputation is usually due to trauma or disease to the limb.
2. To help the patient attain the highest possible level of independence.
3. Phantom limb pain is mostly experienced by the patient who was experiencing pain prior to surgery. This pain can be described as a feeling of coldness, cramping, shooting, burning, or crushing pain.
4. Phantom limb sensations are described as a feeling of aching, tingling, or itching in the missing limb.
5. Prevention of hemorrhage, infection, and contractures.

213

1. Paralysis is the loss of sensation and/or the ability to move a part of the body.
2. Trauma, spinal cord tumors, disease, infections, and congenital defects.
3. Monitor respiratory, cardiac, and GI functioning during this crucial period.
4. To help prevent pressure sores, cardiorespiratory complications, muscle atrophy, and urinary complications.
5. Ischemia or hemorrhage in the brain.
6. During the acute stage of the stroke, the primary goal is to sustain life.
7. Level of consciousness, pupil reactions, hand-grip strength, and foot strength. Vital signs need to be monitored as well.

214

1. Separation, loss of control, fear of bodily injury, and pain.
2. Protest, despair, and detachment.
3. Rooming-in for parents.
4. Physical restrictions, altered routines, or dependency.
5. Open mouth, eyes tightly closed, flaring nostrils, and loud crying.
6. Toddlers and preschoolers.

215

1. Respirations, because taking the pulse or temperature may disturb and irritate the infant or child causing them to cry.
2. Auscultated over the apex of the heart for one full minute.
3. Axillary method.
4. An appropriately sized cuff.
5. Place a towel or nonslip pad on the bottom of the tub to prevent slipping.
6. Offer small amounts of flavored fluids at frequent intervals.

7. Fever and hyperthermia. Fever is a symptom of illness and hyperthermia is caused by external conditions.
8. Antipyretics.
9. Use of commercial cooling blankets, cool applications, and tepid baths.
10. 98.6°.
11. 20–30 minutes.
12. Shivering is rapid muscle contractions that produce more heat.
13. Ensure safety, facilitate exams, and to carry out procedures.
14. Every one to two hours.
15. Elbow restraint.

216

1. Personal hygiene, rest and sleep, elimination, nutrition, and exercise.
2. Alcohol.
3. Reduces the growth media for bacteria and it refreshes the patient and stimulates the appetite.
4. Lack of proper exercise, reduced muscle tone in the GI tract, and less roughage and fluids in the diet.
5. Serving an attractive meal with consideration for the individual likes and dislikes and catering to the patient's personal customs.
6. Uncertainty of the future or the prognosis of a disorder.

217

1. Walk slightly ahead of the patient.
2. Type I is insulin dependent, has a sudden onset, and is the most common form of diabetes in children and young adults. Type II is not insulin dependent and normally develops after 40 years of age.
3. Retinal changes leading to blindness, kidney disease, nerve damage, and circulatory disorders.
4. Due to the increased risk of circulatory and healing problems, diabetic patients can have an injury or wound to a lower extremity or foot without realizing it, putting them at high risk for infection.
5. Surgery, chemotherapy, radiation therapy, and immunotherapy.
6. Denial, anger, bargaining, depression, acceptance.
7. When the physician makes a physical determination of the fact. Any treatment or nursing procedure should continue until the physician makes the determination the patient is dead.
8. Place the body in a natural, straight, recumbent position with the head and shoulders slightly elevated.
9. Headache, irritability, fatigue, dizziness, confusion, and ringing in ears.
10. Any three.
11. Any that may require emergency intervention, such as significant suicidal or homicidal ideation, hopelessness, self-injurious behavior, and/or acute psychotic symptoms.

218

1. An individual's feelings about himself or herself affects his or her perception of themselves and the world around them.
2. All of the outside influences and conditions that affect a person's life and development.
3. People develop personality characteristics by imitating or rebelling against people or objects in their environment.

219

1. (1) d.
   (2) f.
   (3) b.
   (4) e.
   (5) a.
   (6) g.
   (7) c.

2. A psychotic disorder characterized by disorientation and disorganized patterns of thinking.
3. Partial or almost complete unconsciousness.

220

1. (1) c.
   (2) e.
   (3) b.
   (4) d.
   (5) a.
   (6) e.
   (7) c.
   (8) a.
   (9) d.
   (10) b.
2. Set limits and enforce these limits. Let the patient see that you have the support of others.

221

1. No particular type; everybody has these needs.
2. Individuals with no sense of security, lack self-esteem, or receive very little recognition, love, or affection.
3. To strengthen patient defenses so they can adjust to the demands of their environments.

222

1. (1) Appearance of the patient.
   (2) Behavior of the patient.
   (3) Conversation of the patient.
2. As exact as possible.
3. To protect the patient or others from harm, to give certain necessary treatments, or to restrain the patient for traveling when the patient's condition and the conditions of travel make restraints necessary.
4. It is a general indication that the quality of care is poor.
5. When the physician feels that removal is advisable.
6. Elopement.
7. Start resuscitative measures, notify the physician, and try to locate the type of drug or poison and the amount the patient took.
8. Electroconvulsive therapy.

223

1. They have no other way to cope with the situation at hand. These parents often lack the skills and abilities necessary to provide emotionally for themselves.
2. You will have to show consistency in your care. Showing acceptance and tenderness toward the child is very important.
3. Third-degree sexual abuse consists of nudity, disrobing, genital exposure, observation of the child in a state of undress, intimate kissing of a child, fondling, and pornography.
4. A nonjudgmental attitude.
5. Build-up of tension stage, abuse stage, and the honeymoon stage or "loving phase."
6. The abuser displays distrust, isolates from others, will not ask for help in a crisis, and does not offer anyone else help. Personality characteristics include a poor self-image, immaturity, use of drugs or alcohol to help handle difficulties, and a lack of confidence in handling stressful situations.

224

1. The military's need for continuous readiness and reliable adaptability for contingency missions is gravely threatened if personnel are unavailable or only marginally effective due to *psychoactive substance abuse.*
2. AF policy states that all personnel are expected to refrain from substance abuse and maintain AF standards of behavior, performance, and discipline consistent with the *Uniform Code of Military Justice*, public law, and AF publications. Such conduct will not be tolerated and can lead to criminal prosecution and discharge under other than honorable conditions.
3. (1) e.
   (2) b.
   (3) a.
   (4) c.
   (5) d.
4. Due to the possibility of aspiration.
5. The first goal for successful rehabilitation is for the patient to accept the need for change; secondly, assist the patient to stop the abuse; and third to attain sobriety.

Complete the unit review exercises before going to the next unit.

Unit Review Exercises

Note to Student: Consider all choices carefully, select the *best* answer to each question, and *circle* the corresponding letter.

24. (209) Orthopaedic deformities, such as a clubfoot or wryneck, are categorized as
    a. infectious.
    b. congenital.
    c. pathologic.
    d. temporary.

25. (209) A fracture that results from disease, such as metastatic cancer of the bone, is called
    a. hairline.
    b. pathologic.
    c. congenital.
    d. traumatic.

26. (210) The semi-recumbent position should be avoided over long periods of time in patients with orthopedic disorders because it
    a. causes drop foot.
    b. causes venous stasis.
    c. causes external hip rotation.
    d. promotes flexion deformities of the hip.

27. (210) Which term is used to describe the sound that bones make as they rub together?
    a. Crepitus.
    b. Vibration.
    c. Resonance.
    d. Intonation.

28. (211) Pin care is required with what type of reduction of the bone?
    a. Closed reduction, external fixation.
    b. Closed reduction, internal fixation.
    c. Open reduction, external fixation.
    d. Open reduction, internal fixation.

29. (211) What actions, if any, should you take if your patient complains that his or her short leg cast feels tight?
    a. None. It is normal for a cast to feel tight.
    b. Remove the cast.
    c. Bivalve the cast.
    d. Petal the cast.

30. (212) The cramping, burning, or crushing pain complained about by amputees in their missing limb is referred to as a
    a. phantom limb pain.
    b. phantom limb sensation.
    c. physiological phenomena.
    d. psychological phenomena.

31. (212) What equipment is essential to have at the postoperative bedside after surgical amputation of a limb?
    a. Nasogastric (NG) tube.
    b. Tourniquet.
    c. Oxygen.
    d. Suction.

32. (213) Turning a patient on a Stryker frame *quickly* after a spinal cord injury can cause
    a. aspiration.
    b. cardiac arrest.
    c. disorientation.
    d. respiratory arrest.

33. (213) Rehabilitation for a patient with a spinal cord injury is normally
    a. a lifelong process.
    b. of no use because they do not fully recover.
    c. continued for six months after the injury occurred.
    d. continued for up to two years after the final surgery.

34. (213) The side of the body that is affected by a stroke is determined by the
    a. dominant right or left side.
    b. side of the body that is weaker.
    c. side of the brain that was traumatized.
    d. position the patient was in when the stroke occurred.

35. (214) During which child developmental stage is separation anxiety the most stressful?
    a. Early infancy.
    b. Preschool.
    c. School age.
    d. Adolescence.

36. (214) The normal adaptive mechanism used by children when they lose their sense of control is
    a. fantasy.
    b. projection.
    c. regression.
    d. displacement.

37. (215) When caring for a child with nausea and vomiting, a primary concern would be
    a. hypernatremia.
    b. hyperkalemia.
    c. dehydration.
    d. aspiration.

38. (215) Which reason is *not* appropriate for restraining a child?
    a. The physician needs to suture the child's face.
    b. The child continues to climb out of bed in the night.
    c. To prevent the child from falling out of a highchair.
    d. You have other tasks to do, and no time to sit with the child.

39. (216) When providing skin care for the elderly, it is important to avoid using
    a. alcohol.
    b. lotion.
    c. lanolin.
    d. antiseptic soap.

40. (216) How would you help stimulate the appetite of an elderly patient?
    a. Explain the importance of nutrition.
    b. Ask the patient to try new foods.
    c. Cater to the patient's customs.
    d. Bring a tray full of choices.

41. (217) Which is a sign of uremia?
    a. Oliguria.
    b. Hematuria.
    c. Polyuria.
    d. Dysuria.

42. (217) The first stage of dying is
    a. bargaining.
    b. depression.
    c. anger.
    d. denial.

43. (218) All that a person is, feels, and does is generally termed
    a. environment.
    b. personality.
    c. character.
    d. heredity.

44. (218) What affects an individual's feeling about themselves?
    a. Socioeconomic status.
    b. Opinions of others.
    c. Self-perception.
    d. Job title.

45. (219) Which psychiatric term defines an irresistible urge to perform apparently meaningless actions?
    a. Compulsion.
    b. Delusion.
    c. Anxiety.
    d. Conflict.

46. (219) Which psychiatric term defines a mood disorder identified by feelings of elation and well-being, flight of ideas, and physical overactivity?
    a. Neurosis.
    b. Mania.
    c. Obsession.
    d. Psychosis.

47. (220) Your behavior or actions in the presence of a patient who is anxious should be
    a. excited.
    b. consistent.
    c. demanding.
    d. unsympathetic.

48. (220) A patient who feels unloved, unneeded, inferior, and hurt displays a behavior of
    a. withdrawal.
    b. suspicion.
    c. anxiety.
    d. anger.

49. (221) When does the rehabilitation process begin with a mentally ill patient?
    a. During preadmission.
    b. Within 12 hours of admission.
    c. Within 24 hours of admission.
    d. As soon as the patient is admitted.

50. (221) What is the *primary rehabilitation need* of a mentally ill patient?
    a. Strengthening the patient's defenses.
    b. Group therapy to prevent relapse.
    c. Prevention of regression.
    d. Social actions follow-up.

51. (222) When observing and reporting on mentally ill patients, the most important factor to consider is
    a. behavior.
    b. appearance.
    c. conversation.
    d. sleeping habits.

52. (222) Psychotherapy usually includes all of the following treatments *except*
    a. hypnosis.
    b. psychoanalysis.
    c. occupational therapy.
    d. electroconvulsive therapy (ECT).

53. (223) What action, if any, should you take if you notice a child shows signs of abuse, such as burns and bruises?
    a. Report the suspected abuse.
    b. Only report if the parents admits abuse.
    c. Counsel the parent on his or her actions.
    d. Nothing, the technician is not responsible for reporting abuse.

54. (223) What occurs in the third and final phase of spousal abuse?
    a. Counseling is sought.
    b. Tension and stress builds.
    c. Physical or verbal abuse occurs.
    d. Spouse states it will never happen again.

55. (224) Which drug classification causes euphoria, excitement, dilated pupils, diaphoresis, tachycardia, and rapid breathing?
    a. Depressant.
    b. Narcotic.
    c. Alcohol.
    d. Stimulant.

56. (224) What is the *priority* when providing care to a patient that has abused a substance?
    a. Draw blood for alcohol and drug testing.
    b. Monitor vital signs and sustain life.
    c. Contact the First Sergeant.
    d. Contact Security Forces.

Please read the unit menu for unit 3 and continue ➔

Student Notes

Unit 3. Nursing Care Related to Mobility and Immobility

ACTIVITY IS ONE of the basic requirements for good health. Activity (exercise) relieves stress and improves overall body function. Inactivity, on the other hand, causes physical deterioration, obesity, and muscle atrophy and contributes to systemic disorders, like hypertension and atherosclerosis. In fact, every system in the body is affected adversely by inactivity.

In a previous volume, we approached exercise and activity from a personal standpoint. For us, these things are a matter of choice. We have the option of either exercising and staying fit or not exercising and turning into a "couch potato." Patients do not always have that luxury. Some patients are physically incapable of performing any kind of activity, and others have been immobilized to allow injuries and fractures to heal. Regardless of the reason, inactivity causes some degree of physical and mental deterioration.

There are a number of nursing activities that prevent or reduce complications from immobility. These activities include various forms of exercise, positioning, maintaining posture and alignment, skin care, and breathing exercises. In this unit we will talk about the techniques used to move patients. We'll also discuss patient transfers, ambulation, exercises, and safety precautions related to these activities. Before we get into these areas, we'll expand on the different complications and talk about principles of body mechanics.

3–1. Hazards of Immobility

Immobility is simply defined as the lack of movement. The degree of immobility experienced by hospitalized patients varies according to the condition of the patient. For example, patients who have a spinal injury are immobilized because they are incapable of moving or to prevent movement that might cause irreversible damage. On the other hand, patients who recently had a heart attack are capable of movement but are confined to bed to reduce strain on the heart and give the body time to heal. The reason for the immobility has a direct bearing on the outlook of the patient, the results of the immobility, and the type and amount of care you'll provide. In this section we'll first review common causes of immobility and then discuss the physical and psychological effects of immobility.

225. Common causes of immobility

Common causes of immobility include pain, neurological damage, structural defects, weakness, psychological problems, and rehabilitation measures. We'll look at each of these and discuss how the problem affects a patient's outlook and care you'll provide.

Pain

Pain is defined as the sensation of discomfort, distress, or agony resulting from stimulation of specialized pain receptors. It can be caused by a number of factors including tissue damage, muscle spasms, or production of certain chemicals by the body. People react to the pain they feel in many different ways, but one fairly common response is to avoid any type of activity that will cause the pain to get worse. Many postoperative patients, for example, refuse to move or do breathing exercises because those activities cause pain.

Patients who do immobilize themselves because they are in pain present a special kind of nursing challenge. You'll not only have to provide activities for them and assist them with these activities, you'll also have to convince them that this is going to help and motivate them to do the activity. Such patients are usually extremely skeptical and may even become hostile if you persist. Patients who suffer chronic pain from disorders like cancer or arthritis are especially difficult to convince of the benefits of exercise. They're frequently frustrated and hopeless and are more concerned with pain elimination than with possible future benefits from activity.

You'll be most successful if you begin a program of activities early in the patient's hospital stay. This gives the patient a chance to become accustomed to the routine, and the pain is usually less in the early stages. Your patient probably won't believe this, but the longer he or she waits to begin such activities, the worse the pain will be. Reassure the patient and provide a clear explanation of what you want to do, and why you want to do it. If the patient has suggestions, use them if at all possible. Show sincere concern and be very careful and gentle when helping the patient to move. Try to imagine how you would feel in the same situation. Timing is also very important. Schedule activities for the time of day the patient is most energetic. Fatigue lowers pain tolerance. If you schedule an activity for the end of the day when the patient is already tired, the activity will be more painful for the patient, and the patient will be less likely to cooperate. If the patient is receiving medications for pain, wait until these medications have helped before you start any activities. Patients have good days and bad days. Be patient, persistent, provide lots of encouragement, and you'll eventually be successful. Pain commonly accompanies many other conditions. The approaches we describe here will apply to other problems as well.

Neurological damage

Conditions that involve neurological damage include cerebrovascular accident or "stroke," spinal cord injury, muscular dystrophy, myasthenia gravis, and other related disorders. These conditions differ in many ways, but they all impair the patient's physical capabilities to some extent and they are all long term. Some of these patients, such as stroke victims, will not be able to communicate effectively. Other patients will either not be able to move at all or will not be able to control their movements. You'll have to be very patient and provide a lot of encouragement for these patients. Any progress they make will be slow and painful. Always explain what you are doing. A patient may not be able to talk but may still be able to hear and understand. As much as possible, try to involve the patient and try to follow the patient's wishes. Remember, it is the patient who is experiencing this, not you.

Structural defects

Structural defects include conditions like scoliosis, contractures, and similar conditions. These conditions have much in common with the problems we mentioned earlier. They are usually chronic, and progression is slow and painful. Inform the patient that immobility will only aggravate the problem. Provide lots of encouragement and praise for any progress made.

Weakness

Weakness may be caused by inactivity or it may be associated with some degenerative disease process, such as cancer. For these patients, it is important not to exceed their limitations. They'll not be able to do everything right away. Plan activities so that they can see that progress is being made. Patients will quickly become discouraged and stop trying if they think they are not getting anywhere.

Psychological problems

Psychological problems include depression, psychosis, and other mental problems. Those who have such problems are frequently indifferent to their personal health and not concerned with the benefits of exercise or other activities. Your primary goal should be to try to develop a good rapport with these patients. Without that rapport, you'll not be able to do anything.

Rehabilitation measures

A number of your patients will be placed on a limited activity status called bed rest for rehabilitative purposes. The purpose of this limitation is to allow injured tissues to heal. Cardiac patients, patients in traction, and spinal injury patients are examples of patients who require some limitation in their activity.

In some ways, these patients are totally different from other immobilized patients. Many of them do not want to be on bed rest and will not accept the limitations set by the doctor. Your goals for such patients are to first help them understand and accept their condition, and second, work with the patients to develop a program of activity that is within the limitations set by the doctor.

226. Complications of prolonged bed rest

The complications of prolonged bed rest affect the mind and every system in the body. To help you understand the need for the various activities, we'll discuss the complications in-depth.

Psychological effects

We all feel good when we think that we are in control of our lives and careers. When we get a promotion, for example, we are on top of the world and very concerned about the image we project. Things are very different if we don't get that promotion or if we get stuck with an assignment we don't like. We become frustrated and lose interest in our appearance or health. Such feelings are very much like the emotions that bedridden patient may experience. They are in a strange environment and have lost control over many of their basic activities. They are usually frightened because the hospital environment is strange, they don't know what is going to happen, and they are unable to protect or even help themselves. They may also feel frustrated and angry because they are so helpless. They are forced to depend on strangers for very personal activities, such as having a bowel movement. This may be extremely embarrassing and greatly increases their feelings of frustration.

Communication problems and sensory deprivation increase these feelings of frustration and helplessness. Stroke patients have a great deal of difficulty communicating, and may even be totally unable to communicate. This does not mean that they cannot think or hear! Basically, they're just trapped inside their bodies.

Much of our orientation and sense of time is based on what we see changing around us. We develop a sense of time by watching the sunrise and set and by watching the seasons change. Bedridden patients lose all that. There are no seasons in a hospital room and not much difference between night and day. For bedridden patients, time drags along, and minor activities like meals and vital signs become major events. They may also suffer from insomnia because time isn't changing for them and they don't have activities to help them become tired.

Patients react to all this in a variety of ways. Some become very depressed and totally lose interest in their appearance or condition. You'll have to remotivate these patients. Encourage them to do as much as possible for themselves and praise any progress they make. Other patients will react by becoming angry and hostile. Try to channel that hostility into harmless channels like verbal

expression or hobbies. Allow patients to express their feelings, but do not allow patients to become physically abusive with you or anyone else. Finally, some patients respond to their condition by regressing and behaving in a child-like manner. They spend a great deal of time worrying about meals or bowel movements. They may do inappropriate things to get attention, like wetting the bed or ringing the call bell when they don't need anything. For these patients, you'll need to reinforce appropriate behavior and provide meaningful activities to improve their self-image. Increase their sensory stimulation and relieve their boredom by providing a television or radio or simply by coming by to visit as often as possible.

Integumentary effects

One of the most common results of prolonged immobility is *decubitus ulcers* (pressure sores). These ulcers are caused by impaired circulation to the skin and subcutaneous tissues in areas of the body where bones lie close to the skin surface. The mechanism for this breakdown is very simple. Circulation is cut off when these areas are compressed between the weight of the body on a bony prominence and the bed, hence the name—pressure sore. Without blood, the tissues eventually begin to die and an area of ulceration develops. Other factors that are involved are shearing force and friction. Shearing force is the effect produced when one layer of tissue slides over another. You can see the effect of shearing force if you slide your arm along a surface like a desk top. Part of your arm will move before your skin and subcutaneous tissues change position on the desk top. Friction holds these tissues in place while the force you are exerting is pulling your arm in another direction. Patients experience the same effect when they slide down in bed or are pulled from one position to another. On a short-term basis, shearing force and friction do not cause any damage. However, a patient's tissues may be forced apart for an extended period of time. This causes tissue damage and increases the effects of the pressure.

Initially, a pressure sore will appear as an area of pale skin, much like you would see if you press the heel of your hand firmly on a hard surface for minute or two. After a short period of time, the area becomes red and swollen as the body tries to improve circulation to the area. If the pressure is not relieved, the skin becomes darker, or cyanotic, and begins to break down. After that, it is just a matter of how much damage is done before the pressure is relieved. The ulcer just gets bigger and deeper as time goes on.

Pressure sores are categorized according to their appearance and the amount of damage that has been done. With a stage I decubitus ulcer, the skin appears reddened and swollen and does not blanch with fingertip pressure. Actual skin breakdown is limited to the epidermal tissues. A stage II ulcer affects the epidermis, dermis, and subcutaneous fatty tissues. The tissue appears inflamed and may present like an abrasion, blister, or shallow crater. With a stage III ulcer, the damage has penetrated down to the muscle causing distortion of muscle tissue and loss of body fluids. The last level is a stage IV ulcer. The damage has penetrated through all layers of soft tissue and reached the underlying bony structure.

Although a pressure sore can develop over any bony prominence, certain body areas are more susceptible. These areas include skin tissues around the sacral area, ischial tuberosities, greater trochanter (hip and thigh), heels, elbows, ankles, knees, and the back of the head. If you think about it, these areas are mostly located at points where the body is pressing against the bed when the patient is in the supine position. That should tell you that these patients are spending too much time on their backs.

Decubitus Ulcer Stage	Symptoms
Stage I	Skin appears red and swollen and does not blanch with fingertip pressure.
Stage II	Affects the epidermis, dermis, and subcutaneous tissue. Tissue appears inflamed and may present like an abrasion, blister, or shallow crater.
Stage III	Damage has penetrated down to the muscle causing distortion and loss of body fluids.

Decubitus Ulcer Stage	Symptoms
Stage IV	Bone may be visible.

Certain types of patients are more prone to develop decubitus ulcers than others. These include elderly patients, thin and obese patients, edematous patients, malnourished patients, febrile patients, patients in pain, patients who are incontinent, and patients whose movements are restricted for any reason. Actually, any patient who cannot move normally or has some condition that affects the supply of blood and nutrients to the tissues is susceptible to decubitus ulcers.

It is much easier to prevent a decubitus ulcer than it is to heal it after it has developed. The preventive measures are simply good nursing care. They include turning patients from one position to another at least every two hours, keeping the skin dry and clean by using waterproof pads under the patients, giving frequent back rubs and skin care, keeping the sheets clean and wrinkle-free, avoiding abrasive soaps, and using protective devices, such as special padding, foam mattresses, sheepskins, or pillows to support patients in the various positions. If a sore does develop, it can be treated with topical agents, surgery, heat lamps, and various other remedies. The healing process will be long and difficult for the patient.

Musculoskeletal effects

In addition to decubitus ulcers, bedridden patients develop a number of musculoskeletal disabilities including weakness, backache, muscle atrophy, contractures, and disuse osteoporosis. This deterioration is a result of a loss of muscle tone, which is the normal state of constant tension that body muscles exhibit. This tension is responsible for holding your body erect when you are standing, sitting, walking, or balancing. When your body is inactive, the muscles lose this “tone” and become very relaxed. Eventually, the muscles will begin to atrophy, or waste away.

Weakness is the first sign of this deterioration process. After three or four days of bed rest, patients will feel very weak and shaky when they try to stand. If the muscles are not used, they’ll continue to deteriorate, and eventually the patient will not be able to stand at all.

Backaches are caused by a combination of poor posture, lack of support, and stretched muscles. When a patient is lying in bed, the back and neck should be relatively straight. Sleeping in a slouched position, using large pillows, or sleeping on a mattress that is too soft will cause abnormal body alignment. As the muscles relax, they gradually stretch to accommodate this abnormal position. This stretching causes muscle strain or backache.

Muscle atrophy is the wasting away of muscle tissue. If muscles are not used, they begin to deteriorate or decrease in size. This deterioration causes the shrunken appearance many patients have after an extended stay in the hospital. Atrophy is associated with weakness. As muscles get weaker, they atrophy, and vice versa.

A contracture is a type of deformity caused by abnormal shortening of a muscle and stiffening of the joint. Eventually, the muscle becomes fixed and resists stretching. At the same time, the joint stiffens or becomes locked in an abnormal position. Once patients develop a contracture, they are permanently disabled. Footdrop or “plantar flexion” is one type of contracture commonly seen in immobilized patients. In this case, the muscles at the back of the leg shorten, causing the foot to become locked into a position where the toes are pointing downward.

Like muscles, bones begin to deteriorate when they are not used. Disuse osteoporosis is one type of bone deterioration. It is characterized by a disruption of the balance between bone cell production and bone cell destruction. This causes an imbalance in the inorganic (calcium) substances in the bone. The bones become more brittle and susceptible to damage.

As with decubitus ulcers, the best treatment for the various musculoskeletal problems is prevention. Once they have developed, it is very difficult to undo any of these problems. You can prevent these

problems by simply maintaining a regular program of exercise and activity and frequent movement of the patient with the use of bed boards and other support devices, if necessary.

Cardiovascular problems

Cardiovascular problems that result from immobility include increased work load, orthostatic hypotension, cardiac straining, and thrombus formation. Unlike other systems in the body, the heart actually works harder when a person is immobile. Normal activity involves contraction and relaxation of the muscles. The muscle action alternately compresses and releases the veins, helping return the blood to the heart. Immobilized patients do not have this muscle activity and the heart is forced to do extra work. All this puts additional strain on the heart.

The absence of muscle activity also contributes to thrombus formation. A thrombus is a clot that forms in the veins, and one of the primary contributing factors is “venous stasis” or pooling of blood. Since the muscles aren’t helping to push the blood along, blood tends to pool in dependent areas of the body. Occasionally, clots are formed. These clots may cause inflammation (thrombophlebitis) in the veins, or they may break loose and travel through the circulation until they lodge in a blood vessel. Such clots, or embolisms as they are called, are carried to the lungs and eventually form an obstruction in one of the pulmonary blood vessels.

Orthostatic hypotension is a sudden drop in blood pressure when the person stands up. It is caused by inadequate vasoconstriction, which allows the blood to pool in the lower extremities rather than pushing it through the body. Orthostatic hypotension is at least partially to blame for the dizzy, weak feeling patients have when they first stand up.

Cardiac straining refers to activities, such as straining to defecate, coughing, sneezing, or moving up in bed, that place additional strain on the heart. These activities cause fluctuations in pulse and cardiac output, which are dangerous for an already overburdened heart.

A patient with cardiovascular problems related to immobility can be treated medically or surgically, depending on the problem. However, the best treatment is still prevention. The patient is usually placed on a program of progressive activity, which must be provided strictly IAW the doctor’s orders.

Respiratory effects

Respiratory effects of immobility include loss of respiratory muscle tone, inadequate exchange of oxygen and carbon dioxide, disruption of the acid-base balance, hypostatic pneumonia, and atelectasis. Believe it or not, these conditions are all somewhat related.

When someone is inactive, there is a decrease in the body’s respiratory demand. Also, poor posture and weakness often interfere with normal chest expansion, resulting in shallow breathing. As the result of all this, the person does not have an effective oxygen-carbon dioxide exchange. Carbon dioxide builds up in the blood producing an acid-base imbalance. This acid-base imbalance can lead to cardiac failure if not corrected.

At the same time that all this is going on, secretions are pooling in the patient’s lungs. This pooling is also the result of the inadequate breathing and chest expansion. The secretions tend to settle in the lowest part of the lungs and provide an excellent reservoir for the growth of microorganisms. The microorganisms cause infections, which, in turn, lead to a condition called hypostatic pneumonia. The secretions also prevent complete lung expansion by blocking the bronchioles. This causes a condition called atelectasis, or collapse of alveolar tissue.

Respiratory problems can be prevented, or at least reduced, by turning the patient frequently to loosen and prevent pooling of secretions. Deep-breathing exercises will also help break up the secretions and improve oxygen exchange and lung expansion. If a patient is unable to mobilize the secretions, procedures such as postural drainage, suctioning, and mechanical ventilation may be necessary.

Metabolic effects

Immobility usually causes a decrease in the patient's metabolic rate. If a patient has a fever or is in pain, the metabolic rate may increase instead of decrease. The decrease in metabolic rate reduces the body's demand for nutrition, causing a loss of appetite, or anorexia. If the patient's appetite is not stimulated, malnutrition may develop.

To prevent anorexia and all the problems associated with malnutrition, talk to your patients and try to find out their likes and dislikes. Encourage them to eat foods that are high in nutritional value, protein, and fiber. Serve small, frequent feedings and try to schedule activities that will stimulate their appetite. For example, exercise an hour or so before a meal will stimulate the appetite, but a breathing treatment with production of mucus and so forth will kill the strongest appetite. If you can't find any foods a patient likes, arrange a consultation with a dietitian. Also, keep track of what patients eat, and notify the nurse or doctor if a patient's intake starts to drop.

GI problems

Exercise and activity help to stimulate bowel activity. When patients are immobile, this activity is reduced and patients frequently become constipated. Anorexia, as we just mentioned, is also a common GI problem. A tasteful, well-balanced diet that is high in fiber will go a long way toward resolving both problems. Small, frequent feedings also help because the patient does not have a great mass of food processing at any one time. Finally, exercise will stimulate the appetite and promote bowel activity.

Urinary problems

The urinary system is the last problem area we'll discuss here. Urinary problems are related to a slowdown in the system. Like everything else in the body, exercise promotes function. When the urinary system slows down, blood is not filtered properly. Toxic materials float around the body causing problems. The urinary slowdown also causes urinary stasis or pooling. This stasis contributes to the formation of kidney stones and urinary infections.

As a combination of psychological and physical problems occur, many patients have a great deal of difficulty voiding or defecating while they are in bed. Not only are bedpans awkward and difficult to use, we have been taught not to do that sort of thing while we are in bed. Activity is not the only solution to this problem. In many cases, both problems will be eliminated if you encourage patients to drink plenty of fluids and allow them to use the bedside commode (with the doctor's permission, of course). Studies have shown that the commode is safer than the bedpan because it eliminates the straining we mentioned earlier. If patients are unable to get out of bed, provide for patient privacy.

Self-Test Questions

After you complete these questions, you may check your answers at the end of the unit.

225. Common causes of immobility

1. What are the common causes of immobility?

2. What type of special nursing challenge do patients in pain present?

3. Why should you schedule activities for a patient at a time when the patient is feeling energetic?

4. What type of patient is not usually able to communicate effectively?

5. What are two causes of weakness?

6. What is the purpose of bed rest?

7. How do patients who are on bed rest differ from other immobilized patients?

226. Complications of prolonged bed rest

1. What are three reasons immobilized patients might be frightened?

2. What psychological condition is exhibited when a patient spends a great deal of time worrying about meals and bowel movements?

3. What is the primary cause of decubitus ulcers?

4. What are the effects of a stage III ulcer?

5. What treatments can be used for decubitus ulcers?

6. What does muscle tone do?

7. What causes backaches?

8. What is the final effect of disuse osteoporosis on bones?

9. What is the best treatment for musculoskeletal problems related to immobility?

10. What effect does immobility have on the flow of blood through the body?

11. What causes orthostatic hypotension?

12. What effect does immobility have on the respiratory system?

13. What are two reasons an immobilized patient's metabolic rate might increase instead of decrease?

3–2. Body Mechanics and Patient Activities

Body mechanics is defined as the careful, coordinated, and efficient use of the body to do work. We use our bodies every day when we sit, walk, lift, and perform numerous other activities. As medical service technicians, we use our bodies as "machines" when we lift, pull, push, and otherwise manipulate patients. Unfortunately, a lot of us injure ourselves because we don't use our bodies properly. In this section we are going to look at some basic principles of body mechanics. If you follow these principles, you should be able to perform nursing procedures without injuring yourself.

It's important for you to remember that the procedures we describe here are usually used on long-term, seriously ill patients whose chances for complete recovery range from slight to nonexistent. With patients like this, setbacks are common and advances are usually slow and painful. Under conditions like this, many nursing personnel become discouraged and demotivated. It sometimes helps if you go back to your basic goal, which is to restore your patients to the optimum possible health, considering their problems and conditions. In other words, you can't cure them all, but you can treat all of them with dignity and make them feel cared for and as comfortable as possible.

The techniques described throughout this text are not the absolute only way of doing any given procedure. We selected methods most commonly described in various nursing texts. The final authority is and must be local policy as prescribed by senior medical technicians and nurses. Have no qualms about asking them for help if you become confused.

227. Principles of effective body mechanics

Good body mechanics is a combination of good posture and the effective use of body muscles to perform various activities. Good body mechanics are as important for you as they are for your patients. As we mentioned in the last section, if patients do not use good body mechanics, they'll develop backaches, contractures, and other problems. In fact, you can develop permanent problems from using poor body mechanics. In this section we'll first discuss the different aspects of good posture. After that, we'll talk about the best way to use your body muscles to perform different activities.

Posture

Posture, or body alignment, is the proper relationship of body parts to one another. Correct body alignment reduces strain, helps maintain balance, and improves overall body functioning. Good posture requires energy to overcome the pull of gravity. Posture should be maintained in each of the body positions (standing, sitting, lying). We'll briefly discuss proper body alignment in each of these positions.

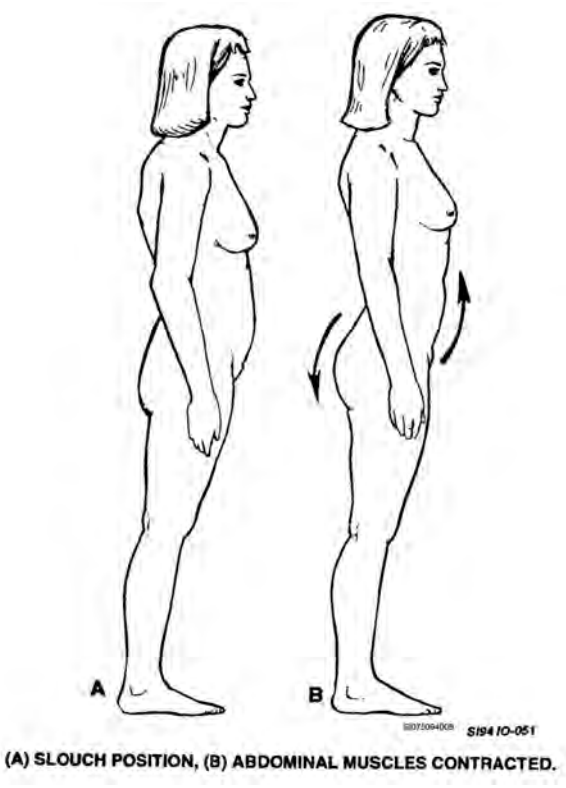


Figure 3–1. Standing posture.

Standing posture

When you are standing, your body should be much like it is when you are in the parade-rest position (fig. 3–1). To stand correctly, keep your back straight without any of the exaggerated spinal curves you have when you are slouching. When you slouch or lean one way or the other, you stretch the muscles on one side and contract the muscles on the other. Over a period of time, a slouched or leaning position will cause the affected muscles to feel strained. Hold your shoulders up and back, and keep your chest up and slightly forward. This position will help maintain good spinal alignment and give your lungs more room to expand. Pull your buttocks in and hold your abdomen up and in. This will help keep your back straight by supporting the abdominal organs and reducing the pull on the lower back.

Keep your head erect and in line with your back. Hold your chin in slightly but not so that it is uncomfortably close to your chest. Avoid any sort of exaggerated leaning position. Your back muscles are also involved in maintaining your head position. Any unusual position will cause back and neck strain.

When you are standing, your feet are your base of support. You should stand so that your weight is centered over your feet. The point at which your body mass is centered is called the *center of gravity*. Your feet should be roughly parallel and approximately 4–12 inches apart. It isn't necessary for your feet to be exactly parallel, so long as your toes are pointing in the same general direction. If one foot is pointing one way and one the other way, your entire body will be thrown out of balance and you'll develop back, hip, and leg strain. Your feet should be at right angles to the lower legs (no high-heeled sneakers) and your body weight should be distributed equally between both feet. Bend your knees slightly so that they do not become locked. Locking your knees interferes with the circulation to your lower legs and reduces the effectiveness of your legs as shock absorbers.

When you stand as we have described, you'll have a firm base of support and your body will be aligned so that your center of gravity is centered over the base of support. You'll feel balanced and you should be able to maintain that position for long periods of time.

Sitting position

Since you don't spend all your time on your feet, you should also be concerned about posture in other positions. When you sit, your base of support shifts from your feet to your seat. What we just said about upper body positioning for the standing position also applies to the sitting position (head erect, back straight, chest out, shoulders back, stomach and buttocks in). Your feet should be flat on the floor and your popliteal area (area behind your knees) should be free of the edge of the chair. Crossing your legs or sitting so that the edge of the chair is pressed against the back of your legs will interfere with your circulation and may eventually cause nerve damage.

Lying position

When you are lying down, your muscles are usually relaxed. When you are standing or sitting, your body alignment is maintained by various muscle groups; when you are lying down, you rely on your

bed to provide that support. You can help if you make sure that your bed is firm enough to provide the necessary support and you are not lying in an abnormal position.

Effective use of body muscles

Your body is covered with muscles of varying sizes and strengths. Your goal should be to use the largest muscles and muscle groups to do the most work. Unfortunately, in the name of convenience, many of us use smaller muscles to do most of the work, or we perform tasks with our bodies contorted into abnormal positions. In either case, we are not using good body mechanics. Experts have developed guidelines for making the most efficient use of our body muscles. These guidelines are as follows:

Plan your movements

When you are standing with a patient half in and half out of bed, it is too late to figure out that you probably should have had help moving the patient. Consider *how* you'll perform the task, *what* equipment you'll need to perform the task, and *how much help*, if any, you'll need.

Be realistic about your capabilities

Most of us are not built like Arnold Schwarzenegger, and we can't lift patients single-handedly. If you do not accept your limitations and work with them, you may injure a patient, and you'll almost certainly injure yourself.

Assess the amount of assistance that the individual helping you can provide

For example, if you weigh 90 pounds dripping wet and the person assisting you is about the same size, you'll probably have some difficulty lifting a 300-pound patient. Of course, you can't always go by size. The best way to learn the capabilities of your fellow technicians is to work with and get to know them.

Maintain a broad base of support

Your base of support is determined by how far apart your feet are, and your base of support determines how well you are balanced. If your feet are close together, your base of support will be small and your balance a little shaky. To illustrate this, place your feet together and try to reach over and pick something up off the floor. If you try it again, with your feet about 15 to 20 inches apart, you should see the difference a broad base of support will make. When you are working with patients, plan your base of support according to the amount of stability you need. If you are trying to support a falling patient, for example, keep your feet relatively far apart for a firm base of support.

Keep your center of gravity low

As we mentioned, your center of gravity is the point at which your body mass is centered. Your stability increases as your center of gravity moves closer to your base of support. Your stability is much greater when you squat to do something than it is when you stoop to perform the same task.

Position yourself so that the line of gravity passes through your base of support

The *line of gravity* is an imaginary vertical line extending straight down through the center of gravity. It is just another way of saying the gravitational pull. If you lean or stoop so that your line of gravity is not over your base of support, your balance will be poor. This is why you move objects within reach so that you can stand erect to work on them or squat to work on objects that are too low for you to reach without bending (fig. 3–2). An erect posture also helps to protect your back muscles.

Use smooth and rhythmic movements

You'll understand this principle better if you first understand the principle of *momentum*. Once an object is moving, it gathers a certain force, or *momentum*, which helps to keep it moving. Each time the object stops moving, the momentum is lost and friction or gravity must be overcome to start it moving again. In other words, because you lose the force of momentum each time you hesitate, it is

much easier to lift a patient with a smooth, steady motion than it is with a series of jerky motions. Smooth, rhythmical motions also make more efficient use of muscles by providing more time for muscle contraction and allowing the muscle to contract completely. Last but not least, smooth motions are more reassuring for patients because they feel less like a puppet on the end of a string.

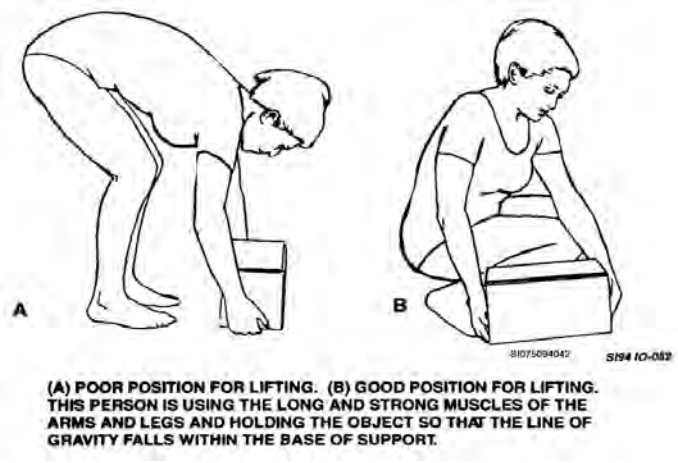


Figure 3–2. Lifting posture.

Use leverage to help move or lift heavy objects

Leverage increases the efficiency of your muscle power. You are using leverage when you brace your body against the side of the bed and use your body weight to help pull the patient towards you. In this example, the bed and your body weight provide leverage, increasing the force provided by your muscles. There are numerous other examples of leverage. The trick is to use your whole body rather than trying to work with muscle power alone.

Move in a straight direction

This principle relates back to our earlier discussion of momentum. The force of momentum acts along a straight line. If you change directions when you are moving an object, you'll lose your momentum. Also, face the direction of your motion. For example, if you are trying to slide a patient up in bed, face the head of the bed, as shown in figure 3–3. This will prevent twisting motions that can cause painful back injuries.

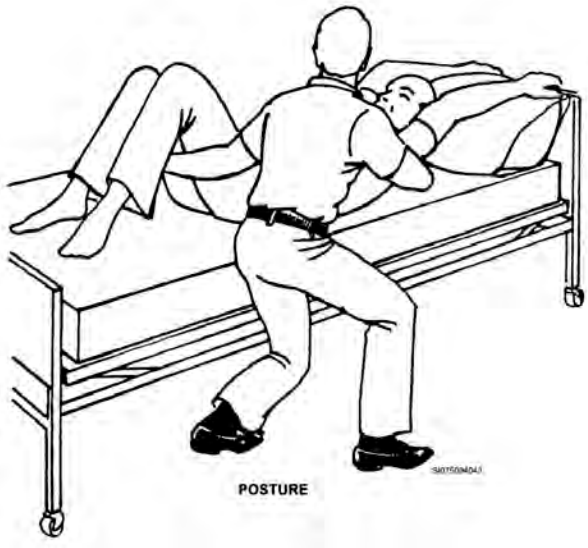


Figure 3–3. Posture for moving a patient up in bed.

Use large muscle groups

This is one of the most commonly violated principles of good body mechanics. Your largest muscles are located in your shoulders, upper arms, thighs, and hips. The muscles in your lower back are much smaller and less powerful. Yet, most people bend over to pick up objects rather than squatting and using the muscles of the legs and thighs. When you bend over, you place a tremendous amount of pressure on your vertebral column. When you pick something up from that position, you increase that pressure and risk injuring your back. Along the same line, you should use as many muscles as possible to avoid strain. If you are helping a patient move, for example, use both arms, rather than just one.

Use the internal girdle of support

When you simultaneously contract your abdominal muscles and your buttocks muscles, you create a muscular barrier around the intervertebral discs of your lower back. This barrier, or "girdle," helps protect your lower back when you strain to lift or move objects.

Use pulling or pushing rather than lifting movements whenever possible

The resistance of friction is less than the resistance of gravity. Thus, it is easier, and safer for your back, to slide a patient to the side of the bed than it is to lift the patient.

Keep your work close to your center of gravity

If you keep your work close, you'll be able to use of your large muscle groups and avoid straining smaller arm and back muscles.

There are other principles or guidelines you can apply to good body mechanics, but those we have covered are the most important. If you plan your work so that you make safe and effective use of your whole body, rather than just your muscles, you will be using good body mechanics.

228. Procedures and equipment used to move bed patients

Now that you understand the possible consequences of immobility as well as principles of body mechanics, we'll move on into the actual patient activities. We begin by talking about the different techniques and equipment we use to move helpless and near-helpless patients. Following that, we'll talk about different exercises that we can help the patients do and that the patients can do themselves. Finally, we'll talk about transfer techniques and equipment used to ambulate patients. Throughout the discussion, we'll refer to the information we've covered on hazards of immobility and proper body mechanics to help illustrate the points we are trying to make.

In this lesson, we discuss techniques used to move and adjust the patient's position. As you know, if bedridden patients do not change their position frequently, they'll develop complications like decubitus ulcers and contractures. Whenever possible, encourage patients to move themselves. There will be many times when a patient either cannot move at all or cannot move without help, and you'll become involved in the movement. Follow the principles of body mechanics we discussed, and move each patient in a safe, careful manner.

Patient positions

Before we get into moving the patient, let's first discuss the various positions for bed patients. Refer to figure 3–4 during our discussion of the following patient positions:

- Supine position (A).
- Prone position (B).
- Fowler's position (C).
- Semi-Fowler's position (D).
- Trendelenburg position (E).

- Sim's position (F).
- Side-lying or lateral position (G).

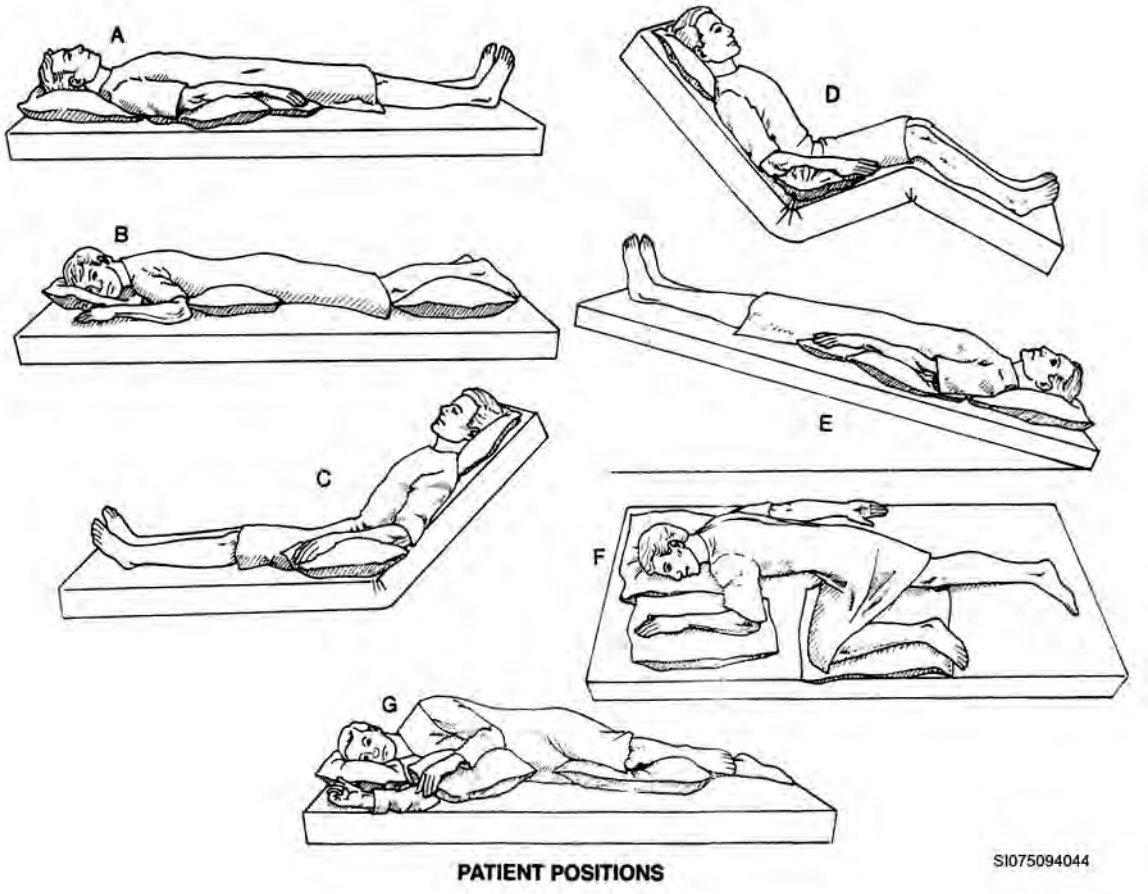


Figure 3–4. Patient positions.

Supine position (A)

A patient in the supine position is lying on his or her back. The patient's arms are at his or her sides with hands pronate. This position is also referred to as the dorsal recumbent position. To place the patient in this position, adjust the bed so that it is flat. Use pillows, sandbags, and similar devices to maintain the patient's alignment and prevent contractures.

Prone position (B)

A patient in the prone position is lying on his or her abdomen with head turned to the side. The patient's elbows are normally flexed so that the hands are up near the head. The bed is flat and alignment is again maintained with pillows and sandbags. Also, place a pillow beneath the patient's lower legs to prevent footdrop. If your patient is very tall, you can hang his or her feet over the end of the mattress.

Fowler's position (C)

Place a patient in the Fowler's position by elevating the head of the bed to a 45–60° angle. This puts the patient in the semisitting position. Maintain the patient's alignment with pillows and hand rolls.

Semi-Fowler's position (D)

The semi-Fowler's position is similar to the Fowler's position except that the head is not usually elevated quite as high and the knees are bent at about a 15° angle. This knee elevation helps prevent the patient from sliding down in bed.

Trendelenburg position (E)

In this position, the mattress is flat, but the bed itself is tilted so that the head is lower than the feet. This is a specialized position and can be used to help provide traction or to treat patients who are in shock.

Sim's position (F)

A patient in the Sim's position is lying on his or her side with the head turned to the side. The patient's lower arm is positioned down behind him or her, and the upper arm is flexed so that the hand is up near the patient's head. The patient's lower leg is bent very slightly and the upper leg is bent and extended so that it is not on top of the lower leg.

Side-lying or lateral position (G)

The side-lying position is much like the Sim's position except that the patient is on his or her side rather than partially towards the prone position. The mattress is flat as before. Both the upper and lower arms are flexed so that the patient's hands are near the head. Both legs are also bent, with the upper leg bent slightly more than the lower leg. The pillows are positioned as before except that there is a pillow between the patient's legs rather than just beneath the upper leg.

The procedures we'll now discuss include moving a patient up in bed; turning a patient to the side, back, and abdomen; moving a patient to the side of the bed; and turning a patient in a turning frame and circular bed. In each procedure, we specify what assistance, if any, the patient can provide.

Moving a patient up in bed

Many patients are placed in bed positions that elevate either the head or the foot of the bed. Over a period of time, gravity causes these patients to slide down in the direction that the bed is angled. Once they slide down, you will need to help them back to their original position to maintain proper body alignment and promote comfort.

You begin this procedure as you would any other: wash your hands, greet the patient, ask the patient his or her name and date of birth, check the patient's ID band, and explain what you are going to do. There are three basic techniques, depending on the patient's size and capabilities—(1) one-person technique, (2) two-person technique, and (3) two-person technique with a drawsheet.

One-person technique

The one-person technique is actually a coordinated effort involving both the patient and technician. As a technician lifts and slides the patient up in bed, the patient uses his or her arms and legs to pull and push him or her toward the head of the bed. The one-person technique only works if the patient is not extremely large and is capable of assisting with the move. If either or both of those do not apply, use a different technique. Some patients may be able to use only their arms or their legs. You can still use the one-person technique if the amount of assistance is enough to move the patient**.**

Ensure the patient is in the supine position. Prepare the bed for the move by raising it to a waist-height working level, and lock the wheels to prevent it from moving as you shift the patient. Lower the head of the bed, if permissible by the patient's condition, to reduce resistance to the move. Lower the siderail on your side of the bed so that you can reach the patient comfortably, but MAKE SURE that the other siderail is up so that the patient can't accidentally fall out. Remove the pillow from beneath the patient's head and place it against the headboard to protect the patient's head.

Instruct the patient to reach back and grasp the headboard with legs bent and feet flat on the mattress. Instruct the patient to pull with his or her arms and push his or her legs when you give the signal, such as at the count of three. Position yourself so that you are facing the head of the bed at about a 40°

angle, place one arm beneath the patient's hips, and the other arm beneath the patient's shoulders. Spread your feet to provide a wide base of support, and bend your knees slightly so you can use your leg muscles to lift. Stand so that most of your body weight is on the leg nearest the foot of the bed.

When you are ready, give the signal. Lift the patient slightly and slide the patient toward the head of the bed. With luck, the patient will pull and push at the same time, and the move will be relatively easy. As you move the patient, shift your weight from your back foot to the foot closest to the head of the bed. This will allow you to use your body weight as leverage. When you complete the move, realign the patient's body, and make sure the sheet is as smooth as possible. Place the pillow back beneath the patient's head, and raise the siderail. Raise the head of the bed, and return the bed back to its original position.

Two-person technique

The two-person technique is similar to the one-person technique except that there are at least two technicians involved and the patient may or may not assist. This technique is for patients who are not capable of assisting or are too heavy for one person to handle safely.

The initial steps of this technique are the same as for the one-person move. The bed is raised to a working level, the wheels are locked, and the head is lowered. The siderails are lowered so that both technicians can reach the patient, and the patient's arms are usually crossed over his or her chest rather than extended over his or her head.

There are several different ways you can move a patient, depending on the capabilities of the patient and your preference. One common technique is simply a modified approach to the one-person technique. The technicians stand on either side of the patient and position themselves so they are facing the head of the bed at about a 40° angle. They then link arms under the patient's shoulders and buttocks, and on signal, lift and slide the patient up in bed. Although it is not essential, the patient should be allowed to assist by pushing with his or her feet, if the patient is capable of doing so. After the move, realign and make the patient comfortable, and return the bed to its original position.

The shoulder-lift is a modified version of the two-person technique. It is used to move patients who are capable of sitting up and using their hands and arms. The technicians stand beside and slightly behind the patient. They each place the arm closest to the foot of the bed beneath the patient's thighs and grasp each other's wrists. The patient drapes an arm over the back of each technician, and the technicians place their free hand on the bed or headboard for support. When the technicians are ready to move, they simply shift their weight and slide the patient along his or her buttocks. The shoulder-lift technique *cannot* be used for patients who have back, shoulder, or chest injuries. It can be used for other patients and is especially useful for moving patients when the bed cannot be raised to the proper working level. Because patients are sitting up, they are higher than they would be if they were in the lying position.

Another variation of the two-person technique is the modified shoulder-drag, which is simply a modification of the way the technicians grasp the patient. Instead of sliding their hands underneath the patient and grasping each other's wrists, they each slide a forearm under one of the patient's upper arms near the axilla. The other hand is placed beneath the shoulder for support and lift. When they are ready to move, the technicians slide the patient toward the head of the bed. Although fast and relatively simple to perform, this technique has certain disadvantages—the technicians' hand position does not provide much lift, the patient is dragged up in bed rather than lifted and slid, it places a lot of pressure on the upper arms and axillary areas of the patient and can be extremely painful to the patient if the technicians are not careful. Obviously, this technique should not be used for very heavy patients or patients who have back, shoulder, and chest injuries. It is useful for moving patients who are small and not seriously disabled. It also adds an element of speed which the other techniques lack.

Two-person technique with a drawsheet

A drawsheet is one of the most useful mechanical aids you'll find. It is really nothing more than a specially constructed, short, heavy sheet or a regular sheet that has been folded in half lengthwise. The drawsheet is placed beneath the patient so that it supports the patient from the head level to below the buttocks.

When the technicians are ready to move the patient, they prepare the bed as in previous examples. After they lower the siderails, they untuck the drawsheet and roll up the sides so they are as close as possible to the patient. The rolled sheet then becomes a handle that the technicians grasp to lift and slide the patient. If two technicians are working together to move the patient, they position themselves on either side and grasp the rolled sheet at the hip and neck level. They then use their body weight and shoulder muscles to lift and slide the patient up in bed. On completion of the move, the technicians simply tuck the sides of the drawsheet under the mattress and ensure that the patient is properly aligned in the bed.

Drawsheets offer numerous advantages over other manual procedures. Because they provide full back support, they can be used to move patients with back injuries. They are also useful for moving very obese patients because more technicians can get involved. Drawsheets eliminate awkward bending positions. Technicians are able to work in an erect position and run less risk of injuring their backs. Drawsheets also eliminate painful holds and friction (shearing forces) between the patient's body and the bed.

Turning the patient

One of the most effective ways to prevent decubitus ulcers and other complications is to turn immobilized patients from one position to another. Doctors will usually specify how often they want patients to be turned, but the normal routine is at least once every two hours for completely immobilized patients. If you are managing such a patient's care, use a schedule to ensure the patient is turned regularly and spends an equal amount of time in each position.

General guidelines

There are a number of general guidelines and precautions that apply to all of the turning procedures. We mentioned most of these guidelines earlier, but we'll review them again.

Always introduce yourself, check the patient's ID, explain what you are going to do, and what the patient can do to help. Patients respond to treatment better if they understand how the treatment is going to help them. Provide privacy during the procedure. Most patients do not want other patients watching them as they are being dragged around. Also, patients are sometimes inadvertently exposed during a moving procedure. In any case, always respect the patient's right to privacy.

Plan your work before beginning. Make sure you know what you are going to do and have the right equipment and enough help. Raise the bed to a working level before beginning the procedure. This precaution will keep your work closer to your center of gravity and help prevent back strain. About the only time you would not follow this rule is when you are positioning a patient to sit on the side of the bed or get out of bed. In either case, you do not want the patient jumping down from a bed that has been raised. Lock the wheels before beginning a procedure. Technicians and patients have been injured because the bed moved at a crucial moment. Lower the head of the bed before moving a patient. It is much easier to move a patient if the bed is in a flat position.

Ensure that any tubes, wires, or other devices attached to the patient are placed so they'll not be pulled loose when you begin the move. Use the siderails to keep the patient from falling out of bed during a procedure. Patients frequently move further and faster than you expect. Protect them by keeping the siderail up on the far side of the bed and putting it back up on your side before you move away.

Always use good body mechanics. Use a wide base of support, large muscle groups, and so forth. Before you leave a patient, make sure the patient's body is aligned properly and that the patient is comfortable.

Turning movements

You'll be turning patients onto their side, back, and abdomen. The procedures are fairly simple, but we'll review them and explain any extra precautions you should take.

Before you turn a patient from a supine position to a side-lying position, cross the patient's arms on his or her chest so the patient won't roll on them. Bend the patient's legs or cross the far leg over the near leg. Either technique will partially shift the patient's weight so the patient is easier to move and will prevent the patient from rolling back into the original position. Assume a wide base of support with one leg braced against the bedframe and the other slightly back and 12–15 inches to the side. This position will allow you to use your body weight as leverage to move the patient. Place your hands on the patient's far hip and shoulder and roll the patient towards you. As you move the patient, bend your knees slightly and shift your weight back to help pull the patient toward you. Position the patient as we discussed under side-lying position, bending the upper leg and using pillows to maintain the patient's position and support the legs, arms, and head.

Turning a patient from a supine to a prone position is simply a continuation of the supine to side-lying move. However, instead of the patient's arms being crossed on the chest, the technicians are positioned so their near arm is extended over the patient's head and their far arm is kept alongside the patient's body. That will keep the patient from rolling over and possibly injuring his or her arm. When the move is completed, you simply adjust the patient's arms to a position that is comfortable for him or her. The patient may request a pillow be placed under his or her head. Make sure the patient's lower ear is not crimped before you leave, and place a pillow under the ankles to prevent hyperextension of the feet. You can also place a patient on the bed so the patient's feet extend over the end of the mattress.

Turning a patient from the prone to the supine or side-lying position is just a reversal of the previous techniques. Extend the patient's near arm up over his or her head and cross the far leg over the near leg. Assume a wide base of support, brace one leg against the bedframe, and shift your weight back to pull the patient toward you.

We recommend that you pull the patient toward you whenever possible. However, it is also acceptable to push the patient away from you into a different position. You do lose a certain amount of control, and if you get too enthusiastic, you may roll the patient out of bed. Regardless of whether you are pushing or pulling, always *be sure* the siderail on the far side of the bed is up.

When you're caring for a patient with a spinal injury, it is extremely important that you keep the patient's back aligned as straight as possible. The technique you use for such a patient is called "logrolling." You need a drawsheet and several technicians to assist you with this procedure. Place a pillow between the patient's legs so that the hips do not shift and pull the spine out of alignment. Position yourself and the other technicians alongside the patient so that you are able to turn the patient as a unit. In cases of spinal cord injury, it is recommended that a fourth person be positioned at the patient's head to keep the head in a neutral in-line position during the logrolling procedure. The drawsheet is useful because it provides more support than your hands do. Plan and coordinate this move so that you turn the patient as a unit.

Moving the patient to the side of the bed

Your patient will need to be moved to the side of the bed to be repositioned for various procedures or in preparation for getting out of bed. The patient can be moved from either the supine (the preferred position) or prone position by one, two, or three technicians. You can also use the drawsheet procedure, which can involve four or more technicians. That procedure is covered when we discuss patient transfers.

The initial procedure is the same as with the previous patient moves—greet your patient, check the patient's ID, and explain what you are going to do. Raise the bed to a working level, lock the wheels, and lower the head so the bed is flat. Line yourself and your assistants on the side of the bed to which you'll move the patient. Designate one person, usually the most experienced technician, to control the move. That technician should have a clear view of the patient's face and see what the other technicians are doing. The best position for this is usually at the head of the patient. For this procedure, we'll assume that you are the most experienced technician.

Begin by crossing the patient's arms over the chest. Then, you and the other technicians slide your arms as far as possible under the patient. As the senior person, you'll be at the head and place your arms under the patient's shoulders and upper back; the next technician will slide his or her arms under the patient's lower back and hips; and the technician closest to the patient's feet will place his or her arms under the patient's thighs and calves. All of you should have a good base of support with one leg braced against the bedframe for leverage. At a prearranged signal, the three of you will step back, pulling the patient to your side of the bed.

Obviously, you'll not need or have three technicians to move all patients. If the patient is small and you have one assistant, position yourself and your assistant so that the weight is equally divided and follow the same procedure. If you are working alone, move the patient in stages; move the head and shoulders first, then the hips, and finally the legs and feet. Do not use this technique if your patient has any sort of back problem or is very large. GET HELP! If your patient is in the prone position, place your arms in the same relative positions. Take care not to trap the patient's near arm beneath his or her body when you make the move. In either case, make sure that the patient is properly aligned before you leave.

229. Procedures and mechanical aids used to transfer patients

The procedures used to move patients from one place to another are called transfer techniques. These techniques are actually just extensions of the lifting and moving techniques discussed earlier. Transfer techniques are used to move patients back and forth from their beds to stretchers, wheelchairs, and bedside chairs. These techniques are also used to transfer patients from bedside chairs to wheelchairs, or from wheelchairs to commodes, and so forth. All of the safety precautions and principles of body mechanics discussed earlier also apply to transfer techniques. In fact, they are more applicable because there is more lifting and movement involved and a much greater chance of injury for both the technician and the patient.

Transfer techniques

The procedure you will use for each type of transfer depends on the size and condition of the patient and the number of technicians and equipment involved in the transfer. The procedure used to transfer a young, healthy preoperative patient from a bed to a stretcher, for example, is totally different from the procedure used to transfer an obese back-injury patient. You should already be somewhat familiar with transfer techniques from technical school, so we won't repeat all the step-by-step procedures. We'll limit our discussion to the specific mechanical principles, safety precautions, and patient comfort measures for each type of transfer.

Bed-to-stretcher transfers

Stretchers (gurneys, litters) are frequently used to transport patients to various locations throughout the hospital. Patients transported in this manner include helpless and nearly helpless patients, such as patients with spinal injuries, stroke victims, pre- and postoperative patients, and other patients who must remain in a lying position. These patients are either physically lifted or slid by physical or mechanical means from the bed to the stretcher.

Bed-to-stretcher transfers are particularly risky for patients because both the bed and stretcher are at waist height and on wheels. Either the bed or the stretcher could be shoved out of place allowing the patient to fall to the floor. At that height, if a patient falls or is dropped, his or her chance for injury

are fairly high. Bed-to-stretcher transfers are also hard on technicians because they require more lifting and reaching than other types of moves.

If the technicians are careful to lock the bed and stretcher wheels and position both to minimize chances of their bed being accidentally moved, much of the risk can be eliminated from these transfers. Technicians can reduce the chances of injury to themselves if they use good teamwork and follow the principles of body mechanics discussed earlier. The most senior technician should be in charge of the move and should be positioned at the head of the bed on the stretcher side. This will enable that technician to see both the patient's face and what the other technicians are doing. This senior technician should control the move with prearranged verbal signals. For example, one person controls a move by saying, "One, two, three, GO!" or "Ready, MOVE!" It doesn't really matter what words are used, as long as everybody knows what they mean.

The first step in the bed-to-stretcher transfer is to prepare the stretcher. Cover it with a clean, dry sheet and tuck it in around the edges to remove the wrinkles. Have another sheet and a blanket available to cover the patient on the stretcher. Also, have a pillow available for the patient that is permitted to raise his or her head. Make provisions to support any IV tubing, catheters, or oxygen tubing the patient may have. Finally, include safety straps to prevent the patient from falling off the stretcher.

If the patient is to be lifted to the stretcher, position the stretcher at a 90° angle to the foot of the bed. At least three technicians should position themselves along the same side of the bed as they did to move the patient to the edge of the bed. In fact, begin the move by moving the patient as close as possible to the edge of the bed. The technicians should maintain the same arm positions and on command, lift and curl the patient into their bodies. Holding the patient in this manner keeps the patient close to the technicians' center of gravity and reduces strain. If the patient is very heavy, has a spinal injury, or an extremity in a cast, it may be necessary to have a fourth technician to provide additional support. If the patient has a spinal injury, the fourth technician should be positioned at the patient's head and ensure that the head maintains proper alignment with the rest of the body.

Once the technicians lift the patient, they move together to the side of the stretcher, and on signal, lower the patient to the stretcher. You can see that there might be a slight problem if the stretcher moved before the technicians could finish lowering the patient. Don't forget to lock the wheels! When the technicians are ready to put the patient on the stretcher, they assume a wide base of support with one foot slightly forward. They lower the patient by uncurling their arms and bending slightly at the knees. They should *not* lower the patient by bending forward while keeping their legs straight. Once on the stretcher, check the patient's body alignment and correct it as needed. Cover the patient and secure in place with safety straps at the chest and thigh levels. If the stretcher has siderails, raise them for additional safety.

This technique will also work to transfer the patient from the stretcher to an operating table, x-ray table, or back to the bed. When the patient is returned to bed, the technicians should go to the far side, use the three-person technique to move the patient to the center of the bed, and reposition him or her. Always raise the siderail, *before* moving to the other side of the bed!

In most cases, it is easier to just slide the patient from the bed to the stretcher. If you are doing so without mechanical aids, such as a drawsheet or roller board, begin by lowering the siderail and positioning the patient as close as possible to the edge of the bed. One technician goes to the far side and holds the patient so the patient doesn't fall out of bed. Keep the siderail on the near side down while the stretcher is being positioned. The other two technicians place the stretcher alongside the bed and then position themselves on the far side of the stretcher. Once they are positioned, the third technician on the far side raises the siderail and joins them. Patients capable of sliding will slide over to the stretcher. You'll help by making sure that the patient is covered during the move and providing physical assistance as needed. If a patient can't move, you and the other technicians will reach across

the stretcher and pull the patient the same way you repositioned the patient. If you have enough help, you can also have technicians stand at the patient's head and feet to help lift and slide him or her.

As you can see, neither of these procedures is entirely satisfactory. The first involves too much lifting and the second involves too much reaching. The preferred method of transferring helpless patients is to use a drawsheet, also called a turning sheet, to pull them over. We'll talk more about this when we discuss the mechanical aids for lifting and moving.

However, here are a few safety practices regarding stretchers:

- N*ever* leave a patient alone on a stretcher. Such a patient is entirely helpless and can easily be knocked off or pushed into something.
- Always use safety straps. Even if the stretcher does have siderails, they won't help much if you have to stop suddenly. In a sudden stop, the patient will just slide right on out the end of the stretcher.
- Transport patients feet first with one technician at the head and one alongside.
- Back patients on stretchers head-first into elevators so they can be taken off feet-first.

Bed-to-wheelchair/bedside-chair transfers

Since the bed plays such an important role in the patient's recovery, it may seem like a contradiction to say that one of your first goals should be to get that patient up and moving as soon as possible. The bed is an important place for the patient to rest and begin the healing process. However, once that process begins, the patient must also begin to move around to restore muscle strength and function. As soon as the patient's condition permits, and the doctor's orders allow you to do so, work toward getting the patient out of bed. Moving the patient from the bed to a wheelchair or bedside chair is the first step in this direction.

Moving a patient from the bed to a chair is a lengthy process. First, allow the patient to sit up in bed. When the patient can tolerate sitting in bed, allow the patient to sit on the side of the bed and "dangle." Finally, transfer the patient from the bed to the chair. Of course, you don't go through all this every time you want to put a patient in a chair; but, since we are describing rehabilitative measures, we should include the steps that lead up to the transfer.

Sitting a patient up in bed

With our adjustable hospital beds, sitting the patient up is a very simple task. Begin by placing the patient in the center of the bed in the supine position. Place a footboard at the base of the mattress to keep the patient's feet at a 90° angle to the rest of his or her body. Raise the head of the bed to the *Fowler's position*. Make sure the patient is far enough up in bed so that the bend of the bed is at the base of the patient's buttocks. Support the patient with pillows under the head and arms.

Dangling the patient

"Dangling" means positioning the patient on the side of the bed with the patient's feet resting on a footstool or the floor. In spite of the name, do not allow the patient's legs to dangle unsupported from the edge of the bed. Doing so would put pressure on the back of the legs and interferes with circulation.

Begin the dangling procedure by moving the patient to the edge of the bed as we described earlier. Raise the siderail, and raise the head of the bed to a high Fowler's position. It will be much easier for you to dangle the patient from that position than it will be for you to first sit the patient up and then turn the patient to a dangling position. Before you sit the patient on the edge of the bed, make sure the bed is in the low position so that the patient's feet will be able to reach the floor. This and actually helping the patient out of bed are two of the few times you'll work with a patient while the bed is in the low position.

When deciding which side of the bed to move the patient, consider the patient's condition. If your patient has had a stroke or another problem that has left him or her weaker on one side, move the patient in the direction of the stronger side so the patient will be able to help with the move. Place the patient's arms across his or her chest so they won't get in the way while you are turning the patient. Also make the patient comfortable for dangling by helping him or her put on a robe and slippers.

Turn the patient to the dangling position by positioning yourself beside the patient, placing one hand and arm under the patient's thighs and one arm behind the patient's shoulders. Lift the patient's legs slightly and pivot the patient outward on the buttocks. Use your body weight as leverage by shifting yourself around as you turn the patient. Once the patient is turned, place the patient's feet on the floor, or footstool if the patient's legs are too short to reach the floor. Patients frequently feel faint the first few times they dangle. *Do not leave the patient's side until you are sure the patient is not going to collapse!* If the patient is going to dangle for awhile, position the overbed table so the patient can rest on it. Remain in the area until the patient is back in the bed. The dangling position is relatively unstable, and the patient can easily fall if you are not around to support him or her.

When the patient has dangled for as long as the patient's condition or the doctor's orders will allow, help the patient back to bed. Move the overbed table and footstool out of the way, and pivot the patient back to the sitting position in the bed. Help the patient remove his or her robe and slippers, and raise the siderails. Lower the head of the bed, raise the bed to a working level, and place the patient in the center of the bed in a comfortable position. Sitting up and dangling are preliminary steps to ambulating the patient.

Figure 3–5. Transfer belt.

Moving a patient to a chair

Moving a patient from the bed to a bedside chair or wheelchair is simply a continuation of the dangling procedure. Place the chair parallel to the bed and on the patient's strong side, if the patient has one. If you are using a wheelchair, make sure that the wheels are locked and the footrests are out of the way *before* moving the patient. Because patients frequently knock the chair backwards as they begin to sit, be sure the chair or wheelchair is placed against some solid object before you begin the move. Sit the patient on the side of the bed as we just described. Help the patient put on a pair of hard-soled, well-fitting shoes. Shoes will prevent the patient from slipping while being moved; patient slippers do not work well for this purpose. You can also help the patient put on a robe so he or she will be comfortable while he or she is sitting. You may want to put a *transfer belt* on a patient who is very unsteady (fig. 3–5). Such a device will give you something stable to hold on to as you are trying to move the patient.

There are several ways to move the patient from the sitting position on the edge of the bed to the standing position. Select the technique you are most comfortable with; the technique that allows you to maintain the most control over the patient's movements and still permits you to use good body mechanics.

With this first technique, assume a wide base of support with one foot between the patient's feet and your knee braced up against the bedframe. This position allows you to use the bed and your body for leverage while controlling and control the patient's movements. Place the patient's hands on your shoulders and place your hands under the patient's axilla or on the transfer belt, if you are using one. Instruct the patient to stand as you lift. Flex your knees and keep your back straight so that you will use your large muscle groups to do the lifting. Use your body weight to counter the patient's weight and pull the patient toward you as you stand.

Allow the patient to stand for a few moments before you move the patient to the chair. As with dangling, the patient may be unsteady for the first few times. Once the patient is stable, pivot yourself and the patient until the patient's legs are touching the edge of the seat of the chair. Have the patient glance back at the chair for reassurance that the chair is actually there. Position yourself again so that you have one foot between the patient's feet and your knee braced against the edge of the seat. Flex your knees and use your weight to counteract the patient's weight as you lower the patient into the chair. Use pillows and other devices to make the patient comfortable and to make sure the patient is properly aligned. If your patient is at all unstable, use a safety belt to secure the patient to the chair. Make sure the call bell is within easy reach of the patient before you leave.

The second technique is just a modification of your body position when you raise patients to the standing position. Instead of placing one foot between the patient's feet, stand so that your feet are braced against the patient's feet. In this position, you will be able to keep the patient's feet from sliding out from under him or her. As before, balance your weight against the patient's weight as you pull the patient to his or her feet. Pivot the patient, and brace your feet against the patient's feet as you lower the patient to the sitting position.

To return the patient to the bed, simply reverse the procedure you used to put the patient into the chair. If you want to move the patient from a bedside chair to a wheelchair or from a wheelchair to a commode, position the equipment so that the patient can be pivoted from one position to the other. If wheelchairs are involved, make sure that the wheels are locked and the footrests are out of the way before you begin the transfer. Use the same techniques as before to actually move the patient.

The techniques we just covered assume that your patient has some degree of body control and can help you with the move. You may also want to put the patient who cannot participate in the move in a chair or wheelchair. A chair offers a welcome change for a patient who has been on prolonged bed rest, and wheelchairs are much more maneuverable than stretchers if you need to transport a patient who can tolerate the sitting position. Depending on the patient's size and your own strength, you can make such a transfer by yourself or with the assistance of one or two other technicians.

If you are working by yourself, position the chair or wheelchair by the bed as before. If you are moving to a wheelchair, remove the armrest closest to the bed. Assist the patient to the side of the bed nearest the wheelchair. Raise the patient to a sitting position by placing one of your arms under the patient's near arm and shoulder and the other behind the patient's neck and far shoulder. Use your body weight and shoulder muscles to pull the patient to a sitting position. Once the patient is sitting, shift your position so that you are behind him or her. Slide your arms beneath the patient's arms and grasp his or her forearms. Lift the patient's upper body slightly and slide it back onto the wheelchair or chair seat. Placing one arm behind the patient's back and one under the thighs, swing the patient's legs off the bed so that his or her feet are resting on the floor. Replace the armrest on the wheelchair, put the patient's shoes on his or her feet, use pillows, as needed, to ensure good body alignment, and use a safety strap to secure the patient in the wheelchair. *Do not* use this technique if the patient is large or if the patient can be injured by compressing the upper body.

If you have an assistant, your assistant can help with this procedure by lifting and moving the patient's legs as you lift the upper body. Even with two people, this technique is not the preferred method for patient movement because it places a great deal of pressure on the back of the person lifting the patient's upper body. Also, it can be painful for the patient because you are supporting the patient's weight on his or her axillary areas, and most technicians tend to increase pressure on the patient's forearms as they lift. If your hands are moderately strong, you can possibly damage the patient's arms.

A third alternative is to use three technicians to move the patient to a chair. Two of the technicians will support the patient's upper body while the third supports the patient's legs. The two technicians will assist the patient to a sitting position and position themselves so that they are behind the patient. They may need to turn the patient so the patient's back is angled toward the edge of the bed. From

that position, they each place one arm behind the patient's shoulders and one arm under the patient's thighs. The third technician slides his or her arms under the patient's legs. All three flex their legs and, on signal, lift the patient slightly and move the patient onto the chair. It is very important that the technicians remember to keep their backs as straight as possible and use their legs and shoulders for lift.

The patient can be returned to the bed by reversing these techniques. If you are working alone, place the patient's feet on the bed first, then lift or slide the patient's upper body onto the bed. Once the patient is in bed, reposition the patient's body and make him or her comfortable.

None of these techniques are very effective with very large or very helpless patients or very large and helpless patients. As we'll discuss shortly, a mechanical hoist is the best way to move such patients. If a hoist is not available, we strongly suggest that you use a stretcher and multiple assistants to transport the patient.

The transfer techniques discussed here will suffice for most situations you'll encounter in a patient-care environment. We'll discuss loading patients onto field stretchers and into ambulances when we talk about emergency medicine. Other situations you might encounter include assisting a patient into an automobile or transferring a patient from a wheelchair, examining table, or bathtub. If you are helping a patient into a tub, use no-slip devices and rails to help steady the patient. In any case, if you use common sense and good body mechanics, you shouldn't have any trouble.

Safety factors

Last and not least, safety factors related to the transfer techniques we discussed are essential! Wheelchair and stretch safety are very similar:

- Never leave a patient unattended in a wheelchair.
- Use a safety strap to prevent the patient from falling out of the stretcher.
- Always transport the patient feet first unless you are entering an elevator or going through a doorway; then you should back in.

Mechanical aids

In the previous section, we mentioned a number of mechanical aids that can be used to help transfer a patient from one position to another. Such devices are designed to provide a smooth transfer and reduce the possibility of injury for either you or the patient. Using such devices does not mean that you are not "macho," but it does mean that you are a lot smarter than someone who tries to show off by not using these aids.

There are a wide variety of mechanical aids. We'll talk about the four examples illustrated in figure 3–6: (1) drawsheet, (2) trapeze, (3) roller board, (4) hydraulic lift.

Drawsheet

As we mentioned earlier, a drawsheet or turning sheet, is a specially constructed sheet that is placed on top of the bottom sheet so that it supports the patient from the neck to the calves. If a regular drawsheet is not available, you can make a reasonably good copy by folding a regular sheet in half from top to bottom and placing that beneath the patient. If you do that, be sure the single fold is toward the head of the patient's bed.

A drawsheet can be used to protect the bed or help move the patient around on the bed or from the bed to a stretcher. When you are using the drawsheet to move the patient, untuck the edges and roll them up as close as possible to the patient. Then, use the rolled portion of the sheet as a handle. Figure 3–6, 1, shows three technicians using a drawsheet to move a patient to the edge of the bed. Notice that one technician is kneeling on the side of the bed to avoid excessive reaching. If these technicians were moving the patient from the bed to a stretcher, they would first move the patient to the edge of the bed. Then, two technicians position the stretcher beside the bed while the third technician holds onto the patient to keep the patient from falling out of bed. Drawsheets are useful for

this purpose, also. The two technicians simply unroll their side of the drawsheet and give it to the third technician to hold the patient securely in place. The first two technicians position themselves on the far side of the stretcher and use the drawsheet to slide the patient onto the stretcher. Do the move in several steps to avoid overextending the reach of the technicians on the far side of the bed.

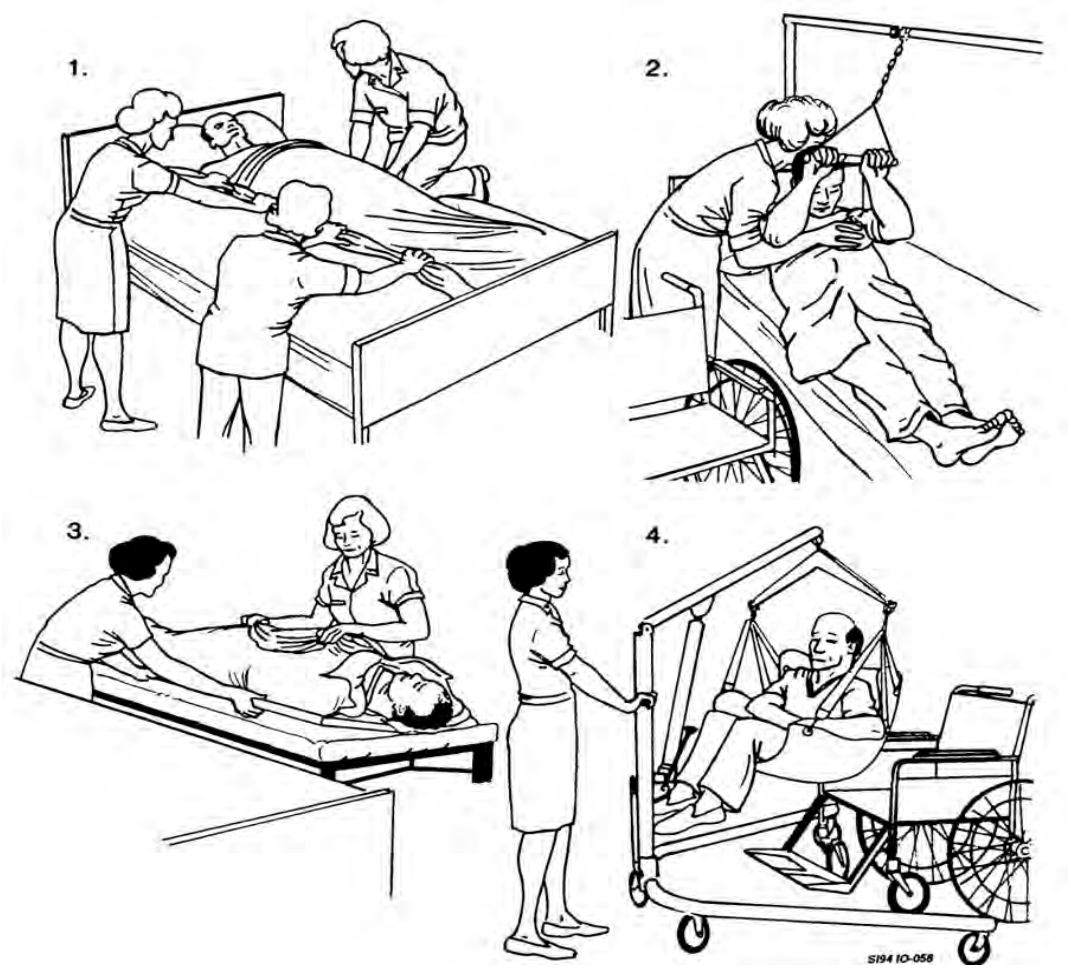


Figure 3–6. Mechanical aids.

Trapeze

The trapeze is simply a bar hanging from an overhead brace (fig. 3–6, 2). Its primary function is to allow the patient to change position in the bed. It can also be used for pull-ups by the patient. The trapeze is also useful for patient transfers. Patients can use it to pull themselves into a sitting position and to swing themselves back into bed from a wheelchair or stretcher.

Roller board

The roller board is made up of a row of round poles mounted in a rigid frame and covered by vinyl or canvas (fig. 3–6, 3). Although the frame is rigid, the poles can roll or turn in place. The board acts as sort of a conveyor belt. The board is placed across the gap between the stretcher and the bed. The rollers turn as the patient is pulled over the board, so less effort is required to move the patient. Since the roller board bridges the gap, it also keeps the patient from falling down between the stretcher and bed.

Hydraulic hoist

A hydraulic hoist or lift consists of a canvas sling supported by a metal frame on wheels (fig. 3–6, 4). The lift has several pivot points, which can be adjusted by a hydraulic cylinder. Without attempting to

teach you principles of hydraulics, suffice it to say that hydraulic pressure provides the leverage required to lift the patient. This pressure can then be adjusted to lower the patient to another position. The lift is usually on wheels, allowing you to pick up and move a patient to another location before lowering.

Hydraulic hoists can be used to transfer patients safely, and with very little effort, from their beds to stretchers, wheelchairs, toilets, tubs, or other locations. When using these lifts, explain the procedure to the patient and follow the manufacturer's instructions carefully. Do not exceed the hoist's weight limitations. Test the hoist by raising and lowering the patient over the bed before attempting to move the patient to another location. This will also help to reassure the patient. Finally, be sure that the condition of the patient is not such that the patient will be harmed by the lift. As you can see from the illustration, the sling does not immobilize the patient's back and neck. Therefore, it should not be used for patients with spine and neck injuries. As with everything else, make sure you have a doctor's order before moving the patient.

230. Techniques and equipment used to ambulate patients

Ambulation, or walking, is the last type of patient movement we'll discuss in this volume. The goal of all the rehabilitative techniques we have discussed is to improve the condition of patients to the point where they can function independently. Ambulation is a major step in that direction. A patient who is able to ambulate alone is well along the road to recovery. Some patients have disabilities, such as fractures and degenerative disorders, which interfere with ambulation. These patients can still achieve some measure of mobility and independence through the use of *ambulation aids.*

In this lesson we discuss techniques for helping the patient to walk and for protecting a patient against a fall. We'll also describe selection and use of the different ambulation aids.

Ambulation of the patient

Patients who have been bedridden for any length of time will not be able to just spring out of bed and run around the room. During the time that they have been lying in bed, their muscles have atrophied and weakened. They are often very unsteady when they first try to stand. You can prevent much of that unsteadiness by helping patients exercise, allowing them to remain as active as possible during the time they are bedridden, and moving them out of bed gradually. As we discussed in the last section, patients should first sit up in bed. When they are able to tolerate that well, patients should be allowed to dangle. Finally, patients should be encouraged to sit in a bedside chair for increasing lengths of time. If you do all that, your patients shouldn't have any problems when the time comes to actually ambulate.

You should always take precautions to prevent injury or to prevent the patient from falling the first couple of times you help your patient walk. These precautions include using a *transfer belt,* positioning yourself to support the patient, and encouraging the patient to use hand rails and other stationary objects for support.

In the last lesson we talked about using the transfer belt to help move a patient to a chair. As illustrated in figure 3–7, these belts can also be used to help the patient walk or just stand up. A transfer belt gives you something firm to hang onto when you are trying to move or support the patient. Without such a device, you'll find yourself trying to support a patient by holding on to the patient's pajamas or various anatomical parts. As I am sure you have already discovered, hospital pajamas are not the most durable garments in the world. If you try to support a falling patient by grabbing the patient's pajamas, you may find yourself with an irate, injured, and naked patient on your hands! Grabbing the patient's body is not much of an improvement. You may be able to support the patient, but you will probably also bruise the patient and possibly even fracture some of the patient's bones.

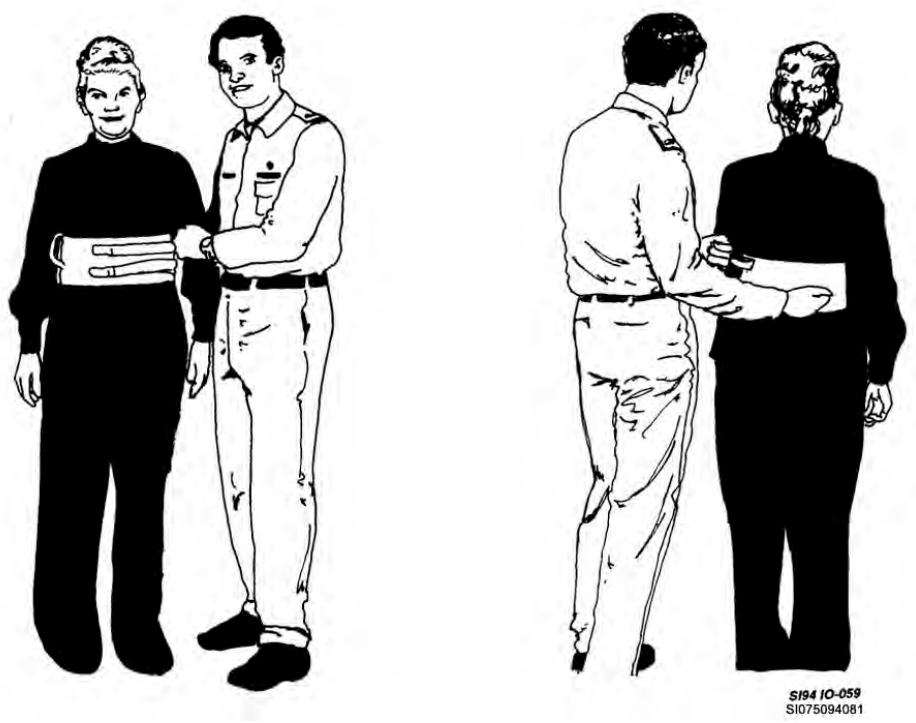


Figure 3–7. Ambulation with a transfer belt.

The transfer belt shown in figures 3–5 and 3–7 are commercial models that have hand holds and lots of support. If you don't have a belt like this, you can improvise with a stretcher strap or even the patient's own belt. All you need is a sturdy belt that will fit around the patient's waist and give you something to hold onto.

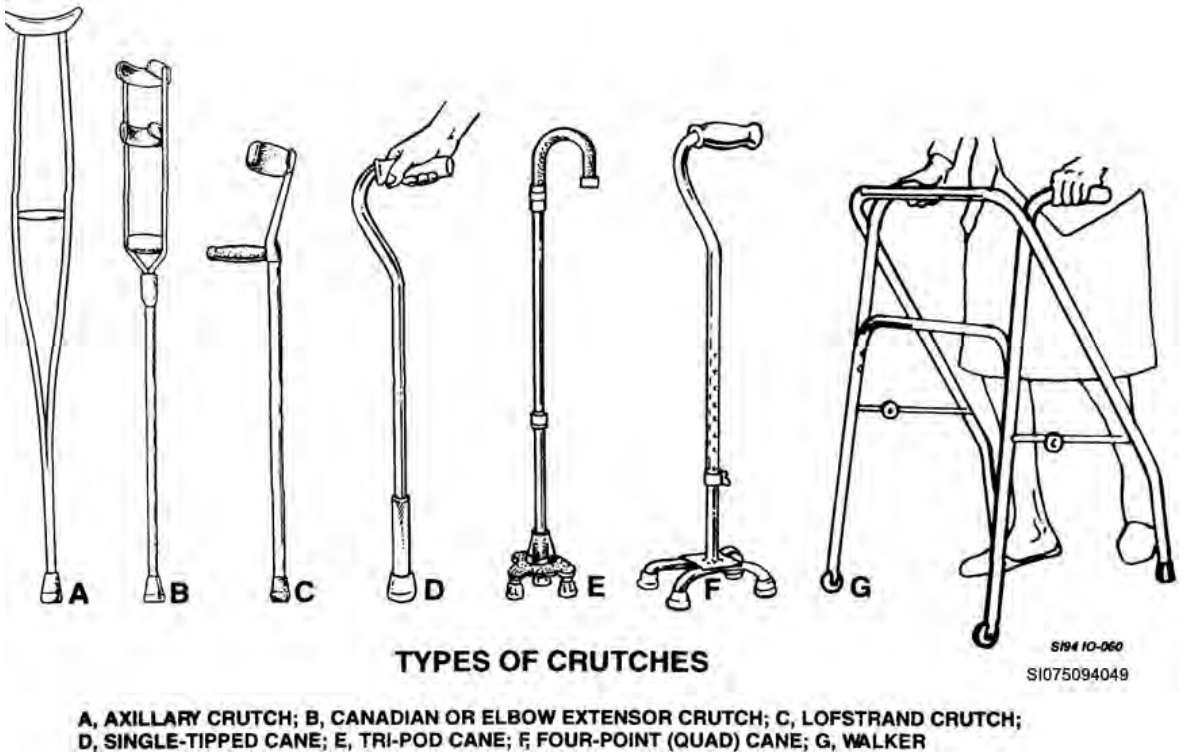
Positioning is also very important when you are helping a patient ambulate. Some textbooks recommend that you walk arm-in-arm beside the patient. If the patient does become faint, you assume a wide base of support and slide your arm up into the patient's axillary region. You then rest the patient against your hip until the patient recovers or help arrives. The arm-in-arm position may provide enough support to hold up a patient who becomes a little unsteady, but it is ineffective for a patient who becomes unconscious or just falls. In either case, the patient will probably pull you down, too.

Figure 3–7 illustrates the preferred position for helping the patient ambulate. Stand beside and a little behind the patient. If you have a transfer belt, either place both of your hands on the belt or place one hand on the patient's waist and one hand under the patient's near arm. If the patient begins to fall, you simply step back and assume a wide base of support with one leg between the patient's legs and one leg to the rear for support. You then slide both hands up into the patient's axillary area and pull the patient back towards you. The patient's buttocks should be resting on your extended leg to allow the patient to slide down your leg to the floor. When the patient is on the floor, ease him or her into a lying position, protecting the head and other vital parts as you do so. When you have completed the move, the patient will be in a safe position and you'll have your hands free to examine the patient for injuries.

Instruct and encourage your patients to use any solid object for additional support. Most medical facilities have handrails in bathrooms and similar areas. Some also have rails in hallways and common areas. If handrails are not available, patients can use the wall, sofas, desks, or other large solid objects. Caution your patients not to try to hold themselves up with light, unstable objects like ordinary chairs or overbed tables. These items provide support when properly used but can easily be pulled over. Objects with wheels are also dangerous because they will roll right out from underneath falling patients.

Ambulation aids

As illustrated in figure 3–8, ambulation aids include devices such as crutches, canes, braces, and walkers. Such devices provide additional support for patients whose legs are injured or otherwise too disabled to support them. Without ambulation aids, many of these patients would be forced to remain in bed or to depend on others for their personal needs. Ambulation aids allow patients to function independently. The specific type of ambulation aid used for each patient depends on that individual's physical condition, support needed, type of disability, and doctor's orders. Although a physical therapist or physical therapy technician will normally be responsible for fitting and instructing the patient on the proper use of ambulation aids, you may have to perform these functions when they are not available.



A, AXILLARY CRUTCH; B, CANADIAN OR ELBOW EXTENSOR CRUTCH; C, LOFSTRAND CRUTCH; D, SINGLE-TIPPED CANE; E, TRI-POD CANE; F, FOUR-POINT (QUAD) CANE; G, WALKER

Figure 3–8. Ambulation aids.

Crutches

Crutches are wooden or metal devices designed to provide support and balance during ambulation for patients with both long- and short-term disabilities. There are three basic types of crutches—each designed to meet different patient requirements for support and strength. Regardless of the type that is used, the crutch must be adjusted to fit the patient, and the patient must be taught how to use the crutch properly.

Axillary crutches, as shown in figure 3–8, view A, are designed to fit under the arm into the axillary area and provide axillary and hand support for the patient. They are the type most commonly used for short-term disabilities (e.g., fractures) and the type you will most likely help the patient use. When axillary crutches are properly fitted, the top piece does *not* dig into the patient's axilla during use. The crutches can be measured with the patient in either the lying or the standing position. With the patient in the lying position, the crutch length is estimated by measuring the distance from the patient's axillary fold and adding two inches or by measuring the distance from the axillary fold to a point 6–8 inches out to the side of the patient's heel. The patient should be wearing sturdy, well-fitting shoes during these measurements. Standing measurements are simpler and more accurate. Have the patient stand up straight and place the crutch tip 6–8 inches out from the side of the patient's heel.

Adjust the crutch so the top piece is two to three fingerbreadths from the axillary fold. You can do the same thing with a tape measure, but who has one when you need it? Adjust the handgrips so that the patient's elbows are bent at about a 30° angle and the patient's wrists are slightly hyperextended when holding the grips. Make sure that the wood is not split or cracked, all fasteners are properly secured, and the crutch tips are flexible and not worn, split, or loose.

Using crutches requires a certain amount of upper body and hand strength. Encourage the patient to do some of the strengthening exercises to prepare for crutch walking. Also, prepare for teaching the patient by becoming thoroughly familiar with the crutches. You'll find your teaching more effective if you demonstrate how to use the crutches than if you just try to tell the patient how it is done. Demonstration will also increase your appreciation of the patient's difficulties.

Begin the instruction by teaching the patient how to balance and handle the crutches. When standing, the patient should have a wide base of support with the crutch tips positioned 6–8 inches to the side and in front of the patient. Emphasize that the patient should support his or her weight on the hands, *not* the axilla. The blood vessels and nerves that supply the hands and arms run through the axillary area. When a patient leans on the crutches, it interferes with this blood supply. The patient may be a little unsteady at first, so start out gradually. You might also want to use a transfer belt to help support the patient until the patient becomes comfortable.

Patients who have learned to balance are ready to learn how to ambulate with the crutches. There are a number of different strides or gaits that patients can use, depending on their physical limitations, preferences, and physician recommendations. The four-point gait is used by patients who can bear some weight on both legs. It is a comparatively slow, safe, stable gait. The patient moves only one support at a time so that three points are in contact with the ground at all times. The patient alternates movement of crutch and foot. First the right crutch is moved forward; then the left foot; then the left crutch; and finally the right foot. Figure 3–9 illustrates gait movements.

The three-point gait is used by patients who can bear full body weight on one foot and partial or no weight on the other. This gait is faster than the four-point gait. The patient moves both crutches and the affected foot forward at the same time, then the patient brings up the uninjured foot.

The two-point gait is used by patients who can bear weight on both feet. A crutch and opposite foot are moved forward at the same time, for example, right crutch, left foot. The crutches are used more for balance than for support purposes. This gait is very much like normal walking movements.

The swing-through gait is used by patients who can bear weight on one foot but some or none on the other. It is a gait you will see frequently because it is simple and fast. Patients move both crutches up together, and then swing their bodies up to or past the crutches. The gait requires considerable balance and upper body strength. It is frequently used by patients who have permanent disabilities, such as amputations. See figure 3–10 for an illustration of the swing-to gait and swing-through gait.

In addition to one or more gaits, also teach the patient how to go up and down stairs and move from sitting to standing positions. If there is a railing or banister, instruct the patient to use it for support on one side. The rule for going up stairs is "body first, then crutches," and "crutches first, then body" for going down stairs. Provide plenty of support and practice until the patient becomes comfortable with stairs. The patient can move from sitting to standing position by using the crutches as leverage on the affected side.

Canadian crutches are also fairly common. (Refer to fig. 3–8, B.) As you can see, they do not have any axillary support. Instead, they have metal bands that fit around the patient's forearms. Patients support themselves on their hands like the axillary crutches. Canadian crutches offer less support and balance for the uninitiated than the axillary crutches and are usually used by long-term patients.

Platform crutches are the third type. They also have no axillary support and are designed so that the patient's forearms rest on the weight-bearing surface. Platform crutches are used by long-term patients who have little hand and wrist strength.

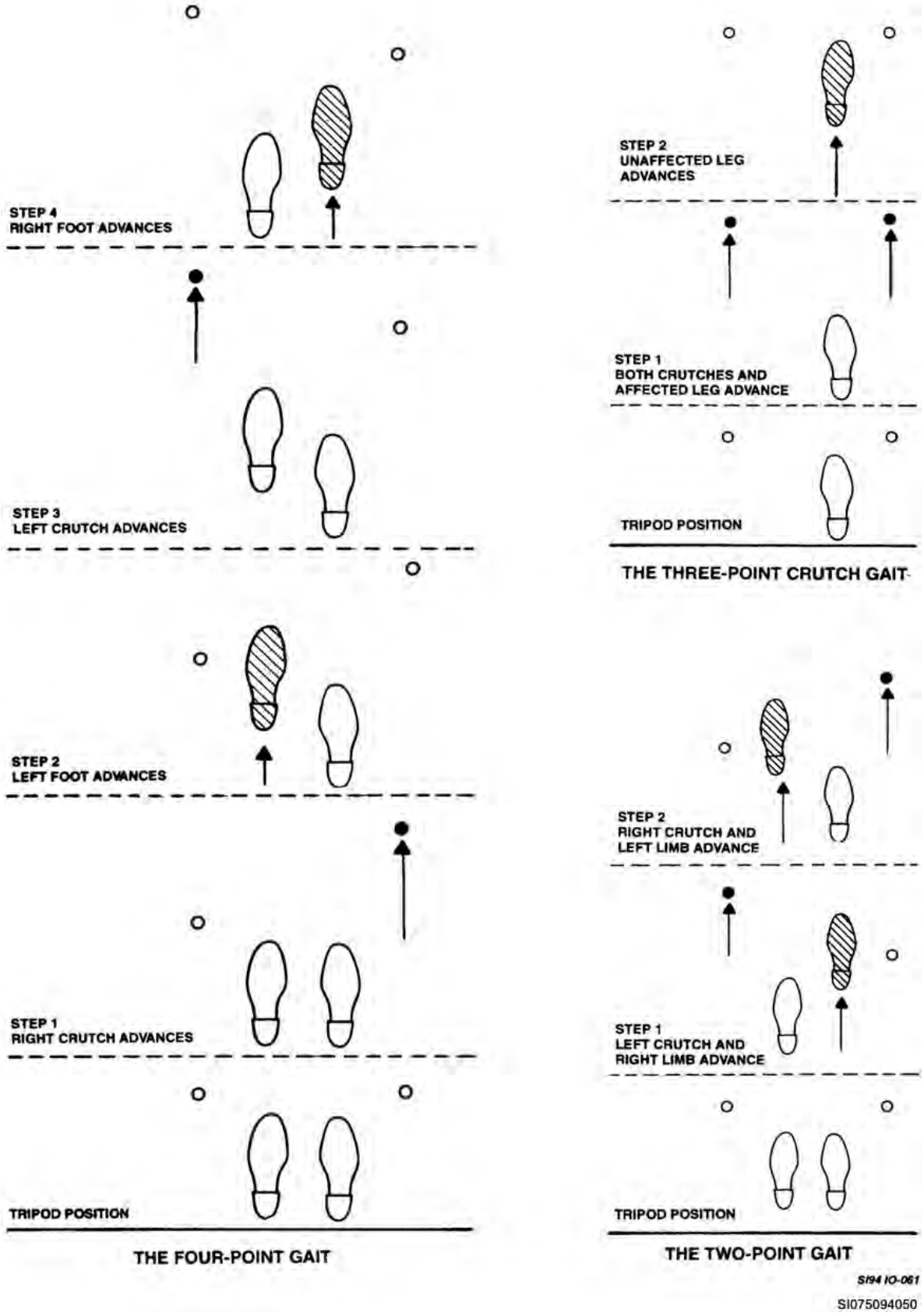


Figure 3–9. Crutch gaits.

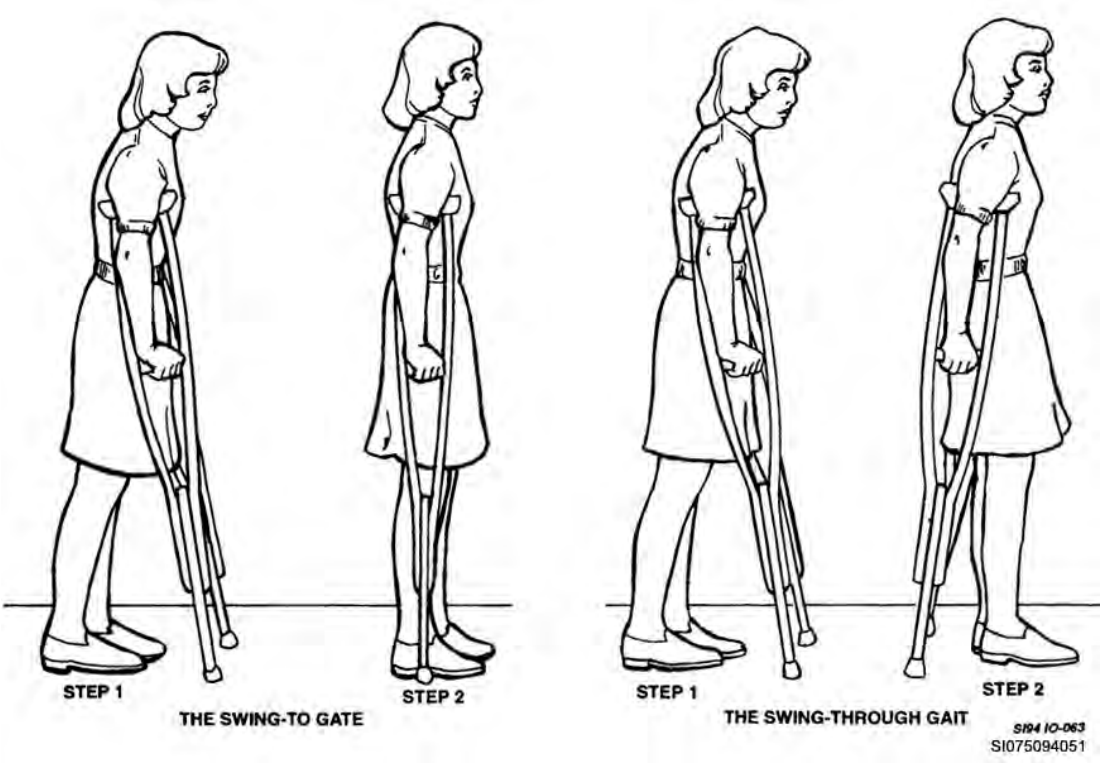


Figure 3–10. Swing gaits.

Canes

Canes (fig. 3–8, D, E, and F) are wood or metal devices used for additional support by people who are unable to bear full body weight on one side. Some canes are single-tipped, others may have three or four tips. Metal canes are usually adjustable, but wood canes are not. A cane is properly fitted when the patient's elbow is slightly bent when supported by the cane. As with the crutches, the tip(s) should be flexible and in good shape.

When using a single-tipped cane, the patient should hold the cane on the unaffected side. To ambulate, the patient should move the cane first, then move the affected foot up to the cane, and finally, the good foot should be moved 10 inches or so past the cane. Three and four-tipped canes are usually held on the affected side. They are heavier and more awkward than the single-tip cane but also offer more support.

Walkers

A walker (fig. 3–8, G) is a metal device used as a four-point walking aid. Walkers are used by patients who are unsteady and/or unable to bear their full weight on their feet. Walker height is adjusted to about the same height as the cane and handgrip for the crutch. Some walkers have been adapted with wheels; others have attachments to carry things. When using a walker, the patient should use a gait similar to the three-point gait discussed earlier. The patient lifts or slides the walker forward and then shuffles along behind it.

Each of the ambulation aids we discussed has numerous advantages and disadvantages. You should be familiar with each type of aid so that you can provide the necessary help to your patient.

231. Different types of patient exercises

Exercise is one of the most basic and essential rehabilitative measures that we can provide. It is necessary for proper body function and muscle tone, and will prevent or improve most of the conditions we discussed earlier. Exercise is not limited to weight lifting, jogging, and other activities.

Any type of activity involves a certain amount of exercise. The two types we are most concerned with are passive and active exercise.

Before we begin our discussion of these exercises, we should mention a word of caution. As helpful as exercises are, they can also be painful and even dangerous for patients who have heart problems and conditions, such as arthritis, fractures, sprains, strains, torn ligaments, and joint dislocations. The doctor will specify the type and amount of exercise the patient is to have, and if you are uncertain, ask the doctor. Of course, a doctor's order for treatment is no guarantee that the patient will not have problems. Stop the exercise and notify the doctor or nurse if the patient begins to show signs of pain, resistance, or fatigue.

Passive exercise

Patients who are either unable or not allowed to exercise actively are provided passive exercise by a technician. A good example of such a patient would be one who has been paralyzed from the neck down. Although such patients are incapable of doing exercises, they will have the same complications, such as decubitus ulcers and contractures that any other inactive person will have. Passive exercises help to maintain muscle tone and joint flexibility.

Many patients are not completely helpless but too weak or disabled to perform exercises or activities on their own. Most patients who are just recovering from a serious illness or surgery fall into this category. For such patients, you may begin with passive exercises and, as the patient's condition improves, allow the patient to perform the exercise as you provide assistance when needed. Intermediate activities like this are called active-assistive exercises. Since active-assistive exercises require some participation from you, we'll consider them to be a form of passive exercise. Unless contraindicated by the doctor's orders or patient's condition, encourage patients to do as many exercises as possible on their own.

The passive exercises you'll be involved with most are range-of-motion (ROM) exercises. As you may recall from your anatomy and physiology, each body joint is capable of certain types of activity. For example, the elbow is a hinge joint, capable of flexion and extension. ROM exercises are simply the movements that are permitted by each joint. These movements depend on the structure of the joint and differ from one joint to the other. Since we discussed the different types of joints and joint movements in your previous course, we'll only review the descriptive terms here (figs. 3–11 through 3–18). Remember to move body parts smoothly and carefully, especially the neck:

- Abduction—Movement away from the center of the body.
- Adduction—Movement toward the center of the body.
- Extension—Straightening a joint or increasing the angle between the body parts that are connected.
- Flexion—Bending a joint or decreasing the angle between body parts.
- Dorsiflexion—Flexing the foot at the ankle by lifting the toes toward the knee.
- Plantar Flexion—Extending the foot at the ankle by pointing the toes downward.
- Hyperextension—Excessive straightening of a joint almost to the point where it is angled backwards.
- Rotation—Circular movement of a body part around a joint.
- Internal Rotation—Rotating a joint toward the midline.
- External Rotation—Rotating a joint away from the midline.
- Supination—Rotating the hand at the wrist so that the palm is facing up.
- Pronation—Rotating the hand at the wrist so that the palm is facing down.

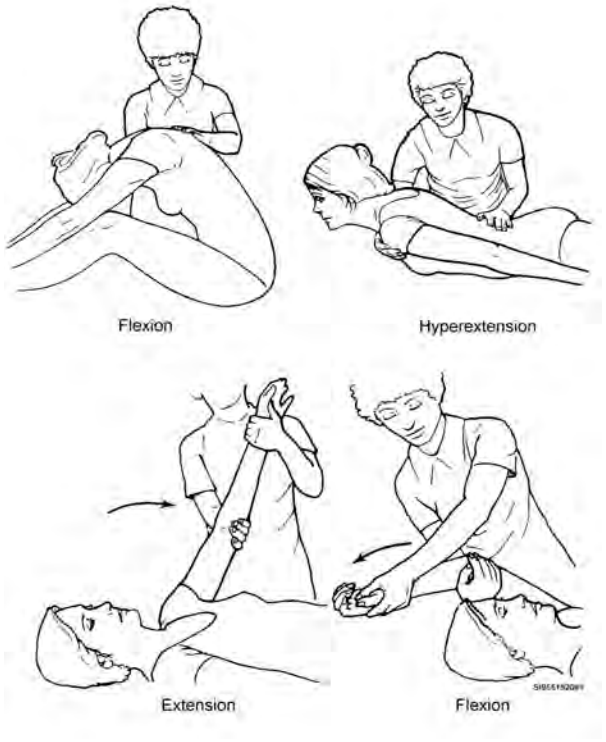


Figure 3–11. Passive exercise I.

Figure 3–12. Passive exercise II.

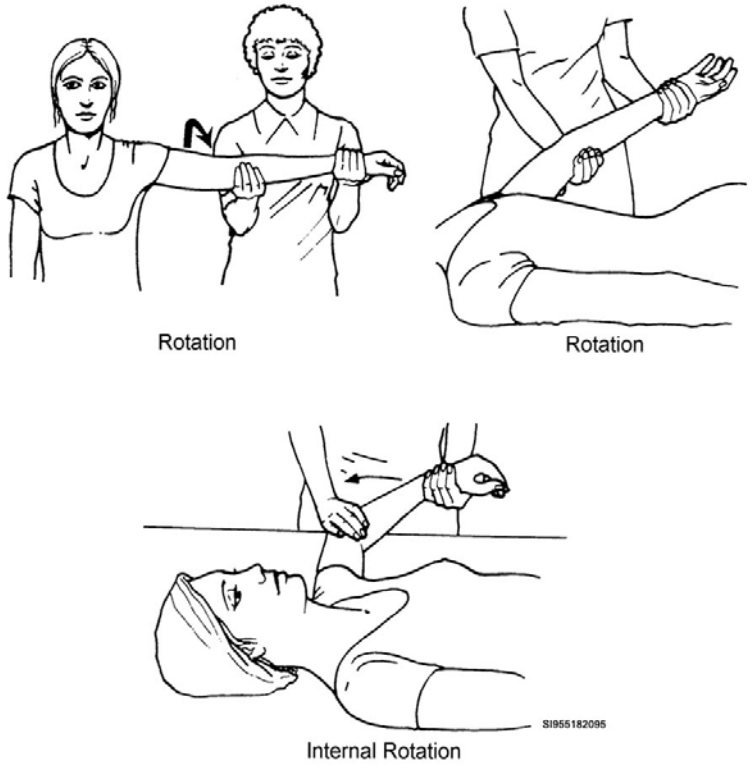


Figure 3–13. Passive exercise III.

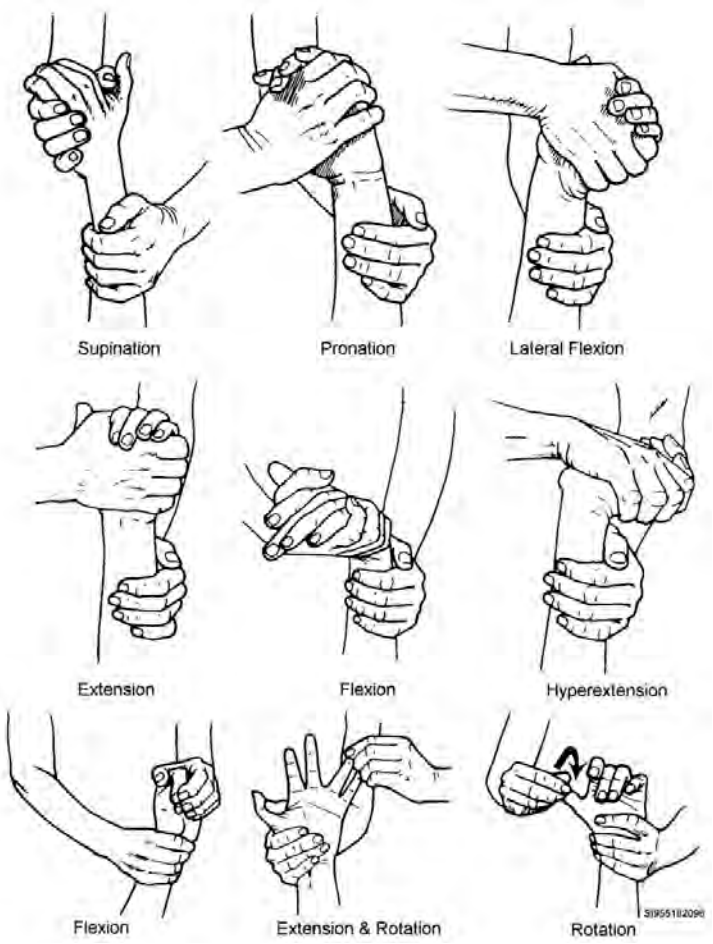


Figure 3–14. Passive exercise IV – Hands.

Figure 3–15. Passive exercise V – Legs.

Figure 3–16. Passive exercise VI – Legs.

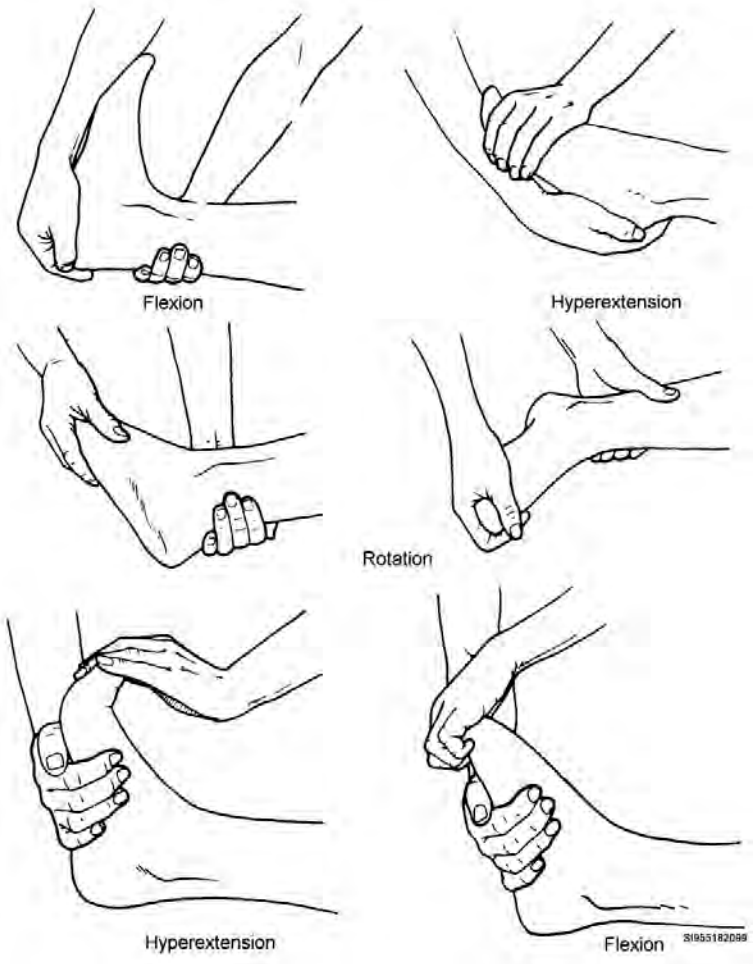


Figure 3–17. Passive exercise VII – Feet.

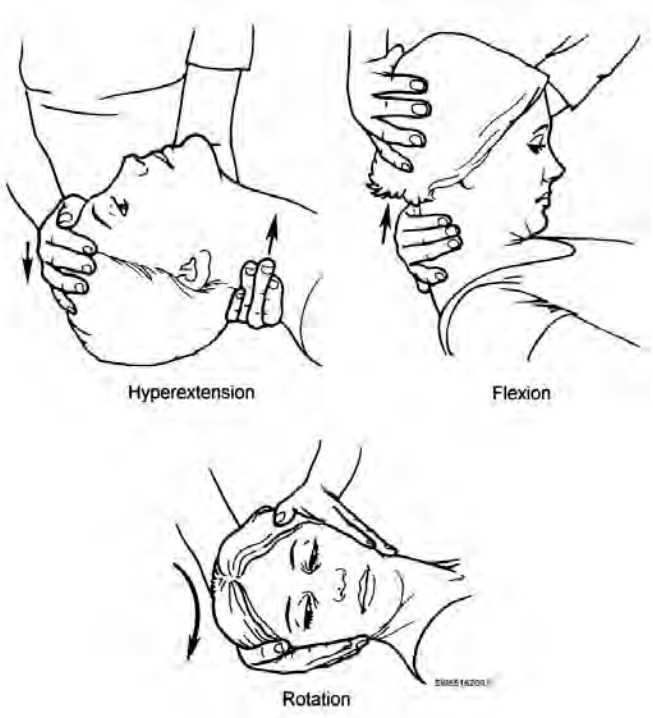


Figure 3–18. Passive exercise VIII – Neck.

You learned the activities associated with these movements in technical school; therefore, we'll not review them again. Rather than repeating that information, we'll talk about the benefits of ROM exercises and discuss general guidelines for performing these exercises.

ROM exercises serve a number of useful functions—

- Help to maintain joint mobility, prevent shortening of muscles, tendons, ligaments, and joint capsules, which leads to joint stiffness and fixation (ankylosis), and contractures.
- Prevent adaptive stretching or lengthening of connective tissue around joints; prevent deformities that limit function; stimulate circulation and sensory nerve endings.
- Restore loss of joint function.
- Maintain or increase muscle strength.
- Increase endurance.

ROM exercises should be performed several times each day, and each joint should be exercised five or six times during each session. Ideally, a physical therapy technician will help the patient with these exercises, but if one is not available, you'll assist the patient.

There are a number of basic guidelines that for you to follow when assisting patients with ROM exercises. These guidelines will help ensure the patient receives full benefit from the exercises, and neither you nor the patient is injured. The guidelines are as follows:

Basic Guidelines for Assisting Patients	
Steps	***Guidelines***
1	Be familiar with the doctor's orders and the patient's diagnosis and capabilities. This information will help you decide what exercises are needed and how much the patient can participate.
2	Explain to the patient what you are doing. This is a *must* for any procedure. Patients will be much more likely to relax and participate in activities if they understand what is going on.
3	Use good body mechanics, such as a wide base of support and large muscle groups, when performing these activities. This will conserve your energy and prevent injury and strain.

Basic Guidelines for Assisting Patients	
Steps	***Guidelines***
4	Avoid overexerting the patient or performing exercises to the point of pain. Fatigue and pain will not help the patient and may cause the patient to stop participating.
5	Begin gradually and work slowly. All movements should be smooth and rhythmic. Irregular, jerky movements are uncomfortable for the patient.
6	Move each joint through its normal ROM until you begin to meet resistance. Stop immediately if the patient experiences pain or muscle spasms. Report such reactions to the nurse or doctor, and delay further exercises until the patient can be examined. Excessive stretching of joints can cause injuries and even bleeding into joints. If the patient can't talk, observe the patient's face for signs of pain as you do the exercise.
7	Support the body part you are moving above and below the joint you are exercising. Cradle or cup the body part and avoid grasping at muscles or tendons.
8	Begin each exercise with the joint in its normal anatomical position and return it to that position at the end of the exercise.
9	Move each joint through its complete ROM, five or six times, slowly, rhythmically, and with control. Repetition is important for joint flexibility, and slow, controlled movements prevent injury.
10	Combine exercises with other activities, such as hygiene and positioning. This will save you time and increase the activity level of the patient.
11	Unless contraindicated, encourage the patient to participate in the exercises. Begin with passive exercises and gradually increase patient participation until the patients can do the exercises without help. Recovery will accelerate as the patient becomes more and more independent.

Active exercises

Active exercises are activities done by the patient. Such activities include active ROM exercises, isometric exercises, bed exercises, such as push-ups and pull-ups, dangling, and ambulation.

Active ROM exercises are simply ROM exercises that are done without assistance. If patients are capable, encourage them to do such exercises at least two or three times a day. Most patients will be eager to do so if they know the exercise will speed their recovery.

Isometric exercises are activities that involve muscle contraction without any body movement. If you place your palms together in front of your chest, for example, and push as hard as you can, you are doing an isometric exercise. Isometric exercises are useful because they do not require any equipment and can be done from any position. A bed patient can do isometric exercises by contracting the various muscle groups. Isometric exercises help to increase the patient's strength and endurance for other activities. Isometric exercises are potentially dangerous if done incorrectly. Instruct patients *not* to strain while holding their breath. Such straining will affect the heartbeat and may cause a heart attack. Also instruct patients not to contract a muscle for a prolonged period. Isometric exercises are most beneficial, if muscles are contracted several times for a few seconds each time.

Bed patients can also do exercises, such as pull-ups and push-ups, while they are still in bed. These exercises increase upper body strength and can be done by those patients who can control their upper body.

There are several different types of push-ups. In the most basic type, patients use their hands and arms to sit up and remain upright in bed. From that position, patients can lift their hips off the bed by pushing down on the mattress. The second type is the classic push-up we all know and love. The patient turns over on the abdomen, places the palms flat on the mattress, and straightens the arms and lifts the upper body off the mattress. Your role during these activities is to encourage the patient, make sure the patient does not overdo the activity, and ensure that the patient does not fall out of bed.

Pull-ups can be done with either the headboard or an overhead trapeze. The patient grasps either object and pulls toward it. Your role during this activity is the same as it is when the patient is doing push-ups.

Self-Test Questions

After you complete these questions, you may check your answers at the end of the unit.

227. Principles of effective body mechanics

1. What possible consequences of using poor body mechanics are discussed in the text?

2. Define posture.

3. How does contracting your abdominal and buttocks muscles help protect your back?

4. What is the proper position for your head?

5. What are two ways that you can impede the circulation to your lower legs when you are sitting?

6. What three factors should you consider when you are planning a task?

7. What will happen if you don’t accept and work with your physical limitations?

8. What is the relationship between your stability and your center of gravity?

9. Why is it easier to lift a patient with a smooth, steady motion than with a series of jerky motions?

10. Describe how you can use leverage to help move a patient to the side of the bed.

11. Where are your largest muscles located?

12. Why should you use pulling or pushing movements rather than lifting movements?

228. Procedures and equipment used to move bed patients

1. At what point do you become involved in moving patients?

2. What four steps should preface any movement procedure?

3. How do you prepare the bed for moving a patient?

4. How can the patient help with the one-person technique?

5. What two types of patient should be moved with the two-person technique?

6. Where do you place the patient's arms using the two-person technique?

7. What types of patients cannot be moved by the shoulder-lift technique?

8. Which two-person technique adds an element of speed to the move?

9. Where do the technicians grasp the drawsheet if there are only two people trying to move the patient?

10. At a *minimum*, how frequently should immobilized patients be turned?

11. What are two reasons you should provide privacy when moving a patient?

12. What is your last step before leaving a patient you have moved?

13. Before turning a patient to the side-lying position, why should you bend the patient's legs?

14. How should you place your feet when preparing to turn a patient to his or her side?

15. Why is it best to pull rather than push a patient into a different position?

16. What are the reasons patients are moved to the edge of the bed?

17. What is the best position for the person who is controlling a move?

18. How do you move a patient to the edge of the bed if you are working alone?

229. Procedures and mechanical aids used to transfer patients

1. Why do safety precautions and principles of body mechanics apply more to transfer techniques than they do to simple patient movements?

2. What types of patients are transported on stretchers?

3. Why are bed-to-stretcher transfers hard on technicians?

4. How do you prepare a stretcher for a patient?

5. Where should the stretcher be positioned if the patient is to be transferred by lifting?

6. What technique do you use to reposition a patient in the bed?

7. How should the technicians position themselves to slide a patient onto a stretcher?

8. What is the preferred method for moving a patient from a bed to a stretcher?

9. How do you place stretcher patients onto an elevator?

10. Why should the patient's legs not be allowed to hang unsupported from the edge of the bed?

11. What position should a technician take when preparing to turn a patient to the dangling position?

12. What two procedures are preliminary steps for both transferring a patient to a chair and ambulating a patient?

13. What type of shoes should a patient wear when being transferred to a chair?

14. What criteria should you use when selecting a transfer technique to move the patient from sitting on the edge of the bed to the standing position?

15. What do you need to watch for when you allow the patient to stand for a few moments before being transferred to a bedside chair?

16. What additional advantage do you obtain by bracing your feet against the patient's feet when helping the patient to a standing position?

17. What two precautions should you take before moving a patient to a wheelchair?

18. How should you position yourself if you are moving a near-helpless patient by yourself?

19. Why are both the one-person and two-person techniques unsatisfactory for moving a near-helpless patient from a bed to a chair?

20. When should you back up with a patient in a wheelchair?

21. What are two purposes of mechanical aids?

22. Why should some of the technicians kneel on the bed when moving a patient with a drawsheet?

23. Briefly describe the construction of a hydraulic hoist.

230. Techniques and equipment used to ambulate patients

1. Why can't patients who have been bedridden for a long period of time just get up and walk?

2. What can you do to reduce patient problems with ambulation?

3. What can you use as a substitute if you don't have a commercial transfer belt?

4. What is the preferred technician's position for ambulating a patient?

5. What objects should the patient avoid using for support?

6. What factors determine the type of ambulation aid that will be used for each patient?

7. What type of crutch is most commonly used for short-term patients?

8. What is the procedure for measuring crutch length on a standing patient?

9. Describe the four-point gait used by patients using crutches.

10. What basic rule should a crutch patient follow when going up stairs?

11. How do platform crutches differ from Canadian crutches?

231. Different types of patient exercises

1. What should you do if the patient begins to experience pain or fatigue during exercise?

2. What types of patients should receive passive exercises?

3. What is adduction?

4. How do ROM exercises help prevent joint fixation?

5. What information will help you decide the type of exercises patients need?

6. How should you support a body part when you are doing passive exercises?

7. What are the different types of active exercises?

8. Why should you instruct patients not to hold their breath as they do isometric exercises?

9. How do patients benefit from pull-up and push-up exercises?

3–3. Nutrition

As we learned earlier in this course, there is a direct relationship between health and nutrition. Good nutrition promotes good health. Poor eating habits and faulty diets often result in health problems. Good health is maintained only if adequate materials are available to supply energy and provide the specific substances needed for growth, maintenance, and repair. These facts are more important for hospitalized patients than for normal, healthy people. In fact, their bodies need additional nutrients to promote healing and fight infection. When these basic needs are not met or provided for, unequalibrium exists. You'll be challenged to assist the patient in meeting these needs. First, we discuss special diets and assisting the patient to eat. Then, we go on to discuss procedures used to help patients with their elimination needs.

232. Hospital diets recommended for the patient's needs

Hospital diets vary according to the patient's age, illness, and particular needs. The doctor always prescribes the specific type of diet the patient is to receive. As a medical service technician, you'll serve the food trays. It is very important for you to recognize the different diets and understand why

some of them are prescribed. The following are a few and the most common diets a physician can prescribe. If one of your patients receives a diet you are not familiar with, consult the nurse or dietitian.

Regular diet

A regular diet has no restriction on types of nutrients the patient can eat. It is usually ordered for patients who don't have any injuries or medical problems that could be affected by what they eat. These patients are encouraged to select whatever they want from the menu selection that dietary personnel bring to the unit each day.

High-calorie, high-protein regular diet

The high-calorie, high-protein diet includes all the items on the regular diet plus additional high-caloric, high-protein supplements. This diet is ordered for patients who suffer from excessive weight loss because of disease, fever, infection, injury, or surgery. These patients make selections from the daily menu and, in some cases, simply take double portions of certain food substances. They should also receive frequent, concentrated-caloric snacks and be encouraged to drink plenty of fluids to ensure an adequate intake. Patients on the high-protein, high-calorie diet should have their intake monitored to ensure it is adequate. This is called a "calorie count."

Liquid diets

Liquid diets consist of foods that are either liquid when they are eaten or become liquid before reaching the stomach. They are usually ordered for patients who have difficulty chewing or swallowing, need to alter the amount of residue in the digestive tract, have some sort of GI disorder, or just need to rest their GI organs. Liquid diets include clear liquid and full liquid.

Clear liquid diet

A basic clear liquid diet is ordered for postoperative patients and patients who are acutely ill. This diet is used to reduce fecal matter, for barium enema preparation, to relieve thirst, and for cases of temporary food intolerance. This diet is inadequate in all nutrients and should not be given for more than three days without some sort of nutritional supplement. Items seen on this diet are coffee, tea, broths, carbonated beverages, juice, and gelatin.

Full liquid diet

The full liquid diet consists of easily digested foods and foods that melt or become liquid in the body. These foods include all the foods on the clear liquid diet, plus foods free from cellulose and spices. The full liquid diet has more nutritional value and is usually given to a patient who has been on a clear liquid diet. Items seen on this diet are ice cream, pureed fruits, custards, eggnog, milk, creamed cereals, and sherbet.

Soft diet

Soft diets are ordered for patients who have disorders of the GI tract or are recovering from surgery or some acute illness. Soft diets are a transition between a full liquid diet and a regular diet. They are also used for patients with chewing difficulties. Foods on a soft diet are low in connective tissue and indigestible dietary fiber, which minimize GI irritation. Fatty foods, gas-forming foods, and highly restricted foods should be restricted to promote easy digestion and patient comfort. Foods allowed include: all liquids, eggs (except fried); boiled, broiled, creamed, grilled without fat, roasted, or stewed meats, poultry, or fish; mild cheeses; baked, broiled, candied, creamed, mashed, or scalloped potatoes; macaroni or other pastas; refined rice; strained or refined breads or crackers; cooked or dry cereals; cooked or canned vegetables; canned fruit, pudding; and plain cakes.

Bland diet

Bland diets are ordered for patients who suffer from ulcers or other irritations of the GI tract. Bland diets are designed to eliminate chemical, mechanical, and thermal irritants. No fried foods are allowed on a bland diet. The foods permitted on this diet are mainly foods cooked without spices or oils.

Restricted diets

There are various types of restricted diets that a physician recommends patients follow. Some of these include calorie-, carbohydrate-, protein-, fat-, and miner-restricted.

Calorie-restricted diet

Calorie-restricted diets are designed to either lose weight or maintain a desirable weight. The diets (800, 1,000, 1,200, 1,500, and 1,800 calories) contain fewer calories than the patient normally metabolizes. Foods allowed on a calorie-restricted diet include foods that are low in fats and carbohydrates. The patient should eat lean meats, fruits, and vegetables and avoid high-fat and high-carbohydrate items, such as butter, pastas, pastries, potato chips, and so forth.

Carbohydrate-restricted diet

Carbohydrate-restricted diets are ordered postoperatively and for treatment of certain disease processes.

Protein-restricted

Basic protein-restricted diets are ordered for patients who have an impaired ability to excrete waste products of protein metabolism due to kidney or liver disease. These diets vary from a total elimination of protein from the diet to around 80 grams of protein per day.

Fat-restricted

Fat-restricted diets are ordered for patients with gallbladder disease, malabsorption syndrome, and hyperlipidemia.

Mineral-restricted diet

Mineral-restricted diets are ordered to treat certain diseases and conditions and for test purposes. Minerals that are reduced include: sodium (Na), potassium (K), calcium (Ca), phosphorus (P), copper (Cu), and oxalate (OX). We'll discuss sodium, potassium, and calcium restrictions.

Sodium-restricted

Sodium is a mineral that is most commonly restricted in the diet. It is commonly found in almost all foods and even in water. The most common form is sodium chloride or salt. The average daily intake of salt is between 6 and 18 grams. Sodium restriction is ordered for patients who are subject to edema, hypertension, congestive heart failure, renal disease, and cirrhosis of the liver.

Potassium-restricted

Potassium-restricted diets are ordered for some patients with kidney diseases. Damaged kidneys have difficulty eliminating potassium. Occasionally, patients have a potassium depletion and require a high-potassium diet. Conditions that cause such a depletion include prolonged IV feedings, severe diarrhea, diuretic therapy, diabetic acidosis, or renal disease.

Calcium-restricted

Calcium-restricted diets are ordered for patients who have recurrent renal calculi or hypercalcemia. The average daily intake of calcium is 800 milligrams (mg). A 400 mg reduction in calcium intake will lower the renal calcium load. Cranberry juice has a strong acidifying effect on the urine and may be effective in increasing urinary calcium excretion.

233. Assisting patients with their nutritional needs

There are a number of factors that can affect the eating habits of patients. The way the patient feels is obviously going to affect his or her appetite. Other factors include cultural, religious, and personal preferences. In this lesson we'll discuss different factors affecting the patient's appetite, preparing the patient for meal time, and feeding the patient.

Factors affecting the appetite

Appetite is defined as the desire for food or an agreeable attitude toward eating food. It is a fairly delicate emotion and can be affected by many things including strong emotions, physical sensations, and physical activities. Unpleasant emotions (e.g., fear, anger, depression) usually cause a loss of appetite or anorexia. Most people can relate to this. When someone is very nervous, for example, it is not uncommon for him or her to become nauseated and possibly even throw up. Most patients feel nervous and apprehensive while they are in the hospital. If they receive unpleasant news or poor nursing care, they may also be depressed or angry. Physical sensations, such as pain, discomfort, or unpleasant sights, sounds, or odors, can also cause a loss of appetite. Medications, treatments, and activities can also upset the patient's appetite.

Eating habits vary tremendously from one culture or religion to another. Some religions prohibit the eating of meat on certain days; others prohibit certain foods altogether. Certain types of foods, eating utensils, and methods of preparation are associated with certain cultures. Your patients come from many different walks of life, and their customs will affect the way they eat in the hospital. These customs and habits should be accommodated, as much as possible. To do that, you must learn a little bit about these customs from the best source of all—the patient.

One of the strongest forces affecting appetite and eating habits is the patient's personal preference. Personal preference is partially the product of his or her cultural and religious background and partially the product of an individual's experiences and personality. One factor that affects personal preference is the patient's age. Young children are particular, and the elderly have a decreased sense of taste.

Preparing the patient

One of your responsibilities is preparing the patient for meals. This preparation begins when you order the meal tray and ends when you take the tray in to the patient. Between these times, you do everything you can to stimulate the patient's appetite and prevent any upsets. Try to avoid giving any medications or treatments for a least half an hour prior to and after the meal. Certainly, make every effort to avoid doing any treatments during the meal!

Ordering the tray

In AF medical facilities, patient trays are ordered on an AF Form 1094, Diet Order (fig. 3–19). AF Form 1094 is filled out (in duplicate) once a day (usually on night shift) from the information in the doctor's orders. When you fill out the diet order, identify the inpatient unit and list the patients by room and bed number. Also, specify where the patients are going to eat (on the unit or in the dining hall) and what diet has been ordered for them. Make sure that you list the diet exactly as the doctor ordered it. As you already know, carelessness could cost the patient his or her life. When you complete the form, take it to the dietitian IAW locally established schedules. One copy of AF Form 1094 remains on the unit for personnel to verify patients' diets. (**NOTE**: Many facilities use computer systems to order diets, eliminating the need for AF Form 1094. If for some reason the computer systems are down, you must always have a backup system.)

If a patient is admitted to the unit after the diet order form has been sent, unit personnel notify the dietary department by phone and add the patient's name and diet to the bottom of the unit copy of the diet order sheet. If a diet is changed or a patient is discharged, the dietary department is notified and the change is annotated on AF Form 1094.

DIET ORDER

INPATIENT UNIT: 2 South

SIGNATURE OF CHARGE NURSE: Kelly Field, Capt, USAF

DAY: Mnday

DATE: 5 Jan 09

ROOM	BED	NAME	NEW ADMISSIONS SCREENING DATA: HEIGHT (Inches)	WEIGH (Pounds)	SEX: MALE	SEX: FEMALE	AGE (Years)	LOCATION: UNIT/INPATIENT	LOCATION: ROOM/DINING	HOLD/NPO	PASS OUT ON	TYPE OF DIET: REGULAR	DENTAL	SOFT	FULL LIQUID	CLEAR LIQUID	PARENTERAL NUTRITION	(Therapeutic Diets; Calorie Counts; Fluid Restrictions; Enteral Feedings: specify product, cc per hour, strength; and Other Special Requirements)	MEAL CODE FOR SPECIAL ITEMS	FOOD ITEMS
1	A	Johnson, Eric	68	175	X		38	X										High Fiber - No Seafood		
1	B	Smith, Jack	72	200	X		45	X				X								
2	A	Cannon, Brooke	58	110		X	12								X					
	B																			
3	A	Edwards, Vance	69	193	X					X										
	B																			
4	A																			
	B	Miller, Julie	63	103								X						2,200 calorie		
5	A																			
	B																			

AF FORM 1094, 19920501 *(REVERSE) (IMT-V1)* PREVIOUS EDITIONS WILL BE USED. SI085182117

Figure 3–19. Sample AF Form 1094.

Tray preparation

When the dietary personnel receive the diet-order sheet, they prepare, assemble, and deliver the food to each inpatient unit for the patients. The food is assembled on trays and delivered to the unit in special carts. Unit personnel take the trays from the cart, check them, and deliver them to the patients. If there is a discrepancy, the dietary department is notified by phone and unit personnel get another tray from the dietary department. When the patients have finished eating, return the trays to the cart. After a specified time, dietary personnel return to the inpatient units and take the cart back to the dining hall. This process is repeated for each meal. Between times, certified dietary personnel come to the unit to discuss diets with the patients and give them their daily menus.

Physical preparation

Meals are served at approximately the same time each day. A short time prior to the arrival of the cart, prepare your patients for their meals. The amount of preparation varies according to the capabilities of the patient. Wash your hands and collect any equipment you might need (e.g., towels, washcloths, clean pajamas, etc.). Provide privacy, explain to the patient that it is almost mealtime, and you want to get him or her ready for the meal. Assist the patient with oral hygiene; a clean mouth helps stimulate his or her appetite. Offer to help the patient to the bathroom or use the bedpan or urinal. Bowel and bladder movements frequently occur around mealtimes. If you anticipate this, the patient will not have the unpleasant feeling of fullness or urge to defecate or urinate while he or she is eating. When the patient finishes, provide equipment so that he or she can wash his or her hands. Straighten out or change the bed linen, as necessary. Raise the head of the bed to a sitting position (if allowed), or assist the patient to sit in the bedside chair. Position the overbed table in front of the patient, and ensure the call bell is within reach. Put away the equipment and clean up any mess. Make

sure there is nothing like a bedpan or urinal around to upset the patient's appetite. As the patient desires, open the screen or door. Some patients with disfigurements or eating problems prefer to eat privately and should be accommodated. Remember to wash your hands when you finish preparing the patient for his or her meal.

Assisting with feedings

If you properly prepare the patient and do everything you can to stimulate his or her appetite, the actual feeding should be easy. Try to be ready when the trays arrive so they don't interrupt some procedure. Take a tray from the cart and compare the diet slip and contents with AF From 1094. When you are sure that the tray contains the proper diet ordered for the patient, take the tray to the patient. Place the tray on the overbed table and check the patient's ID. Remove food covers, open cartons, cut up food, and so forth, as needed by the patient. Make sure that the napkin, utensils, and call bell are within the patient's reach.

The amount of help each patient needs varies. Encourage the patient to do as much as possible for himself or herself. Encourage independence, not dependence. The patients who require more assistance should always be served last. That way their food stays reasonably warm on the cart, the other patients get their trays while they are still warm, and you'll not be interrupted while you are feeding a patient.

Patients who have to be fed often feel humiliated or resentful. You can alleviate that by demonstrating a helpful, relaxed, unhurried attitude. The patient may want to say a brief prayer prior to eating. Encourage the patient to do whatever he or she can, and do not become upset if he or she accidentally spills something. Place the tray in a convenient position on the overbed table where the patient can see it. Feed the patient in the order in which he or she likes to be fed. Do not show signs of being in a hurry. Sit down if you can reach the patient's mouth while you are sitting. Feed the patient, slowly offering varied foods in small amounts. Offer fluids during the meal. If the patient wants to talk, talk to him or her. This is another excellent opportunity to get to know and develop rapport with your patient. When the patient finishes, remove the tray and provide oral hygiene. Make the patient as comfortable as possible. Note what they did or didn't eat and return the tray to the cart. Note your observations, and any specific complaints or problems to the nurse, and record the patient's intake, if necessary.

Blind patients will be very aware of food aromas. However, you may still need to tell the patient what is being served. One method used to explain the location of foods on the plate is the clock method (fig. 3–20). By using the numbers on a clock, you can explain locations of food. Also, you may want to use descriptive terms when describing foods.

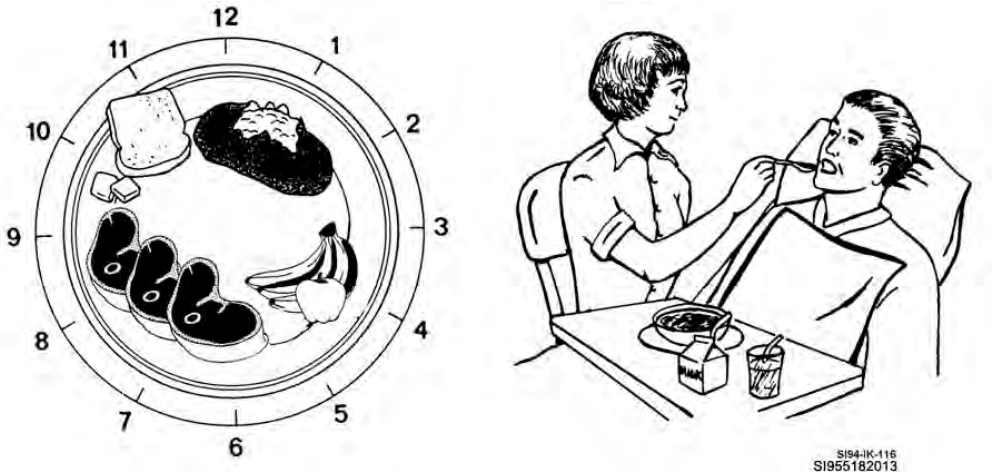


Figure 3–20. Feeding a blind patient.

Passing water and appropriate fluids to patients

Another part of your job is ensuring the patient has bedside water. Fresh water is usually passed at the end of every shift (times may vary depending on your facility) and whenever the pitcher is empty. Be sure to use medical aseptic technique and check the physician's orders for any changes (e.g., NPO orders, no ice, or ice chips only).

Nasogastric tubes

Gastric intubation is a common procedure in diagnosing and treating disorders of the GI system. This procedure—the insertion of a plastic or rubber tube into the stomach and intestine—is used to diagnose a disorder, feed a patient, relieve distension caused by fluid or gas, drain the stomach, and wash out the stomach. Let's discuss some of the therapeutic procedures that require NG intubation. The procedures you will see and help with most frequently are gastric suction, gastric gavage, and gastric lavage. The medical service technician may, in some facilities, be responsible for the insertion of the gastric tube. This is a procedure you learned in technical school; therefore, we'll quickly review the steps for insertion of the NG tube.

NG tube insertion

Prior to insertion, ensure there is a written order for insertion. Wash your hands, gather your equipment, identify the patient, and explain the procedure to the patient. The equipment you'll need is: the NG tube, water-soluble lubricant, clamp for tubing, towel, tissues, and emesis basin. Place the NG tube in an emesis basin with ice water to give the tube rigidity and make it easier to pass. You'll also need tape (½ and 1 inch), stethoscope, tongue blade, and disposable gloves.

Prepare the patient by placing him or her in a high Fowler's position with a towel across the chest, and have the patient blow his or her nose to clear the nostrils. Next, the length of tube needed to reach the stomach is determined by using the following measuring technique. Place the end of the tube at the tip of the nose, extend it to the patient's earlobe, and then down to the xiphoid process (fig. 3–21). Mark the tube at that point with a small piece of tape. Put your gloves on and lubricate the NG tube. Have the patient tilt his or her head back while you are inserting the NG tube into the nose. Once the tube reaches the nasopharynx, allow the patient to rest. Now, have the patient flex his or her head to his or her chest and begin to swallow as you pass the tube. This will prevent passage of the tube into the trachea. If allowed, have the patient take sips of water as you pass the tube down the esophagus to the stomach. If at any time the patient begins to gasp for air, coughs, or turns cyanotic, STOP, and remove the tube. This means you may have entered the trachea.

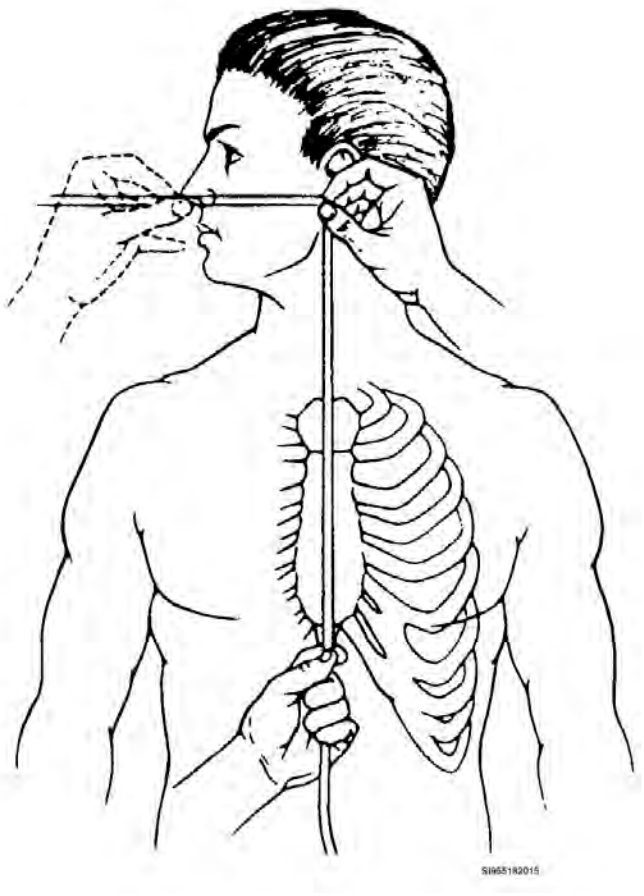


Figure 3–21. NG tube measurement technique.

If you have not encountered any problems, and you have passed the tube to the measurement mark, check to ensure you are in the stomach. Tube placement can be checked by four methods:

1. Aspiration of stomach contents using a 20–50 mL syringe.
2. Using a stethoscope over the epigastric area, and injecting 5–15 mL of air, then auscultating for a whooshing sound.
3. If the patient cannot speak, it is an indication you may have entered the patient's trachea.
4. An x-ray may be obtained to ensure placement.

Always check tube placement before gavage, lavage, or irrigations. NG tubes can become dislodged very easily. Once placement has been determined, clamp or hook the NG up to suction, and tape the tube to the bridge of the patient's nose.

Gastric suction

Gastric suction is used to remove fluids and gas from the stomach and upper intestinal tract. It is commonly used on a surgical unit to empty the stomach before surgery and after surgery to prevent distention and vomiting. It is also used to prevent obstruction caused by a lack of peristalsis following certain types of abdominal surgery. There are several devices used to create a vacuum and produce this suction. As with other procedures, you'll learn how to use the type available where you work. However, there are several points about the care of the patient with gastric suction that you'll need to know and understand.

Patients who have nasal suction tubes in place need frequent mouth and nasal care. The tube is very irritating and the patients must breathe through their mouth, making mouth care essential. Take the patient's temperature rectally or tympanically. Why? Remember they must breathe through their mouth, so an oral temperature would not be accurate. Secure the tube carefully to the patient and bed so that it will not pull out as the patient moves about in bed. Observe the drainage closely. Measure and record it accurately and report any unusual characteristics, such as fecal odor or blood. You should also report any excessive drainage or lack of drainage to the nurse immediately. Notify the nurse, too, if the suction does not appear to be working properly.

Figure 3–22. Gastric gavage.

Gastric gavage

A gastric gavage is the procedure of feeding a patient through a tube inserted through the mouth or nose into the stomach. The tube may be left in place for several days, or it may be inserted before each feeding. Feedings of this type are most often seen in a newborn nursery and mental-health units. Mouth care is the same as for the gastric suction procedure. Accurate records must be kept of the food and fluids given the patient. Figure 3–22 illustrates manual gastric gavage.

The equipment needed will be: feeding solution (physician's order will specify), irrigation syringe or funnel, graduated measuring device, and water. Prior to the feeding, *ensure NG tube placement is correct*. Place the patient in a semi-Fowler's position (this will prevent aspiration and promote digestion), and place a drape across the patient's chest. Keeping the NG tube clamped, connect the irrigation syringe to the end of the

tube. Pour in the feeding solution, which is at room temperature, and release the clamp. When the syringe is three-quarters empty, you will pour in additional solution. *Do not allow air to enter the tube.* Continue to administer the feeding slowly over 10–20 minutes. When the patient has received the prescribed amount of solution, flush the NG tube with 50 mL of water. Clamp the tube and keep the patient in a Fowler's position. Then, you will report and record results.

Gastric lavage

You have probably heard or read about people who have had their stomach "pumped out." This is the procedure we call gastric lavage. It consists of introducing a solution through a tube into the stomach and then siphoning the solution back out. This procedure is usually done as an emergency measure to cleanse the stomach of harmful substances. Your main responsibility for this procedure will be to assemble the equipment and assist the physician performing the procedure.

Irrigations

Irrigations are similar to gastric gavage and lavage, except the fluid instilled is removed. This is done to improve or ensure patency of the NG tube. Equipment needed is an irrigation kit, irrigation solution, and gloves. Once again, ensure the NG tube is in the correct place, the stomach. Open the irrigation kit and pour the solution into the irrigation bottle. Draw up 50 mL of solution and attach the syringe to the NG tube. Slowly instill the solution, then you should withdraw the solution. Remember to report and record the results.

Self-Test Questions

After you complete these questions, you may check your answers at the end of the unit.

232. Hospital diets recommended for the patient's needs

1. Who specifies what diet the patient is to receive?

2. Match the diet description in column A with its name in column B.

Column A	*Column B*
__(1) Used for patients with hypertension or congestive heart failure.	a. Full liquid.
__(2) Eliminates chemicals, mechanical, and thermal irritants.	b. High-calorie, high protein regular.
__(3) Used as a transition between a full liquid diet and a regular diet.	c. Clear liquid.
__(4) Inadequate in all nutrients and not given for more than three days.	d. Regular.
__(5) Easily digested foods that melt and foods free from cellulose and spices.	e. Soft.
__(6) Used for patient who suffer from excessive weight loss.	f. Bland.
__(7) Contains fewer calories than the patient normally metabolizes.	g. Calorie-restricted.
__(8) No restrictions on types of nutrients that patient can eat.	h. Protein-restricted.
__(9) Used for patients with kidney or liver disease.	i. Sodium-restricted.

233. Assisting patients with their nutritional needs

1. Define appetite.

2. Using the text, what are the physical sensations that can cause a loss of appetite?

3. In what ways does culture affect the way a person eats?

4. What is the strongest force that affects a person's appetite?

5. On what form do you identify where the patient will eat?

6. How should you help to prepare a patient for mealtime?

7. When do you serve patients who require the most assistance?

8. What method is used to explain the location of foods to a blind patient?

9. What are five reasons for the use of an NG tube?

10. What position is the patient placed in for NG insertion?

11. What are the steps used to determine the length of tube needed to reach the stomach?

12. How do you prevent entrance of the NG tube into the trachea?

13. During placement of the NG tube, what patient reactions will indicate the need for you to stop and remove the tube?

14. What are the four methods used for assuring proper NG tube placement?

15. What term is used to denote tube feedings?

16. Prior to feeding the patient via an NG tube, what is your first priority?

17. At what temperature should the tube feeding solution be when you use it?

18. How many minutes will it take to properly administer a tube feeding?

19. Define the term *lavage*.

20. Why are irrigations performed?

3–4. Elimination Needs

Assisting the patient with his or her elimination needs may not be your most favorite part of the job, but it is something that has to be done. At times, you must put yourself in the patient's position. Most patients don't want to depend on someone else to help them with elimination needs. So think about how they must feel; the embarrassment must be overwhelming. In most cases of complete bedrest, assisting patients with their elimination needs is necessary to reduce heart and muscle strain.

234. Assisting patients with their urinary elimination needs

A healthy adult should eliminate 1,000–1,500 mL per day. Some of the factors that affect the elimination pattern include age, illness, amount of intake, and medication. This lesson includes assisting with the bedpan and urinal, urinary catherizations, specimen collection, and irrigation of the bladder.

Catheterization

Catheterization is the introduction of a tube (catheter) into the urinary bladder (fig. 3–23). It is introduced through the urethra, then threaded to the bladder to drain the bladder of urine. Its purpose may be to relieve or prevent bladder distention, collect a sterile urine specimen for laboratory analysis, or empty the bladder before certain surgical procedures. It is never done unless it is absolutely necessary. Anytime a catheter is inserted into the bladder, there is a chance that infection will follow the procedure, which is why the physician usually orders it only as a last resort.

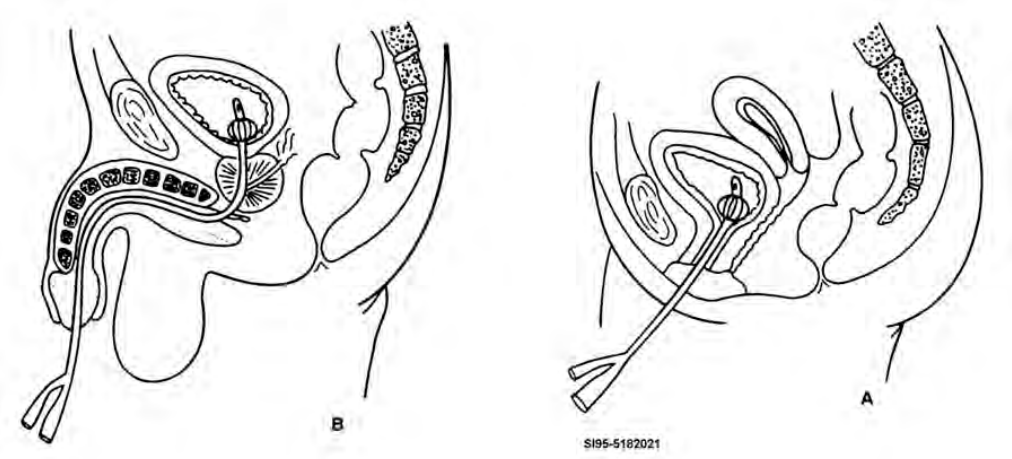


Figure 3–23. Anatomical view of catheter placement.

Warning: Slow decompression of the bladder is essential. Therefore, remove no more than 750–1000 cc at any one time. Rapid decompression may allow the bladder to collapse and result in bladder damage causing possible shock, chills, and fever.

Types of catheters

As stated before, a catheter is a special type of tube used to withdraw urine from the urinary bladder. There are many types, each designed for a specific purpose. Types you should be familiar with include the French, Foley, and mushroom. See figure 3–24 for an example of some catheters you may use.

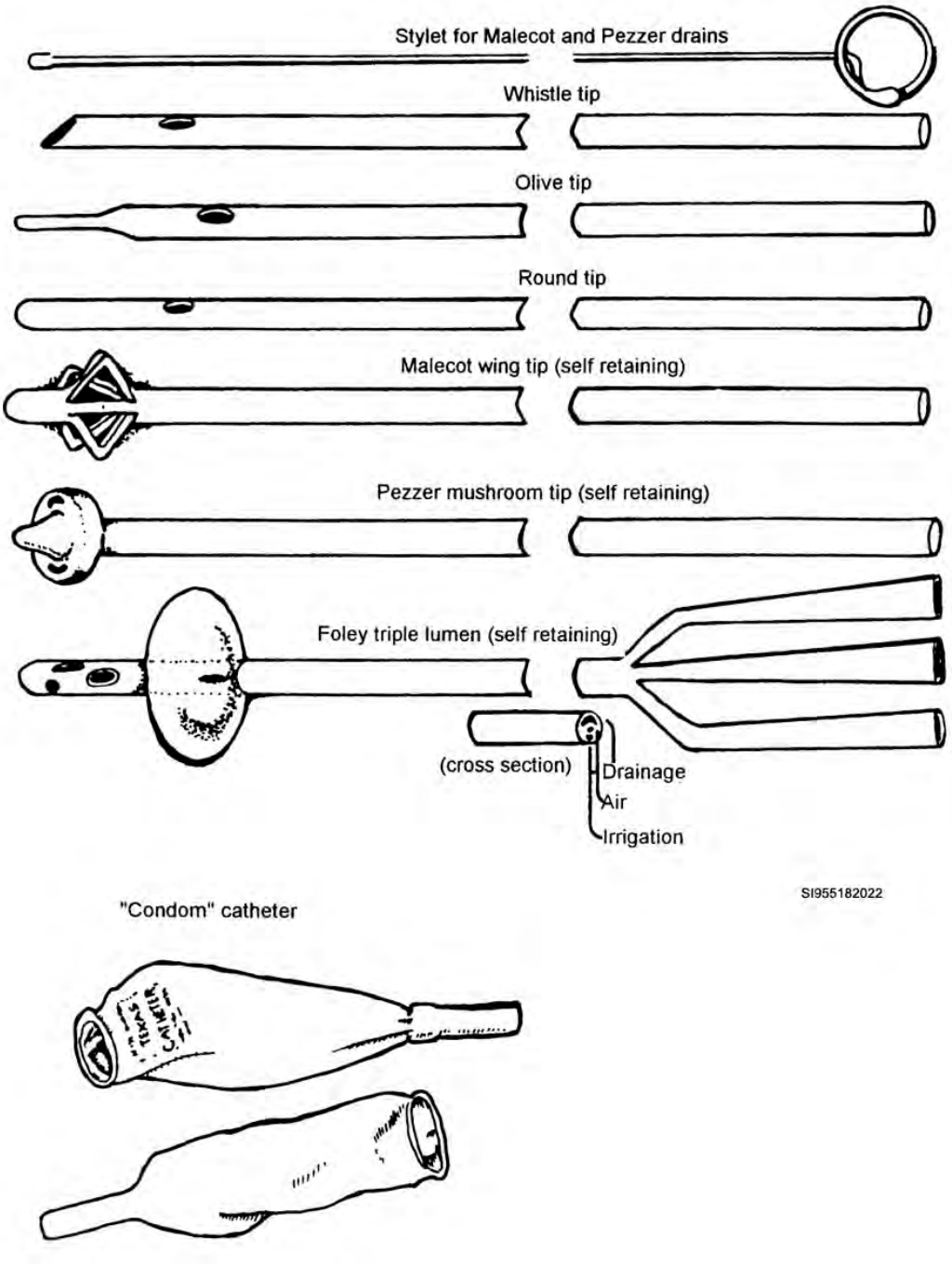


Figure 3–24. Catheters.

Straight catheter

The Straight catheter is a single-lumen catheter. It is commonly used to obtain a sterile urine sample and then is removed.

Foley catheter

The Foley is a double-lumen catheter. It has one opening for drainage, the other for inflating a small balloon bag at the tip of the catheter. The catheter is inserted and the bag is filled with a sterile solution or air. This air or fluid must be aspirated before the catheter is removed. This keeps the catheter in place.

The physician can learn a great deal about the condition of the urinary system, especially the kidneys, from the study of urine. Abnormal findings, such as a red color, referred to as hematuria, may mean that red blood cells are passing through a diseased nephron unit. Albumin in the urine may indicate several types of kidney disorders. Sugar may indicate diabetes mellitus, a disease of carbohydrate metabolism. Highly concentrated urine may appear in such disorders as diphtheria or may follow severe burns. Let's now discuss the procedure of catherization.

First of all, gain the patient's cooperation by explaining the necessity and purpose of the procedure. Because of its nature, the procedure may cause fear and emotional strain for the patient. These reactions may constrict the urethral muscle, making insertion of the catheter difficult. Provide the patient with privacy and avoid unnecessary exposure. By doing this, you not only care for an emotional need but a personal need as well. Get all your equipment organized. If a disposable set is not available, then you must obtain the necessary equipment from central supply service. The size of the catheter is determined by the size and condition of the urethra. If a specimen for laboratory analysis is to be obtained, a sterile, capped bottle must be used. Remember, this is a sterile procedure and all rules for sterile aseptic technique apply to this procedure! The patient must be draped and properly cleaned before attempting to insert the catheter.

See figure 3–25 for cleaning a female patient. First, separate the labia majora with your thumb and ring finger. Soak your cotton balls in antiseptic, then pick them up with sterile forceps. Using one cotton ball per wipe, clean from the pubic area to the rectum, down the middle first and then the outer sides of the labia majora. Second, separate the labia minora in an upward manner, using your remaining sterile fingers. Clean downward from the meatus to the rectum and then the sides of the labia minora using only one cotton ball per wipe. *Do not* allow the labia to fall back into the area that has been cleaned; this prevents contamination of the urinary meatus. Using your sterile hand, lubricate the catheter tip, and gently insert it into the urinary meatus. Exercise caution; never use force. Resistance to the passage of the catheter may indicate an obstruction.

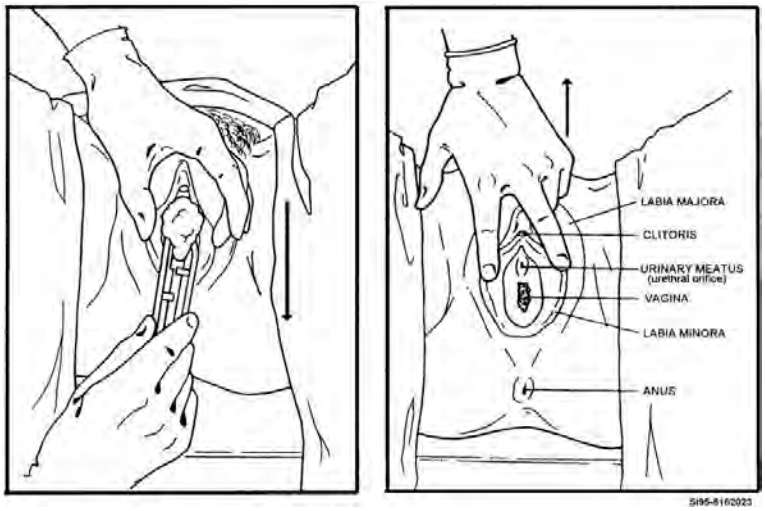


Figure 3–25. Cleaning of female genitalia.

For cleaning a male patient, hold the penis in the nondominate hand and lift upward at an angle of about 90°. This straightens the urethral canal. See figure 3–26 for cleaning the male patient and angle for catheter insertion.

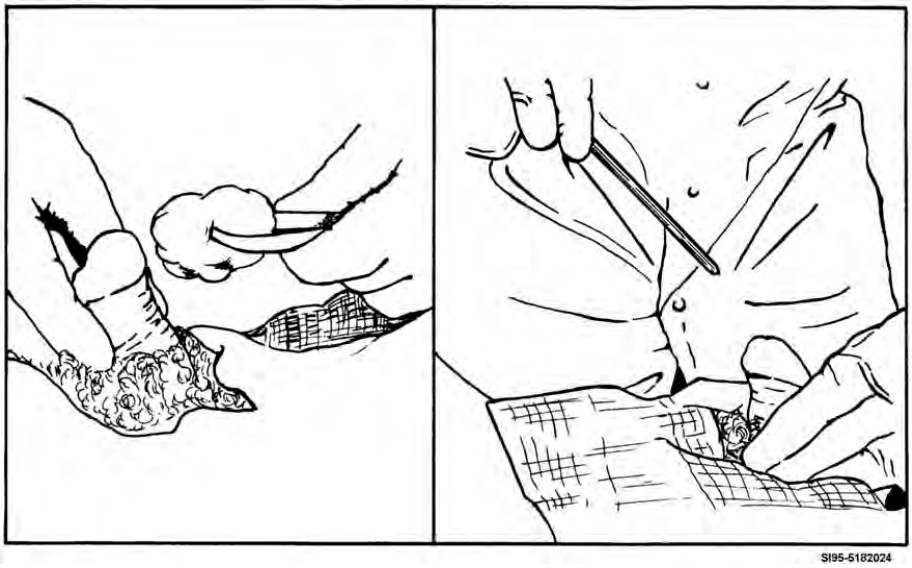


Figure 3–26. Cleaning penis and position for inserting catheter.

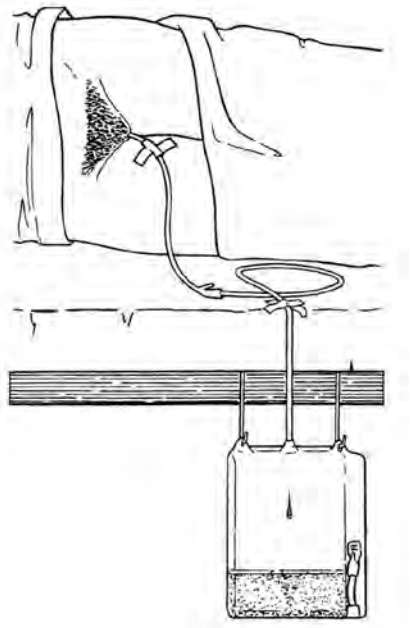


Figure 3–27. Anchoring catheter for female.

For male patients, insert the catheter about 6–10 inches, normally an average of 8 inches, or until the urine begins to flow for straight catheters, and almost to the catheter bifurcation for indwelling catheters. However, use caution and don't insert the catheter an unreasonable distance. The bladder just might be empty, and you could cause injury to both bladder and urethra. For the female patient, the urethra is a short canal. Advance the catheter only 2–3 inches, or until urine begins to flow. Obtain the urine specimen needed. If you are performing a straight catheterization only for a sterile urine sample, then the catheter may be removed. To remove a straight catheter, pinch off the tubing during removal to prevent air from entering the bladder. If you are inserting an indwelling catheter, you must now inflate the balloon tip of the catheter. Ensure you are in the bladder by advancing the catheter an additional inch. Inflate the balloon, and pull back gently on the catheter tubing. Secure the indwelling catheter for the female by taping it to the thigh (fig. 3–27). For males, tape the catheter to the lower abdomen.

When removing the indwelling catheter, be sure you have completely deflated the balloon! If it is not deflated, you could cause severe damage to the urethra. When removing, if you feel resistance, STOP and get your nurse to help you. Remember to pinch the tubing and remove.

Clean-catch specimen

There are times when the physician may want a clean urine specimen for laboratory analysis but wants it collected without catheterization. Because there is always a chance of introducing infection into the urinary tract, a "sterile" or "clean catch" technique is used. The external meatus is cleaned with a suitable cleaning solution. The patient voids about 50 cc, which is discarded, and then he or

she voids into a sterile specimen bottle. The bottle and bottle cap are handled in a sterile manner to prevent contamination.

When any patient is having trouble voiding, there are several things you can do that may promote urination. Since the nervous system controls the urinary sphincter and bladder muscle, patients must be free of any frightening, tense, or embarrassing situations. Patients who are hurried or embarrassed forget about trying to void. If at all possible, leave the patients alone while they are urinating. If the patient is in a private room, step outside and close the door. If the patient is on an open ward, screen the bed. Unless contraindicated, place the patients on their back with the head of the bed elevated. Gravity helps the urine to flow out of the bladder.

Irrigation and drainage

Irrigation of the bladder is done to remove or wash out blood, pus, bacteria, or waste products following urinary surgery. The irrigation is usually done with an indwelling or retention catheter (fig. 3–28). These catheters provide constant or intermittent drainage of the urinary bladder. They are normally inserted by the physician and left in place for several days or changed as often as needed. The catheters are periodically irrigated to keep them open. Irrigation of both the catheter and bladder is carried out by introducing a small amount of solution, usually normal saline or sterile water, into the bladder. The solution is then allowed to drain out of the bladder.

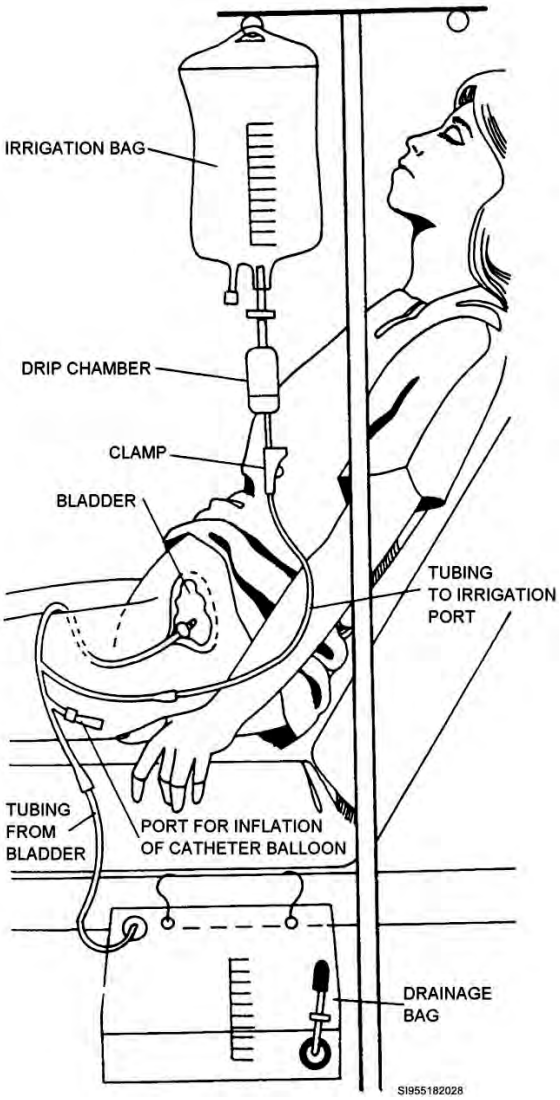


Figure 3–28. Constant irrigation of bladder.

Either system of drainage (i.e., intermittent or continuous) must be carefully maintained. Drainage tubes must be watched to see that there is an outflow of urine. A drainage tube can become obstructed by a blood clot, or the patient can unknowingly lie on it. Either way, the tube may become obstructed. Clamp the tube to the bed or bedsheets and lay it over the patient's leg. This will prevent accidental slipping or kinking of the tube. Once the catheter is in place, thoroughly clean the urinary meatus with soap and water at least once a day. In addition, the patient's fluid intake should be increased, and the drainage bag emptied whenever it is full or at least once per shift.

External condom catheter

The condom catheter allows the patient to urinate through a condom-type device that connects to tubing and a bag. Once the kidney releases waste fluid (urine), the bladder fills up and the patient will feel the urge to urinate. The bladder holds between 400–500 ml of urine without overdistension. Once it crosses this limit, this muscular sac tries to distend to accommodate the extra urine that flows within the bladder. Another option to relieve or prevent bladder distention involves the use of an external condom catheter.

Based on the patient's ability to move, steps can be taken to minimize travel to and from the bathroom when patients have limited mobility. A condom catheter performs similar functions of other catheters but is placed externally over the penis versus internally (inside the urethra and through the bladder) and is an easier option to consider by medical staff.

To determine what type of catheter is best and why it's required, physicians/nursing staff consider these factors:

- Patient is able or unable to control his or her bladder. *(Condom catheter allows patient to urinate with an external condom and bag attached alongside leg or hospital bed.).*
- Patient is very ill and may have a condition that makes urination difficult, such as a spinal cord injury. *(Condom catheter attaches externally and require minimal patient movement.)*

To determine when an external condom catheter is used versus other options is a matter of choice as it depends on the patient and his or her medical status/condition. Let's look at a few examples of when to choose an external condom catheter:

- Cooperative male patients without urinary retention or bladder outlet obstruction. *(Uncooperative patient with urinary retention require internally placed catheters to fully control and relieve distension.)*
- A need to decrease chances of catheter associated urinary tract infection. *(External catheters don't enter inside the body, thus decreasing infection risk.)*
- There is not a need to continually drain urine from bladder. *(External catheters cannot continuously drain bladder; patient will void urine when ready.)*
- Patient cannot move or will not get up to use toilet or bedside urinal. *(External catheters are easy to use and remove as well as more comfortable when urinating without catheter inside urethra wall/bladder.)*

Pediatric urine collection bag

Measuring and recording I&O during a 24-hour period helps complete the assessment database for fluid and electrolyte balance. The nurse or 4N0 is responsible for recording all intakes (liquids taken orally, by feeding tube, and parenterally) and all output (e.g., urine, diarrhea, emesis, gastric suction, and drainage from surgical tubes). When possible, assistance from the child (when developmentally appropriate) or family facilitates accuracy, independence, and a sense of participation in the plan of care.

Normal fluid intake (or maintenance fluid requirement) varies according to each child's weight. Neonates have a higher percentage of water as body weight, and intake should reflect this difference. Monitoring I&O may be an independent or a dependent nursing intervention. Keeping records of I&O is appropriate if a child has a fever, hyperventilation, renal or cardiac disease, or diaphoresis; is

receiving IV or diuretic therapy; is placed on restricted fluids; or has cystic fibrosis. It is also important when a child has electrolyte losses associated with vomiting, diarrhea, GI drainage, or extensive open wounds, such as burns that can deplete or alter fluid reserves.

General monitoring of I&O should be evaluated for all children, although measuring and documentation on the chart is not required in some situations. Infants and young children have a greater need for water and are more vulnerable to alterations in fluid and electrolyte balance from conditions such as vomiting and diarrhea. Measuring output in infants may be done by weighing diapers: 1 g of diaper weight is equal to 1 ml of urine. Infants need to ingest a greater amount of fluid per kilogram of body weight than do older children. When indicated, I&O is totaled and evaluated at the end of each shift or at specified times. Significant alterations are apparent by comparing totals over several days. Because fluid imbalance may occur at any time, awareness of I&O should be maintained for all children, even when documentation is not required. The nurse should ascertain from the family what terminology the child uses to describe output and should use the familiar language with the child.

If urine output is not adequate, identify conditions that can cause increase or decrease fluid loss:

- Fever.
- Diarrhea and/or vomiting (rapid loss of fluids).
- Surgical wound drainage or chest tube drainage.
- Gastric suction.
- Cardiac or renal disease.
- Major burns.
- Cystic fibrosis.
- Severe trauma, especially crushing injuries.
- Diabetic ketoacidosis.
- Tachypnea.
- Infant under radiant warmer or undergoing phototherapy.
    - Identify conditions that also increase the risk for insufficient fluid intake:
        - Impaired swallowing.
        - Unconsciousness.
        - Impaired mobility.
        - Congestive heart failure.
        - Neuromuscular disease.
        - Prolonged NPO status without IV fluids.
    - Identify any medications the child is taking that can influence fluid balance, including diuretics and steroids.
    - Assess for signs and symptoms of dehydration and/or fluid excess.
    - Weigh children daily. Daily weights must be obtained with the same scale, at the same time of day, and with comparable articles of clothing.
    - Monitor laboratory reports:
        - Urine specific gravity.
        - Hematocrit.
    - Assess child's (if developmentally appropriate) and family's knowledge of the purpose and process of I&O measurement.

235. Assisting patients with intestinal elimination needs

There are many procedures associated with assisting patients with intestinal elimination needs. These include the administration of enemas, colostomy care and irrigation, and sitz baths. We begin this lesson with the administration of enemas.

Enemas

An enema is an injection of a solution into the rectum. Its purpose is to cleanse the lower intestine or administer medication. There are two types—cleansing and retention.

Cleansing enemas

Cleansing enemas are used to promote bowel evacuation by softening the feces and distending the bowel to produce peristalsis, thus removing fecal material from the rectum, sigmoid colon, and descending colon. This enema is done in two ways—by instilling sufficient fluid to stretch the rectal wall or by instilling an irritating substance, which excites the rectal wall and produces a bowel movement. Most hospitals use prepackaged commercial enema units, which are ready to use and disposable. Cleansing enemas are usually ordered because of constipation, for preparation for surgery, or for diagnostic procedures (e.g., endoscopic examinations of the bowel). A physician's order is required before an enema is given. The order usually specifies the solution to be used and any special directions to be followed. Your primary responsibility is to carry out the procedure and report the results.

The patient is preferably positioned on his or her left side (laterally recumbent position), or, if necessary, may be positioned on his or her back for the enema (fig. 3–29). Sitting up or lying on the right side is undesirable because the rectum and sigmoid are elevated when the patient is in either of these two positions, causing the solution to "run up hill." The solution should be retained at least five minutes so that full benefit of the rectal wall stimulation is obtained. If you are using fluid alone to stimulate the rectal wall, at least 1,000 mL, or approximately one quart, should be used. The temperature of this solution should not be above 105°F.

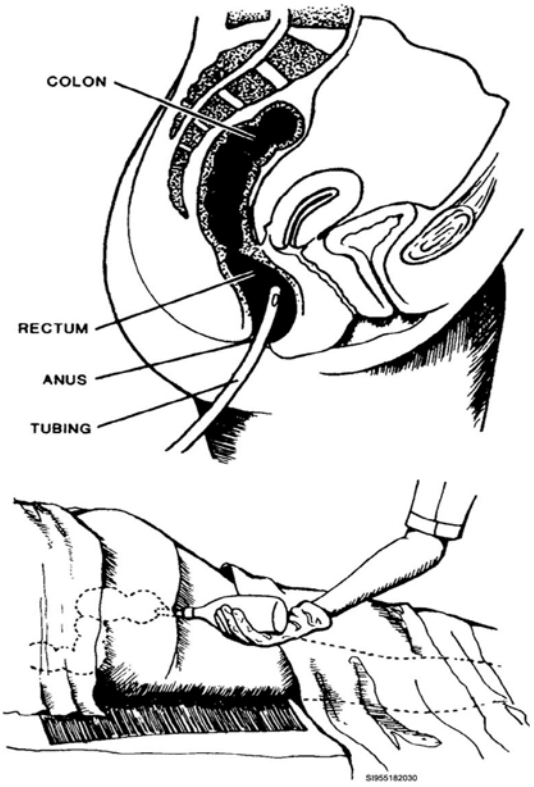


Figure 3–29. Cleansing enema administration.

Retention enemas

Retention enemas are used to treat diseases of the rectum and lower colon. They are usually given to soften fecal material or to soothe an irritated colon or rectum. Occasionally, they are used to administer medication that cannot be administered by any other route. Before you give a retention enema, it is very important for you to explain to the patient what you are going to do. In your explanation, emphasize that you are giving a small amount of enema solution, usually not over 90 mL and that it is to be retained. The patient is positioned the same way as for the cleansing enema. The solution should be warmed to body temperature and given very slowly with a very small rectal tube to reduce the possibility of the patient expelling it. The solution container should be approximately 12 inches above the rectum but not more than 18 inches (fig. 3–30). If held higher, there is danger that the pressure of the solution entering the rectum will damage the rectal wall. After the solution is instilled, you can also help the patient to retain the fluid by exerting slight pressure against the anus immediately after the rectal tube is withdrawn. After the solution has been instilled,

encourage the patient to remain on his or her side until the urge to defecate passes. In most cases, the solution will be administered from a commercially prepared container, as shown.

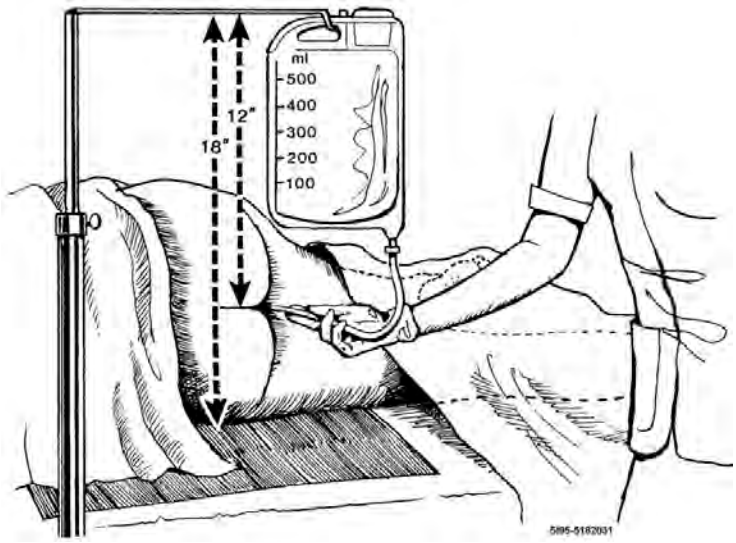


Figure 3–30. Retention enema administration.

Colostomy care

Are you wondering what a colostomy is? A colostomy is a surgical operation in which a loop of bowel, from the colon, is brought to the outside of the body through an opening in the abdominal wall, referred to as the *stoma*. This loop is then opened and forms an artificial anus. You may also see or hear a surgically formed artificial opening that serves as an exit for the bowel or intestine referred to as an ostomy. The term *colostomy* just references the part of the intestine that has had the opening created. Supplies and care of the sites are often referred to as ostomy supplies or ostomy care. For our purposes here, the terms are used interchangeably. Figure 3–31 shows potential colostomy sites. For you to have a better understanding, we'll briefly discuss some of the things you should know about a colostomy.

A colostomy is done when a patient cannot expel feces through the rectum. It may be temporary to rest a portion of the bowel, or it may be permanent if the rectum is removed. Probably the most common reason for doing a colostomy is for cancer of the rectum. During times of war and conflict, you may encounter a number of patients who have had colostomies performed because of combat injuries.

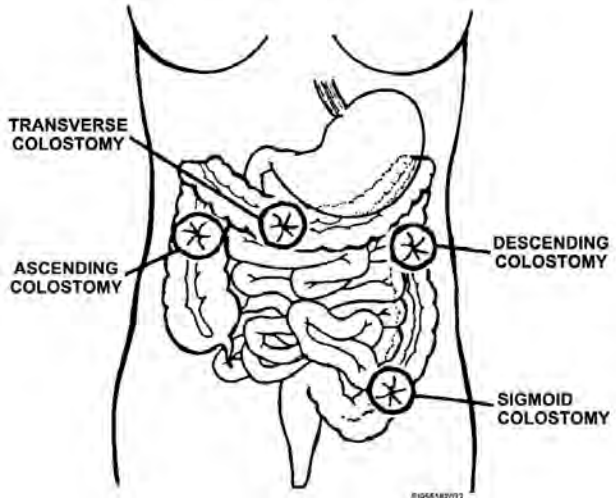


Figure 3–31. Colostomy sites.

A colostomy creates a number of problems for patients. One of the most distressing is that the stoma has no sphincter muscle to close the opening, so gas and fecal material may be expelled at any time. There is a bag attached to the stoma to catch expelled contents, but the bags can leak. The patient has no control over this, a fact which the patient often finds frightening or disgusting. If the colostomy is to be temporary, patients can usually accept it as an unpleasant but temporary thing. It is much more difficult for patients with a permanent colostomy. These patients worry constantly about odor and soiling themselves and feel that no one wants to be around them. They may also feel that life is no longer worth living and become depressed and frightened about the future. These patients need a great deal of reassurance that they can live a normal, happy life, even with a colostomy. Be careful when taking care of these patients. Do not indicate in any way that their care might be unpleasant or repulsive to you. A matter-of-fact accepting manner is most important.

You'll be taught, on the job, the exact technique of doing colostomy irrigations and the equipment used; therefore, we only briefly discuss colostomy care. Caring for a patient with a fresh colostomy requires meticulous skin care and changing the ostomy bag when it is one-third full. To change the colostomy bag (fig. 3–32), first prepare the patient by explaining the procedure and encouraging him or her to participate in the care. Expect the entire procedure to take approximately 20–30 minutes. Gather your supplies—replacement appliance, cleansing solutions, skin-care products, and tape if needed. With the patient in a supine position, remove the ostomy appliance from the skin, being careful not to damage the skin. Preventing the breakdown of the skin around the stoma is very important. Place the used appliance into a waterproof bag and dispose of it properly after the procedure. Wash the stoma area with warm, soapy water. Inspect the stoma and skin for signs of infection. Dry the area around the stoma, and apply the skin barrier recommended by the physician. Prepare the clean ostomy appliance by ensuring the hole you are cutting fits the size of the patient's stoma. Make sure the skin area around the stoma is dry. Peel back the adhesive backing from the new appliance and apply it over the stoma, ensuring the skin does not wrinkle underneath. Press the appliance down. Close the bottom of the appliance and remove any air in the bag. Some patients, depending on the location of the colostomy, may have their bag changed daily; others may only need to have their appliance changed every three to five days.

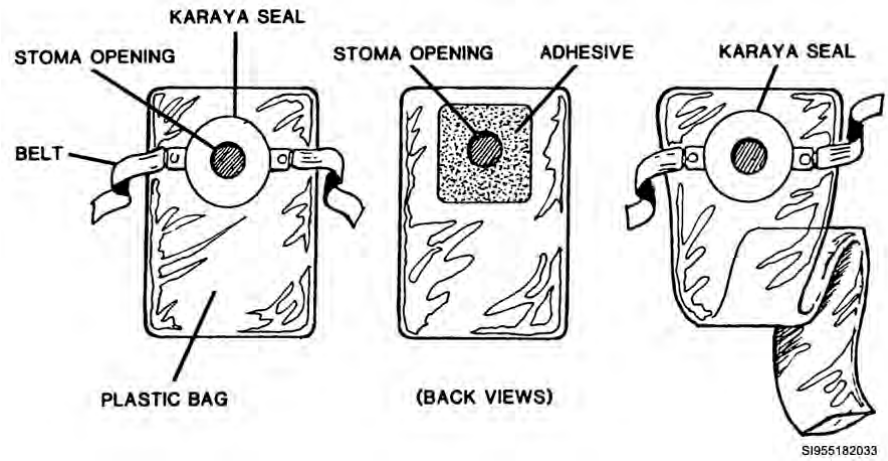


Figure 3–32. Ostomy applications.

Colostomy irrigations

The physician may order colostomy irrigations after the bowel has sufficiently healed. Daily irrigations are a means of establishing fecal control and keeping the patient clean. You will probably only assist with these irrigations the first few times they are done, but later you may be the one to do them. When the irrigation is ordered to establish regularity of the bowel, it is important that the irrigation be done at the same time every day. It should not be planned for your convenience but for the patient's. The nurse discusses this with the patient and determines the time that will be best for the

patient after the he or she goes home. The irrigation is then given daily at that time while the patient is in the hospital. To deviate from this will prevent the patient from establishing regular times of defecation, which continues the patient's distress regarding the colostomy. Another important aspect of these irrigations is to teach the patient how to do them. You may be responsible for portions of this teaching, so find out from the nurse just how much you should teach and how much the patient should do. If the colostomy is a permanent one, the irrigation should be done with the equipment the patient will use at home. Figure 3–33 depicts a patient with a colostomy bag in place.

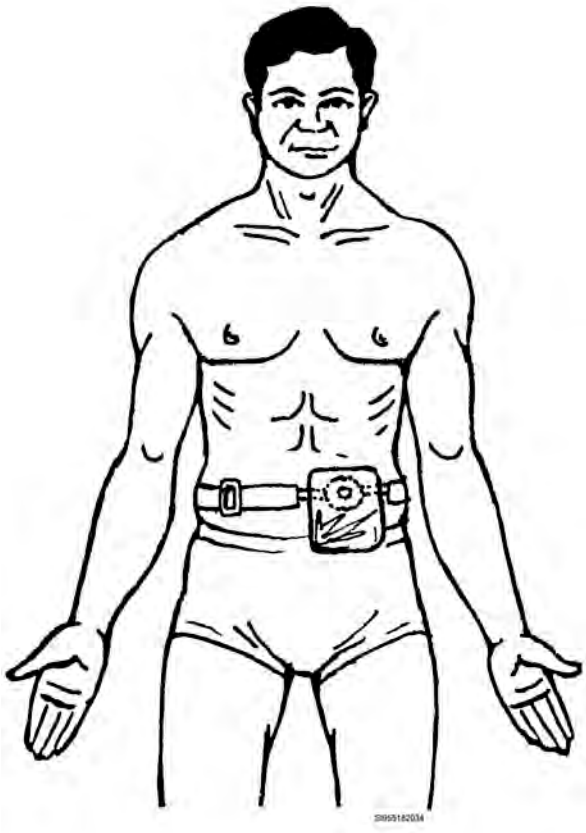


Figure 3–33. Colostomy bag on patient.

Self-Test Questions

After you complete these questions, you may check your answers at the end of the unit.

234. Assisting patients with their urinary elimination needs

1. What are three reasons a catheterization is performed?

2. Why is it important to decompress the bladder slowly?

3. What are two types of catheters?

4. What type of technique is used when inserting a catheter?

5. How far into the urethra is the catheter inserted for the male patient?

6. How far into the urethra is the catheter inserted for the female patient?

7. Why do you pinch the catheter tube prior to removing it?

8. To prevent damaging the urethra, what must you remember to do what when removing an indwelling catheter?

9. What is the purpose of bladder irrigations?

10. When is keeping a child's I&O records appropriate?

235. Assisting patients with intestinal elimination needs

1. What are two types of enemas?

2. What are three reasons for the use of cleansing enemas?

3. What position is the patient placed when administering an enema?

4. When giving a cleansing enema, how many minutes should the solution be retained?

5. When giving a retention enema, how high should the solution container be held above the rectum?

6. What are retention enemas used for?

7. What are two reasons for colostomy irrigations?

8. What is the most common reason for receiving a colostomy?

Answers to Self-Test Questions

225

1. Pain, neurological damage, structural defects, weakness, psychological problems, and rehabilitation measures.
2. They must be convinced that the activity is going to help and motivated to do the activity.
3. Fatigue lowers pain tolerance.
4. Stroke victim.
5. Inactivity or degenerative processes like cancer.
6. Allows injured tissues to heal.
7. Many do not want to be on bed rest and will resist limitations.

226

1. They are in a strange environment, they don't know what is going to happen, and they can't do anything to protect or help themselves.
2. Regression and child-like behavior.
3. Impaired circulation to the skin and subcutaneous tissue in areas of the body where the bony prominences lie close to the skin surface.
4. The ulcer has penetrated down to the muscle causing distortion of muscle tissue and loss of body fluids.
5. Topical agents, surgery, heat lamps, and various other remedies.
6. Holds the body erect when you are standing, sitting, walking, or balancing.
7. A combination of poor posture, lack of support, and stretched muscles.
8. Bones become brittle and susceptible to damage.
9. Prevention.
10. The flow is slower because there is no muscle activity helping to push the blood through the body.
11. Inadequate vasoconstriction.
12. Loss of respiratory muscle tone, inadequate exchange of oxygen and carbon dioxide, disruption of the acid-base balance, hypostatic pneumonia, and atelectasis.
13. The patient may have a fever or be in pain.

227

1. Backaches, muscle strains, and other permanent problems.
2. The proper relationship of body parts to one another.
3. When you simultaneously contract your abdominal muscles and your buttocks muscles, you create a muscular barrier around the intervertebral discs of your lower back. This barrier, or "girdle," helps protect your lower back when you strain to lift or move objects.
4. Your head should be erect and in line with your back—not leaning in any particular direction.
5. Crossing your legs or sitting so the back of the chair is pressing against your popliteal area.
6. How you will do the task, what equipment you will need, and how much help you will need.
7. You would injure either yourself or your patient, or both.
8. Your stability increases as your center of gravity moves closer to your base of support.

9. Using jerky motions, you lose your momentum and need more energy to start moving again.
10. Use your body weight to help pull the patient towards you.
11. Shoulders, upper arms, thighs, and hips.
12. The resistance of friction is less than the resistance of gravity.

228

1. Whenever the patient cannot move himself or herself.
2. Hand washing, greeting the patient, checking the ID, and explaining the procedure.
3. Raise it to a working level, lock the wheels, lower the head of the bed, and place the pillow against the headboard.
4. By pulling with the arms and pushing with the feet.
5. Patients too heavy for one person to handle safely and patients who are incapable of assisting with the move.
6. Across the chest.
7. Patients who have back, shoulder, or chest injuries.
8. The modified shoulder drag technique.
9. At the hip and neck level.
10. Every two hours.
11. Most patient do not want other patients staring at them as they are dragged around the bed, and some patients are accidentally exposed during the procedure.
12. Make sure the patient is comfortable and his or her body is aligned properly.
13. To shift the patient's weight and to prevent him or her from rolling back to the original position.
14. About 12–15 inches apart with one slightly behind the other.
15. When you push, you lose some control and risk the possibility of accidentally pushing the patient out of bed.
16. For repositioning, to perform various procedures, and in preparation for getting out of bed.
17. At the head of the patient so he or she can see the patient and what the other technicians are doing.
18. In stages.

229

1. There is more lifting and moving involved as well as a greater chance for injury to the patient and technician.
2. Helpless and near-helpless patients, preoperative and postoperative patients, and others who must remain in a lying position.
3. There is more lifting and reaching involved.
4. Cover it with a clean, dry sheet, tuck it in around the edges to eliminate wrinkles, have another sheet and blanket available to cover the patient after he or she is on the litter, also have a pillow available if allowed, and have in place attachments to support any equipment (e.g., IV tubing, catheters, or oxygen tubing) that is attached to the patient.
5. At a 90° angle to the foot of the bed.
6. Three-person technique.
7. One technician goes to the far side and holds the patient so the patient doesn't fall out of bed. The other two technicians place the stretcher alongside the bed and then position themselves on the far side of the stretcher. Once they are positioned, the third technician on the far side raises the siderail and joins them.
8. With a drawsheet.
9. Headfirst.
10. The edge of the bed will put pressure on the backs of the patient's legs and interfere with circulation.
11. Beside the patient with one arm behind the patient's shoulders and the other arm beneath the patient's thighs.
12. Sitting up and dangling.

13. Well-fitting, hard-soled shoes.
14. The technique that you are most comfortable with, allows you to control the patient's movements, and still permits you to use good body mechanics.
15. The patient may be a little unsteady when first standing up.
16. Prevents the patient's feet from sliding out from under him or her.
17. Be sure the wheels are locked and the footrests are out of the way.
18. Behind the patient with your arms under the patient's arms and grasping the patient's forearms.
19. Because it puts too much strain and pressure on the back of the person lifting the patient's upper body; the first technician's back.
20. When going through a doorway or entering an elevator.
21. To provide a smooth transfer and to reduce the possibility of injury to patient and technician.
22. To avoid excessive reaching.
23. It consists of a canvas sling supported by a metal frame on wheels. The lift has several pivot points that can be adjusted by a hydraulic cylinder.

230

1. Their muscles have atrophied and weakened, and they are usually unsteady.
2. Help the bedridden patient remain as active as possible and move the patient out of bed in gradual stages.
3. A litter (stretcher) strap or even the patient's own belt.
4. Standing beside and a little behind the patient, with one hand on the patient's waist and the other hand supporting the patient's near arm.
5. Light, unstable objects and objects that are on wheels (overbed tables) or ordinary chairs.
6. Patient's physical condition, support needed, type of disability, and the doctor's orders.
7. Axillary crutches.
8. Have the patient stand up straight and measure from a point six to eight inches out from the side of the patient's heel. Adjust the crutch so the top piece is two to three fingerbreadth below the patient's axillary fold.
9. The supports move one at a time. If you start with the right crutch, it is followed by the left foot which is followed by the left crutch, and finally by the right foot.
10. Body first, then crutches.
11. Patients using Canadian crutches support themselves on their hands; platform crutches are designed to support the patient's weight on the forearms and require very little hand strength.

231

1. Stop the exercise and notify the doctor or nurse.
2. Patients who are unable or not allowed to do active exercises.
3. Movement toward the center of the body.
4. They prevent shortening of the muscles, tendons, ligaments, and joint capsules that lead to joint fixation.
5. Doctor's orders and patient's diagnosis and capabilities.
6. Cradle or cup the body part and support it above and below the involved joint.
7. Active ROM exercises, isometric exercises, bed exercises, dangling, and ambulation.
8. Straining causes irregular heartbeats that may cause a heart attack.
9. Increased upper body strength.

232

1. The patient's physician.
2. (1) i.
   (2) f.
   (3) e.

(4) c.
(5) a.
(6) b.
(7) g.
(8) d.
(9) h.

233

1. The desire for food or an agreeable attitude toward eating food.
2. Pain, discomfort, and unpleasant sights, sounds, or odors.
3. Types of food, eating utensils, and methods of preparation.
4. Personal preference.
5. AF Form 1094, Diet Order.
6. Assist the patient with oral hygiene, assist the patient to the bathroom or bedpan, provide equipment to wash his or her hands, straighten the linen, and raise the head of the bed to a sitting position.
7. Last.
8. The clock method.
9. Diagnose a disorder, feed a patient, relieve distension, drain the stomach, or wash out the stomach.
10. High Fowler's position.
11. Place the end of the tube at the tip of the nose, extend it to the patient's earlobe, and then down to the xiphoid process.
12. With the NG tube at the level of the nasopharynx, have the patient flex his or her head to his or her chest and begin to swallow as you pass the tube.
13. Gasping for air, coughing, or turning cyanotic.
14. (1) Aspiration of stomach contents, (2) auscultating for air sounds with injection of 5–15 mL of air into the stomach, (3) assuring the patient can speak, and (4) an x-ray to ensure placement.
15. Gavage.
16. Ensuring proper placement of the NG tube.
17. Room temperature.
18. 10–20 minutes.
19. Introduction of a solution into the stomach through a tube and then siphoning the solution back out.
20. To improve or ensure patency of the NG tube.

234

1. (1) Relieve or prevent bladder distention, (2) collect a sterile urine specimen, or (3) empty the bladder before certain surgical procedures.
2. To prevent bladder damage, shock, chills, and fever.
3. Straight and Foley (double-lumen).
4. Sterile aseptic.
5. 6–10 inches or until the urine begins to flow for straight catheters and to the catheter bifurcation for indwelling catheters.
6. 2–3 inches or until urine begins to flow.
7. To prevent air from entering the bladder.
8. Deflate the balloon.
9. To remove or wash out blood, pus, bacteria, or waste products following urinary surgery.
10. If the child has a fever, hyperventilation, renal or cardiac disease, or diaphoresis; is receiving IV or diuretic therapy; is placed on restricted fluids; or has cystic fibrosis. It is also important when a child has electrolyte losses associated with vomiting, diarrhea, GI drainage, or extensive open wounds, such as burns, that can deplete or alter fluid reserves.

235

1. Cleansing and retention.
2. (1) Relieve constipation, (2) preparation for surgery, and (3) preparation for diagnostic procedures.
3. Left lateral recumbent or on his or her back.
4. At least five minutes.
5. Approximately 12 inches above the rectum, but no more than 18 inches.
6. Treat diseases of the rectum and lower colon, soften fecal material or soothe an irritated colon or rectum, and administer medication.
7. Establishing fecal control and keeping the patient clean.
8. Cancer of the rectum.

Complete the unit review exercises before going to the next unit.

Unit Review Exercises

Note to Student: Consider all choices carefully, select the *best* answer to each question, and *circle* the corresponding letter.

57. (225) For patients who suffer from pain, the *best* way to ensure a successful exercise activity program is to
    a. schedule the activities for afternoon or evenings.
    b. begin the program early in the patient's hospital stay.
    c. plan the activities in conjunction with pain medications.
    d. provide reassurance and a clear explanation of the program.

58. (225) When planning activities for patients with psychological problems, your *primary* goal should be to
    a. motivate the patient.
    b. reassure the patient.
    c. show sincere concern.
    d. develop a good rapport.

59. (226) What should you do to help patients who become angry and hostile?
    a. Involve the patient in group therapy sessions.
    b. Allow the patient to become physically abusive.
    c. Refer the patient to the nurse or physician for counseling.
    d. Allow them to channel their hostility through verbal expression.

60. (226) To aid in preventing decubitus ulcers, patient positioning should be changed every
    a. one hour.
    b. two hours.
    c. three hours.
    d. four hours.

61. (227) Why should your feet be parallel when you are standing?
    a. Prevent back, hip, and leg strain.
    b. Prevent back, hip, and neck strain.
    c. Maintain balance and prevent back, hip, and leg strain.
    d. Maintain balance and prevent back, hip, and neck strain.

62. (227) To use the internal girdle of support, you *must*
    a. simultaneously contract abdominal and buttocks muscles.
    b. simultaneously contract abdominal and shoulder muscles.
    c. contract buttocks muscles and relax abdominal muscles.
    d. contract abdominal muscles and relax buttocks muscles.

63. (228) Which factors determine the technique you will use to move the patient up in bed?
    a. Size and capabilities of the patient.
    b. Size and capabilities of the technicians.
    c. Size of the patient and capabilities of the technicians.
    d. Size of the patient, capabilities of the technicians, and available equipment.

64. (228) When turning a patient, what is the *most important* precaution to take whether you are pushing or pulling the patient?
    a. Do not push too hard.
    b. Raise the far siderail.
    c. Raise the near siderail.
    d. Lock the wheels on the bed.

65. (229) The person in charge of a bed to stretcher transfer should be positioned
    a. Near patient's shoulder furthest from stretcher.
    b. At the bottom of the bed on the stretcher side.
    c. At the head of the bed on the stretcher side.
    d. Near patient's shoulder closest to stretcher.

66. (229) Which devices can be used to *slide* a patient from the bed to a stretcher?
    a. Drawsheet and trapeze.
    b. Drawsheet and roller board.
    c. Drawsheet and patient hoist.
    d. Roller board and patient hoist.

67. (230) When helping a patient to ambulate, how should you stand and where should you place your hands?
    a. Beside the patient with your near arm interlocked with the patient's near arm.
    b. Beside the patient with one hand on the patient's waist and one hand under his or her near arm.
    c. Beside and a little behind the patient with your near arm interlocked with the patient's near arm.
    d. Beside and a little behind the patient with one hand on the patient's waist and one hand under the patient's near arm.

68. (230) Which is a safe, stable gait that can be used by patients who can bear some weight on both legs?
    a. Two-point.
    b. Three-point.
    c. Four-point.
    d. Swing-through.

69. (231) Which type of patient exercise is provided for patients who are either unable or *not* allowed to exercise?
    a. Isometric.
    b. Isotonic.
    c. Passive.
    d. Active.

70. (231) Care *must* be taken to ensure patients do *not* strain while holding their breath when performing isometric exercises as that may cause
    a. muscle strain.
    b. heart attack.
    c. dizziness.
    d. acidosis.

71. (232) What diet is usually ordered for patients who have difficulty chewing or swallowing or need to alter the amount of residue in the digestive tract?
    a. Soft.
    b. Bland.
    c. Liquid.
    d. Regular.

72. (232) The diet that is inadequate in all nutrients and should *not* be given for more than three days is the
    a. soft diet.
    b. full liquid.
    c. clear liquid.
    d. mineral-restricted.

73. (233) Which precaution should be taken *just prior* to performing a procedure that uses the patient's nasogastric (NG) tube?
    a. Check the physician's orders.
    b. Check for tube placement.
    c. Inform the patient.
    d. Wash your hands.

74. (233) What should the solution temperature be during gastric gavage?
    a. Hot.
    b. Chilled.
    c. Lukewarm.
    d. Room temperature.

75. (234) During catheterization of a male patient, at what angle is the penis held, and how many inches is the catheter inserted?
    a. 20°, 4 to 5 inches.
    b. 30°, 6 to 10 inches.
    c. 60°, 4 to 5 inches.
    d. 90°, 6 to 10 inches.

76. (234) During catheterization of a female patient, how many inches (how far) is the catheter inserted for placement in the urinary bladder?
    a. 2 to 3.
    b. 3 to 4.
    c. 4 to 5.
    d. 5 to 6.

77. (234) When measuring urine output of an infant, one gram (g) of diaper weight is equal to
    a. one milliliter (ml).
    b. two ml.
    c. three ml.
    d. four ml.

78. (235) For administration of an enema, the patient is preferably positioned
    a. prone.
    b. supine.
    c. on his or her left side.
    d. on his or her right side.

79. (235) Colostomy irrigations are performed to
    a. prevent the patient from having to wear an ostomy appliance.
    b. keep the bowel empty as much as possible.
    c. prevent the possibility of odors.
    d. establish fecal control.

Please read the unit menu for unit 4 and continue ➔

Unit 4. Special Care and Procedures

HAVE YOU HAD the experience of caring for someone during an asthma attack or maybe even witnessing a cardiac arrest? I'm sure if you have; your adrenaline was pumping and you were afraid that you may do something wrong. Understanding why, when, and how you give oxygen therapy should be one of your priorities as a medical service technician. This unit is designed to teach you about cardiorespiratory care.

4–1. Oxygenation

Many diseases and conditions can directly affect the respiratory system, some you've learned in a previous course. When providing care for patients in respiratory distress, keep in mind that not being able to breathe is frightening. Keeping the patient calm and focused is very important! Other major goals related to oxygen therapy are maintenance of a patient's airway and relief of pain. Let's first discuss the body's oxygen needs.

236. Oxygen needs of the body

"Your body needs oxygen to survive." You probably learned this principle in grade school, but I'm sure you realize there is more to it than that. In our previous unit, we discussed fluid and electrolyte balance along with respiratory acidosis and alkalosis. We'll discuss these two subjects again as they relate to the respiratory system.

Oxygen needs

As you recall from anatomy and physiology, the respiratory system is involved with the exchange of gases, specifically, oxygen and carbon dioxide (CO_2). Through respiration, we take air into our lungs to obtain oxygen in exchange for the CO_2 that we exhale. It is important to remember that with normal healthy individuals, the level of CO_2 in the arterial blood provides the stimulus to breath.

NOTE: Patients with chronic obstructive pulmonary disease (COPD) are opposite; their stimulus to breath is the level of oxygen. Giving high concentrations of oxygen to a COPD patient could cause respiratory arrest.

To determine the amount of gases present in the patient's blood, the physician will order "arterial blood gases" (ABG) be performed. In most cases, a respiratory technician will draw the sample; in emergencies, the physician may perform the procedure himself. Later, we will discuss your role in assisting with or performing this procedure, but for now, what exactly do the results of an arterial blood gas mean? This chart lists abbreviations for blood gas results and normal values.

Subject	Abbreviation	Normal Values
Partial pressure of arterial oxygen (oxygen tension)	PaO_2	80–100 mm Hg
Partial pressure of arterial carbon dioxide (carbon dioxide tension)	$PaCO_2$	35–45 mm Hg <35=respiratory alkalosis >45=respiratory acidosis
Percentage of hydrogen ions	pH	7.34–7.45 <7.35=acidosis >7.45=alkalosis
Arterial oxygen saturation	SaO_2	95–98 percent <80 percent is abnormal
Venous oxygen saturation	SvO_2	

This chart lists a few medical terms you should be familiar with.

Term	Meaning
Hypocapnia	Low carbon dioxide concentrations in arterial blood.
Hypercapnia	High carbon dioxide concentrations in arterial blood.
Hypoxia	Low oxygen levels at the cellular level.
Hypoxemia	Low oxygen content in arterial blood.

Keep in mind, the percentage of gases in the lungs directly affects the pH of the blood. If the patient is having difficulty breathing; the respirations are slow, shallow, and weak; and the patient exhibits signs of cyanosis or pallor, he or she is *hypoventilating.* Hypoventilation causes a decrease in the PaO_2. Remember, when there is a decrease in O_2, the tissues of the body are not receiving an adequate amount of O_2. When this occurs, CO_2 is building up in the patient's lungs, and his or her $PaCO_2$ is greater than 45 mm/Hg. As the CO_2 builds up, it mixes with the water in the blood serum, which results in the formation of carbonic acid. In turn, this causes the blood to become acidic, resulting in what we call *respiratory acidosis.*

In another example, the patient may be exhibiting rapid, deep breathing, as with the asthmatic patient. This is referred to as *hyperventilation.* In this case, the patient is "blowing off" all the CO_2 during exhalation. This causes an excessive loss of an acid, causing a condition called *respiratory alkalosis*. In this case, the blood pH will be high and the $PaCO_2$ will be low.

Place the terminology and laboratory values listed above in your memory banks. Pay special attention the next time you see ABG results. This will give you a greater understanding of why the physician orders certain procedures, special equipment, and specifies liters per minute of oxygen delivery.

237. Providing oxygen to the body

As discussed in the previous lesson, oxygen must be perfused throughout the body to sustain life. In this lesson you'll learn about oxygen delivery systems. But first, we'll discuss the assessment of the patient's respiratory status.

Assessing breathing and lung sounds

When doing a primary assessment, you look, listen, and feel for breathlessness. Although, in an emergency situation, you may not have the time to use a stethoscope to auscultate for air exchange, it is one of the options available to you. Unfortunately, this technique takes practice to develop and experience to understand what you are listening to. There are records and tapes available that help teach listening to lung sounds; you may want to check your hospital library or nursing continuing education office for the availability of these resources. Also, listening to lung sounds is an important part of providing respiratory care (e.g., coughing and deep breathing exercises, inhalation treatments,

chest percussion and postural drainage, etc.). Prior to giving these treatments, listen to the patient's lung sounds. After the treatment, listen again. Has there been any improvement? Can you identify which part of the lungs is involved? Practice listening to your patient's lung sounds, then get a nurse to verify your assessment. Look at figure 4–1, it shows you the proper placement of the stethoscope when auscultating lung sounds and the lobular location.

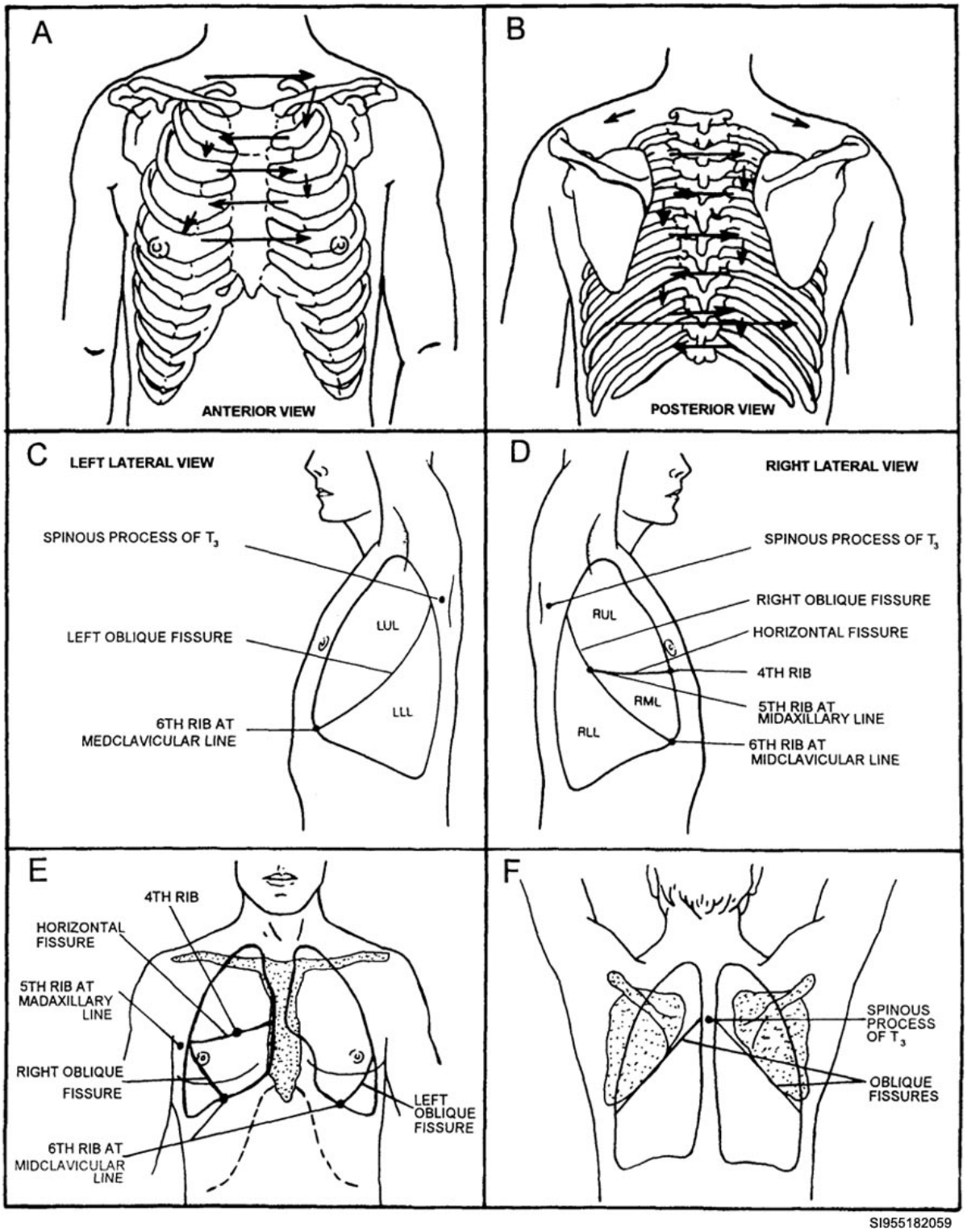


Figure 4–1. A and B: Auscultation points, C–F: Lobular locations.

Terminology Used To Describe Various Lung Sounds	
Term	**Definition**
Stridor	Harsh sound made during inspiration; it is usually associated with obstruction or edema.
Wheezing	A whistling sound heard upon inspiration or expiration. Wheezing is caused by narrow airways and is a common noise associated with the asthma patient.
Snoring	Noisy breathing usually caused by an obstructed airway.
Rales	Fine, crackling sounds (imitated by rubbing hair between fingertips).
Rhonchi	Coarse, gurgling sounds heard best on expiration.

Safety factors related to oxygen delivery

The safety factors, including the equipment and procedures used, involved with the administration of oxygen can vary from facility to facility. The information discussed here will give you the basic working knowledge of the safety factors related to the delivery of oxygen. Please read your section's OIs thoroughly to become familiar with your facility's policies.

Any time oxygen is used or handled, strict safety precautions must be observed. Although oxygen itself does not burn, it supports combustion. Items that would normally burn slowly in ordinary air will burn violently in the presence of oxygen. Therefore, follow these rules:

1. Place "No Smoking" signs outside any rooms or unit where oxygen is in use.
2. Remove all matches and smoking equipment from the bedside to remind the patient that smoking is not permitted when oxygen is in use.
3. Do not use oils or greases with any oxygen equipment.
4. Do not use combustible materials (e.g., alcohol or ether) near the patient. In the presence of a high oxygen concentration, these substances may ignite and cause an explosion.
5. Ban all electrical devices and appliances.
6. Allow only cotton blankets to be used so that there will be no danger of sparks from static electricity.

The supply of oxygen is available at the bedside from a centrally located oxygen supply by pipes or tubes or from a metal tank brought to the bedside. Before you use a metal tank, ensure its fill date does not exceed five years. This date is normally stamped into the metal somewhere around the top of the cylinder. If a metal tank is used, secure it to keep it from falling. Most AF hospitals are equipped with a centrally located oxygen supply system. Outlet valves are situated at each area of use.

Oxygen administration methods

Oxygen is administered by an oxygen tent, oxygen mask, nasal cannula, or ventilator. Figure 4–2 illustrates some of the equipment commonly used to administer oxygen. Refer back to this illustration as we discuss the specific equipment. Regardless of the method used, the objective is the same—to provide a direct concentration of oxygen to the patient. The physician determines the method of administration and the concentration of oxygen. The choice depends on the patient's condition, immediate situation, available equipment, and whether the patient can tolerate the specific type of equipment necessary for its administration.

Humidified oxygen

Humidified oxygen is used for patients who are likely to be on an oxygen source for an extended period of time, some medical conditions, and for the patient's comfort. If you think about oxygen blowing across the mucus membranes, it's not too difficult to figure out that it will dry out the mouth and nose rather quickly. Humidified oxygen also helps keep secretions from becoming thick and dried out as well. The humidifier setup generally consists of a bottle of sterile water with a top that can be hooked to a flowmeter (to the wall or tank) and an outlet to connect oxygen tubing. Turn the flowmeter on to the directed liters per minute, ranging from 2–12 liters per minute, and ensure that

the oxygen is flowing well prior to placing the mask or cannula on the patient. Humidified oxygen is also used with other oxygen delivery methods, such as oxygen tents/croup tents, hoods, masks, cannulas, and ventilators.

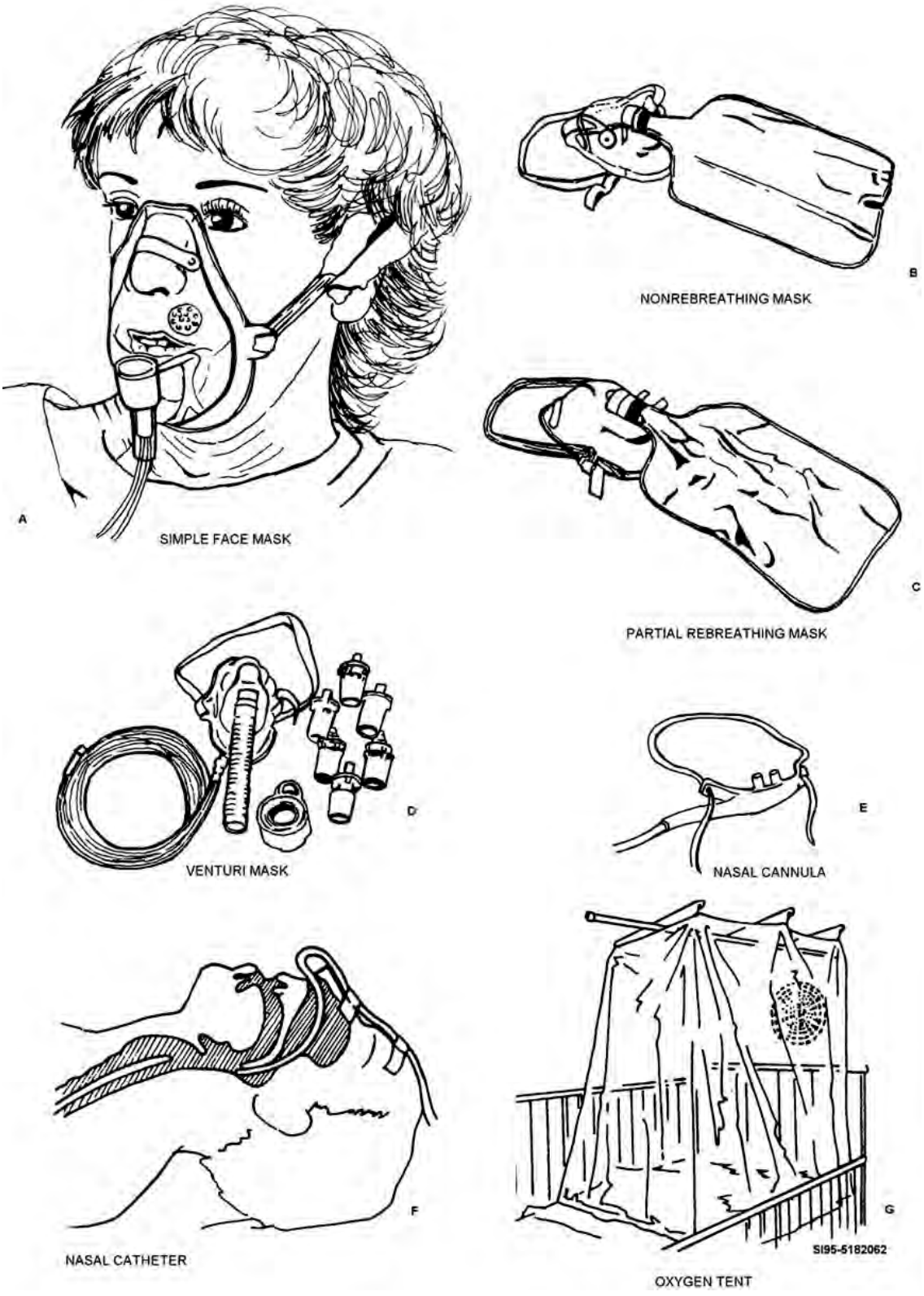


Figure 4–2. Oxygen delivery devices.

Oxygen tent/croup tent

Although usually seen on pediatric units, the oxygen tent is an accepted method of administering oxygen to any patient. It is often the method chosen with the very sick, restless, or uncooperative patient. The tent consists of a transparent plastic canopy, which covers the patient and part of the bed, and a cabinet connected to an oxygen supply. Oxygen is first piped through the cabinet where it is cooled and humidified, then it is circulated throughout the canopy. A blower motor keeps the oxygen inside the tent circulating while a thermostat controls the temperature at 17.8–21.1°C (64–70°F). Concentrations of oxygen within the tent are maintained at 30–50 percent. To ensure the flow of oxygen remains constant, it must be tested with an oxygen analyzer every one to two hours. The tent should not be opened except when it is necessary to give care to the patient.

Oxygen hood

An oxygen hood, which is a plastic container that fits over the patient's head, is usually seen in neonatal units. The plastic hood is filled with warm, humidified, and highly concentrated oxygen. The oxygen is warmed to 31–34°C (87.8–93.2°F) to prevent cold stress to the infant. The oxygen concentrations, along with the temperature and humidity, are continuously monitored by an oxygen analyzer.

Oxygen masks

Oxygen masks are used most often because they permit a higher concentration of oxygen to be administered. There are many types of face masks—the face tent or open-top mask, partial rebreathing or nonrebreathing masks, venturi mask, and positive airway pressure masks. The type of mask used will be selected by the patient's physician. It is important to know that a well-fitting mask is the only way oxygen concentrations of 90–100 percent can be supplied. Ensure the mask fits properly and is comfortable to the patient. To prevent facial irritation, remove the mask every three to four hours. While the mask is off, thoroughly wash and dry the patient's face. Do not use a mask for patients who cough frequently or who need oral feeding. Let's take a look at a few of the masks you'll use.

Nonrebreathing mask

A nonrebreathing mask looks similar to the simple face mask except that it has an inflatable bag attached under the nose. The inflatable bag is referred to as the reservoir bag and stores 100 percent oxygen. Between the reservoir and the mask, there is a one-way valve to prevent exhaled air from entering the bag and divert it to the atmosphere. The exhalation ports are also covered with a one-way valve to prevent atmospheric air from entering the mask. With all the oxygen being supplied by the mask/reservoir, the patient can receive 100 percent oxygen and an inspired oxygen concentration of 60–90 percent. To implement use of the nonrebreathing mask, verify the physician's orders and assess the patient's vital signs and level of consciousness. Always ensure oxygen safety is being enforced and explain the procedure to the patient. Attach the tubing, humidifier, and flowmeter to the oxygen outlet. Flush the mask and reservoir with oxygen and adjust the flowmeter to the rate specified by the physician. Make sure there is an airtight seal between the mask and the patient. The patient should not deflate the bag during inhalation; if he or she does, you'll need to adjust the liter flow.

Venturi mask

A venturi mask is used when the patient needs low concentrations of oxygen, 24–50 percent. Various color-coded interchangeable adapters are used to change the mixture of oxygen and room air that is delivered to the patient. The force of the oxygen being sent into the mask prevents the accumulation of CO_2 within the mask. This is often the oxygen delivery method of choice for patients with COPD because they require lower amounts of oxygen. A COPD patient's incentive to breath comes from oxygen levels rather than CO_2 levels in the blood. In other words, they have a continually high level of CO_2. To administer a specific low level of oxygen, the venturi mask with correlating oxygen delivery masks of 24, 28, 31, 35, 40 or 50 percent can be used.

The following steps will give you guidance on using a venturi mask:

1. Check doctor's orders and gather equipment (oxygen source, flowmeter, correct concentration venturi mask). If high humidity is desired, you will need a compressed air source and flowmeter, humidifier with distilled water, and large-bore tubing. Many places require NO SMOKING signs to be posted where oxygen is being used, so check your local policy.
2. Wash hands, correctly identify the patient, and accomplish baseline vital signs.
3. Show the patient the mask and explain the procedure.
4. Connect the tubing to the mask and oxygen source.
5. Turn on the oxygen flowmeter, adjust to the ordered flow rate (normally indicated on the mask), and ensure oxygen is flowing through the mask.
6. Place mask over the patient's mouth and nose. It should fit comfortably over the nose and around the chin. Adjust the elastic straps to keep the mask comfortably in place.

If high humidity is being used, follow steps 1–3 above, then:

1. Connect the humidifier to the compressed air source.
2. Attach the large bore (flexible tubing) to the humidifier, then connect the tubing to the base of the venturi mask via the high-humidity fitting.
3. Place on patient as in step 6 above.

Once these steps have been completed for either of the two procedures above, document the oxygen flow rate, concentration, and time started. You may also need to document the patient's oxygen saturation levels after observing for a few minutes. Ensure you check the doctor's orders for required observation and assessment of the patient. Due to the size and appearance of the mask, patients will often only tolerate them for short periods of time. They will also need to be removed for eating and drinking. If the patient's condition improves, the provider may decide to change oxygen delivery method to the nasal cannula. If the patient must be transported, consider all the safety methods of other treatment and observation devices. Ensure you have plenty of oxygen and compressed air available if using the high-humidity procedure. Monitor the patient during transport and reassess when you arrive at the patient's destination.

Nasal cannula

The nasal cannula can be used to administer oxygen to a patient when a low-to-medium concentration of oxygen is desired and when the patient is prone to CO_2 retention. The equipment needed is: an oxygen source, plastic nasal cannula with connecting tubing, humidifier filled with distilled water to the indicated level, flow meter, and NO SMOKING signs.

Some of the same preparatory steps taken with the cannula patient will be repeated with the oxygen catheter patient. Post the NO SMOKING signs, show the cannula to the patient, and explain what you are about to do and how the patient can help. Make sure the humidifier is properly filled. If the humidifier bottle is too full, the bubbling water may overflow into the gauges. Connect the tubing from the nasal cannula to the humidifier outlet and start the oxygen flow rate at two liters per minute. Check to determine if oxygen is flowing through the tips of the cannula.

Place the tips of the cannula in the patient's nose. Position the cannula so the tips of the cannula do not extend more than an inch into the nares. Adjust the flow rate according to the physician's instructions. Flow rates in excess of six liters per minute may cause air swallowing and irritation to the nasal and pharyngeal mucosa. Fasten the tubing to the pillow or bed clothing. The table below illustrates the oxygen concentrations that can be delivered by the nasal cannula.

Liter Flow	Percent Oxygen Concentration
1 liter	24 percent
2 liters	28 percent
3 liters	32 percent
4 liters	36 percent
5 liters	40 percent
6 liters	44 percent

Change the cannula, humidifiers (fig. 4–3), tubing, and other equipment exposed to moisture at least every 48 hours. Continuous oxygen therapy and humidity may cause virulent infections via contaminated equipment in debilitated patients. At regular intervals assess the patient's physical and mental aberrations, as well as the functioning of the equipment. Report any abnormal findings to the charge nurse or physician.

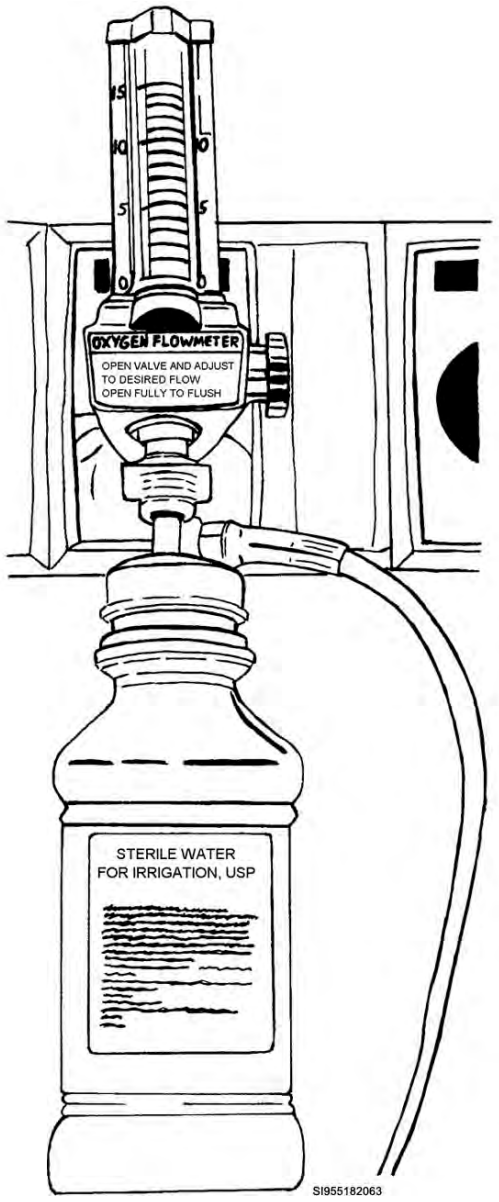


Figure 4–3. Oxygen flowmeter with humidifier.

Ventilator

There are two basic types of ventilators, negative- and positive-pressure ventilators. The negative-pressure type of ventilator is often referred to as the "Iron Lung." These ventilators work by applying a vacuum inside the tank to cause the chest to expand. The positive-pressure ventilators actively deliver air into the patient's lungs under positive pressure, and exhalation is passive. One example of a positive-pressure ventilator that you may see or hear about frequently is the continuous positive airway pressure (CPAP) device.

Negative-pressure ventilators

Negative-pressure ventilators work by applying negative pressure around the chest wall causing intra-airway pressure to become negative, which results in air being drawn into the patient's lungs via mouth and nose. The "Iron Lung" was developed in 1929 and is also known as the Drinker and Shaw tank. It resembles a tube that cocoons the body. The positive-pressure ventilator is now more widely used than the negative-pressure ventilator.

Positive-pressure ventilators

Positive-pressure ventilators can be used with a mask, endotracheal tube, or tracheostomy tube. Positive pressure enables air to flow into the airway until the predetermined ventilator breath is reached. Once the desired airway pressure is reached it drops to zero and the breath is released through passive means. Another type of positive-pressure ventilator is the CPAP.

Continuous positive airway pressure

Referred to as a CPAP, it provides positive airway pressure during the entire respiratory cycle. It is normally used with spontaneous ventilation rather than mechanical. This type of ventilator is often used with a mask for patients who are breathing spontaneously but need airway support. A CPAP is used when other attempts to increase the patient's PaO_2 have failed and prior to intubation. The mask has a cushioned mask and a head strap that helps maintain a tight seal on the face. It is also the desire of some physicians to insert a NG tube to prevent gastric distention related to the swallowing of air. Some CPAP masks have an adapter for the NG tube to prevent air from escaping from the mask. When you use an O_2 blender to mix the oxygen and air, the patient can receive oxygen in concentrations of 21–100 percent. Carefully monitor the patient's blood gases, observing any increase in PaO_2 that suggests hypoventilation. Using the CPAP can be tiring for the patient, causing hypoventilation and may only be used for short period of time (e.g., 72 hours). It is also commonly used for patients with sleep apnea. When used for this reason, patients will normally use the device when sleeping.

Examples of other ventilation devices you will see are the hand-controlled devices, such as the bag valve mask (BVM), continuous flow (anesthesia) bag, and mechanical ventilators. Since endotracheal tubes are often used with ventilator devices, we will briefly touch on some information about them.

Endotracheal tubes

Endotracheal tubes (fig. 4–4) are designed to be inserted into a patient's trachea for direct administration of air and oxygen into his or her lungs. It is the most effective airway device, but a considerable amount of skill is required to place it properly. Endotracheal tubes are most commonly

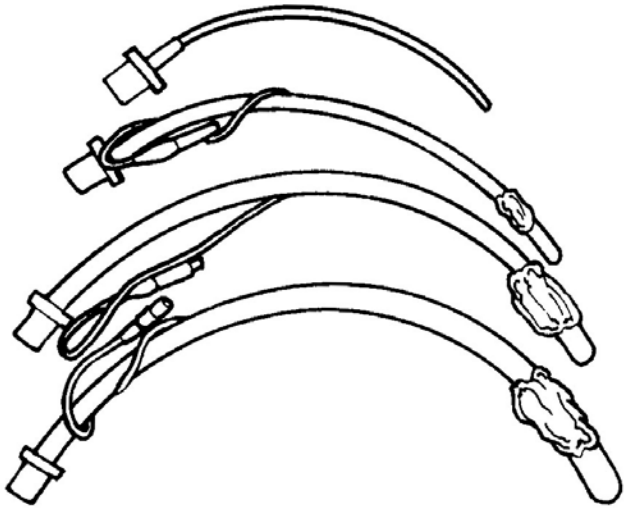


Figure 4–4. Endotracheal tubes.

inserted by a doctor or anesthetist. Your role will usually be to assist the doctor and maintain the tube once it is in place. To do that properly, you have to understand how the tube is inserted.

When a doctor is ready to insert the tube, he or she will hyperextend the patient's neck to provide easy access to the trachea. The doctor will then insert a laryngoscope into the patient's mouth to visualize the tracheal opening and hold the tongue up out of the way. Then, the endotracheal tube will be inserted through the opening into the trachea. The balloon is inflated to seal the passage and hold the tube in place. An airway or bite block is also placed in the patient's mouth so that he or she cannot bite down on the tube. Both the airway and the tube are taped in place.

When the tube is properly secured, it can be used for mouth-to-tube breathing, for BVM ventilation, or with other devices (e.g., ventilators). The tube provides direct access to the lungs. Since the balloon holds the tube in place, you do not have to hold it while you are ventilating the patient.

There are numerous problems that can occur during insertion of the endotracheal tube. If the neck is not properly hyperextended, the tube can be accidentally inserted into the esophageal passage. If that happens, the patient will get gastric distention, vomiting, and no lung inflation. The doctor can also accidentally damage the patient's teeth or oral tissues if he or she roughly inserts the laryngoscope or pries it up against the teeth. If the procedure takes over 30 seconds, the patient will become hypoxic and may suffer tissue damage. Finally, the vocal cords or trachea may be damaged when a tube is inserted or when the balloon is inflated.

Endotracheal tube care

1. Prior to care, ensure that the patient has equal, bilateral breath sounds throughout the lung fields. Check the marked points on the tube at the insertion level to determine if the tube has moved.
2. Inspect the positioning and stabilization of the tube. Position changes can obstruct the airway and potentially cause tissue erosion and necrosis.
3. Inspect the nose and mouth for any ulcers or pressure areas. Provide oral and nasal care.
4. Reposition and tape the oral endotracheal tube care (ETT) to the opposite side on a daily basis. Note the tube depth each time. Provide mouth care every two hours.

Mouth care

To care for the patient with an endotracheal tube, mouth care should be given every shift, or as frequent as needed. Check for oral secretions because they tend to accumulate in the mouth, which increases the risk for infection.

NOTE: A patient with an endotracheal tube should NEVER be given oral feedings. For patient nutrition, enteral tube feeding or parenteral hyperalimentation is required.

Patient transfer with ventilators

You should recall the information you read previously on transferring patients with oxygen and monitoring devices. It would certainly be harmful to accidentally pull out an IV or another device, but imagine the impact if the patient's source of respirations were to be lost! Extreme care of the airway, airway adjuncts, and ventilator equipment needs to be provided when moving a patient. Some simple rules and tips to follow are:

1. Prepare the patient and equipment prior to moving or transporting the patient.
2. Ensure correct tube or mask placement prior to, during, and after transport. Even with careful maneuvering of the patient, tubes and equipment can shift while moving a patient and should be checked frequently for patency.
3. If using a mechanical ventilator, ensure that the batteries are charged and have an extra set in case of failure for lengthy transports. Ensure cords are removed from the wall prior to moving

the patient and that detachable cords are transported with the machine (most ambulances have outlets that can be used en route).

4. Secure the ventilator correctly to the stretcher.
5. Take a back-up ventilation device, such as a BVM, naso, or oropharyngeal airways.
6. Ensure you have plenty of oxygen, delivery devices, handles/wrench or oxygen blender device, and stethoscope.
7. Use care when moving the patient so oxygen delivery devices are not accidentally stepped on, kinked, or pulled loose.
8. Monitor your patient throughout transport and re-evaluate frequently.

238. Special respiratory procedures

Several different diagnostic and therapeutic procedures are used in the care and treatment of the patient with pulmonary disorders (e.g., sputum collection, gastric washings, breathing exercises, thoracentesis, postural drainage, etc.). Some of these you'll do yourself; others you'll assist with or set up the equipment. To understand these procedures, consider each of them separately.

Breathing exercise

You should remember the breathing exercises that were discussed in the previous unit; however, it is important to reinforce the need for patients to correctly perform these exercises with respiratory problems and procedures other than postoperatively. Remember that the chief objective of breathing exercises is to increase or develop the expiratory phase of breathing and develop the muscles concerned with respiration. Deep-breathing exercises also maintain and cleanse the airway, improve vital capacity, and help prevent such conditions as atelectasis and postoperative pneumonia. Blow bottles and incentive spirometry (fig. 4–5) are sometimes used in the exercise program.

Figure 4–5. Breathing exercise equipment.

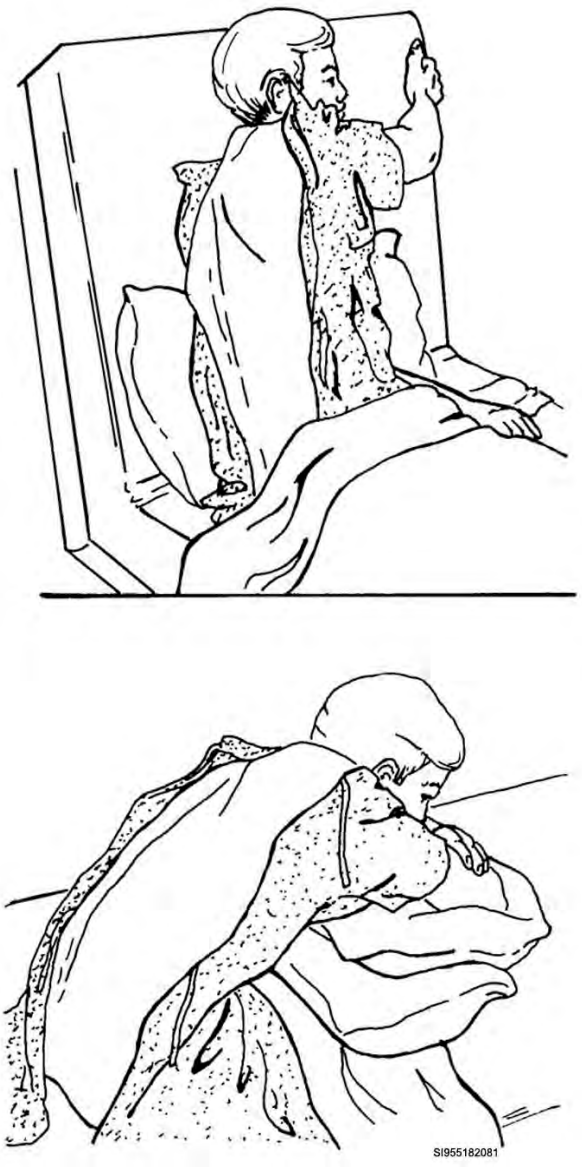


Figure 4–6. Positions used for thoracentesis.

Paracentesis

The withdrawal of excess fluid from the abdominal or peritoneal cavity is called a paracentesis. This procedure is performed by a physician to obtain fluid for diagnostic examination, to remove excess fluid, or to prepare the patient for other procedures (e.g., surgery or peritoneal dialysis). Your job will be to prepare the patient for the procedure and assist the physician throughout the procedure. Prior to the procedure, ensure a permit has been signed, the patient has voided, and vital signs are taken. The patient will be placed in a Fowler's position, but some physicians may prefer to have the patient sit on the side of the bed. The items needed for the procedure will include: paracentesis tray, anesthetic injectable medication (which may be included in the kit), and skin preparation solution. Most kits will have collection bottles or bags and specimen bottles. In most cases the physician will open the kit and prepare his or her sterile field. The physician will then prep the patient's skin and administer the local anesthesia. The needle will be introduced into the abdomen and the fluid drained. Your job will be to observe the patient throughout the procedure, observing for pallor, cyanosis, or syncope. After the procedure is over, apply a dressing over the needle insertion site. Help to make the patient comfortable, and continue to check the patient's vital signs every half hour for 2 hours, every four for the next 24 hours. (Vital-sign frequency may vary with each physician.) It will be important for you to observe for leakage or scrotal edema after the procedure. The patient could develop shock after a large amount of fluid has been drained.

Thoracentesis

Thoracentesis is the surgical puncture or tapping of the chest wall to remove fluid or air from the pleural space. The physician may perform this procedure as part of the treatment for pneumothorax (i.e., air in the pleural space), hemothorax (i.e., blood in the pleural space), or emphysema (i.e., pus in the pleural space). It may be done to confirm the diagnosis of fluid in the pleural space, to obtain a culture of organisms present, or to relieve respiratory symptoms.

The procedure is performed with a surgical aseptic technique. The skin is cleansed and an antiseptic applied. A local anesthetic is injected into the entrance site and the thoracentesis is accomplished. All equipment needed for the procedure should be contained in a tray prepared specifically for it.

Positioning patients depends on the wishes of the physician. The patient may be sitting on the side of the bed, in a chair, or lying in a lateral, recumbent position (fig. 4–6). Regardless of the patient's position, assist the patient and, if necessary, support the patient. After the procedure, apply a sterile dressing to the tap site, place the patient in the position specified by the physician, make the patient

comfortable, and observe him or her for several hours for signs of shock, bleeding, or respiratory difficulty (dyspnea). If any of these signs occur, report them to the nurse immediately.

Postural drainage

Postural drainage is used to assist the patient in raising sputum or excess secretions of purulent materials during inflammatory conditions of the chest. Postural drainage helps to remove these secretions by gravity. The general principle involves positioning patients so their head is lower than their chest. Figure 4–7 shows positions that may be used to promote postural drainage. While patients are in one of these positions, they should be instructed to turn from side to side, breathe deep, and cough to facilitate drainage and loosen secretions.

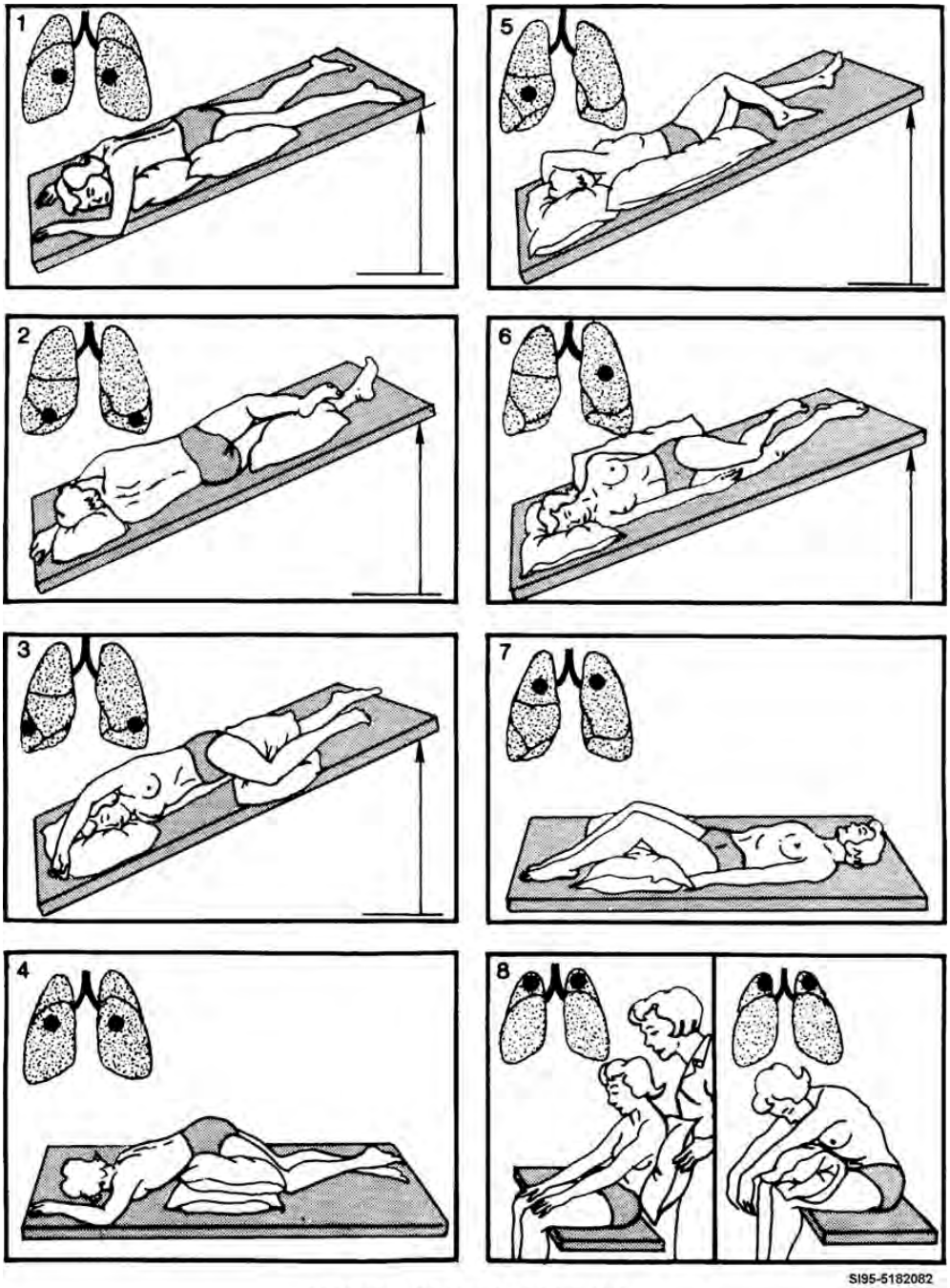


Figure 4–7. Postural drainage positions.

Chest percussion is accomplished along with postural drainage. In a postural drainage position, clap the patient's back over the lung lobes using cupped hands. Dizziness is likely to occur during this procedure. To prevent the patient from falling, remain with the patient during the entire procedure. The first few times the patient is in this position should be brief—just a few minutes. Gradually, it can be increased to l5 or 20 minutes, depending on the orders of the physician. Provide the patient with a small basin or sputum cup for expectoration.

After the procedure, mouth care is very important. The purulent materials brought up from the lungs leave an unpleasant taste in the mouth. A suitable mouthwash helps to remove any mouth odor and leaves the mouth refreshed. A small glass of citrus juice may also be offered. *Postural drainage is never done without a physician's order.*

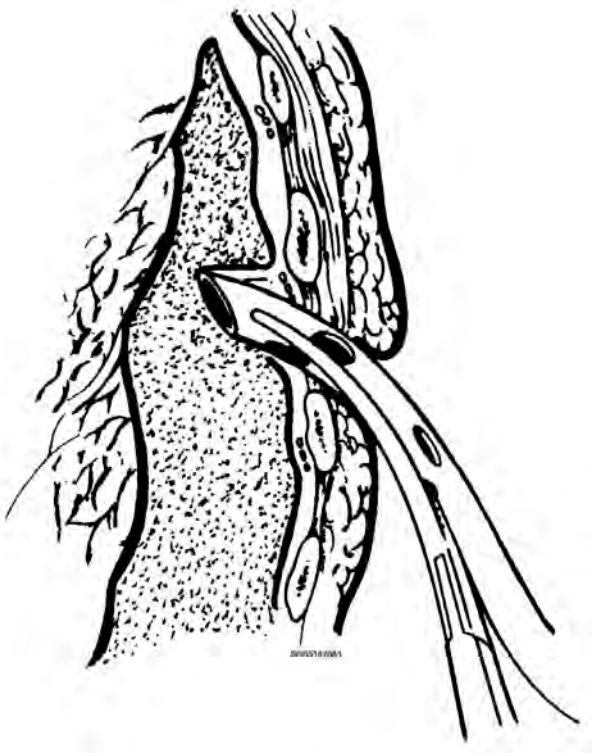


Figure 4–8. Chest tube insertion.

Chest tube insertion

Referred to as a tube thoracostomy, chest tube insertion is done to help evacuate air, blood, or fluid from the pleural space. A physician will perform the procedure; your job will be to assist him. The first thing you'll need to do is gather the equipment needed to perform the procedure including—chest tube insertion tray (thoracostomy tray), suture material, local anesthetic, a chest tube, and a drainage system. In preparation, the physician will usually obtain an x-ray to help evaluate the extent of lung collapse or amount of bleeding in the plural space. You'll assemble the drainage system and explain the procedure to the patient; the physician will clean and anesthetize the skin area. The physician will then make an incision and insert the chest tube using hemostats. See figure 4–8 for insertion of a large-bore chest tube. After proper insertion, the tube is connected to the drainage system, sutured into place, and covered with a sterile dressing. After the procedure, be sure the drainage system is working properly, and observe the patient for signs of infection. Report any signs of air or fluid leakage from around the tube to the nurse.

Closed-chest drainage, also called underwater or water seal drainage, is a drainage system used to re-expand a collapsed or partially collapsed lung. It is used after some types of chest surgery and in the treatment for certain pulmonary disorders to remove air, pus, blood, or fluid from the pleural cavity. It is called closed drainage because it allows the removal of these foreign materials under a closed system of tubes and drainage bottles. It is a one-way system; nothing is allowed to re-enter the lungs.

The pressure within the pleural cavity is normally slightly lower than atmospheric pressure and is called negative pressure. This negative pressure is necessary to permit the normal movement of air into and out of the lungs. Any accumulation of foreign materials or an opening allowing air to enter the pleural cavity destroys this normal negative pressure. This event causes pain, labored breathing, and an inadequate exchange of oxygen, and it allows the lung to collapse. Negative pressure must be restored to the pleural cavity and the lung re-expanded to its normal size. This is the main purpose of the closed-chest drainage system.

Drainage is accomplished by connecting a rubber tube to a catheter that has been inserted into the pleural cavity. The rubber tube is then connected to a water seal drainage bottle. The system may be used with one, two, or three drainage bottles or with a drainage container (fig. 4–9). It works on the principle that the pressure in the drainage bottle is lower than that in the pleural cavity. This lower pressure causes the contents of the pleural cavity to be siphoned off into the drainage bottle, which is partly filled with water. During each breath, some air is forced from the pleural cavity. The water in the container acts as a "seal" to prevent air from re-entering the tube and pleural cavity. The drainage container must always be lower than the patient; otherwise, gravity would force material back into the pleural cavity.

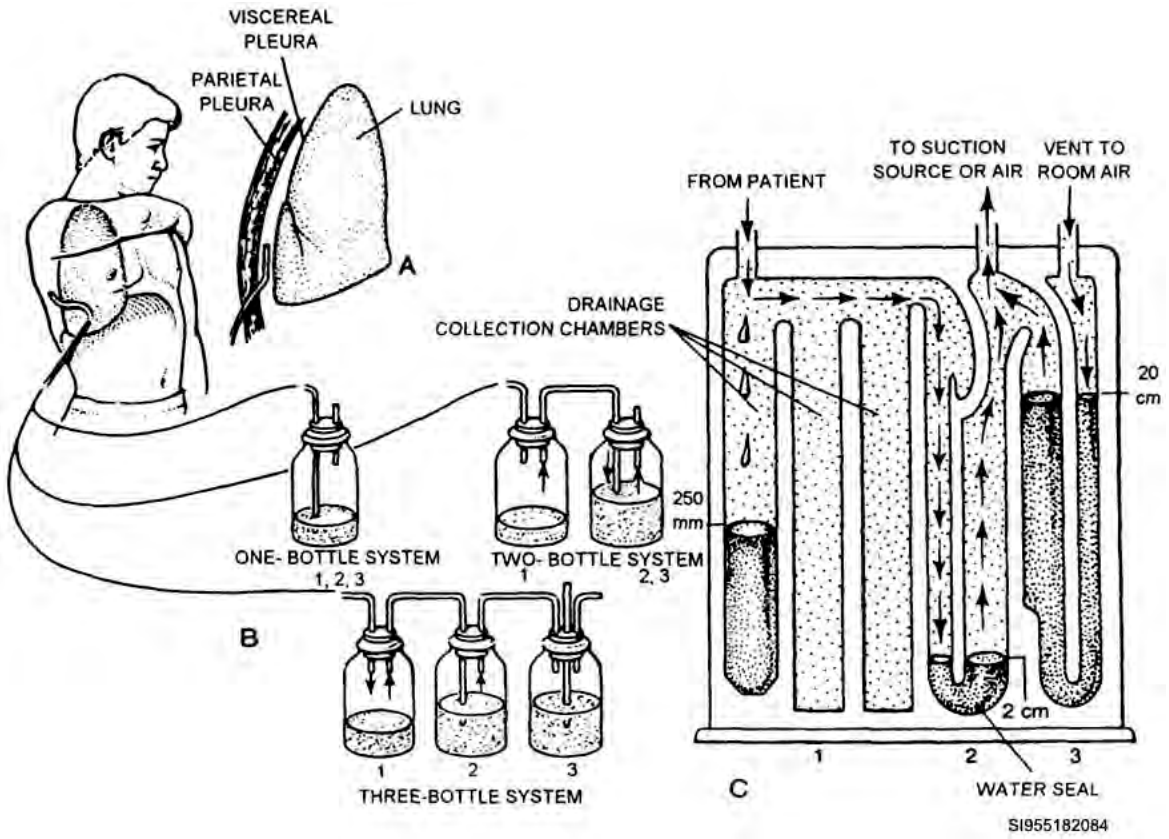


Figure 4–9. Chest drainage systems.

When the drainage system is functioning properly, a small amount of water is drawn into the tube on inspiration, and bubbles should appear in the water during expiration. Gallon jugs are usually used for drainage bottles. These containers should be secured to the floor or held in a specially designed holder to prevent someone from accidentally kicking them over. A large clamp or hemostat should be attached to the bed to clamp off the tube in case there is a break or some type of disruption in the drainage system. The drainage tube must be kept open. A blood clot in the tubing can cause the drainage to stop. A special tool is used to "strip" the tubing to prevent this from happening. The drainage tube may need to be stripped every 30 minutes to every 2 hours, depending on the amount of drainage. Keep a watchful eye on the system; it's an important part of the care and treatment of the patient.

Tracheostomy tube/dress stoma

A tracheostomy (fig. 4–10) is usually performed as an emergency measure when there is obstruction of the upper air passages. To create a tracheostomy, the physician will make an incision at the level of the 2nd or 3rd cartilage ring. Your job will be to suction the patient's throat, as needed, and keep the tracheostomy area clean and dry, thereby preventing infection and skin irritation.

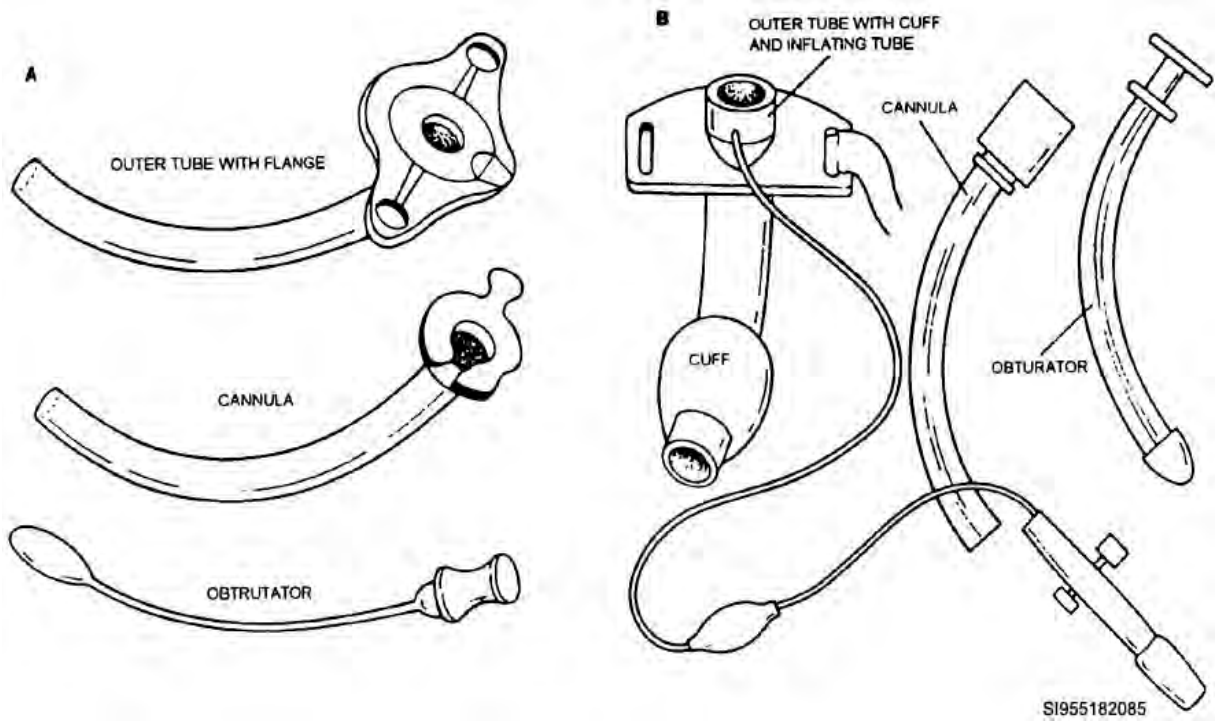


Figure 4–10. Tracheostomy sets.

To perform tracheostomy care, gather the equipment needed—a tracheostomy care kit, which contains sterile towels, sterile gauze sponges, sterile cotton swabs, gloves, sterile water, and hydrogen peroxide. Also ensure that you have oxygen and suction immediately available.

The purpose of tracheostomy care is to ensure the patient has a patent airway, suction out secretion easier, improve ventilation, prevent infection and the potential for injury, and prevent aspiration during feeding. Prior to performing trach care, assess the stoma for patency. It is also a good idea to suction the trach prior to cleaning; this will help to maintain a clean area longer. Remove the stoma dressing; and look for redness, swelling, purulent, foul-smelling drainage, or bleeding. Rewash your hands, assemble your equipment using sterile aseptic technique, and put on sterile gloves. Begin the technique by placing the top sterile towel on the patient's chest directly under the tracheostomy. Keeping in mind the wash, rinse, and dry method, you begin by cleaning (*wash*) the external end of the tracheostomy tube with sterile hydrogen peroxide–soaked gauze sponges, *rinse* with sterile water, then *dry* with sterile gauze. Moving to the stoma area, clean (*wash*) the stoma with hydrogen peroxide–soaked sponges, *rinse* with sterile water, then *dry*. Use as many sterile sponges as it takes to thoroughly clean the tracheostomy. Replace the sterile dressing if the patient had one, and replace the neck tie every 24 hours or when soiled. Tracheostomy care should be performed every eight hours, or as often as the physician orders it.

Tracheostomy-care steps

The following information is a breakdown on the steps to clean the inner cannula and ostomy and change the tracheostomy tube ties and twill ties.

Cleaning the Inner Cannula and Ostomy	
Steps	***Explanation***
1	Tracheal cleaning tray—If you don't have premade cleaning trays, you will need at least two sterile basins, pipe cleaners, brush, and sterile 4X4 gauze. Sterile, normal saline will be needed to help clean the cannula. This is considered a sterile procedure.
2	Ensure you have a French suctioning catheter and suction equipment available.

Cleaning the Inner Cannula and Ostomy	
Steps	***Explanation***
3	Prior to cleaning the tracheal cannula, check the doctor's order and patient-care plan. Additional cannulas may be needed if the cannula is disposable. If indicated, suction the trach tube prior to cleaning. Wash your hands.
4	Explain to your patient what you are going to do and why. Open the sterile trach tray and put on one sterile glove. Separate the basins with your gloved hand and use the ungloved hand to pour saline into the basin.
5	Don the second glove and secure the outer cannula neck plate with an index finger and thumb. Unlock the inner cannula by turning it left 90°.
6	Gently pull the inner cannula slightly upward and out towards you. Soak the nondisposable cannula in the sterile basin with saline to remove any dried secretions. The outer cannula will remain.
7	Cleanse the lumen and the outer surface of the cannula with pipe cleaners or brush moistened with saline. This will help to remove the dried secretions.
8	Rinse the cannula thoroughly with saline and place on a sterile 4X4 and dry the tube completely.
9	Replace the inner cannula carefully, stabilizing the outer flange of the cannula with your other hand.
10	Lock the inner cannula by turning the lock to the right so that it is in an upright position. Cleanse around the tracheostomy site with the applicator soaked in normal saline. The outer cannula should be cleansed with a separate applicator.
11	After cleaning, apply a precut, nonraveling trach dressing around the insertion site. The flaps on the dressing should be pointing up towards the patient. If needed, the tracheal ties on either side should be changed at that time.

Changing Tracheostomy Tube Ties	
Steps	***Explanation***
1	To change a trach tube tie, determine what type the patient has. Some patients may have the more traditional twill (looks like a shoe lace) tape or a commercial tracheostomy tube holder. Forceps and scissors may be needed.
2	Prior to the task, seek an additional person to help you. This person can assist by holding the trach tube in place when changing the ties. Explain to your patient the reason for the procedure, place the patient in a semi- to high-Fowler's position and wash your hands.

Twill Tape Ties	
Steps	***Explanation***
1	If the ties are not precut, cut the ties to the desired length. If the trach ties are over 1½ inches, folds the ends of the ties and cut a slit in the piece starting at the folded edge.
2	If you have an assistant, have him or her hold the trach tube in place, cut the old trach ties and remove.
3	Pass the slit ends of the ties through the flange loop of the trach tube (the opening slot on either side of the tube) about 2–3 inches (forceps can be used if needed). If an assistant is unavailable, it is recommended to leave the old ties in place until the new ones are threaded to prevent accidental dislodgement.
4	Thread the other end of the other end of the tie all the way through the slit and pull firmly in place to anchor the tie around the flange loop.
5	Repeat on the other side. Bring the ties around the patient's neck and tie it in a square knot to one side of the neck, leaving enough slack to insert a finger. Cut off any soiled trach tie and discard.

Tracheostomy care is vital to establishing and keeping a patent airway. Remember to always keep an eye on your patient to ensure that the tracheostomy has not become blocked with secretions or fluids used for cleaning or have become dislodged. You are working on the patient's airway, so make sure you have all the necessary supplies and equipment, to include suction and an oxygen source prior to starting the procedure. Never leave tracheostomy ties unsecured if you must leave the room or step away from the patient. Talk to the patient before the procedure to give him or her an overview of

what you will be doing, talk the patient through the procedure as you perform it and reassess the patient's airway and respirations once you have completed the task.

Self-Test Questions

After you complete these questions, you may check your answers at the end of the unit.

236. Oxygen needs of the body

1. Match the subject in column A with its normal value in column B.

Column A	*Column B*
___(1) Partial pressure of arterial oxygen.	a. 7.34–7.45.
___(2) Partial pressure of arterial CO_2.	b. 35–45 mm/Hg.
___(3) Percentage of hydrogen ions.	c. 80–100 mm/Hg.
___(4) Arterial oxygen saturation.	d. 95 to 98 percent.

2. What term means the patient has a low oxygen content in the arterial blood?

3. Hyperventilation can cause what type of acid-base imbalance?

4. Hypoventilation can cause what type of acid-base imbalance?

237. Providing oxygen to the body

1. When providing respiratory care, when do you listen to lung sounds?

2. Match the definition in column A with its proper term in column B.

Column A	*Column B*
____ (1) Course, gurgling sounds heard best on expiration.	a. Rales.
____ (2) A whistling sound.	b. Rhonchi.
____ (3) Fine, crackling sounds.	c. Wheezing.
____ (4) Noisy breathing caused by an obstructed airway.	d. Snoring.

3. Why should "No Smoking" signs be posted outside rooms where oxygen is in use?

4. What type of blanket must be used in areas where oxygen is in use?

5. What safety precautions should you take if you are using a metal oxygen tank?

6. What factors determine the method of oxygen administration the physician will select?

7. For what type of patient is an oxygen tent used?

8. How is the concentration of oxygen monitored within the oxygen tent?

9. What type of mask is used to administer inspired oxygen concentrations of 60–90 percent?

10. What type of mask is used when the patient needs low concentrations of oxygen, 24–50 percent?

11. When is a CPAP mask used?

12. What will happen if the humidifier is too full when you are using a nasal cannula?

13. How often are oxygen humidifiers changed?

14. Who is normally responsible for inserting endotracheal tubes?

238. Special respiratory procedures

1. Match terms for special nursing procedures listed in column B with appropriate statements about them from column A. Terms in column B may be used more than once.

Column A	*Column B*
____ (1) The surgical puncture of the chest wall to remove fluid or air from the pleural space.	a. Closed-chest drainage.
____ (2) A drainage system used to re-expand a collapsed or partially collapsed lung.	b. Postural drainage.
____ (3) This procedure maintains and cleanses the airway, improves vital capacity, and helps prevent such conditions as atelectasis and postoperative pneumonia.	c. Breathing exercise.
____ (4) Helps to remove excess secretions by gravity.	d. Thoracentesis.
____ (5) May be done to confirm the diagnosis of fluid in the pleural space, to obtain a culture of organisms present, or to relieve respiratory symptoms.	
____ (6) Patient may become dizzy the first few times chest percussions are done in this position; however, in time, the length of time of this procedure may be extended to 15 or 20 minutes.	
____ (7) The patient may be sitting on the side of the bed or lying in a lateral, recumbent position	

2. Why is a tracheostomy usually performed?

3. Why do you suction a tracheostomy prior to changing the dressing?

4. How often should tracheostomy care be performed?

4–2. Circulation

Circulation of oxygenated blood is the primary work of the heart. If the heart fails, then perfusion of the tissues with oxygen cannot take place. Another way to look at it is, if oxygen is not being taken in, such as during choking, there is no sense in circulating the unoxygenated blood. The two systems work hand in hand. Let’s quickly review the heart and circulation.

If you recall from your anatomy and physiology, unoxygenated blood returns to the heart via the superior and inferior vena cava. The first chamber of the heart that receives this unoxygenated blood is the right atrium. As this right-sided pump squeezes, the blood then goes into the right ventricle by way of the tricuspid valve. Once the blood passes through the right ventricle, it is sent to the lungs through the pulmonary arteries. Oxygenated blood returns to the heart via the pulmonary veins and enters the left atrium. Then, passing through the bicuspid valve and into the left ventricle, the blood goes to the rest of the body via the aorta. This two-sided pump is something we cannot live without. There are a number of conditions that can cause the pump to fail. Heart failure and myocardial infarctions are two of the conditions we see the most. This section will present you with signs and symptoms associated with heart disease and procedures you may perform as a medical service technician that are associated with the circulatory system.

239. Cardiovascular deficits and abnormal cardiovascular functions

Heart disease remains the number one cause of death in the United States. Whether you work in the ER or on the wards, you have probably cared for a patient with heart disease. Since you have already learned a little about cardiovascular problems in your "A" course, we'll try not to repeat that information, but this lesson is designed to teach you more about the signs and symptoms related to cardiovascular deficits.

Common symptoms associated with cardiovascular deficits

Some of the more common symptoms associated with heart disease include: dyspnea, chest pain, palpitations, syncope, and fatigue.

Dyspnea

Difficulty breathing or breathlessness is a sure sign that oxygen is not getting to where it needs to be. Dyspnea is associated with elevated left atrial and pulmonary venous pressures caused by left ventricular systolic dysfunction. In simpler terms, the left side of the heart is not working like it should. There are different types of cardiac dyspnea. *Exertional dyspnea* is difficulty breathing on exertion, which is relieved by rest. *Orthopnea* is difficulty breathing in a lying-down position.

Chest pain

Pain associated with the cardiovascular system is the result of ischemia (lack of oxygen to the heart muscle). Mostly, patients have commonly described ischemic pain as an uncomfortable sensation (e.g., a dull, aching, sensation of pressure or tightness, or squeezing). This type of pain usually goes away after 30 minutes but may last longer. The location of this pain is retrosternal or left precordial and may radiate to the throat, lower jaw, shoulders, arms, or back. Precipitating factors are usually exertion, large meals, stress, or cold temperatures.

Palpitations

Palpitations are unusual or irregular heartbeats felt by the patient. This is usually described by the patient as a jumping, pounding, or stopping of the heart within the chest. Palpitations can be caused by an enlarged heart or arrhythmias. It is also important to find out from the patient if there were any precipitating factors that may have caused the palpitations.

Syncope

Cardiogenic syncope (i.e., fainting) may be caused by a fall in cardiac output, which results in cerebral ischemia. Although recovery is immediate, seizure-like activity can be observed.

Fatigue

Low cardiac output is usually the cause of fatigue associated with heart disease.

Common signs associated with cardiovascular deficits

Some of the more common signs associated with heart disease include: cyanosis and pallor, pulse abnormalities, and heart sounds and murmurs.

Cyanosis and pallor

Cyanosis is a bluish discoloration of the skin and mucous membranes. Cyanosis is caused by a reduced amount of hemoglobin in the blood. Pallor is indicative of anemia but could also be a sign of low cardiac output (e.g., reduced flow of blood from the left ventricle).

Pulse abnormalities

Pulse rates that are difficult to palpate are referred to as diminished peripheral pulses. Diminished pulses may result from several problems, such as arteriosclerosis (i.e., hardening of the arteries), shock, hypovolemia, and other disorders. Another sign of problems is asymmetry of pulses; this means the pulses taken at different locations are not in sync with each other. Carotid pulses can

provide information of left ventricular functioning, and the jugular pulsations provide information regarding the right side of the heart or central venous pressure (CVP).

Heart sounds and murmurs

As with auscultating breath sounds, learning the fine art of auscultating heart sounds takes years of experience. Books and tapes can be obtained from your hospital library to help learn heart sounds. To keep this simple, let's discuss heart sounds S_1 and S_2, also referred to as the "lub" and the "dub" of the cardiac cycle. The best anatomical area on the chest to hear these sounds is the apex of the heart. The S_1, "lub," is associated with closure of the mitral and tricuspid valves, the S_2, "dub," is associated with closure of the aortic and pulmonic valves. As you are listening, note the quality of the sound (i.e., crisp or muffled), intensity (i.e., loud or soft), and rhythm of the beats. Also, listen for abnormal sounds (i.e., murmurs, gallops, or clicks). Murmurs are associated with a blowing or swooshing sound and represent abnormalities with the valves.

240. Procedures related to the body's circulatory needs

As an aerospace medical service technician, you'll be involved with performing many of the procedures involved with the cardiac system. This lesson covers the performance of taking an apical-radial pulse, doing arterial punctures, monitoring and inserting CVP lines, and monitoring hemodynamic.

Apical-radial pulse

For many patients who have a cardiovascular disorder or for those who may be receiving medications which affect the action of the heart, an apical-radial pulse may be ordered. Its purpose is to compare the pulse rate at the apex of the heart with that at the radial artery to determine if a pulse deficit exists. The procedure requires two personnel positioned on either side of the patient—one listens (i.e., auscultates) over the apex of the heart with a stethoscope, while the other palpates the pulse at the wrist (i.e., radial artery). Place the watch so both of you can count the pulse rate for a full minute during the time interval.

Defibrillation procedures

Defibrillation is an emergency procedure in which an electrical current is delivered to the heart to terminate ventricular fibrillation or ventricular tachycardia. This electrical shock will sometimes cause the heart to revert back to a normal rhythm. (**NOTE**: Only medical service technicians trained in advanced cardiac life support may initiate defibrillation procedures. Check your local protocol). To perform defibrillation, you must be familiar with the procedure and be able to recognize these two life-threatening arrhythmias (unless using an Automated External Defibrillator (AED) as it only recognized two shockable rhythms—ventricular fibrillation and ventricular tachycardia). As illustrated in figure 4–11, ventricular fibrillation may be either coarse or fine. Once you see the rhythm, you should initiate the defibrillation procedure. Apply a conductive gel to the defibrillator paddles or defibrillator pads, and select the energy level as stated in the standing orders or as ordered by the physician. The normal charge is 200–300 joules. Charge the defibrillator. Apply the defibrillator paddles to the patient's chest to the positions shown in figure 4–11. Use sufficient pressure to ensure a good contact. Check to ensure that nobody is touching the patient or touching any metal that is in contact with the patient. You should also yell, "Clear," to warn those performing cardiopulmonary resuscitation (CPR) or other procedures to back away from the patient. The person performing artificial respirations should also remove the oxygen source (be careful to leave all airway devices in place!) to decrease the risk of a potential spark when the shock is delivered. Press the button to deliver the charge and watch to see if the patient received the charge. In most cases, the patient will jump or jerk when the charge is administered.

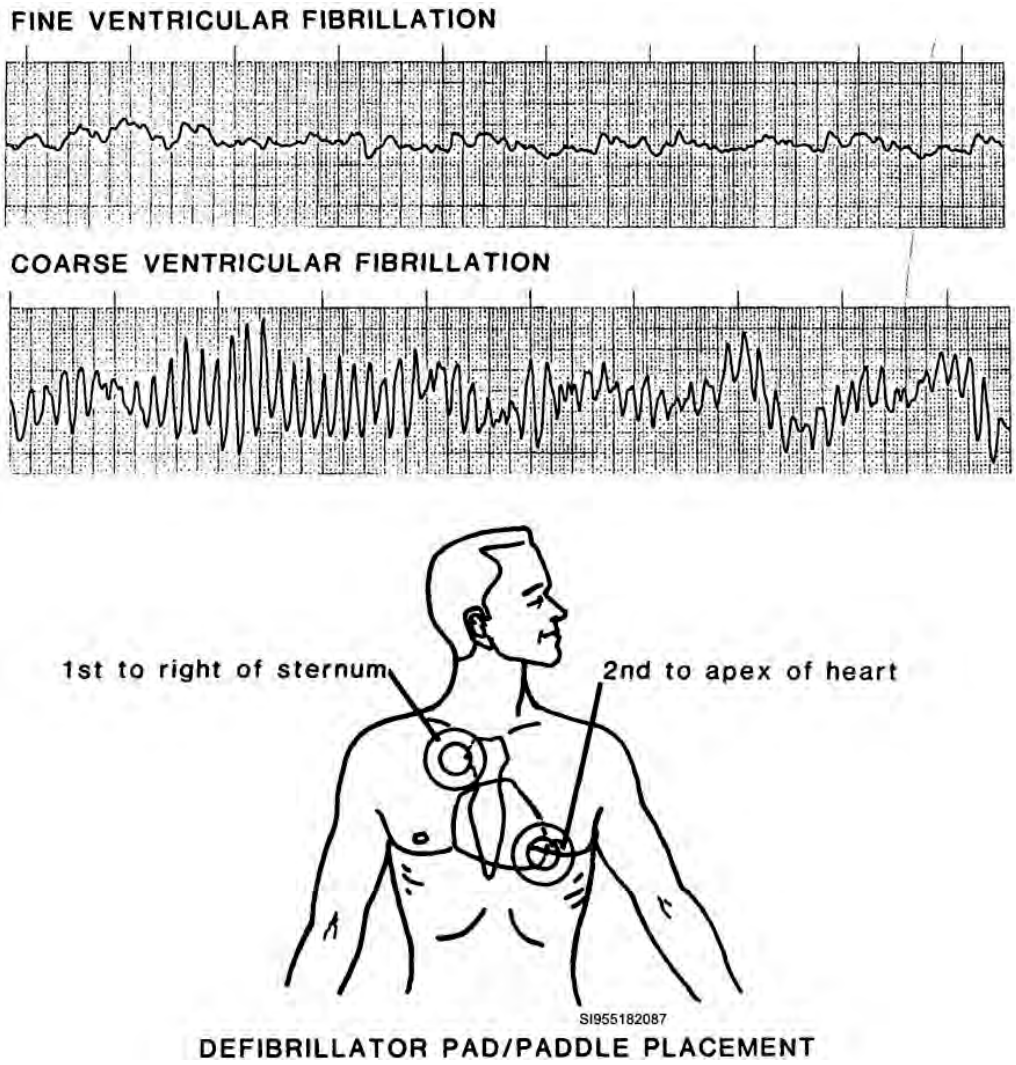


Figure 4–11. Defibrillation techniques.

If the defibrillation is unsuccessful (i.e., no pulse), the provider will normally increase the joules successively and give up to three shocks in a row; you should continue CPR until the physician determines whether the next course of action. The next step may involve CPR, administration of medication, or possibly another set of shocks. Defibrillation may be performed several times over the course of a resuscitation before the patient converts or the doctor decides to pronounce him or her dead. All medical personnel should be trained to use an AED even if you are not trained to use the handheld defibrillator. The AED will only shock the two life-threatening rhythms you learn here.

Bedside monitoring

If you are working in an intensive care or coronary-care unit, continuous bedside monitoring is required for all patients. This monitoring is viewed at the nurses' station, and someone is required to view the screens at all times. Of course, if you are the screen monitor, you'll be thoroughly trained on interpretation of the various arrhythmias.

To connect the patient to the bedside monitor, attach the leads to the three chest electrodes. For electrical current to flow, there must be a positive and negative electrode forming a *lead*. Various leads may be used in monitoring arrhythmias, with each lead "looking" at the heart from a different vantage point. One single lead commonly used to monitor arrhythmias is lead II. Don't forget to turn

on the alarm system. This gives an auditory warning to nursing personnel that something is wrong with the patient's rhythm.

Telemetry

Telemetry is electronic monitoring over airwaves, like a transistor radio. The patient is connected to the telemetry unit in the same manner as the bedside monitor. The only difference, the patient can walk around while being monitored. Telemetry is commonly used on cardiac step-down units.

Arterial lines

An arterial line is inserted into the artery. The process of insertion is the same as the IV line, except arterial pressure is much greater. Since there are higher pressures in the artery, a pressure bag is used on the solution container to prevent backflow of blood into the tubing. Once the arterial line is inserted by the physician, it can be connected to an electronic transducer. The transducer will change hydro pressure into electrical impulses. The electrical impulses will read out on a monitor, which will give you the arterial pressure, or blood pressure, of the patient.

Insertion of an arterial line is a sterile, invasive procedure performed by a physician. You'll be responsible for assisting with the procedure. To assist, first gather all supplies needed—cannula (e.g., usually over the needle type), IV infusion set with solution bag and pressure bag, antiseptic skin cleanser, anesthetic agent, electronic transducer, and bedside monitor, which should be in the patient's room. The physician will start the arterial line and connect it to the infusion line, and the pressure bag must be inflated around the solution bag to prevent blood from entering into the line. A transducer is placed between the patient and the solution container and connected to the monitor. The monitor will give a constant readout of the arterial waveform and pressure.

Pressure	Normal Values
Arterial systolic pressure	100 to 140 mm/Hg
Arterial diastolic pressure	60 to 80 mm/Hg
Arterial mean pressure	70 to 90 mm/Hg

Central venous pressure

A CVP is the pressure measured in the great veins of the thorax or the right atrium. It can provide valuable information for the physician in regards to venous blood volume, assessment of right-sided heart failure, and determination of heart infarctions.

To obtain CVP information, the physician must place a CVP catheter into one of the large central veins—brachial, femoral, subclavian, or jugular. After extensive training, you may be required to assist the physician with the insertion of the CVP catheter. Once inserted, you'll take and record the CVP readings according to the physician's order.

Central venous line insertion

To prepare for CVP line placement, gather the needed equipment—venous pressure tray, cutdown tray, infusion solution/infusion set with CVP manometer, IV pole, dressing material, gowns, masks, caps, gloves, ECG or EKG monitor, and a carpenter's level. Prepare the patient for the procedure and explain how to perform the Valsalva maneuver. The Valsalva maneuver is performed by the patient during catheterization to decrease the chance of an air embolism. The patient should also be restricted to NPO six hours prior to insertion. Place the patient in a supine position. If the arm vein is to be used, extend arm on an arm board; if a neck vein will be used, place the patient in a Trendelenburg position (prevents the chance of an air emboli) and place a small rolled towel under the shoulders. Flush IV infusion set and manometer. Attach manometer to the IV pole and ensure the zero point on the manometer is level with the patient's right atrium. The patient should also be connected to the ECG monitor. Now you are ready for the procedure.

The actual insertion is performed by the physician under sterile conditions. The physician will cleanse the site and insert the catheter; see figure 4–12 for a view of the placement within the superior vena cava. Remain with the patient and encourage him or her to remain still throughout the procedure. Monitor the patient for arrhythmias during insertion of the catheter. Once the CVP line is in place, connect the already primed tubing to the catheter and adjust a flow rate to a keep vein open (KVO) rate (25 mL maximum). The CVP line is then sutured in place and a dressing applied over the site.

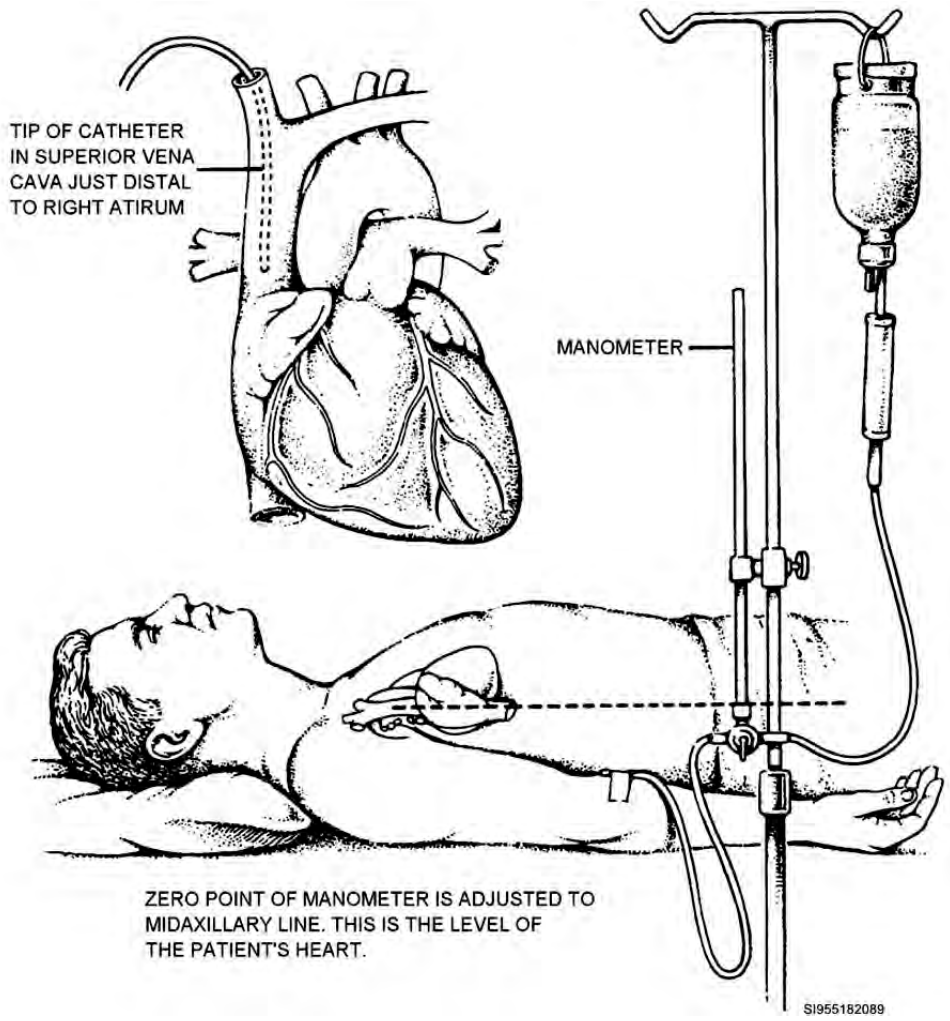


Figure 4–12. Central venous pressure.

Measuring central venous pressure

To measure the CVP, place the patient in a comfortable position. Position the zero point of the manometer at the level of the right atrium. The right atrium is located on the midaxillary line in the fourth intercostal space (fig. 4–12). The next step will be to turn the three-way stopcock to fill the manometer with IV solution to about 20–25 cm level. Turn off the flow of IV solution, which will cause the solution from the manometer to flow into the patient. Closely observe the fall of the solution in the manometer. Record the level at which the solution stabilizes or stops moving downward. This is the CVP. A normal CVP may range from 5–12 cm H_2O. A CVP near zero indicates hypovolemia—anything above 15–20 cm H_2O may be caused by hypervolemia or poor cardiac contractility.

Hemodynamic monitoring

Hemodynamic monitoring is the assessment of the patient's circulatory status. Insertion of a special balloon-tipped catheter can obtain measurements of the heart rate, intra-arterial pressure, pulmonary artery and pulmonary capillary wedge pressure, CVP, and cardiac output and blood volume. Look at figure 4–13 for a view of catheter placement within the heart and main pulmonary artery. Placement of the balloon-tipped catheter is similar to insertion of a CVP line, except a transducer system must be used to obtain measurements.

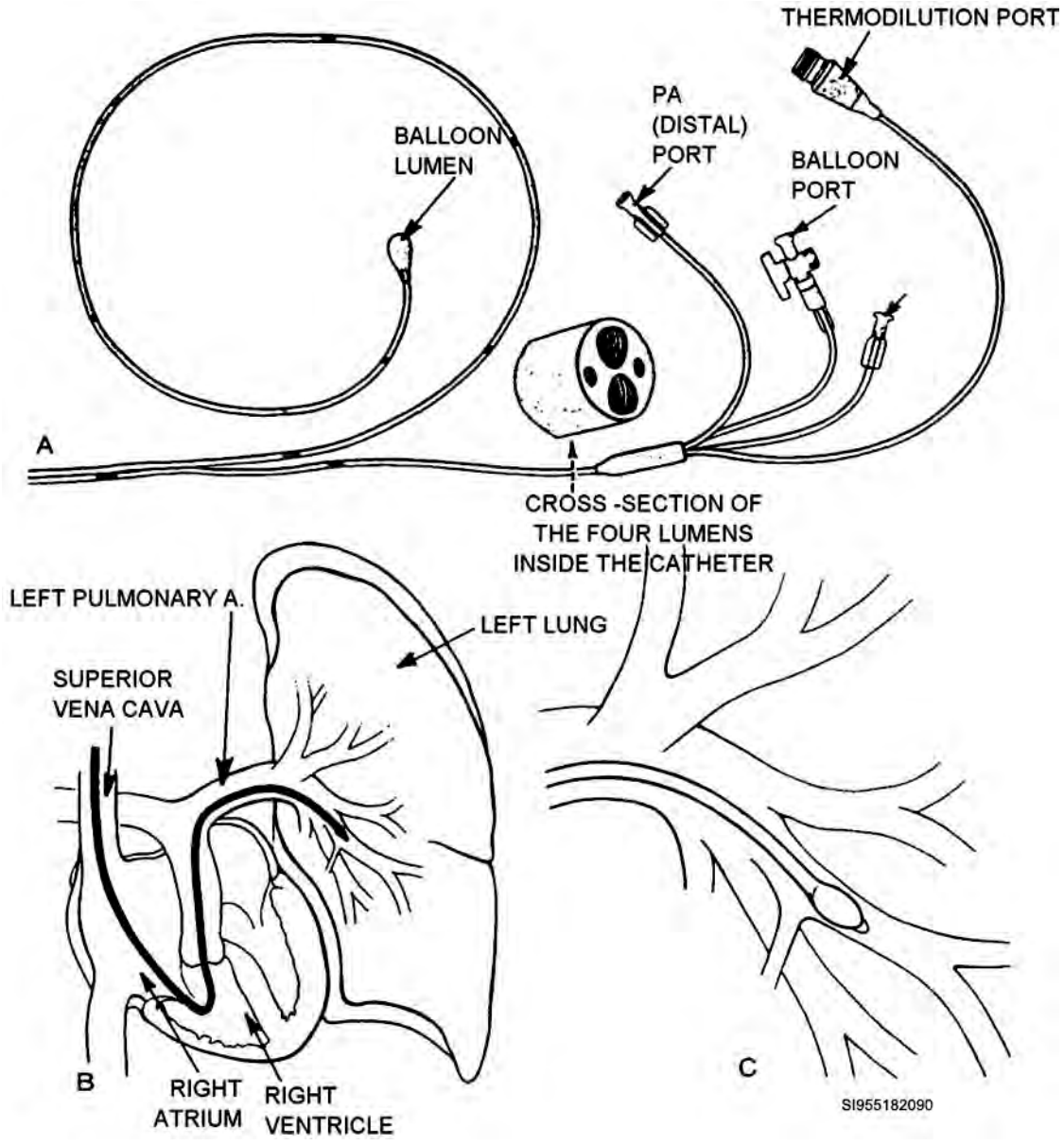


Figure 4–13. Placement of pulmonary artery catheter.

The equipment needed for balloon-tipped catheter includes: catheter set, bedside monitor, defibrillator, pressure transducer, cutdown tray, sterile saline, inflatable pressure bag, heparin infusion in plastic bag, continuous flush device, local anesthetic, skin antiseptic, dressing material, and tape.

Ensure the patient and his or her significant other understand and consent to the procedure. Connect the patient to the bedside monitor and take vital signs. Place the patient in a comfortable position; this position will be used for all future measurements to ensure consistency. All equipment must be

assembled—transducer and flushing systems assembled according to the manufacturer's directions. Calibrate all equipment, and place transducer at the level of the patient's right atrium. Under sterile conditions, inflate the balloon-tipped catheter with sterile water or saline to ensure there are no leaks.

Using sterile technique, the physician will identify the site for insertion, clean the skin with antiseptic, and anesthetize the area. Possible sites include the internal jugular, subclavian, or any easily accessible vein. The physician advances the catheter to the superior vena cava, then gently advances it into the right atrium (fig. 4–13). Closely observe the cardiac monitor for any signs of arrhythmias. The balloon will then be inflated with air. The inflated balloon is then guided by the flow of blood through the right atrium and into the right ventricle and further on into the main pulmonary artery. The inflated balloon will advance itself to the furthermost possible point in the pulmonary vessel, called the *wedge position*, the pulmonary capillary wedge pressure (PCWP), or pulmonary artery wedge pressure (PAWP). Normal PCWP is 8–10 mm/Hg. Pressures less than 8–10 mm/Hg are associated with a reduced cardiac output and hypotension and pressures greater than 20 mm/Hg are associated with left ventricular failure, pulmonary congestion, and hypervolemia.

The balloon is then deflated. This deflated reading will give a continuous pulmonary artery systolic, diastolic, and mean pressure. The catheter is then connected to a continuous heparinized flushing system. The physician will suture the balloon-tipped catheter into place and cover it with a sterile dressing. If fluoroscopy is not used during the insertion process, a chest x-ray will be taken to confirm catheter position.

To obtain a PCWP, inject one mL of air into the balloon-tipped catheter, carefully watching the pulmonary artery pressure produced by the transducer on the monitor. As the waveform changes to that of a wedge pressure, do not push any more air into the balloon. The PCWP should be taken during expiration. Deflate the balloon as soon as the PCWP reading is completed. If there is any blood noted in the syringe used for the PCWP reading, notify the nurse or physician immediately; this is a sign that the balloon may have ruptured.

Extreme care should be taken in the daily care of the catheter. The risk of sepsis increases due to the presence of the catheter. Monitor the insertion site for signs of infection, swelling, and bleeding. Always record the date and time of dressing or IV tubing changes performed on the patient. Carefully observe the deflated waveforms of the balloon catheter because changes in the waveform could indicate the catheter has moved back into the right ventricle or possibly be wedged in the pulmonary artery.

Self-Test Questions

After you complete these questions, you may check your answers at the end of the unit.

239. Cardiovascular deficits and abnormal cardiovascular functions

1. Define exertional dyspnea.

2. What are palpitations?

3. What is one cause of cardiogenic syncope?

4. What is the cause of cyanosis?

5. What can cause diminished pulses?

6. Where is the best anatomical location to hear heart sounds?

7. During auscultation of heart sounds, what does the S_1 sound represent?

240. Procedures related to the body's circulatory needs

1. What is the purpose of taking an apical-radial pulse?

2. Why do you need two people to take an apical-radial pulse?

3. What is the purpose of defibrillation?

4. What should you do if defibrillation is unsuccessful?

5. What is telemetry?

6. What is the normal arterial mean pressure?

7. What prevents blood from backing up into the tubing of an arterial line?

8. What type of information can a CVP provide to a physician?

9. Name four possible insertion sites for a CVP line.

10. Why is the patient taught to perform the "Valsalva maneuver" prior to insertion of a CVP line?

11. What is the normal CVP range?

12. What is the normal range for the PCWP?

13. What are PCWPs greater than 20 mm/Hg associated with?

4–3. Wound Management

In this lesson, you'll study the characteristics and treatment for injuries of the face and throat. You must be concerned about this area because the face and neck are relatively unprotected and vulnerable to injury. Soft-tissue injuries and fractures are very common. Some of these injuries are potentially life threatening and many leave disfiguring scars on the face and throat if not treated properly. In the last lesson of this unit, you'll study burn management and how burns affect multiple body systems. You'll also learn about the effect existing health problems have on the burn patient.

241. Face and throat injuries

In addition to the injury itself, the patient may have associated injuries of the neck and spinal cord. Take care to protect and immobilize the potential spine injury. Injuries to the face and throat can also lead to airway obstruction from bleeding, loose dentures or teeth, deformity, or swelling. The patient can also have a direct injury to the trachea or a brain injury that interferes with breathing. Use the techniques we described earlier to clear the airway and ensure that it remains clear.

Eye injuries

Eye injuries include foreign bodies, burns, lacerations, and blunt trauma. To determine the specific problem, you must do a thorough examination. Look for specific abnormalities or conditions, such as swollen or lacerated eyelids from blunt or penetrating injury. The conjunctiva frequently becomes bright red soon after irritation or injury. The cornea readily loses its smooth, wet appearance after injury. In a normal, uninjured eye, the entire circle of the iris is visible; the pupils are round and equal in size; both eyes move together in the same direction when the patient focuses on a moving object, and the pupils react equally to light.

Foreign bodies

Large objects are prevented from penetrating the eye by the bony orbit that surrounds it, but small- and medium-sized objects can enter the eye and cause significant damage. Even a very small, foreign body, such as a grain of sand lying on the surface of the conjunctiva of the eye, causes severe irritation. The conjunctiva becomes inflamed and red almost immediately, and the eye begins to produce tears in an attempt to flush out the irritating object. Intense pain is produced by irritation of the conjunctiva, and the patient has difficulty keeping the eyelids open because the irritation is further aggravated by bright light.

If a small, foreign body is lying on the anterior surface of the patient's eye, gently irrigate the eye with normal saline solution. Irrigation with 500–1000 cc of saline will frequently flush away small, loose particles. Even after it is flushed away, the particle often leaves a small scratch on the surface of the conjunctiva that continues to irritate the eye and feels like the particle is still in place.

You usually won't be able to flush out foreign bodies that are stuck to the cornea or lodged under the upper eyelid. *Do not attempt to remove particles on the cornea!* A small mistake in this area will cause permanent blindness. Notify the doctor and let him or her handle the problem. Particles under the upper eyelid can sometimes be removed by everting, or flipping back, the upper eyelid and removing the object with a moist, cotton-tipped applicator.

Large, foreign bodies may be impaled in the eye**.** *Such objects MUST be removed by the PHYSICIAN.* Support the object with a dry, sterile dressing to prevent further contamination and to minimize motion of the object. Then cover the injured eye with a paper cup or cone to prevent further penetration. If you cover one eye, cover both. In most people, the eyes move together as individuals focus on different things. Even though it is patched and injured, the injured eye follows the motions of the uninjured eye as the patient looks at different things. Once both eyes are patched, reassure the patient and provide information about what is happening.

Burns

The eye can be burned by chemicals, heat, and light rays. The delicate tissues of the eye can be permanently damaged, and prompt emergency care must be directed at stopping the burning process and preventing further damage to the eye.

Chemical burns are usually caused by acid and alkali solutions. The only treatment you can provide is immediate and thorough flushing with sterile saline or water. In some circumstances, you may even have the patient hold his or her head under a running tap. Irrigate the eyes for at least 20 minutes for any chemical. If the patient begins to complain about renewed burning, wash the eyes for five more minutes. Because the eye is in pain, you may have to force it open to allow the irrigating solution to enter. You must protect the uninjured eye during the irritation. Do not allow the fluid to run from the injured eye to the uninjured eye. Doing so causes burns to the uninjured eye. Turn the patient's head slightly so that the injured eye is slightly lower than the uninjured. After the irrigation is complete, cover the eyes with moistened pads and take the patient to a hospital. Irrigation may be done in the ambulance if the patient needs to be seen sooner.

When a patient experiences a thermal burn to the face, he or she usually closes the eyes because of the heat. The eyelids are exposed and are frequently burned. This type of injury requires specialized care. Cover both eyes with a sterile dressing and transport to the medical facility.

Exposure to light can cause significant damage to the cells of the retina. Infrared rays, eclipse light, sun light, and laser burns cause injuries that aren't painful but may cause permanent damage. Ultraviolet rays or snow blindness can cause superficial burns that are not initially painful but may cause extreme pain three to five hours later. The patient develops severe conjunctivitis with redness, swelling, and excessive tear production. The pain may be diminished by covering the eyes with sterile, moist pads and having the patient lie down during transport. The patient should be seen by a physician as soon as possible.

Lacerations

Eyelid lacerations require special handling to restore appearance and function. Initially the bleeding is severe, but it can usually be controlled by gentle, manual pressure. If there is a laceration of the eye itself, do *not* apply pressure. Compression can interfere with the blood supply at the back of the eye and result in loss of vision from damage to the retina. Furthermore, the pressure may squeeze the vitreous humor out of the eye and cause irreparable damage. Use the following principles when you are treating penetrating injuries of the eyes:

- *Never* exert pressure on or manipulate the injured eye in any way.
- If part of the eye is exposed, gently apply a moist, sterile dressing to prevent drying.
- Cover the injured eye with a protective cup or metal eye shield.
- Cover the opposite eye with a bandage to decrease movement on the injured side.

Occasionally, an eye is displaced from its socket. Do *not* attempt to replace it. Cover the eye with a moist sterile dressing and transport the patient to the hospital in the supine position.

Blunt trauma

Blunt trauma may cause bleeding (hyphema) into the anterior chamber of the eye, or fracture of the bony orbit or bones that support the floor of the orbit (blowout fracture). Patients with fractures may experience double vision.

Place any patient who complains of pain, double vision, or decreased vision following an eye injury on a litter and transport to the emergency room (ER). Protect the eye from further injury with a metal shield and patch the uninjured eye to minimize movement.

Abnormalities in appearance or function of the eye often occur following a head injury. Any of the following findings should alert you to the possibility of an underlying head injury:

- Difference in pupil size.
- Eyes pointing in different directions.
- Failure of the eyes to follow a moving object.
- Bleeding into the sclera.
- Protrusion or bulging of an eye.

If you find any of these abnormalities, document your exact observations along with the time they were noticed. If the patient is unconscious, close or cover the eyes to prevent drying of the tissues. Cover the eyes with gauze or tape them shut. Normal tears will then keep the eyes moist.

Many people wear contact lenses of varying sizes and colors. Under normal circumstances, do not attempt to remove these lenses in the field if there is any question of eye injury. Manipulation of the lens can aggravate the existing damage. The only type of eye injury where the lens should be removed immediately is with a chemical burn of the eye. The chemical will get under the lens and make irrigation very difficult. Unconscious patients with hard contact lenses should also have them removed because prolonged wearing can damage the cornea. In general, these lenses are removed in the ER.

To remove a contact lens, use a suction-cup device, the end moistened in saline. If you don’t have such a device, remove the lens by first moistening the eye and then sliding the lower eyelid under the lens. Remove soft contact lenses by placing a couple of drops of saline onto the lens and gently pinching the lens between the thumb and index fingers. The lens can then be lifted out of the eye.

The patient may be wearing an artificial eye. You may suspect the presence of such a prosthesis if the eye does not react to light or move with the other eye. If you are unsure, ask the patient or a family member. In any case, no harm is done if you treat the prosthesis as a real eye.

Corneal abrasions

A corneal abrasion can be very painful for the patient. One way to detect abrasions is to perform a *fluorescein eye stain*. Once in the ER, this is done with a fluorescein paper strip wet with sterile normal saline. With the patient in a lying or sitting position, pull the lower lid down and gently touch the conjunctival sac with the stain strip. Have the patient blink a few times. The damaged tissue will turn green and the physician can then examine the eye. After examination, the eye is then flushed and a prescribed antibiotic is instilled to prevent infection.

NOTE: All eye emergencies should have their visual acuity checked in each eye prior to any treatment. Visual acuity is checked with an eye chart.

As you learned in tech school, the patient stands 20 feet away from the chart and reads the letters to you as directed. Other methods of checking visual acuity are counting fingers, hand motion detection, and light perception.

Soft-tissue wounds

Soft-tissue injuries of the face and scalp are very common. Contusions usually cause swelling, but some contusions of the scalp and forehead cause large hematomas that present themselves as lumps.

Lacerations and avulsion injuries are especially common. Because the face is well supplied with blood vessels, even minor wounds usually bleed heavily.

Treat soft-tissue injuries of the face as you would anywhere else. Apply ice to control the swelling and use direct pressure to control the bleeding. Do not apply excessive pressure to the scalp if you suspect a skull fracture. If a penetrating injury exposes an eye, the brain, or other sensitive tissues, cover the exposed part with a sterile dressing to protect it. If a laceration extends through a cheek, it may be necessary to apply pressure on both sides of the cheek. You may have to remove the penetrating object before the bleeding can be controlled.

Always check for bleeding inside the mouth. Broken teeth and lacerations may cause extensive bleeding, but the bleeding may not be apparent if the patient is swallowing the blood. Check all patients with facial trauma for bleeding in the mouth. Blood draining down the throat can cause vomiting and airway difficulties. Open and clear the airway with suction. If the patient has a potential spinal injury, avoid airway maneuvers that may cause further damage (i.e., neck lift). Stabilize the spine and turn the patient to his or her side to allow drainage. If you find a partial or complete avulsion of tissue, use the management principles we described earlier.

Nose injuries

Soft-tissue injuries of the nose are usually caused by blunt trauma. Have the patient lean his or her head forward. Place an ice pack over the bridge of the nose or pinch the nostrils together, when tolerated, to control the bleeding. A roll of gauze packed between the upper teeth and upper lip sometimes exerts enough pressure to help control the bleeding.

Objects that are inhaled or stuffed into the nose can cause severe pain and bleeding but generally do not cause airway problems. Such objects should be removed by the doctor in the ER. If you attempt to remove them, you may end up pushing them further back into the nose.

Facial fractures

Facial fractures are caused by blunt impact (i.e., straight right to the jaw). The fracture may involve the nose, orbit, maxilla, or mandible. Fractures about the nose and mouth cause deformity, loose bone fragments, swelling, and bleeding that may combine to cause an airway obstruction. Any patient with blunt trauma to the face is considered to have a facial fracture. Even if the fracture is not readily evident, some clues that may indicate its presence include pain and swelling, bite irregularity, loose or absent teeth, inability to talk or swallow, increased salivation, bleeding in the mouth, and loose bone fragments. Make sure the airway remains clear. Open the airway, maintain it, and assist with ventilations as you transport the patient to the hospital.

Dental emergencies

Some common dental emergencies include dislodged teeth or broken dental appliances. In the case of a dislodged tooth, your first concern is to take care of bleeding. For the conscious patient, have him or her bite down on gauze placed over the bleeding socket. If your patient is unconscious, apply gauze in the socket to control the bleeding. Place the dislodged tooth in saline or milk, or wrap it in a moist dressing and transport to the hospital. There is a high rate of success for tooth replacement if a dentist carries out the procedure within 30 minutes of the accident. For broken appliances, simply remove any broken parts and transport with the patient.

Throat or neck injuries

Soft-tissue injuries of the neck can also cause severe bleeding and swelling that may result in airway obstruction. Your primary concern is to maintain an open airway. Control bleeding with an occlusive dressing. An occlusive dressing is used to prevent the possibility of an air embolus being sucked in through a vein. The cervical spine must also be stabilized and protected.

You may be expected to treat a patient with an impaled object in the neck. Stabilize the object as we discussed earlier. Do not attempt to remove it.

The larynx or trachea may be fractured in a crushing injury to the anterior aspect of the neck. When this injury occurs, loss of voice, severe and sometimes fatal airway obstruction, and even occasionally air leakage into the soft tissues of the neck may result. The presence of air in these tissues produces a very characteristic crackling sensation on palpation called subcutaneous emphysema. Fractures of the cervical spine are often present with these injuries.

Emergency care consists of securing the airway, administering supplemental oxygen, and splinting the cervical spine. Keep the patient as calm as possible and transport him or her to the hospital.

Ear injuries

Injuries to the ear can include simple soft-tissue injuries to foreign objects in the ear canal. Soft-tissue injuries to the external ear are obvious, but you have no way of knowing if the internal structures are damaged. In most cases, the same signs and symptoms are present for a skull fracture and middle ear trauma. The following are signs and symptoms of ear injury and possible skull fracture:

- Patient complains of ringing in the ear.
- Patient complains of ear pain.
- Wetness in the ears.
- Vertigo.

Some of your observations include:

- Blood or clear fluid oozing from the ear.
- Patient appears to lose balance when standing.

The emergency-care steps you need to take are: apply dressings to any open soft-tissue injuries; loosely apply dressings to any oozing coming from the ear canal; and do not remove or probe into the patient's ear canal. Treat the patient as through he or she has a fracture of the skull, and transport.

242. Burn management

Most people consider burns to the skin as soft-tissue injuries; in fact, burns can do much more damage than just to the skin surface. Burn injuries often involve structures below the skin, including muscles, bones, nerves, and blood vessels. Affecting multiple body systems, burns can injure the eyes beyond repair and the respiratory system can become involved to the point of respiratory arrest. Also consider what happened prior to the burn injury. Did the patient have a cardiac arrest while smoking in bed, or did the patient fall down possibly fracturing his or her skull due to smoke inhalation?

Burns are injuries to body tissues from exposure to heat, chemicals, electricity, or radiation. They are one of the most difficult types of injury to treat. They cause disfigurement, loss of body function and earning power, social problems, and worst of all, loss of life. Burns are one of the most frequent causes of home injury and serious injury.

The effects of a burn depend on the type, duration, and intensity of the causative agent. Any burn involving more than 20 percent of the body surface endangers life, and a burn of more than 30 percent is generally fatal in the absence of adequate medical treatment. The mortality rate is high in facial burns since such burns are usually accompanied by injuries to the respiratory tract.

You are faced with many problems when you are caring for a burn victim. The fire or substance that caused the burn may have to be extinguished or removed. The patient may be in shock or have respiratory difficulty and may have associated injuries, such as fractures or lacerations. He or she may be in a hazardous environment (e.g., fire or radiation materials), and you have to determine how to help him or her without risking yourself in the process.

Classifying and evaluating the burn

The process of patient assessment includes classifying and evaluating the burn.

There are three ways in which to assess the burn victim:

1. By agent and source.
2. By depth.
3. By severity.

Agent and source of burns

Burns are caused by heat (thermal), radiation, electricity, and chemicals. Heat may be either moist or dry, derived from such sources as boiling liquids, flame, hot metals, and steam. Heat is the most common cause of burns. Radiation burns may be caused by exposure to x-rays, radium, ultraviolet rays, and fissionable materials, such as occur in nuclear materials. Electrical burns are caused by contact with a live electrical wire. The extent of an electrical burn depends on amperage and voltage of the current, and the burn may be of any size and depth. Electrical burns usually injure tissue far removed from the original contact point. Chemical burns are caused by contact with strong chemicals, such as acids and alkalis (e.g., dry lime).

Depth of the burn

Burns are also classified according to the depth of penetration. A *superficial* burn involves damage to the epidermis. A superficial burn causes localized areas of redness due to dilation and hyperemia of the blood vessels in the skin. Pain, tenderness, and temperature elevation of the affected area are also present. Also referred to as first-degree burns, superficial burns usually heal rapidly without scarring. A mild sunburn is a good example of a superficial first-degree burn.

A *partial-thickness* burn results in damage to the epidermis with possible damage to the dermis and its appendages. There is usually severe pain because the nerve endings were injured and exposed. A partial-thickness burn, also referred to as a second-degree burn, is followed by the appearance of vesicles or blisters, possible chilling, fluid loss (which may cause dehydration), and possible shock, depending on the area burned. When treated with reasonable care, partial-thickness burns heal themselves and produce very little scarring.

A *full-thickness* burn involves destruction of all layers of skin and its appendages. Nerves, muscles, and bones may also be involved. Regeneration is impossible, and the area becomes scar tissue or must be covered with skin grafts. A full-thickness burn, also referred to as a third-degree burn, results in a charred and coagulated or white and lifeless surface, possible shock, and slow healing. The pain is usually less after the initial injury because of the destruction of the nerves.

Severity of the burn

When considering the severity of a burn, you must consider the following factors: the agent or source of the burn, body regions burned, depth of burn, extent of burn area, age of patient, and any other illnesses or injuries. Location of the burn can also be used to determine that the burn is severe. Burns to the face and upper airway, hands, feet, or genitalia are severe.

Agent or source

First determine the source or agent. Was the burn caused by electricity or chemicals? With an electrical burn, suspect internal injuries. With a chemical burn, consider that the agent may continue to burn, possibly for days and finally reach the blood stream.

Body regions burned

Burns to the face pose a significant threat to airway and possibly damage to the eyes. Burns to the hands and feet can cause disability. Burns to the groin, genitalia, buttocks, or medial thighs are at high risk for bacterial contamination. Circumferential burns can seriously cause circulation impairment to the distal extremity making healing difficult.

Depth of burn

Are the burns superficial, partial, or full thickness burns?

Extent of burn area

The system used to estimate the extent of the surface area involved is called the “Rule of Nines” (figs. 4–14 and 4–15). The percentage of body area burned is determined by the size of the patient’s hand which is equal to 1 percent BSA (body surface area). This percentage system is used in what is called the ***Rule of Nines***; it breaks down each body part into a predetermined number of percentage points. They are as follows:

- **Adult**: Head and neck—9 percent, Each upper extremity—9 percent, Anterior trunk—18 percent, Posterior trunk—18 percent, Each lower extremity—18 percent, and Genitalia—1 percent.
- **Infant**: Head and neck—18 percent, Each upper extremity—9 percent, Anterior trunk—18 percent, Posterior trunk—18 percent, Each lower extremity—14 percent, and Genitalia—1 percent.

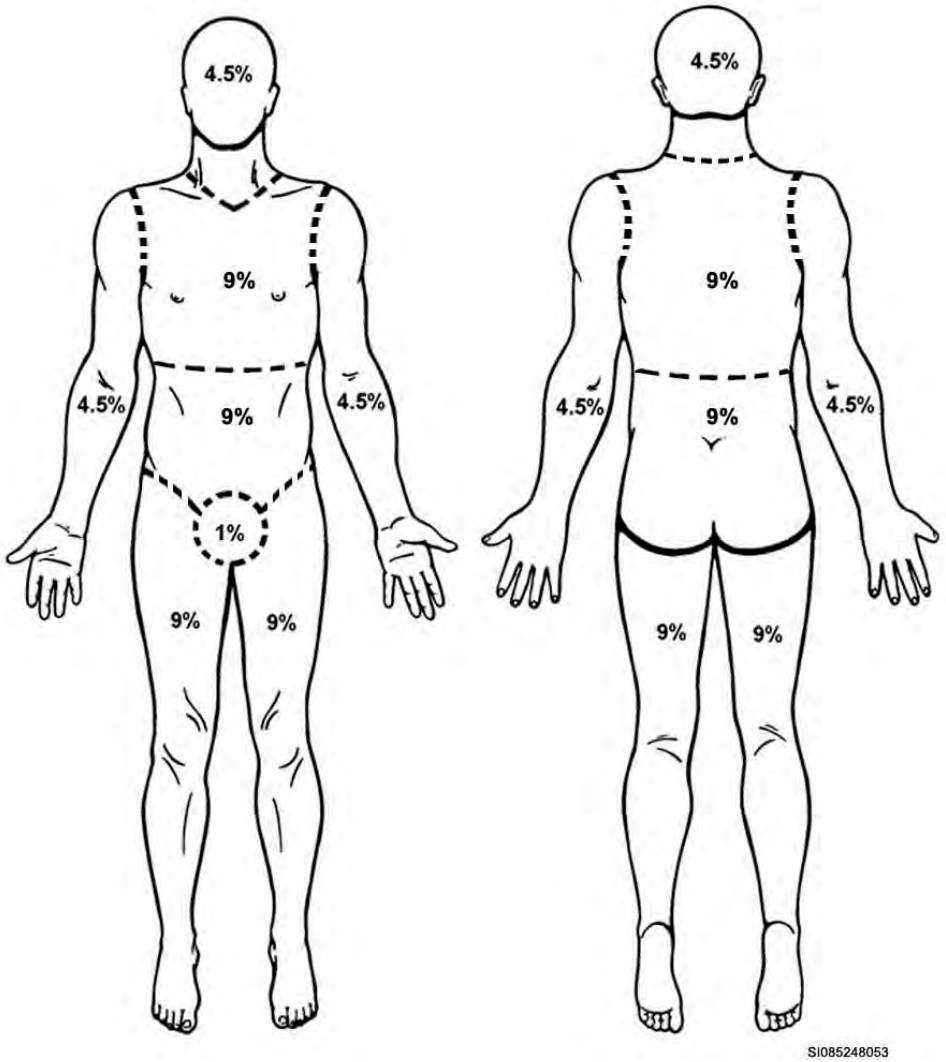


Figure 4–14. Rule of Nines—adult.

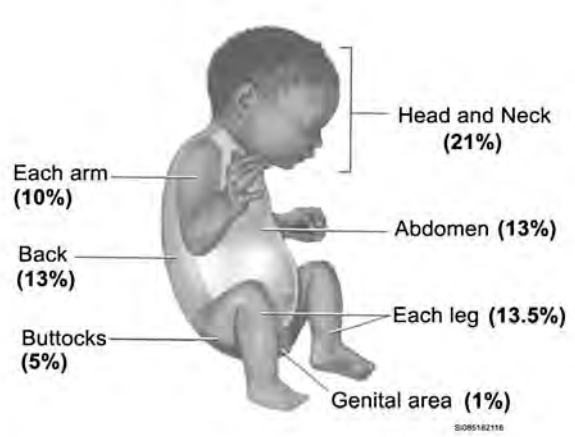


Figure 4–15. Rule of Nines – Infant.

Age of patient

Children under the age of 5 and adults over the age of 55 have the most severe reactions to burns. With the younger child, serious burns can cause a large amount of fluid loss. For the older adult, serious burns are more difficult to heal due to aging tissue.

Other illnesses or injuries

Patients with respiratory and heart disease or diabetes have a more serious reaction to burns than the otherwise healthy person.

All of the above must be determined to help you prioritize the situation. The following chart helps you classify the severity of burns.

Classification of Severity for Burns	
Minor burns	Full-thickness burns involving less than 2 percent of the body surface, excluding face, hands, feet, genitalia, or respiratory tract. Partial-thickness burns that involve less than 15 percent of the body surface.
Moderate burns	Full-thickness burns that involve 2–10 percent of the body surface, excluding face, hands, feet, genitalia, or respiratory tract. Partial-thickness burns that involve 15–30 percent of the body surface. Superficial burns that involve more than 50 percent of the body surface, and superficial burns less than 50 percent of the BSA.
Critical burns	All burns complicated by injuries of the respiratory tract, other soft-tissue injuries, and injuries of the bone. Partial- or full-thickness burns involving the face, hands, feet, genitalia, or respiratory tract. Full-thickness burns involving more that 10 percent of the body surface. Partial thickness burns involving more than 30 percent of the body surface. Burns complicated by painful, swollen, or deformed extremities. Burns, which by classification are moderate but appear in a person less than 5 or greater than 55 percent. Circumferential burns.

Treatment of thermal injuries

In caring for thermal injuries due to scalding liquids, steam, contact with hot objects, flames, and flaming liquids and gases, take the following steps:

1. Stop the burning process and prevent injury. Wet down flames, smother, then remove clothing. For grease, tar, or wax; cool with water, do not remove the substance.
2. Ensure the patient has an open airway and assess breathing.

3. Assess the burned patient for signs of airway injury, such as soot deposits, burnt nasal hair, and facial burns.
4. Complete the initial assessment.
5. Treat for shock and provide high-concentration oxygen.
6. Evaluate burns for depth and severity (use Rule of Nines).
7. Remove any clothing and jewelry, but do not attempt to debride wounds or burns.
8. Wrap burns with a dry sterile dressing. For thermal burns to the eyes, apply sterile gauze pads to both eyes. For chemical burns to eyes, flush eyes for 20 minutes en route to hospital.

Management of chemical burns

Chemical burns occur when caustic substances (acids, alkalis, etc.) come into contact with the skin, eyes, or respiratory tract (fumes). The basic treatment for this type of injury is to stop the burning process. The chemical is usually removed from the skin (or eyes) by flushing the area with massive amounts of water. Do not use forceful streams because you may add mechanical injury to the burn itself. Remove clothing as the area is flushed. To protect yourself from the chemical agent, don gloves and flush the burn site for at least 20 minutes, even if the patient claims the pain is gone. Many chemicals have a delayed reaction and continue to burn even after the sensation is gone. After the flooding is completed, cover the area with a dry, sterile dressing and transport the patient to the hospital.

Certain chemicals become activated when they are exposed to water. If you are caring for a patient who was exposed to such chemicals, brush the chemical away (dry chemicals) or follow local protocol. Otherwise, remove the patient's clothing, cover, and transport as before.

If the patient inhaled toxic fumes, he or she will probably complain of dyspnea and exhibit other signs of respiratory distress. Administer oxygen and transport the patient promptly to the hospital. Be prepared to provide respiratory support as necessary.

Management of electrical burns

Electrical burns are caused by contact with high- or low-voltage electricity or by lightning. Such burns are associated with two major dangers. First, the amount of tissue injury is usually far more extensive than is evident from the appearance of the skin wound. Second, the electricity may disrupt the electrical currents in the heart causing cardiac arrest.

For electricity to cause damage to the body, it must enter at one point and exit at the other. The current usually follows an erratic path as it travels through the body and destroys tissues as it passes through. Follow the steps below for care of the patient with an electrical burn:

1. Size up the scene. Make certain that you and the patient are not in contact with any electrical source and outside the area where downed or broken wires or other sources of electricity can reach you.
2. Provide airway care; assess airway and breathing.
3. Provide CPR, if needed, for cardiac arrest.
4. Care for shock and administer high-concentration oxygen.
5. Provide care for spinal injuries, head injuries, or fractures.
6. Evaluate the burn; look for entry and exit indications. Provide care for these areas as you would a thermal burn.
7. Apply dry sterile dressings to the burn sites.
8. Transport as soon as possible; keep in mind, electrical burns cause internal injury.

NOTE: If you are outside a facility at an accident scene, your first priority is to protect yourself from the electricity. If the patient were burned by a high power line that is still live, stay away until the power is turned off. Do not attempt to extricate the patient until this is done. You won't be able to

help the patient much if you are lying dead beside him or her! Lightning burns do not pose any risk for you. Once the lightning is gone, the current is also gone and the patient can be safely handled.

Management of radiation burns

Radiation burns are caused by exposure to ultraviolet radiation (sunlight), nuclear explosions, or radioactive materials. Sunlight is produced by atomic explosions in the sun. Some of the ionizing radiation produced by these explosions passes through the ozone layer and can cause a burn injury. Burn injuries are usually caused by too much exposure to the sun and are usually first-degree. They are painful but usually do not require any definitive medical care. If a large percentage of the skin is involved, the patient may experience severe discomfort and systemic reactions. Transport such patients to the hospital for definitive care.

You'll learn how to deal with burns associated with nuclear explosions and radioactive materials in your medical readiness training. Be aware, however, that such patients need to be isolated from other patients and staff, and that decontamination precautions should be followed after any contact with the patient.

Burn debridement

Another form of wound care you will be associated with is burn debridement. You will assist the physician during this process. Aseptic technique will be utilized to prevent and control infections. The below table explains the procedure.

Burn Debridement	
Step	***Action***
1	Assemble equipment. Don personal protective equipment (PPE).
2	Identify and explain the rationale and procedures to patient/family.
3	Open sterile towel using sterile technique.
4	Open packages of 4x4s using aseptic technique and place on sterile field.
5	Using sterile technique, the physician gently picks up any loose eschar (scab or dry crust) with forceps and will cut off with scissors. Eschar is not to be debrided to the point that bleeding occurs.
6	Apply the prescribed topical agent after debridement is completed.
7	Debridement may be done while patient is in a tub or immediately following a bath or in the patient's room for evening or frequent dressing changes. **NOTE:** The patient will not be allowed to remain in the tub for longer than 15–20 minutes for debridement. If this does not allow sufficient time, the patient is removed from the tub. The procedure may be completed while the patient is on the stretcher before returning to his or her bed.
8	Document on the appropriate form the date, time, area debrided, appearance of area, person doing procedure, and patient response.

243. Wound care

As you read, you may recall seeing some of this material earlier in your studies in the anatomy and physiology volume. Wound care is a critical skill you must possess. We will now build upon the knowledge you currently have on this information.

A wound is an injury that disrupts the normal continuity of the tissues. These wounds can be classified as either open or closed. An open wound exposes the underlying tissues to the environment, thereby exposing the injured patient to infection. When the skin is unbroken, the wound is closed.

Wound types

Wounds can also be accidental or intentional. An intentional wound is created for therapeutic reasons, such as during an operation. The different types of accidental wounds include:

- Contusions.

- Hematomas.
- Abrasions.
- Amputations.
- Avulsions.
- Lacerations.
- Incisions.
- Puncture wounds.

Contusion

This is commonly referred to as a bruise. This type of injury involves the skin and subcutaneous tissue. The skin remains intact, but the underlying tissues are damaged. The extent of the damage depends on the amount of force that was applied to cause the injury. The damage usually includes cell damage and torn blood vessels in the dermis, and leakage of tissue fluid and blood into the damaged tissues. This leakage causes edema and pain and produces a characteristic black and blue discoloration called *ecchymosis.*

Hematoma

This is a pool of blood that forms beneath the skin when large amounts of tissue are damaged and large blood vessels are ruptured. Hematomas also occur when fractures or organs are damaged. The extent of the bleeding depends on the force of the injury, size of the damaged blood vessel, and the location of the injury. The femur, for example, is surrounded by large blood vessels. When the femur is fractured, these vessels are usually damaged causing pooling of large amounts of blood. In some cases, this pooling may be enough to cause hypovolemic shock. By contrast, a hematoma can form when you pinch the skin on your finger, but it is so small that it is only be a minor inconvenience.

Another common type of hematoma is the *subungual* hematoma. After a blow or crushing injury to the fingernail, the patient experiences severe and sometimes excruciating pain that persists for hours and may even be associated with a vaso-vagal (sudden loss of consciousness) response. The fingernail has an underlying deep blue-black discoloration which may be localized to the proximal portion of the nail or extend beneath its entire surface.

Many times you will assist the physician in performing a trephination (excision) at the base of the nail, using the free end of a hot paper clip, electric cauterizing lance, or drill. When performed quickly, patients do not feel the heat, just relief from pain. The cautery or drill is rapidly tapped a few times in the same spot at the base of the hematoma until the hole is through the nail. When resistance from the nail gives way, stop further downward pressure to avoid damaging the nail bed. Apply pressure to stop the bleeding and apply antibacterial ointment and bandage accordingly.

Abrasion

This is the loss of a portion of the epidermis as the result of the skin being rubbed or scraped across a rough surface. There may be some bleeding from the capillary vessels in the dermis, but the abrasion usually does not penetrate completely through the dermis. Abrasions are usually extremely painful because multiple pain sensors are normally found in the damaged area. Abrasions are also known as road burns, a strawberry, and rug burn.

Amputation

This is the surgical removal or traumatic severing of a part of the body. Extremities and its attachments are most subject to amputations. Amputations can be partial or complete.

Avulsion

This is an injury in which a piece of skin is either torn completely loose from all attachments or left hanging as a flap. Avulsed tissues ordinarily separate at normal anatomical planes, usually between

the subcutaneous tissue and the muscle fascia. Usually, there is significant bleeding from the bed of the wound. If the avulsed part remains attached by a small pedicle of skin, circulation to the flap may be in jeopardy.

Laceration

This is a cut produced by a sharp object. The cutting object may leave a torn or jagged wound through the skin and may penetrate into the subcutaneous tissue, underlying muscles, and associated nerves and blood vessels.

Incision

This is a smooth cut produced by a sharp object. The sharp object in most cases is a knife or surgical scalpel.

Puncture wound

This is an injury caused by a stab with a knife, ice pick, splinter, or any other pointed object, including a bullet. External bleeding is not normally severe because the entrance wound is small, but the penetrating object may injure structures deep within the body causing rapid, fatal bleeding if structures such as the large blood vessels within the chest are involved. Puncture wounds are also highly susceptible to infection because of the depth of the penetration. In some cases, the wound actually penetrates all the way through the body or extremity. Such wounds are called *perforating wounds.*

Healing process

In volume 1, we introduced wound care in a clinical-type setting. Now let's build on what you've already learned about the healing process with wounds that may be more extensive, such as those you might see in a deployed setting or at a facility with inpatient services. Wounds can be caused intentionally, like those a surgeon will make and those that can be caused from multiple other situations. Because wounds are caused from different mechanisms in different environments, wounds may need to heal through different processes.

There are three basic ways in which a wound heals (fig. 4–16):

1. First intention.
2. Second intention.
3. Third intention.

First intention healing

It is also referred to as primary union. An excellent example of first intention healing is a surgical closure. There is a minimum of tissue damage, inflammation, or scarring. Of course, closing a wound can only be done when no infection is present; therefore, some few accidental wounds cannot be sutured and healed in this manner.

Second intention healing

It is also referred to as granulation. When there is a danger of infection, or when there is an infection already present, the wound is left open to heal from the deeper layers of tissue to the epidermis. This filling in of new pink tissue is called granulation.

Third intention healing

It is also referred to as secondary closure. There may be times when the physician may want to delay wound closure due to repeated debridement, irrigations, and excessive drainage. Once the physician ensures that the wound is free of infection, the granulated tissues are approximated (brought together) and then sutured. Another example is when the initial closure breaks open, which is referred to as a wound *dehiscence*, and is then resutured. Whichever healing process is used, you are responsible for daily dressing changes.

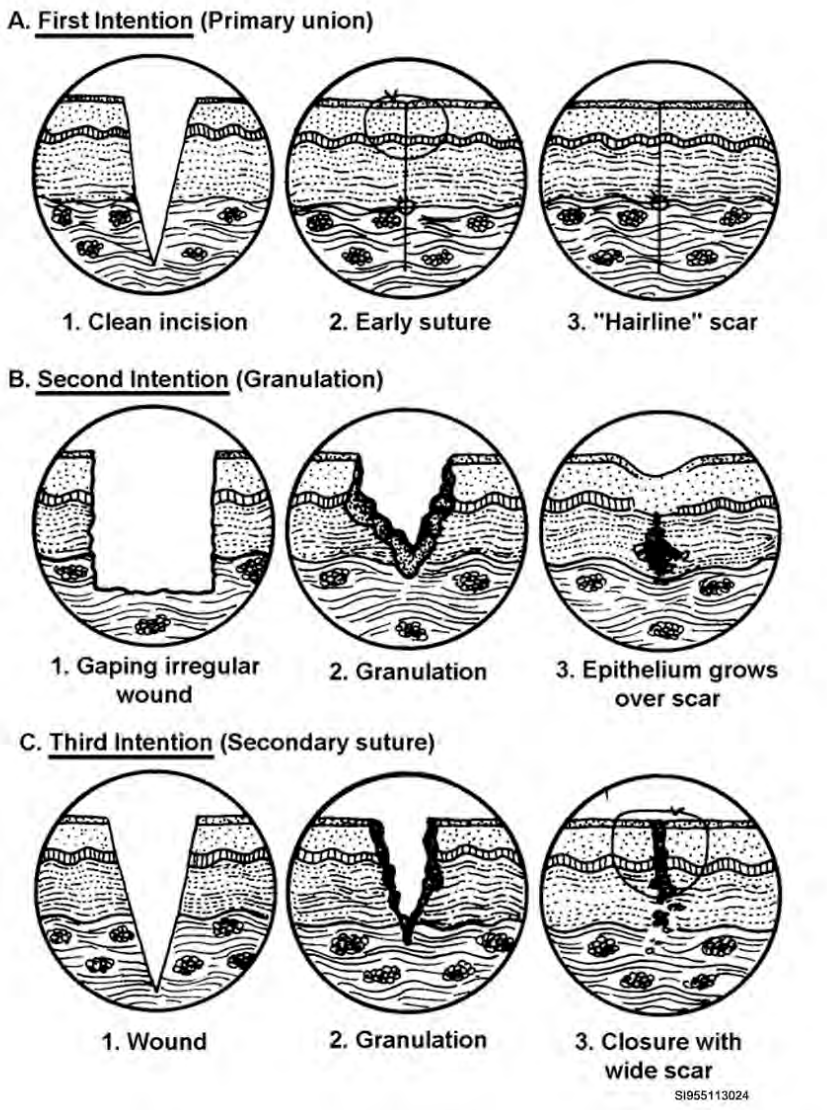


Figure 4–16. Healing process.

Changing sterile dressings

A protective covering placed over a wound is referred to as a *dressing*. There are a number of different reasons why a wound is dressed. Protecting the wound from further trauma and bacteria is one common reason. A dressing may also be placed to apply pressure to a wound at the time of injury as well as postsurgery. After surgery, you will notice a large, tight dressing over the patient's incision upon return from the OR. The pressure helps to stop further bleeding and help approximate wound edges. A dressing is also used to immobilize and support the wound, reducing discomfort and promoting healing. We will cover three types of dressings first and then list the steps. The basic procedure for all three types of dressing changes are the same except for the specific requirements of the dressing to be dry, wet, or wet to dry.

Dry dressings

Dry dressings are primarily used for wounds healing by primary or first intention. Dry dressings offer wound protection and absorb drainage for esthetic reasons (covers a wound the patient or others may not want to look at). Dry dressings are also used to apply pressure to wounds in varying degrees depending on the wound and the provider's orders. A disadvantage to this dressing is that the material

often adheres to the wound surface or drainage as it dries. Removing the dressing can cause the patient discomfort and disrupt granulation tissue (new growth). When removing this dressing, the provider will normally have you soak the dressing for a few minutes with a sterile solution, and then carefully and slowly remove the dressing so you don't tear the tissue away.

Wet-to-wet dressing

Wet dressings are wet compresses applied to the skin. It is used on clean, open wounds or on wounds with granulating surfaces. The purpose of this type of dressing is to reduce inflammation; cleanse the skin of thick exudates, crusts, or scales; and to maintain drainage of affected areas. Wet-to-wet dressings provide an environment that is warm and moist, which can improve healing and patient comfort. The dressing is saturated in the directed solution, then the dressing is lightly squeezed to remove excess solution to avoid dripping and then applied to the wound. The solution used depends on the provider's order based upon the desired outcome of the dressing. Commonly used solutions are saline and antimicrobial agents. Other solutions that you may encounter are colloidal (oatmeal or antipruritic affect) and oils (antipruritic and soothing affect). A disadvantage to the wet-to-wet dressing is maceration (softening or break down) of the surrounding tissue and may also increase the risk of infection. As you might guess, a dressing that is wet is likely to make clothing and bed linens damp, which can chill your patient or make them uncomfortable. You will need to check these patients frequently and may need add a protective layer beneath the patient or change linen frequently.

Wet-to-dry dressings

Wet-to-dry dressings are applied to wounds that are untidy or infected wounds that require debridement and are healing by secondary intention. Like the wet-to-wet dressing, gauze is saturated with a sterile saline or antimicrobial solution and is placed over or packed into the wound. Unlike the wet-to-wet dressing, in this case, you will apply a *dry* dressing (gauze sponges or absorbent pads) over the wet dressing and allow them to dry. The objective is to apply wet gauze over the wound, which moistens or softens the tissue and traps debris within the gauze as it dries. The dressing is removed as it becomes dry or just before it dries. The frequency of dressing changes will depend on the provider's orders and the amount of necrotic debris that is removed with each dressing change. When removing this dressing, gently and steadily pull the gauze to remove it from the wound. It is a good idea to remove the dressing away from the patient's face to prevent any anxiety. The advantage to this dressing application over the wet-to-wet dressing is the fact that the patient's comfort is maintained by applying a dry dressing over the wet one, which decreased the chances of clothing and linen becoming damp. There are no specific disadvantages to this type of dressing; however, keep the risk of infection and patient discomfort in mind in all three dressing types.

No dressing

In some cases, you will find the provider has ordered a wound to be left open to air. You will most commonly see this after an initial dressing on a clean, dry, and intact incision is removed. Advantages of not using a dressing include: better visualization of the wound, elimination of the conditions prime for organism growth (warm, moist, and dark), minimizes reaction to adhesive tape, and it is economical. Now that you have a better idea of the differences in the types of dressings, let's look at the steps you will follow to change them. Always start by confirming the doctor's orders!

To change a dressing, first gather your supplies. The following is a list of what you normally need:

1. Sterile gauze sponges.
2. Dressing materials.
3. Antiseptic solution (ordered by the physician).
4. Moisture-proof bag.
5. Sterile and nonsterile gloves.

6. Sterile container.
7. Tape.

As with all procedures, identify the patient and explain the procedure. Wash your hands and apply nonsterile gloves. Remove the old dressing by pulling the tape toward the incision. Look at the wound itself and observe the wound drainage. Is the drainage foul smelling, purulent, or blood-tinged (serosanguinous)? Is the wound healing; is there redness or swelling; are the sutures embedded; or is the wound pulling apart? If so, have the nurse or provider look at the wound before continuing. Once you have removed the old dressing, drop the soiled dressing into a moisture-proof bag. Rewash your hands. Prepare your supplies for the sterile cleaning and redressing of the wound.

Prepare a sterile field by dropping all needed supplies onto the sterile field using proper, sterile aseptic technique. Pour solution into a sterile container. Apply sterile gloves. Using sterile forceps moisten your sterile gauze sponge and begin to clean the wound with the desired antiseptic solution or sterile water. Using only one sponge at a time, clean the wound, taking one swipe from the wound's edge, then outward (fig. 4–17, A). Never wipe inward toward the wound as this brings organisms closer to the wound, increasing the risk of infection. Another method of cleaning is to use downward swipes (fig. 4–17, B). Remember that you start at the wound and move outward away from the wound and use a new sterile sponge each time. Once the area is clean, pat the wound dry (again starting at the wound and moving outward). Now, you are ready to cover the wound with sterile gauze or the type of dressing ordered by the physician. If a wet-to-wet or wet-to-dry dressing is being used, you can carefully pour the solution onto the sterile dressing (over a trash can is a good idea in case it runs off the dressing) or you can use a second sterile container to soak the gauze. Gently squeeze excess solution from the gauze and place over the wound. To hold the dressing in place, you will normally use adhesive tape that is specifically made for medical use.

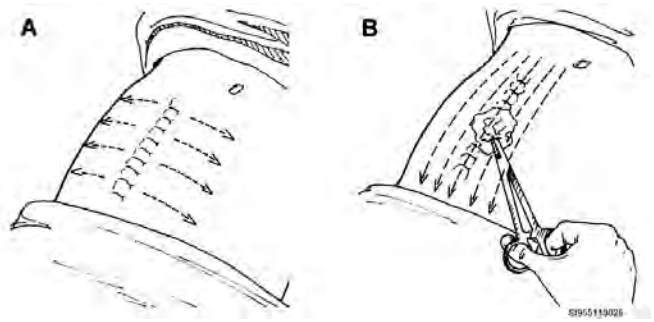


Figure 4–17. Wound cleaning: A. Outward strokes, B. Downward strokes.

Place the tape across the wound to aid with approximation (fig. 4–18). Also, never totally cover the dressing with tape. Leaving portions untaped allows for dissipation of moisture and heat. Always observe the skin surrounding the wound for redness, swelling, blisters, or irritation as some people react to adhesive tape. Report any such findings to the nurse or provider before reapplying adhesive material. An alternate means of holding the dressing in place may be required (such as Kerlix), or a different type of tape may decrease or eliminate the problem.

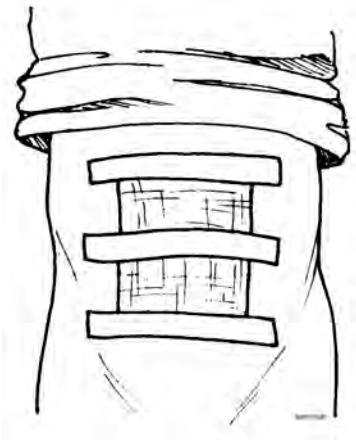


Figure 4–18. Properly taped dressing.

Wound drainage systems

There are various types of drainage systems that are inserted into wounds to facilitate the removal of excess drainage. After surgery, if fluids, pus, and/or blood accumulate within the wound, it can create the perfect breeding ground for bacteria, place pressure on internal organs, and cause necrosis of internal tissues. The

insertion of a drain can eliminate these problems. As mentioned, there are various types of drains; one often seen is the *vacuum drain.* Vacuum drains (fig. 4–19) can be connected to suction or compressed to create a negative pressure. The surgeon places the vacuum draining system in place during surgery. Your responsibility is to empty the evacuator bag when it is full and reestablish suction. To empty the evacuator, put on gloves and use a face shield or plastic glasses to protect yourself against possible splashing of blood. Open the drainage plug, invert the bag, and empty the drainage into a measuring receptacle. Once you drain the vacuum bag, place it on a solid, flat surface. Compress the vacuum bag, and close the drainage plug to establish the vacuum.

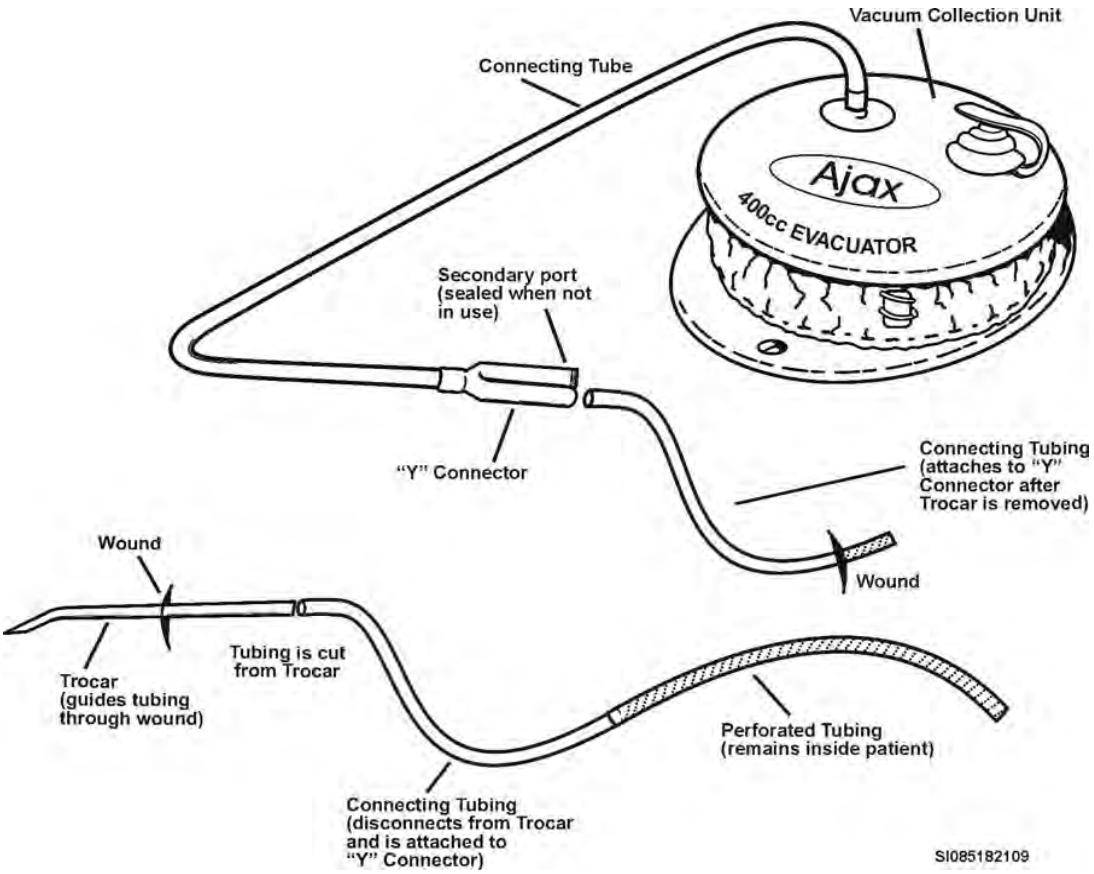


Figure 4–19. Vacuum drainage system.

244. Heat and cold treatments

One of the oldest and most effective types of therapy is the application of heat and cold to the body. Heat and cold therapy can be used to relieve pain, promote comfort and healing, and reduce swelling. There are some potential dangers with these types of therapy, such as burns or worsening the patient's condition, so you need to know what you are doing and why.

Effects of heat

When heat is applied to an area of the body, the superficial blood vessels in the area become dilated or enlarged. At the same time, the heat decreases the blood viscosity or thins the blood. The result of these two actions is a tremendous increase in blood flow to the heated area. More oxygen and nutrients are carried in, and lymph flow is also increased. The increased circulation carries away waste products, damaged cells, and excess fluid at a faster rate. Tissue metabolism to the area is increased and there is an increase in antibacterial activity. Phagocytes begin to clean up the area. It is important to remember that when blood flow is increased in one part of the body, it decreases

somewhere else. It usually affects internal organs, such as the heart. As the circulation decreases through the heart, the blood pressure drops, but the pulse increases in an effort to maintain equilibrium. These effects are usually minute unless you are applying heat to a large part of the body. In that case, there is always a possibility that the patient receiving the treatment could go into shock. Individuals who have weak hearts should consult a physician before using something like a hot sauna or Jacuzzi.

Heat applications also cause changes in the appearance of the skin and in muscles of the area. The skin feels warm to the touch and appears reddened (erythema) and slightly swollen from the excess blood flowing through it; there is an increase in metabolic and lymphocytic activities. Depending on what part of the body is affected, the heat may also cause the sweat glands to secrete perspiration. The muscles react to heat applications by becoming tonic or relaxed.

Heat applications have a number of very useful purposes. To begin with, they are an excellent way to warm the body. Heat also promotes healing by stimulating the circulation and increasing the antibacterial action in the area. It promotes comfort by relaxing the muscles. Heat helps to relieve congestion around internal organs by drawing the blood out to the superficial tissues. Finally, heat is useful in reducing edema. However, as we mentioned in the beginning, you do have to be careful with this. Edema accumulation is usually a reaction to tissue damage. This reaction continues for a certain period of time (24–48 hours) and gradually diminishes after that. If you apply heat during the reaction time, you simply increase the amount of edema in the area. But, if you wait until after the swelling period, the heat relieves the swelling by improving the circulation and carrying off the fluid.

Heat should only be applied at moderate temperatures and for short periods of time. Temperatures above 115°F for moist treatments and 125°F for dry treatments are considered extreme heat and result in burns. Never apply heat continuously for more than one hour (usual treatment length is 20–30 minutes). One exception to this rule is the use of the electric aquatic heating pad that is applied as continuous or intermittent low heat (time is specified by the physician). After an hour or so, the body begins to adapt to the heat and the blood vessels constrict (reflex vasoconstriction). This is part of the body's protective mechanism to protect itself. Continued application results in tissue damage.

Burns can also result after prolonged applications of heat. The longer the application is in contact with the skin, the less sensitive the patient becomes to the heat; therefore, a burn could result without the patient realizing it. This is why it is important for you to check on the patient receiving the heat application every five minutes. Monitor the patient closely and frequently for severe pain, extreme erythema, and blisters. Also, make sure the temperature of the application has not changed. Most importantly, remember that the elderly and pediatric patients have fragile skin and are more susceptible to complications.

Effects of cold

The effects of cold are essentially the opposite of heat—blood vessels constrict. This results in a decrease in blood flow and metabolic and lymphocytic activity. Although this probably looks as if it is doing more harm than good, cold does have several useful applications. Cold reduces body temperature. It also increases the blood flow to internal organs, such as the heart, and can be useful in raising the blood pressure. It is dangerous for this same reason. By reducing the flow of blood and other fluids into an area, cold acts to limit swelling and reduce bleeding. Cold also numbs the areas of application, which is useful in reducing pain.

In addition to affecting sensory receptors and circulation, cold affects both the integumentary and muscular systems. The pilomotor muscles in the skin react to cold by tensing and making little bumps under the skin (goosebumps) and by making your hair stand on end. Cold affects muscles by making them tense. Extreme cold causes muscles to vibrate (shivering) in an effort to produce body heat.

Like heat, cold should only be applied for short periods of time and at moderate temperatures. The maximum is usually 20–30 minutes. Extreme cold is somewhat difficult to define, but 59°F is

considered to be very cold. The body adapts to prolonged cold by dilating the blood vessels (reflex vasodilation). Since the cold also has a numbing effect, the tissue is very susceptible to damage.

Exposure to prolonged or extreme cold causes tissue damage. Signs of the damage include burns, blisters, cyanosis (blue skin from lack of oxygenated blood), and frostbite. Again, some individuals are more susceptible, such as pediatric and elderly patients. To prevent any complications, you must check on your patient every five minutes.

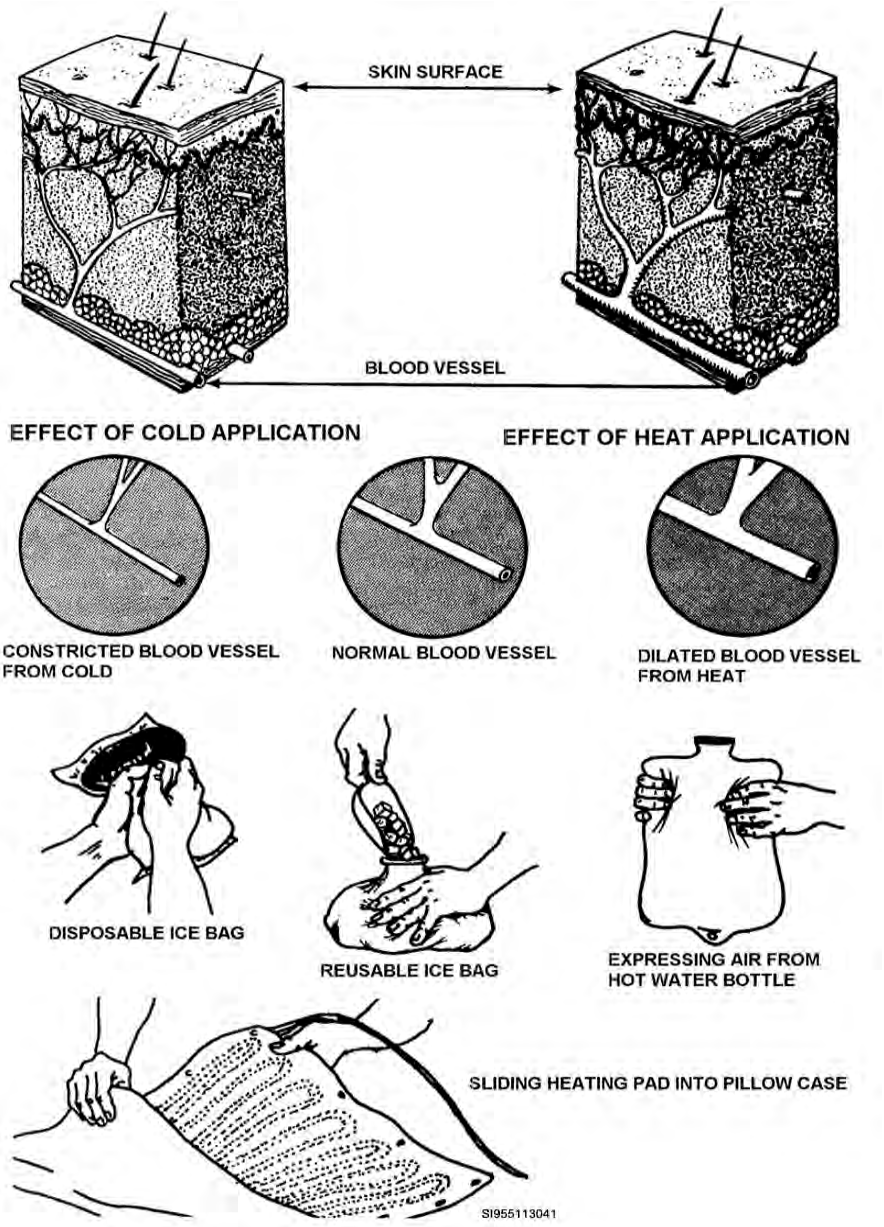


Figure 4–20. Treatments and effects of heat and cold.

Heat and cold applications

There are many types of heat and cold applications (fig. 4–20). Rather than describe each of them in detail, we will simply list them and give you a few rules that apply to all of them.

Principles of application

Begin all types of procedures in the same way. Wash your hands and gather your equipment. Ask the patient for his or her name and check it against the ID band. Then, explain the procedure to the patient. Use a bath thermometer to check the temperature of your application. Normal ranges are as follows:

- Warm—93 to 98°F (33.8 to 37°C).
- Hot—98 to 105°F (37 to 40.5°C).
- Very hot—105 to 115°F (40.5 to 46.1°C).
- Cool—65 to 80°F (18.3 to 26.6°C).
- Cold—59 to 65°F (15 to 18.3°C).
- Very cold—59°F and below (15°C and below).

Always check the physician's orders with the nurse to be sure what temperature and type of treatment was ordered. If the patient has delicate skin, find out what temperature adjustment is needed. Always protect the patient's skin by wrapping the application. Also, protect the bedding by placing a waterproof bed protector under the application. *Monitor the patient closely*. Look for signs of tissue damage and report them and any patient complaints immediately. Do *not* exceed the time limitations for the application. If the treatment does not achieve the desired effect, reapply it later with the physician's permission. Make sure that the patient does not adjust the application. Ensure that electrical devices are safe; check out the equipment prior to use. Also, make sure the patient's call light is within reach.

Heat applications

Heat can be applied by hot-water bottles, electric or chemical heating pads, soaks, baths, compresses, packs, heat cradles, heat lamps, and hypothermia blankets. The soaks and baths are obviously forms of moist heat. The other devices can be made moist by moistening a towel or washcloth and placing it between the application and the patient. Moist heat penetrates deeper than dry heat, and therefore, increases the likelihood of complications.

Cold applications

Cold can be applied by ice collars, ice bags, packs, compresses, sponges, baths, and the hypothermia blanket. Like heat, a dry cold application can be made moist by applying something damp between it and the patient.

Self-Test Questions

After you complete these questions, you may check your answers at the end of the unit.

241. Face and throat injuries

1. What types of head and facial injuries could result in airway problems?

2. How does the conjunctiva react to injury or irritation?

3. Why does a small particle continue to irritate the eye even after it is removed?

4. What should you do with a particle that is lodged on the cornea?

5. Why should you cover both eyes when a patient has an injury to only one eye?

6. What is the treatment for chemical burns to the eyes?

7. Why should compression not be applied to an eye laceration?

8. What is hyphema?

9. Under what circumstances would you remove contact lenses in the field?

10. How do you detect corneal abrasions?

11. How should you handle a laceration that extends all the way through the cheek?

12. How should you handle a patient who is bleeding from the mouth and has a possible spinal cord injury?

13. Why should you not attempt to remove objects that have been forced into a nose?

14. What are the indications of facial fractures?

15. What type of dressing should be used on neck injuries and why?

242. Burn management

1. What elements can cause burns to body tissues?

2. Why is the mortality rate high for facial burns?

3. What are the three ways used to assess a burn victim?

4. What are the signs and symptoms of a superficial burn?

5. How can you tell a burn is a partial-thickness type?

6. What is the appearance of full-thickness burns?

7. What is used to determine the extent of burned surface area?

8. Patients under what age and over what age have the most severe reactions to burns?

9. A partial-thickness burn that involves less than 15 percent of the body surface is classified as what type of burn?

10. A full-thickness burn that involves more than 10 percent of the body surface area is classified as what type of burn?

11. What is the treatment for a thermal burn to the back?

243. Wound care

1. How are wounds classified?

2. What type of wound is created during surgery?

3. Match the accidental wound definition in column A with its medical term in column B.

Column A	*Column B*
____ (1) A cut produced by a sharp object.	a. Contusion.
____ (2) Loss of epidermis as the result of the skin being rubbed or scraped.	b. Hematoma.
____ (3) Caused by a stab with a pointed object.	c. Abrasion.
____ (4) Skin is torn completely loose or left hanging as a flap.	d. Avulsion.
____ (5) A pool of blood that forms beneath the skin.	e. Laceration.
____ (6) Referred to as a bruise.	f. Puncture.

4. What is a good example of first intention healing?

5. Define granulation.

6. What term is used to describe the pulling together of tissue prior to suturing?

7. What term is used to refer to a wound when the initial suture closure breaks open?

8. Give three reasons for the use of a dressing over the wound.

9. What direction do you wipe when cleaning a wound?

244. Heat and cold treatments

1. What effect does the application of heat have on the superficial blood vessels?

2. Why should patients who have weak hearts consult a physician before using a hot sauna or Jacuzzi?

3. How often should you check on a patient receiving a heat treatment?

4. What effect does cold temperature have on the blood vessels?

5. What is the purpose of shivering?

Answers to Self-Test Questions

236

1. (1) c.
   (2) b.
   (3) a.
   (4) d.
2. Hypoxemia.
3. Respiratory alkalosis.
4. Respiratory acidosis.

237

1. Before and after respiratory treatments.
2. (1) b.
   (2) c.
   (3) a.
   (4) d.
3. Because oxygen supports combustion and makes things more flammable.
4. Cotton.
5. Ensure that the fill date does not exceed five years and that the tank is secured to keep it from falling over.
6. The patient's condition, the immediate situation, the available equipment, and whether the patient can tolerate the specific type of equipment necessary for its administration.
7. Patients who are very sick, restless, or uncooperative.
8. With an oxygen analyzer.
9. Nonrebreathing mask.
10. Venturi mask.
11. When other attempts to increase the patient's PaO_2 have failed and prior to intubation.
12. Water may overflow into the gauges.
13. Every 48 hours.
14. A doctor or anesthetist.

238

1. (1) d.
   (2) a.
   (3) c.
   (4) b.
   (5) d.
   (6) b.
   (7) d.
2. As an emergency measure when there is obstruction of the upper air passages.
3. To help maintain a clean and dry area longer.
4. Every eight hours, or as often as the physician orders it.

239

1. Difficulty breathing on exertion, which is relieved by rest.
2. Unusual or irregular heartbeats felt by the patient.
3. A fall in cardiac output.
4. A reduced amount of hemoglobin in the blood.
5. Arteriosclerosis, shock, or hypovolemia.
6. Apex of the heart.
7. Closure of the mitral and tricuspid valves.

240

1. To compare the pulse rate at the apex of the heart with that at the radial artery.
2. One listens over the apex of the heart with a stethoscope, while the other counts the pulse rate of the radial artery.
3. To terminate ventricular fibrillation or ventricular tachycardia.
4. Continue CPR until the physician decides the next course of action.
5. Electronic monitoring of the heart rhythm over airwaves.
6. 70–90 mm/Hg.
7. A pressure bag.
8. Venous blood volume, assessment of right-sided heart failure, and determination of heart infarctions.
9. Brachial, femoral, subclavian, or jugular veins.
10. To decrease the chance of an air embolism.
11. 5–12 cm H_2O.
12. 8–10 mm/Hg.
13. Left ventricular failure, pulmonary congestion, and hypervolemia.

241

1. Injuries to the face and throat can lead to airway obstruction from bleeding, loose dentures or teeth, deformity, or swelling. The patient may also have a direct injury to the trachea or a brain injury that interferes with breathing.
2. The conjunctiva frequently becomes bright red.
3. The particle often leaves a small scratch on the surface of the conjunctiva that continues to irritate the eye and makes it feel like the particle is still in place.
4. Do not attempt to remove it. Notify the doctor and let him or her handle the problem.
5. In most people, the eyes move together as individuals focus on different things. Even though it is patched and injured, the injured eye follows the motions of the uninjured eye as the patient looks at different things.
6. Immediate and thorough flushing with sterile saline or water for 20 minutes.
7. Compression can interfere with the blood supply at the back of the eye and result in loss of vision from damage to the retina. Furthermore, the pressure may squeeze the vitreous humor out of the eye and cause irreparable damage.
8. Hyphema is bleeding into the anterior chamber of the eye.
9. With a chemical burn of the eye.
10. Perform a fluorescein eye stain.
11. Apply pressure on both sides of the cheek.
12. If the patient has a potential spinal injury, avoid airway maneuvers that may cause further damage (i.e., neck lift). Stabilize the spine and turn the patient to the side to allow drainage.
13. Such objects should be removed by the doctor in the ER. If you attempt to remove them, you may end up pushing them further back into the nose.
14. Pain and swelling, bite irregularity, loose or absent teeth, inability to talk or swallow, increased salivation, bleeding in the mouth, and loose bone fragments.

15. An occlusive dressing is used to prevent the possibility of an air embolus being sucked in through a vein.

242

1. Heat, chemicals, electricity, and radiation.
2. Facial burns are usually accompanied by injuries to the respiratory tract.
3. By agent and source, by degree, and by severity.
4. Localized areas of redness due to dilation and hyperemia of the blood vessels in the skin. Pain, tenderness, and temperature elevation of the affected area are also present.
5. Appearance of vesicles or blisters.
6. Charred, coagulated, or white and lifeless surface appearance.
7. "Rule of Nines."
8. Under 5 and over 55.
9. Minor burn.
10. Critical burn.
11. Wrap burn with a dry sterile dressing.

243

1. Open or closed.
2. An intentional wound.
3. (1) e.
   (2) c.
   (3) f.
   (4) d.
   (5) b.
   (6) a.
4. A surgical closure.
5. The filling in of new pink tissue in a wound.
6. Approximation.
7. Wound dehiscence.
8. Protection from trauma and bacteria, apply pressure to wound, patient comfort, and promote healing.
9. Swipe from the wound edge, then outward.

244

1. The superficial blood vessels in the area become dilated or enlarged.
2. When we increase blood flow in one part of the body, it will be decreased somewhere else. It usually affects internal organs, such as the heart. As the circulation decreases through the heart, the blood pressure drops but the pulse increases in an effort to maintain equilibrium. These effects are usually minute unless you are applying heat to a large part of the body. In that case, there is always a possibility that the patient receiving the treatment could go into shock.
3. Every five minutes.
4. Causes vessels to constrict.
5. Shivering is an attempt by the body to produce heat.

Unit Review Exercises

Note to Student: Consider all choices carefully, select the *best* answer to each question, and *circle* the corresponding letter. When you have completed all unit review exercises, transfer your answers to the Field Scoring Answer Sheet.

Do not return your answer sheet to the Air Force Career Development Academy (AFCDA).

80. (236) What is the *normal* arterial oxygen saturation range?
    a. 85 to 88 percent.
    b. 89 to 91 percent.
    c. 92 to 95 percent.
    d. 95 to 98 percent.

81. (236) What condition occurs if CO_2 builds up and mixes with water in the blood stream?
    a. Metabolic acidosis.
    b. Metabolic alkalosis.
    c. Respiratory acidosis.
    d. Respiratory alkalosis.

82. (237) When using an oxygen tent, how frequently should oxygen concentrations and temperature be checked?
    a. 1 to 2 hours.
    b. 3 to 4 hours.
    c. 4 to 8 hours.
    d. 8 to 12 hours.

83. (237) For patients using a *nonrebreathing* mask, the *inspired* oxygen concentration is
    a. 30 to 40 percent.
    b. 40 to 50 percent.
    c. 60 to 90 percent.
    d. 80 to 100 percent.

84. (237) What action(s) should you take when moving a patient on a venturi mask?
    a. Monitor in transport.
    b. Reduce oxygen flow in transport.
    c. Monitor in transport and reassess patient on arrival.
    d. Reduce oxygen flow in transport and reassess patient on arrival.

85. (238) What complications could occur to the patient following a thoracentesis?
    a. Shock, bleeding, and dyspnea.
    b. Hypertension, tachycardia, and dyspnea.
    c. Bleeding and increase in distance between systolic and diastolic blood pressures.
    d. Dyspnea and decrease in distance between systolic and diastolic blood pressures.

86. (238) Closed-chest drainage is a drainage system used to
    a. deflate the chest cavity.
    b. deflate a collapsed lung.
    c. reexpand a collapsed lung.
    d. reexpand the chest cavity.

87. (239) What cardiac related condition may be caused by a fall in cardiac output resulting in cerebral ischemia?
    a. Palpitations.
    b. Syncope.
    c. Dyspnea.
    d. Fatigue.

88. (239) The physiological function that the heart sound S1 (“lub”) is associated with is
    a. closure of the aortic and pulmonic valves.
    b. closure of the mitral and tricuspid valves.
    c. opening of the aortic and pulmonic valves.
    d. opening of the mitral and tricuspid valves.

89. (240) When preparing a patient for insertion of a central venous pressure line, what maneuver is taught to the patient to decrease the chance of an air embolism?
    a. Webber.
    b. Valsalva.
    c. Vagal.
    d. Allen.

90. (240) What position should a patient be placed in for insertion of a central venous pressure line into a neck vein?
    a. Left lateral recumbent.
    b. Right lateral recumbent.
    c. Trendelenburg.
    d. Supine.

91. (241) As a minimum, how many minutes should you irrigate a patient’s eye with chemical burns?
    a. 5.
    b. 10.
    c. 20.
    d. 30.

92. (241) How are corneal abrasions detected?
    a. X-ray.
    b. Venogram.
    c. Angiogram.
    d. Fluorescein stain.

93. (241) There is a high rate of success if a dentist carries out a tooth replacement procedure within how many minutes of the accident?
    a. 10.
    b. 20.
    c. 30.
    d. 40.

94. (242) Damage to the epidermis with possible damage to the dermis and its appendages is classified as what type of burn?
    a. Superficial.
    b. Full thickness.
    c. Partial thickness.
    d. Severe thickness.

95. (242) A burn is classified as moderate if it involves
    a. full-thickness burns that involve 2 to 10 percent of the body surface.
    b. partial thickness burns that involve less than 15 percent of the body surface.
    c. partial thickness burns involving more than 30 percent of the body surface.
    d. full-thickness burns involving more than 10 percent of the body surface.

96. (242) When caring for a patient with electrical burns at a facility, your first priority is
    a. to apply sterile dressings to the burn sites.
    b. management of the patient's airway.
    c. evaluate extent of the burn.
    d. infection control.

97. (243) How would you apply a dressing with the intention of debriding a wound?
    a. Dry.
    b. Wet.
    c. Wet to dry.
    d. Wet to wet.

98. (243) What is the proper sequence for cleaning a wound?
    a. Remove old dressing, don sterile gloves, wipe from the wound out.
    b. Remove old dressing, don sterile gloves, wipe towards the wound.
    c. Apply sterile gloves, remove old dressing wipe from the wound out.
    d. Apply sterile gloves, remove old dressing, wipe towards the wound.

99. (244) What reflex action would be caused if you leave a heat treatment in place for a prolonged period of time?
    a. Reflex vasoconstriction.
    b. Reflex vasodilatation.
    c. Babinski's reflex.
    d. Haab's reflex.

100. (244) How do you apply moist heat?
    a. Fill a water bottle with hot water and place on affected area.
    b. Moisten a towel and place between heat application and patient.
    c. Wash the affected area with warm water then apply a heat source.
    d. Place the patient under a heat lamp and use a spray bottle to dampen skin.

Glossary

Terms

AAAHC	Accreditation Association for Ambulatory Health Care
A&D	admissions and dispositions
ABG	arterial blood gases
AE	aeromedical evacuation
AED	Automated External Defibrillator
AET	aeromedical evacuation technician
AF	Air Force
AFI	Air Force Instruction
AFOSH	Air Force Occupational Safety and Health
AFPAM	Air Force Pamphlet
AHLTA	Armed Forces Longitudinal Technology Application
AIDS	acquired immunodeficiency syndrome
ANA	American Nurses Association
AOC	alteration of consciousness
APIE	Assessment Problem, Intervention, and Evaluation System
AWOL	absent without leave
BLS	basic life support
BM	bowel movement
BSA	body surface area
BVM	bag valve mask
BX	Base Exchange
C	Celsius
Ca	calcium
CBC	complete blood count
cc	cubic centimeter
CDC	career development course
CFETP	Career Field Education and Training Plan
CHCS	Composite Health Care System
CNM	certified nurse-midwife
cm	centimeter
CO_2	carbon dioxide
COPD	chronic obstructive pulmonary disease
CPAP	continuous positive airway pressure

cps	cycles per second
CPR	cardiopulmonary resuscitation
Cu	copper
CVA	cerebrovascular accident
CVP	central venous pressure
db	decibel
DD	Department of Defense
DEERS	Defense Eligibility Enrollment Reporting System
DNA	deoxyribonucleic acid
DSM-IV-R	Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Revised
EOM	extraocular movement
ECG/EKG	electrocardiogram
ECT	electroconvulsive therapy
EMS	Emergency Medical Services
EMT	emergency medical technician
ER	emergency room
ETT	endotracheal tube care
FVD	fluid volume deficit
F	Fahrenheit
FVE	fluid volume excess
g	gram
GI	gastrointestinal
Hz	hertz
I&O	intake and output
IAW	in accordance with
ICU	intensive care units
ID	identification
IED	improvised explosive device
IV	intravenous
K	potassium
kg	kilogram
KVO	keep vein open
lb.	pound
LOC	level of consciousness
MAJCOM	major command
MAR	Medication Administration Record

mEq/L	milliequivalent
mg	milligram
mL	milliliters
mm/Hg	millimeters of mercury
MSA	medical service account
MTF	military or medical treatment facility
MVA	motor vehicle accident
Na	sodium
NATO	North Atlantic Treaty Organization
NG	nasogastric
NKDA	no known declared allergies
NPO	nothing by mouth
OF	optional form
OI	operating instructions
OP	oropharyngeal airway
OPQRST	Onset Provoke Quality Radiation Severity and Time
OR	operating room
OX	oxalate
P	phosphorus
PA	physician assistant
PAWP	pulmonary artery wedge pressure
PCWP	pulmonary capillary wedge pressure
PERRLA	pupils equal, round, reactive to light, and accommodation
pH	percentage of hydrogen ions
po	*per os* (By mouth)
POW	prisoner of war
PPE	personal protective equipment
PT	physical therapy
PTA	post-traumatic amnesia
PTSD	post-traumatic stress disorder
PRN	*pro re nata (*As needed)
RBC	red blood cells
RMO	resource management office
ROM	range-of-motion
SDSC	same day surgical center
SF	standard form

SOAPP	subjective, objective, assessment, plan, and prevention
SOAPIE	subjective, objective, assessment, plan, implementation and education
TBI	traumatic brain injury
TC&DB	turning, coughing, and deep-breathing exercises
TENS	transcutaneous electrical nerve stimulation
TJC	The Joint Commission
TPR	temperature, pulse, respiration
VA	Veterans Administration

Student Notes

AFSC 4N051
B4N051 02 1612
Edit Code 05