LaFleur Brooks' Health Unit Coordinating

7th edition

Chapter 17

Treatment Orders

Lesson 17.1

Cardiovascular and Interventional Radiology Treatments

1. Define the terms in the vocabulary list.
2. Write the meaning of the abbreviations in the abbreviations list.
3. Discuss three methods that may be used to treat cardiovascular conditions and identify three areas within the hospital where cardiovascular surgical and treatment procedures may be performed.

Lesson 17.1

Cardiovascular and Interventional Radiology Treatments (cont'd)

4. Identify the three commonly used procedures performed to repair obstructed coronary blood vessels.
5. Identify the name and location of a vein and an artery that may be used for grafts during a coronary artery bypass graft.
6. Discuss the reasoning for cardiovascular treatment procedures being performed in conjunction with diagnostic procedures and list five treatment procedures performed in interventional radiology.

Methods Used to Treat Cardiovascular Conditions

- Cardiovascular conditions may be treated with:
  - Medication
  - Surgery
  - Placement of various therapeutic cardiac instruments

Cardiovascular Procedures

- Many cardiovascular therapies are invasive and are performed by an interventional cardiologist and/or an interventional radiologist.
- May be performed in the:
  - Cardiovascular Lab (CV Lab or Cardiac Cath Lab)
  - Special x-ray or Interventional Radiology
  - Surgery department

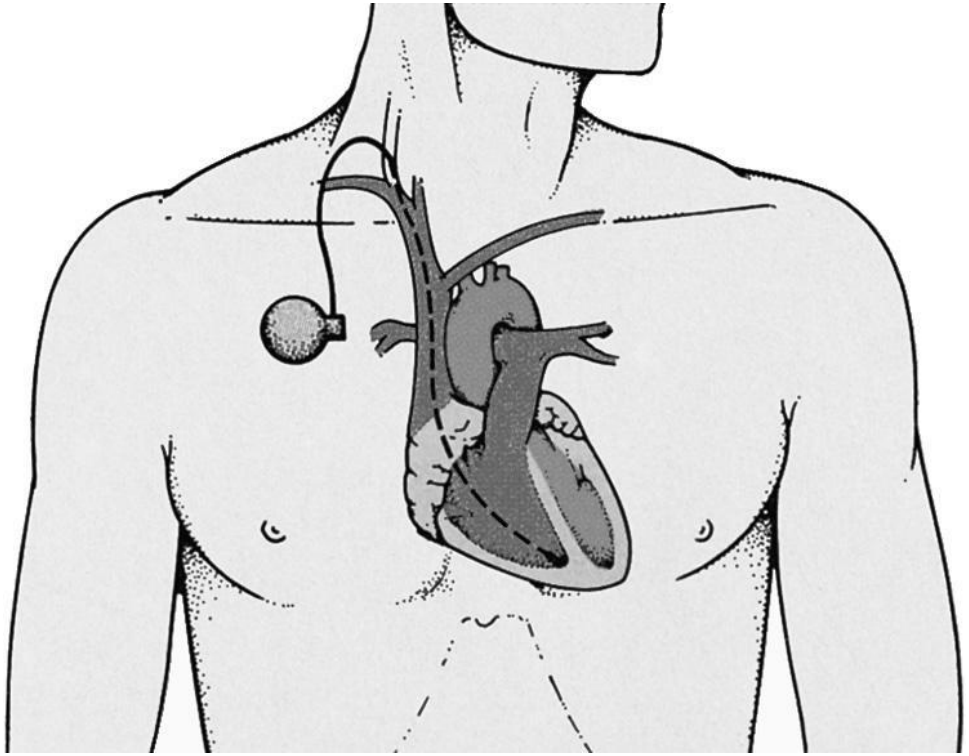
Defibrillation

- Process in which an electronic device sends an electric shock to the heart to correct life-threatening fibrillations of the heart, which could result in cardiac arrest
- External defibrillators deliver the shock through the chest wall.
- Internal defibrillators (ICD) deliver the shock via implanted electrodes within the heart.

Invasive Cardiovascular Therapies

- Insertion of a Cardiac Pacemaker
  - An electric apparatus used to increase the heart rate in severe bradycardia by electrically stimulating the heart muscle
  - May be permanent or temporary
  - May emit the stimulus at a constant and fixed rate or may fire only on demand
- Permanent pacemakers are implanted under a chest muscle during surgery.
- With temporary pacemakers, wires from outside the body lead into the heart.

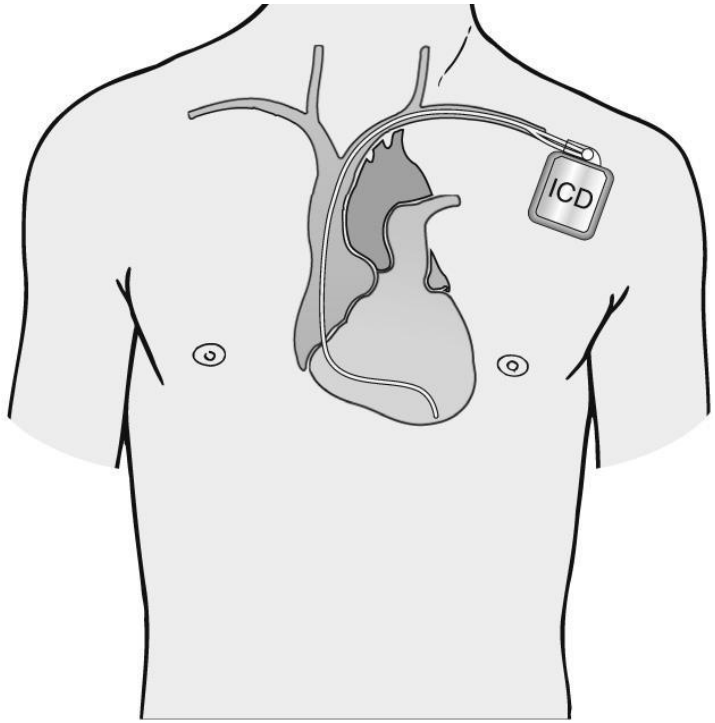
Cardiac Pacemaker



Invasive Cardiovascular Therapies, cont'd

- Insertion of an Implantable Cardioverter-Defibrillator:
  - An electric device that monitors and restores proper rhythm by sending low-energy shocks to the heart when the heart begins to beat rapidly or erratically
  - May be referred to as an automatic implantable cardioverter-defibrillator (AICD)
  - Is implanted in the chest
  - Most are also capable of pacing the heart in response to bradycardia.

Implantable Cardioverter-Defibrillator



Radio Frequency Ablation (RFA)

- Done in conjunction with invasive diagnostic procedures, such as electrophysiology studies
- Radiofrequencies emitted from a catheter tip ablate (kill) abnormal heart tissue that is the source of cardiac dysrhythmia.

Repair of Obstructed Coronary Blood Vessels

- Angioplasty
- Coronary Stent
- Rotational Atherectomy
- Coronary Artery Bypass Graft (CABG)

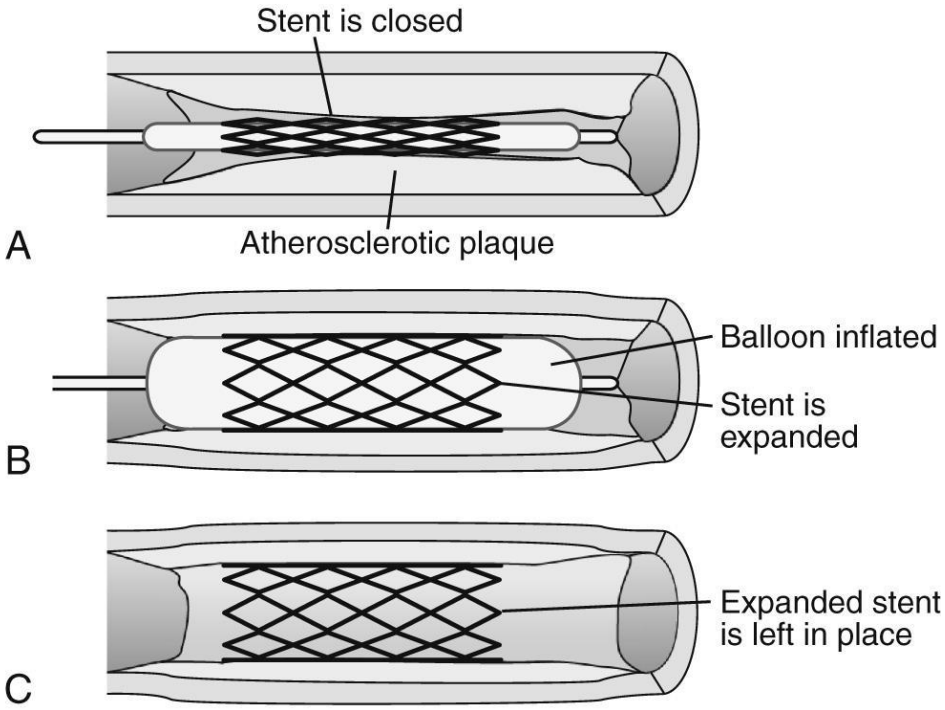
Angioplasty

- A medical procedure in which a balloon is used to open narrowed or blocked blood vessels of the heart (coronary arteries)
- Usually performed during a heart catheterization, when it is deemed necessary depending upon the results of the coronary arteriography
- The balloon catheter is moved into or near the blockage, and the balloon on the end is blown up (inflated), which opens the blocked vessel and restores proper blood flow to the heart.

Coronary Stent

- Placed at the site of a narrowing or blockage in order to keep the artery open
- An intraluminal coronary artery stent is a small, self-expanding, metal mesh tube that is placed inside a coronary artery after balloon angioplasty to prevent the artery from reclosing.
- A drug-eluting stent is coated with medicine (sirolimus or paclitaxel) that helps to further prevent the arteries from reclosing.
  - Similar to other coronary stents, it is left permanently in the artery.

Coronary Stent



Rotational Atherectomy

- A special catheter with a small, diamond tip is used to drill through hard plaque and calcium that is causing the blockage.

Atrial Septal Defect (ASD) Repair

- Repair of a congenital hole between the right and left atrium in newborns
- May be performed in the cath lab by inserting the surgical instruments through the femoral vein

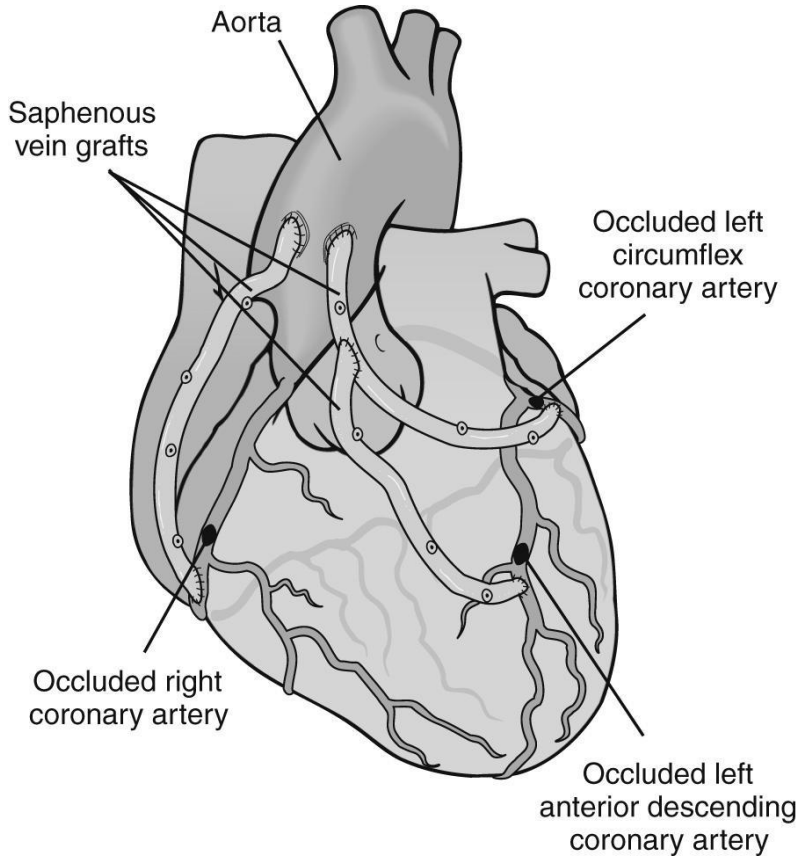
Coronary Artery Bypass Graft (CABG)

- Common treatment for blocked arteries when they are too severely blocked to be treated with angioplasty
- Heart bypass surgery creates a detour or “bypass” around the blocked part of a coronary artery to restore the blood supply to the heart muscle.
- An incision is made in the middle of the chest and separates the breastbone.
  - Through this incision, the surgeon can see the heart and the aorta (the main blood vessel leading from the heart to the rest of the body).

Artery and Vein Grafts

- A vein from the leg, called the *saphenous* vein, may be used for the bypass.
- An incision is made in the leg and the vein removed.
  - The vein is located on the inside of the leg, running from the ankle to the groin.
- The saphenous vein normally does only about 10% of the work of circulating blood from the leg back to the heart.
  - It can be taken out without harm to the patient or harm to the leg.
  - The internal mammary artery (IMA) may also be used as the graft.

Coronary Artery Bypass Graft (CABG), cont'd



Interventional Radiology

- Invasive diagnostic tests performed in the special procedures division of diagnostic imaging or in the cardiac cath lab often result in concurrent treatment based upon the findings at the time of the test.
- Due to the invasive nature and associated risks, it is expected that any treatment or intervention would occur in conjunction with the test itself.

Treatments Performed in Interventional Radiology

- Embolization: delivery of clotting agents (coils, plastic particles, gel, foam, etc.) through a thin catheter directly to an area
- Biliary Drainage and Stenting: use of a stent (small mesh tube) to open up blocked ducts and allow bile to drain from the liver
- Brachytherapy : radiation therapy performed by introducing radioactive pellets which travel and lodge in vessels of the targeted cancerous tissue

Treatments Performed in Interventional Radiology, cont'd

- Chemoembolization: delivery of cancer-fighting medications directly to the site of a cancer tumor
- Hemodialysis Access Maintenance: use of catheterization and thrombolysis to open blocked grafts needed for hemodialysis, necessary to treat kidney failure
- Stent Insertion: used to treat a variety of medical conditions in order to open blood vessels or other pathways that have been narrowed or blocked by tumors or obstructions

Treatments Performed in Interventional Radiology, cont'd

- Infection and Abscess Drainage: drainage of infection site with insertion of a catheter through a small nick in the skin and to the site of the infection
- Needle Biopsy: procedure to retrieve tissue from breast, lung, and other organs to diagnose cancers; an alternative to surgical biopsy
- Radiofrequency Ablation: use of radiofrequency (RF) energy to "cook" and kill cancerous tumors

Treatments Performed in Interventional Radiology, cont'd

- Endograft Insertion: reinforces a ruptured or ballooning section of an artery (an aneurysm) with a fabric-wrapped flexible mesh tube (stent) used to "patch" the blood vessel
- Thrombolysis: dissolves blood clots by injecting thrombolytic (clot-busting) drugs at the site of the clot
- Transjugular Intrahepatic Portosystemic Shunt (TIPS): a life-saving procedure to improve blood flow and prevent hemorrhage in patients with severe liver dysfunction

Treatments Performed in Interventional Radiology, cont'd

- Percutaneous Nephrostomy Tube Insertion: insertion of a catheter through a nick in the skin and into a blocked kidney to drain the urine
- Varicocele Embolization: a treatment for "varicose veins" in the scrotum, which can cause male infertility and pain
- Varicose Vein Treatment: saphenous vein is sealed shut through the use of a laser or radio frequencies.

Treatments Performed in Interventional Radiology, cont'd

- Vena Cava Filter: a tiny cage-like device inserted in a blood vessel to break up clots and prevent them from reaching and lodging in the heart or lungs
- Vertebroplasty: pain treatment for fractured vertebra in which medical-grade bone cement is injected into the vertebra

Lesson 17.2
The Cardiopulmonary (Respiratory Care) Department

7. State the purpose of the cardiopulmonary (respiratory care) department pertaining to patient treatment orders and list at least five cardiopulmonary (respiratory care) treatments.
8. Explain the importance of the health unit coordinator (HUC) including the entire doctor's order when communicating a cardiopulmonary (respiratory care) order (electronically, by requisition, or by telephone) and list the information that would be needed when sending an order for oxygen.

Lesson 17.2

The Cardiopulmonary (Respiratory Care) Department (cont'd)

9. List four types of aerosol delivery devices and identify at least two types of aerosolized drugs.
10. Explain the procedure and equipment needed to obtain an induced sputum specimen.
11. Discuss the purpose of incentive spirometry, chest percussion therapy, and noninvasive positive pressure ventilation and explain the use of a mechanical ventilator.

Cardiopulmonary (Respiratory Care)

- Evaluates patients with respiratory conditions
- Performs treatments to maintain or improve function of patients' respiratory systems
- Treatments usually are performed by a certified respiratory therapist (CRT) (also called a respiratory practitioner) at the patient’s bedside.

Communication of Cardiopulmonary Orders

- With CPOE:
  - Physician inputs order into the patient's EMR via the computer, and the order is sent directly to the cardiopulmonary department.
- With Paper Charts
  - Physician writes order in the patient's chart, and the health unit coordinator transcribes and sends the order to the cardiopulmonary department by
    - Using the computer or
    - Completing a cardiopulmonary (respiratory care) treatment requisition.
- HUC responsible for notification of stat orders

Examples of Cardiopulmonary Treatments

- Oxygen Therapy
- Aerosol Treatments
- Incentive Spirometry
- Chest Percussion Therapy or Chest Physiotherapy (CPT)
- Noninvasive Positive-Pressure Ventilation

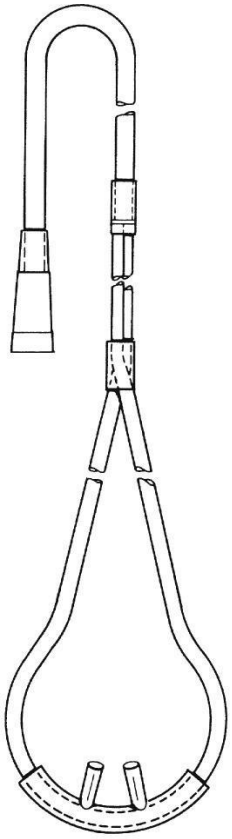
Treatments Performed in Cardiopulmonary

- Oxygen therapy is order to:
  - Treat hypoxemia (deficiency in the content of oxygen in arterial blood)
  - Decrease the work of breathing for a patient with dyspnea
  - Reduce myocardial (heart muscle) work
- Oxygen is piped into the patient's room via a wall outlet and is administered under pressure.

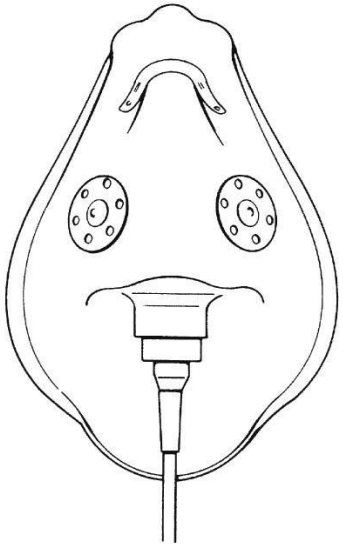
Treatments Performed in Cardiopulmonary

- Low-flow oxygen administration devices:
  - Nasal cannula (NC) or Nasal prongs (NP)
  - Simple mask
  - Partial rebreathing mask
  - Nonrebreathing mask
- High-flow oxygen systems:
  - Jet mixing mask or Venti mask
  - Large-volume nebulizer

Devices Used to Administer Low-Flow System Oxygen

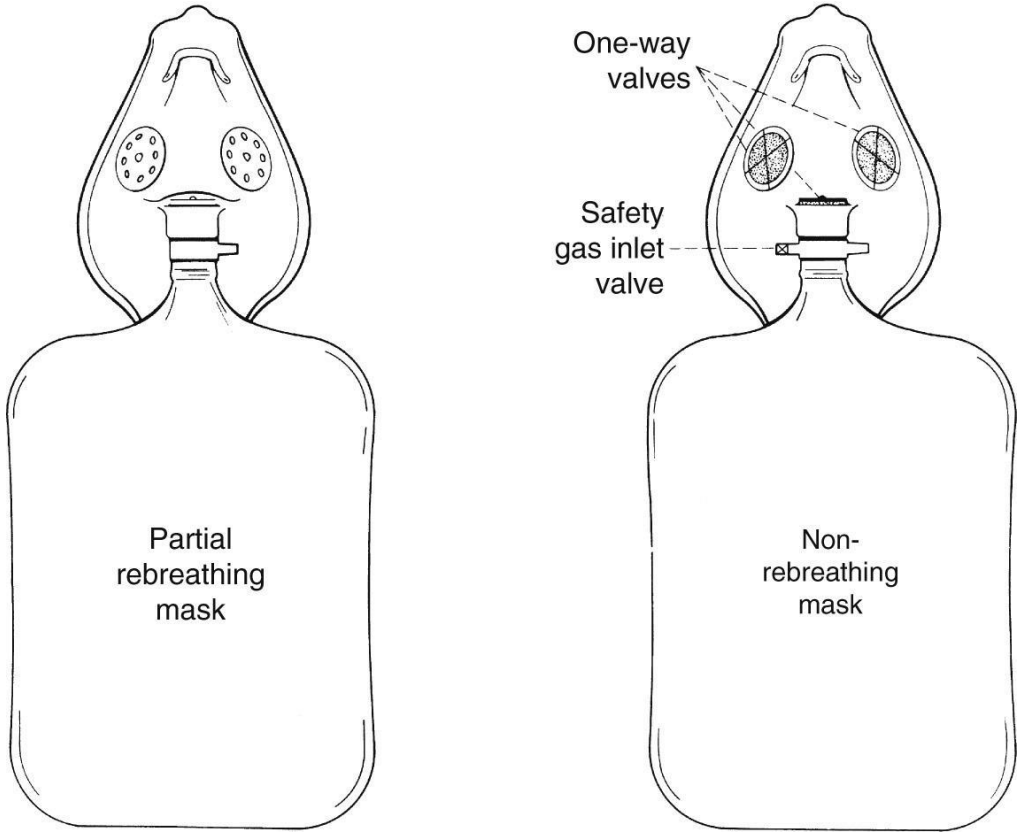


Nasal cannula

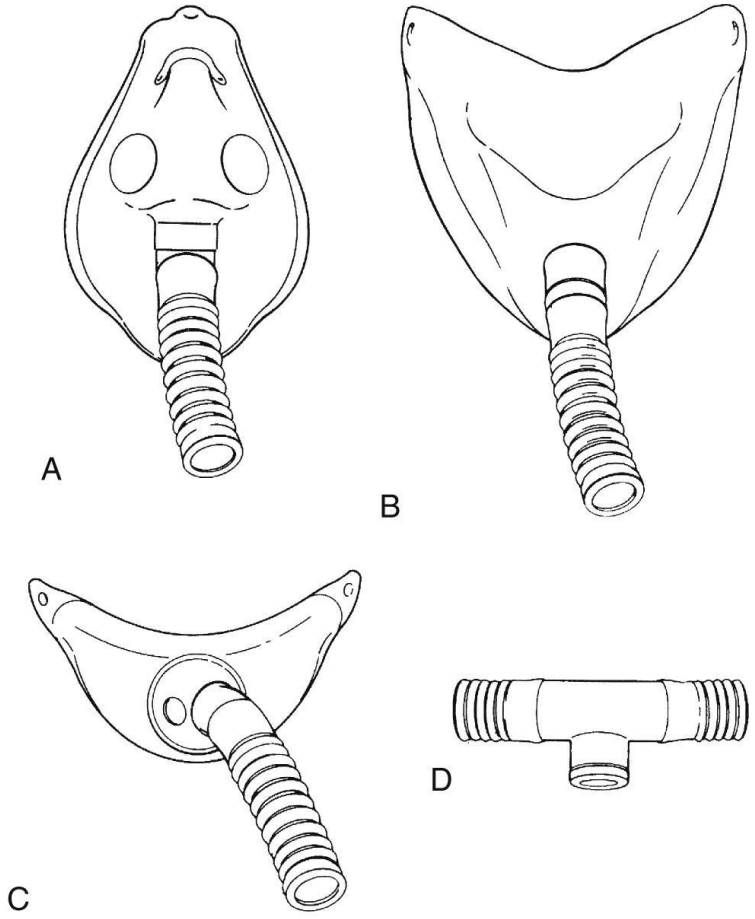


Simple mask

Devices Used to Administer Low-Flow System Oxygen, cont'd



Devices Used to Administer High-Flow System Oxygen

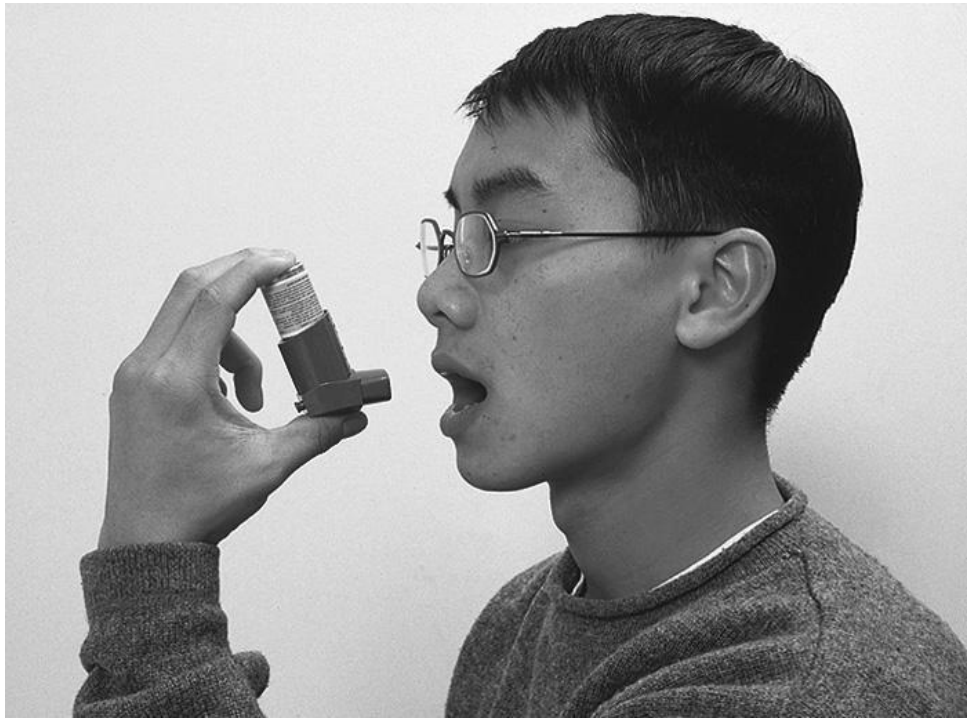


Wall Outlet for Oxygen

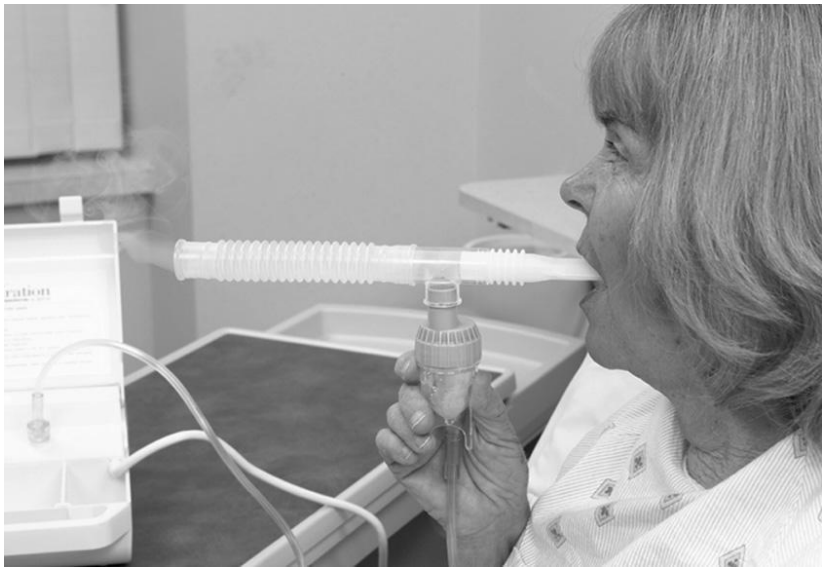
Aerosol Treatments in Cardiopulmonary

- Aerosol Delivery Devices:
  - Metered-Dose Inhaler (MDI): small portable aerosol canister filled with medication; the most common type of aerosol treatment
  - Small-Volume Nebulizer (SVN) (Handheld Nebulizer [HHN]): last between eight and 12 minutes and allow for numerous breaths to administer the medication
  - Dry powder inhaler (DPI): a device that provides the drug in powder form to be delivered into the lungs for absorption

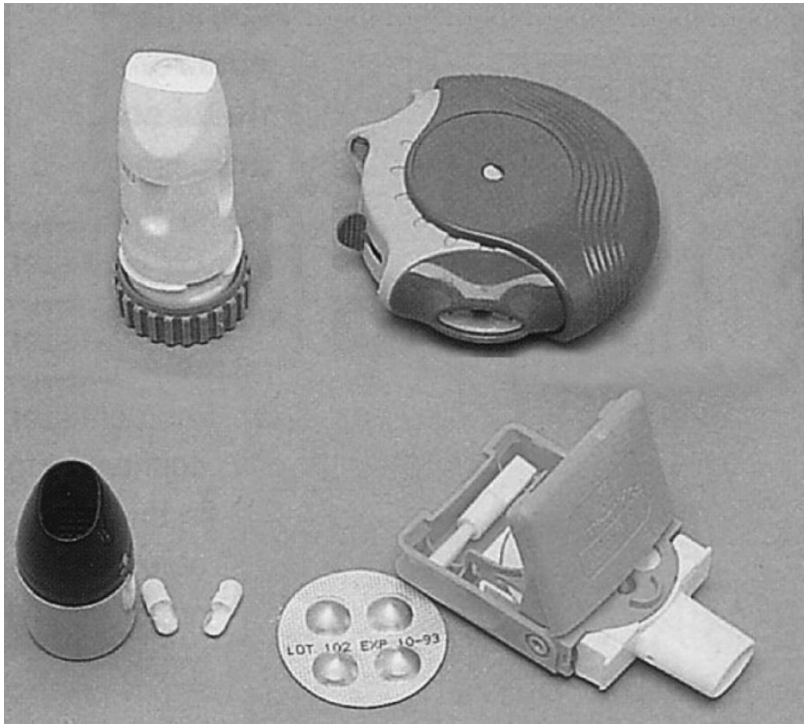
Metered-Dose Inhaler



Nebulization



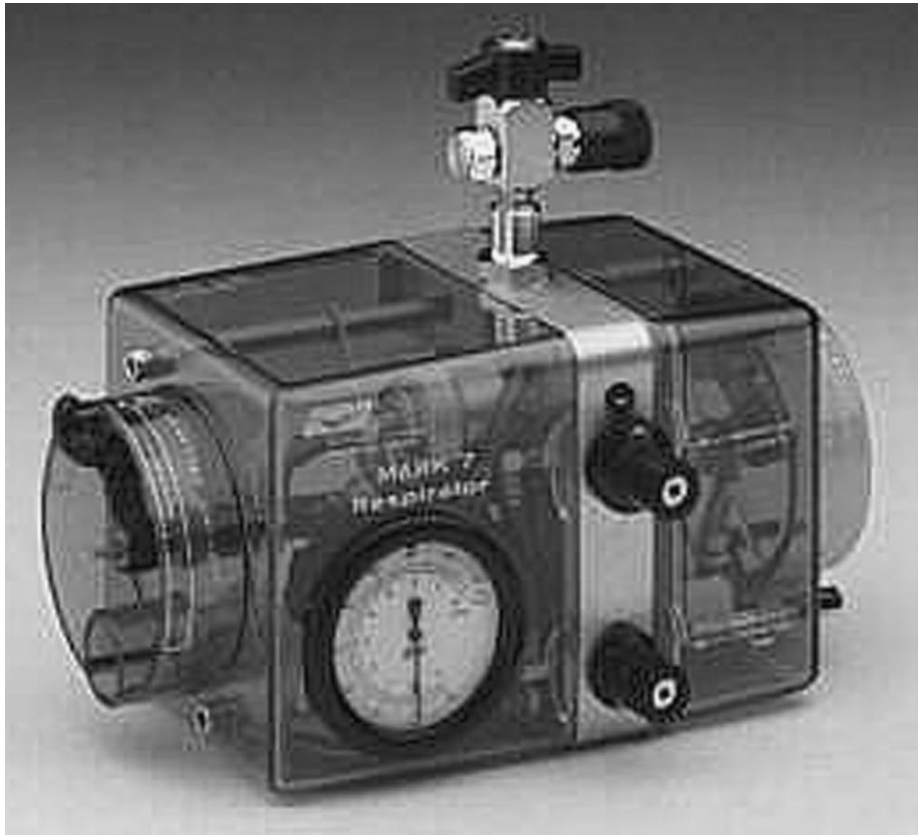
Dry Powder Inhalers



Aerosol Treatments in Cardiopulmonary, cont'd

- Intermittent Positive-Pressure Breathing (IPPB): a technique used to provide short-term or intermittent mechanical ventilation for the purpose of augmenting lung expansion, delivering aerosol medication, clearing retained secretions, or assisting ventilation
- Continuous Bronchodilator Nebulizer Therapy (CBNT): introduces aerosolized bronchodilator with oxygen on a continuous basis (low or high flow), or while the patient is on a mechanical ventilator.

Intermittent Positive-Pressure Breathing Machine



Types of Aerosolized Drugs

- Nasal Decongestants:
  - Found primarily as over-the-counter squeeze bottles sprayed into nostrils
  - Example – Neo-Synephrine.
- Bronchodilators:
  - Enlarge the diameter of the airway
  - Examples – Ventolin, Atrovent, Maxair, and Serevent
- Antiasthmatics:
  - Desensitize the allergic response to prevent or decrease the incidence of asthma
  - Examples – cromolyn sodium and nedocromil sodium.

Types of Aerosolized Drugs, cont'd

- Corticosteroids:
  - Used in moderate and severe asthma attacks to reduce the inflammatory response within the lung
  - Examples – AeroBid, Pulmicort, Vanceril, Flovent, and Azmacort
- Intranasal Corticosteroids:
  - Decrease vascular permeability and congestion
  - Examples – Beconase, Rhinocort, Flonase, Nasacort and Nasonex

Types of Aerosolized Drugs, cont'd

- Mucolytics:
  - Break down secretions in the lungs to aid in expectorate
  - Examples – Pulmozyme and Mucomyst
- Antimicrobials:
  - Aerosolized antibiotics and antriviral agents that fight bacterial and viral infections involving the respiratory system
  - Examples – gentamicin, tobramycin, amphotericin B, ribavirin, and pentamidine

Communicating Doctors' Orders for Cardiopulmonary Treatments

- It is very important to be accurate when entering the order information into the computer or copying the information onto the cardiopulmonary (respiratory care) requisition.
  - Helps the therapist bring the correct equipment and/or supplies to carry out the order
- The respiratory therapist is also required to read the physicians' orders before administering treatment.

To Include When Ordering Oxygen

- Orders for oxygen therapy must include:
  - Amount of oxygen
  - Flow rate and/or concentration
  - Type of delivery device

Obtaining an Induced Sputum Specimen

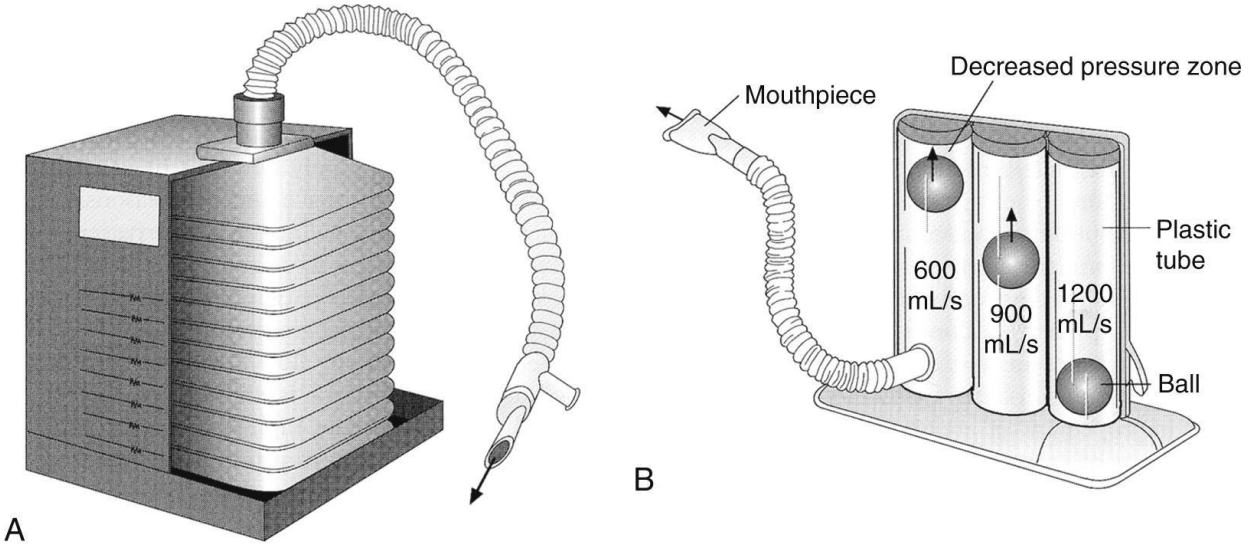
- Ultrasonic nebulizer with hypertonic solution: often used to induce a sputum specimen
  - Produces an aerosol that carries deep into the airways of the lung to loosen secretions so the patient may produce a sputum specimen
- Lukens sputum trap: often is used by a respiratory therapist to collect a sterile induced sputum specimen

Lukens Sputum Trap

Other Cardiopulmonary Treatments

- Incentive spirometry (IS) is often used postoperatively to encourage and reinforce the patient to take protracted, slow, deep breaths.
- The benefits of IS include improving inspiratory muscle performance.
  - This reestablishes or simulates the normal pattern of pulmonary hyperinflation.

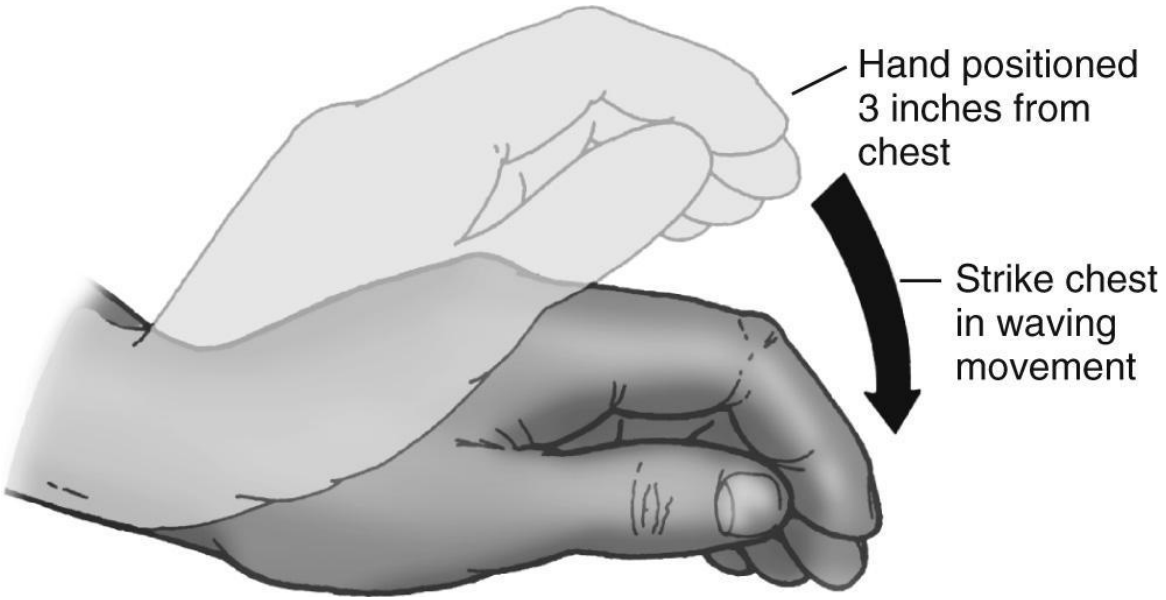
Spirometers



Other Cardiopulmonary Treatments, cont'd

- Chest percussion therapy (CPT) is a technique of rhythmically tapping the chest wall with cupped hands or a mechanical device
  - Used to loosen secretions in the area underlying the percussion via the air pressure that is generated by the cupped hand on the chest wall
- Usually is performed in conjunction with postural drainage
  - A treatment of patient positioning that is designed to remove secretions from the lung

Chest Physiotherapy



Other Cardiopulmonary Treatments, cont'd

- Mechanical Ventilator: A device designed to provide mechanical ventilation to a patient
  - Used chiefly in intensive care medicine, home care, and emergency medicine (as stand-alone units) and in anesthesia as a component of an anesthesia machine
- Mechanical ventilation is indicated when the patient's spontaneous ventilation is inadequate to maintain life.
- Also indicated to prevent imminent collapse of other physiologic functions or ineffective gas exchange in the lungs

Other Cardiopulmonary Treatments, cont'd

- Noninvasive positive-pressure ventilation (NIPPV)
  - The application of positive pressure by noninvasive means to a patient with acute or chronic respiratory failure or while weaning a patient from ventilatory support

Lesson 17.3
Wound Care, Traction or Orthopedics, Physical Medicine and Rehabilitation, Dialysis, and Radiation Treatments

12. State the purpose of the wound care department and explain the purpose of hyperbaric oxygen therapy.
13. Identify the two basic types of traction and the traction setup used by patients to assist them to move in bed.
14. Identify three divisions that make up the physical medicine department.
15. Describe the purpose of the physical therapy (PT) division of physical medicine and list four methods that would be used by PT personnel.

Lesson 17.3
Wound Care, Traction or Orthopedics, Physical Medicine and Rehabilitation, Dialysis, and Radiation Treatments (cont'd)

16. Describe the purpose of the occupational therapy (OT) division of the physical medicine department and list three doctors' orders that would be sent to the OT department.
17. Explain the purpose of speech therapy and describe the patients who would benefit from speech therapy.
18. Explain the need for dialysis, identify two types of dialysis, and discuss the process of each type.
19. Identify three areas in the hospital that may provide radiation treatments and explain the HUC's role regarding doctors' orders for radiation.

Wound Care Department/Clinic

- Specializes in the treatment of nonhealing, or slow-healing, wounds such as pressure sores caused by sitting or lying in one position and foot and leg ulcers connected to diabetes and burns
- Provides educational, medical, and supportive services to patients and their caregivers.

Hyperbaric Oxygen Therapy

- Patient breathes 100% oxygen while in an enclosed system pressurized to greater than normal atmospheric pressure (three times normal).
- Delivers oxygen systemically to injured areas quickly and in high concentrations
- Changes the normal cellular respiration process and causes oxygen to dissolve in the plasma
  - This stimulates the growth of new blood vessels.
    - Results in a substantial increase in tissue oxygenation that can arrest certain types of infections and enhance wound healing

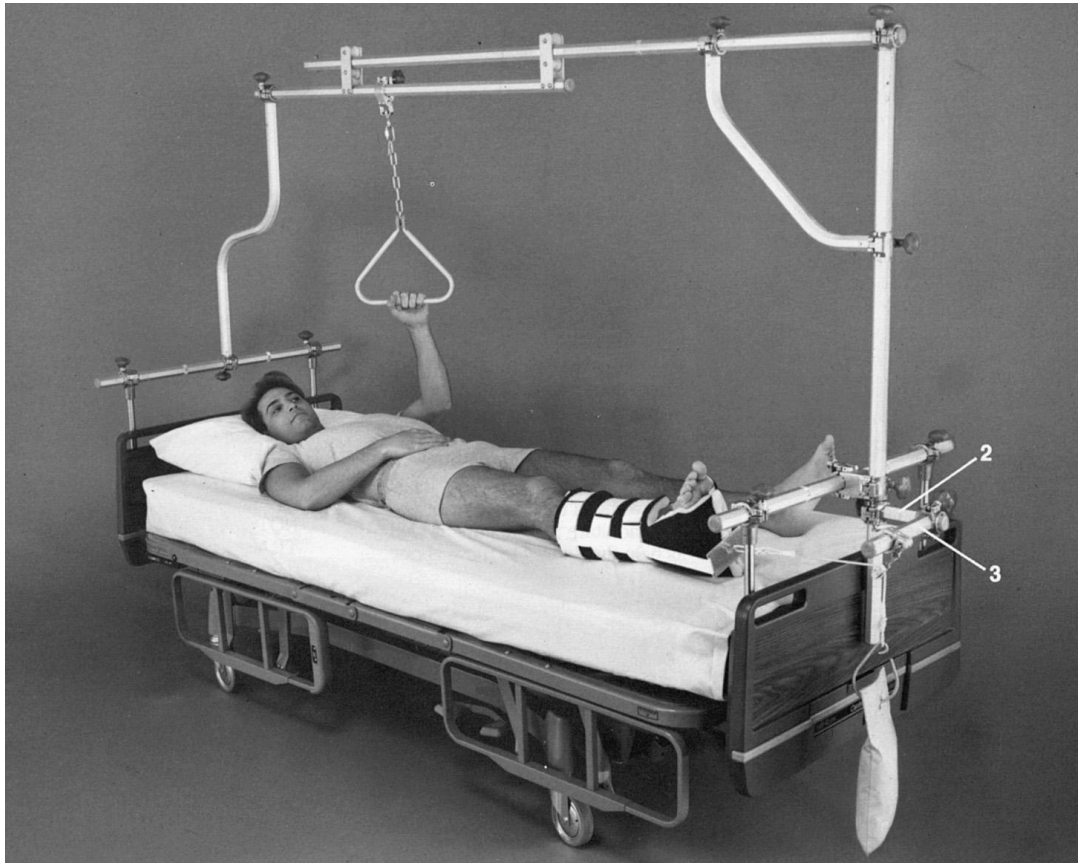
Traction

- The process of putting a limb, bone, or group of muscles under tension with the use of weights and pulleys to align or immobilize, to reduce muscle spasm, or to relieve pressure
- Used to treat patients with fractures, dislocations, and long-duration muscle spasms and to prevent or correct deformities
- Can be used in short-term or long-term therapy

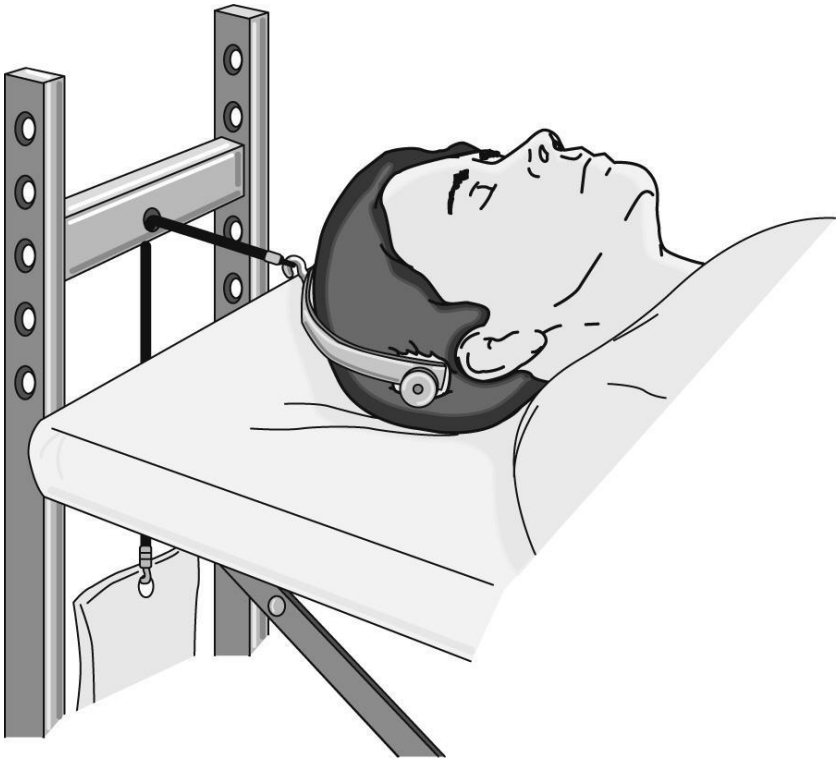
Traction, cont'd

- Two basic types of traction include:
  - Skin traction: applies pull to an affected body structure through straps attached to the skin surrounding the structure
    - Types include adhesive and nonadhesive skin traction.
  - Skeletal traction: applied to the affected structure by a metal pin or wire inserted into the structure and attached to traction ropes

Unilateral Buck's Traction



Crutchfield Tongs



Overhead Frame and Trapeze (Trapeze Bar)

- Used to help the patent move and support weight during transfer or position change
- Also may aid in strengthening upper extremities

Physical Medicine Divisions

- Physical Therapy
- Occupational Therapy
- Speech Therapy

Physical Therapy

- Division of physical medicine that treats patients to improve and restore their functional mobility
- Patients include those injured in accidents, sports, or work-related activities.
- Children affected by cerebral palsy and muscular dystrophy are assisted toward normal physical development through physical therapy.
- Individuals who experience strokes, spinal cord injuries, and amputations are assisted back to their highest level of physical function through therapy.

Exercises Performed with the Assistance of Physical Therapy

- Passive exercise: performed with the patient submissive and the PT moves the patient's limbs
- Active exercise: performed by the patient without assistance as instructed by PT
- Resistive exercise: use of opposition
  - T band or water may be used to provide resistance for patient exercises.
- Active assistive exercise: involves a patient moving an extremity with assistance from the PT as required

Exercises Performed with the Assistance of Physical Therapy, cont'd

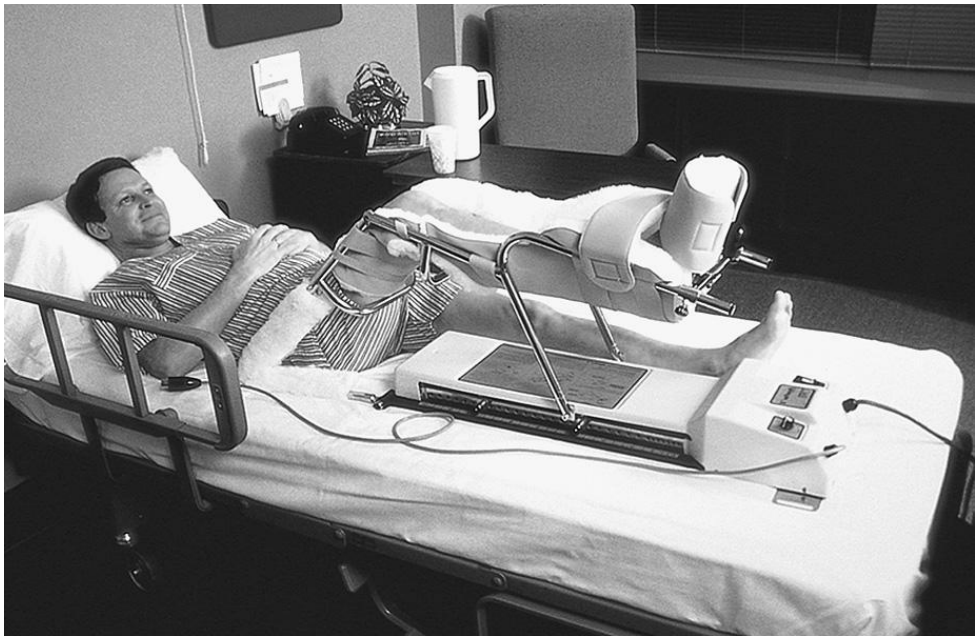
- Progressive exercises: gradually increasing the type of exercise
- Muscle reeducation exercise: use of physical therapeutic exercises to restore muscle tone and strength after an injury or disease
- Coordination exercises: designed to improve coordination and balance
- Relaxation exercises: other types of exercises that may be ordered by the doctor

A Hubbard Tank

Examples of PT Orders

- ROM bid to UE
- Strengthening of all four extremities
- PT to amb pt with walker as tol
- PT to eval and treat
- THA and TKA protocols
- Gait training with a walker, WBAT LLE
- Crutch walking, NWB daily
- CPM 0 to 45 degrees, progress to 0 to 90 degrees by day 5

Continuous Passive Motion



Examples of Other Physical Therapy Orders

- Heat and Cold Orders
  - Ultrasound and massage to lower back
  - Hydrocollator packs or hot packs to back bid
  - Ice or cold packs to left leg bid
- Postop TENS
- Apply knee immobilizer to lt knee

Transcutaneous Electric Nerve Stimulation (TENS)

Knee Immobilizer

Occupational therapy (OT)

- Works toward rehabilitation of patients, in conjunction with other health team members
- To return the patient to the greatest possible functional independence
- Creative, manual, recreational, and prevocational assessments are examples of activities used in rehabilitation of the patient.

Examples of Occupational Therapy Orders

- OT for evaluation and treatment if needed daily
- Training in activities of daily living (ADLs)
- Supply and train in adaptive equipment such as button hooks and feeding utensils for ADLs
- OT to increase mobility
- Fabricate cock-up splint for left upper extremity

Speech Therapy

- Evaluation and treatment of oral, motor, swallowing, cognitive-linguistic, speech and language disorders
- Often needed to address a multitude of patient needs, including:
  - Developmental problems related to the ability to speak and be understood
  - Deficiencies that are a result of:
    - Stroke
    - Seizures
    - Cancer
    - Other brain injuries

Dialysis

- Kidneys
  - Essential organs in the removal of toxic wastes from the blood
  - When the kidneys fail to remove those wastes, medical intervention is necessary to sustain life.
- Types of dialysis:
  - Hemodialysis
  - Peritoneal dialysis

Doctors' Orders for Hemodialysis and Peritoneal Dialysis

- Hemodialysis: for A-V Shunt
  - A cannula is inserted into an artery and another into a vein.
  - Both are then connected to tubing that allows easier needle insertion for hemodialysis.
- Peritoneal Dialysis: for Tenckhoff Catheter Placement
  - Involves surgical placement of a long-term catheter or tube into the patient's abdomen so that peritoneal dialysis can be performed

Radiation

- Radiation may be performed in the following areas in the hospital:
  - Division of the diagnostic imaging department
  - A totally separate department
  - Interventional Radiology department

HUC Responsibilities Regarding Radiation Orders

- May be called upon to schedule an appointment for an inpatient requiring treatment for a malignant neoplasm (cancer)
- Many hospitals require that units use a requisition form; others may schedule an appointment by telephone.