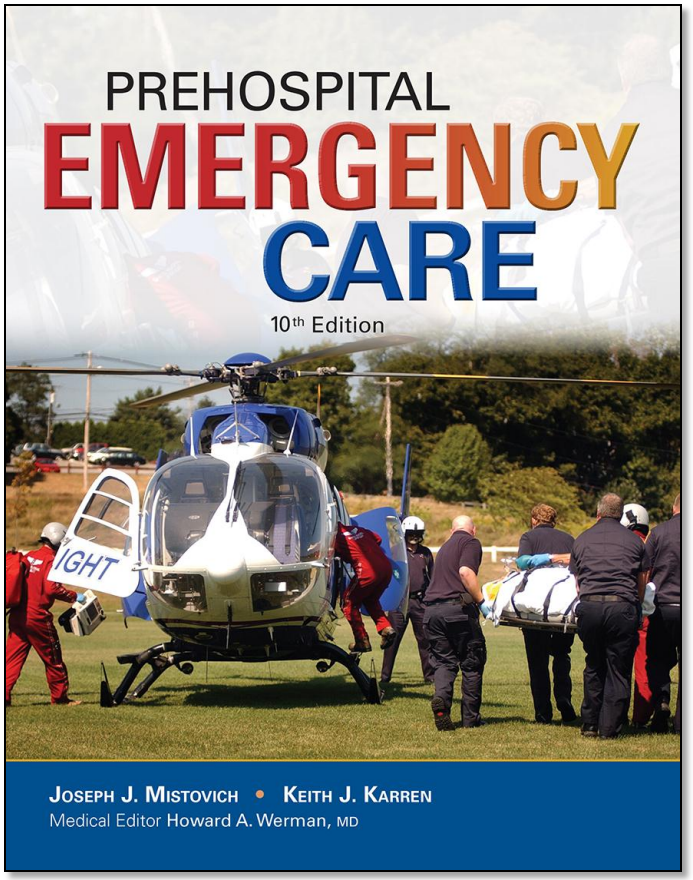
PREHOSPITAL EMERGENCY CARE

TENTH EDITION



CHAPTER 40

Patients with Special Challenges

Learning Readiness

- EMS Education Standards, text p. 1117

Learning Readiness Objectives

- Please refer to page 1117 of your text to view the objectives for this chapter.

Learning Readiness Key Terms

- Please refer to page 1117 of your text to view the key terms for this chapter.

Setting the Stage

- Overview of Lesson Topics
  - Sensory Impairments
  - Cognitive and Emotional Impairments
  - Paralysis
  - Obesity
  - Homelessness and Poverty
  - Abuse
  - Technology Dependence
  - Terminally Ill Patients

Case Study Introduction

EMTs Alice Combs and Tristan Mullins arrive on a call for a patient whose home ventilator alarm is going off. They are met at the door by the patient's mother, who says she has tried to determine the problem, but the alarm keeps going off. She tells the EMTs that her 23-year-old son has been ventilator-dependent since becoming a quadriplegic in a car accident eight years ago.

Case Study

- What are the first actions the EMTs should take?
- What are some special concerns in the assessment of this patient?
- What kinds of problems should be anticipated because the patient's ventilator and paralysis?

Introduction

- Some patients have special health challenges, ranging from obesity to homelessness to dependence on medical technology.
- Medical technology ranges from hearing aids to mechanical ventilators.
- Advances in medical technology allow people with certain medical problems to live at home.

Sensory Deficits

- Sensory impairment includes problems with hearing, vision, or speech.
- Sensory deficits can lead to difficulty communicating.
- There are steps that can improve communication with patients who have sensory deficits.

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Sensory Deficits

- Hearing impairment
  - Deafness is the inability to hear.
  - Deafness may involve one or both ears and a patient may be partially or totally deaf.

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Sensory Deficits

- Vision impairment
  - May be caused by disease, injury, or degenerative disorders.
  - Problems include glaucoma, diabetic retinopathy, and cataracts.
  - Vision loss can be acute or gradual.

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Sensory Deficits

- Speech impairment
  - Articulation disorders are caused by impairment of the tongue or other muscles.
  - The patient cannot pronounce words correctly.
  - Can result from learning words incorrectly or from hearing impairment.

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Sensory Deficits

- Speech impairment
  - Voice production disorders occur from damage to the larynx or vocal cords.
  - The sounds produced may be harsh, hoarse, of unusual pitch, or have nasal distortion.

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Sensory Deficits

- Speech impairment
  - Language disorders occur when the patient is unable to understand the spoken word.
  - May result from congenital problems, hearing deficits, or inadequate language stimulation in early life.
  - In later life, language disorders can occur from stroke, head trauma, and brain tumor.

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Sensory Deficits

- Speech impairment
  - Fluency disorders present as "stuttering" speech.
  - Speech has sounds or syllables that are repeated.
  - The interview process may be lengthened as you allow the patient time to answer questions.

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Sensory Deficits

- Accommodations for sensory deficits
  - Hearing impairment
    - Make sure hearing aids are available and turned on.
    - Make sure the patient can see your face.
    - Communicate in writing.
    - Use a sign language interpreter, if available.

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Sensory Deficits

- Accommodations for sensory deficits
  - Vision impairment
    - Speak clearly.
    - Explain what you are going to do before you do it.
    - Transport service animals, if possible.
    - If necessary, allow the patient to place his hand on your arm or shoulder to guide him.

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For the visually impaired patient, speak clearly and always explain what you are going to do.

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Sensory Deficits

- Accommodations for sensory deficits
  - Speech impairment
    - Ask questions that allow the patient to answer in as few words as possible.
    - Do not finish the patient's words or statements for him.
    - A speech impairment does not reflect cognitive ability.

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Sensory Deficits

- Accommodations for sensory deficits
  - Speech impairment
    - Allow the patient the time to respond to your questions.
    - Only use other communication when verbal communication has failed.
    - Never pretend that you understood something the patient said when you didn't.

Cognitive and Emotional Impairment

- A developmental disability involves the brain and causes an inability to learn at a normal rate.
- The endocrine system also may be involved.
- The problem may not be noted until the child fails to reach certain developmental milestones.

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Cognitive and Emotional Impairment

- Developmental disabilities include:
  - Down syndrome
  - Fragile X syndrome
  - Autism
  - Fetal alcohol syndrome
  - Phenylketonuria (PKU)
  - Hypothyroidism
  - Rett syndrome

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Persons with Down syndrome may have numerous disabilities but can participate in normal activities with help from family and friends. (© J.B.S.I./Custom Medical Stock Photography)

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Cognitive and Emotional Impairment

- Accommodations for patients with mental, emotional, or developmental impairments
  - Treat the patient with respect.
  - Rely on caregivers for information, if needed.
  - Compare the patient's behavior to what is normal for him.
  - Provide clear explanations.

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Cognitive and Emotional Impairment

- Accommodations for patients with mental, emotional, or developmental impairments
  - Patients are sensitive to tone of voice and body language.
  - Establish trust.
  - Avoid loud noises or extreme lighting changes.

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Cognitive and Emotional Impairment

- Brain-injured patients
  - Brain injury can result in permanent damage.
  - There may be changes in cognition, learning ability, emotions, and motor function.
  - Causes can include infant abuse, meningitis, encephalitis, and traumatic head injury.

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Cognitive and Emotional Impairment

- Brain-injured patients
  - Cerebral palsy
    - Motor impairments that arise early in development
    - The degree of impairment varies.
    - There is difficulty controlling muscles, and there may be stiffness and contractures.

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Cognitive and Emotional Impairment

- Brain-injured patients
  - Cerebral palsy
    - Facial grimacing may occur.
    - In some cases, there is cognitive impairment, in other cases there is not.
    - There may be communication difficulties.

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Cognitive and Emotional Impairment

- Brain-injured patients
  - Disability from traumatic brain injury varies.
  - Disability ranges from mild speech impairment to unresponsive and ventilator-dependent.

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Cognitive and Emotional Impairment

- Accommodations for brain-injured patients
  - Distinguish between the baseline condition and acute changes.
  - Be aware of and manage any technology (pumps, ventilators, catheters) the patient relies on.

Paralysis

- EMTs may respond to patients who have been paralyzed from past trauma or strokes.
- Paralyzed patients are prone to a number of problems related to technology dependence, pressure sores, and infection.

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Patients with paralysis or muscle weakness may want you to arrange for transport of their assisting devices, such as wheelchairs or canes, to the hospital. (David M. Grossman/ PhototakeUSA)

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Paralysis

- Accommodations for paralyzed patients
  - Follow protocols regarding transportation of wheelchairs.
  - For ventilator-dependent patients, keep the ventilator settings as you find them.
  - You may need to suction the breathing tube or stoma.

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Paralysis

- Accommodations for paralyzed patients
  - Be alert to the possibility of a urinary catheter; keep the catheter bag below the level of insertion.
  - Make sure feeding tubes and colostomy bags are secured.
  - The family is usually knowledgeable about how to best move the patient.

Obesity

- Bariatrics is the branch of medicine that deals with the management of obese patients.
- A person who is 20% or more over his ideal weight is obese.
- A person who is more than 50% to 100% over his ideal weight or more than 100 pounds over his ideal weight is morbidly obese.

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TABLE 40-1 Effects of Excess Weight on Body Systems

System	Disease State
Cardiovascular	Hypertension, coronary artery disease, congestive heart failure, stroke
Respiratory	Obstructive sleep apnea, asthma, chronic obstructive pulmonary disease
Endocrine and reproductive	Diabetes mellitus, infertility, birth defects, menstrual disorders
Gastrointestinal	Esophageal reflux, liver disease
Musculoskeletal	Osteoarthritis, gout, back injuries, immobility
Psychological	Depression, suicide

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Assessment and care of the obese patient follows a normal format, but modifications may be required because of the patient's size. (© Mark C. Ide)

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Obesity

- Obese patients can have difficulty breathing in a supine position.
- If the patient is unable to protect his own airway, position the head in a neutral position; you may need to place folded towels or bath blankets beneath the shoulders and neck.

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Obesity

- Pay particular attention to adequacy of respiratory rate and tidal volume.
- Positive pressure ventilation of obese patients is more difficult.

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Obesity

- Lifting and moving obese patients requires the assistance of an adequate number of providers.
- Obese patients may exceed the structural limitations of standard ambulance cots, and may require use of a bariatric device.

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Bariatric devices include special cots designed to support the greater weight of an obese patient and loading devices such as ramps and winches that interface with specially designed ambulance cot-locking systems. (© Ray Kemp/911 Imaging)

Homelessness and Poverty

- Factors that contribute to homelessness
  - Poverty
  - Substance abuse
  - Lack of affordable housing
  - Mental illness

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Homelessness and Poverty

- Factors that contribute to homelessness
  - Prison release back into society
  - Domestic violence
  - Mortgage foreclosure/forced eviction
  - Natural disaster

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Homelessness and Poverty

- Issues associated with homelessness
  - Increased risk of violence and abuse
  - Increased risk of illness/disease
  - Discrimination from others
  - Reduced access to health care

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Homelessness and Poverty

- Issues associated with homelessness
  - Limited or no access to education
  - Limited or no access to modern communications
  - Not seen as suitable for employment purposes

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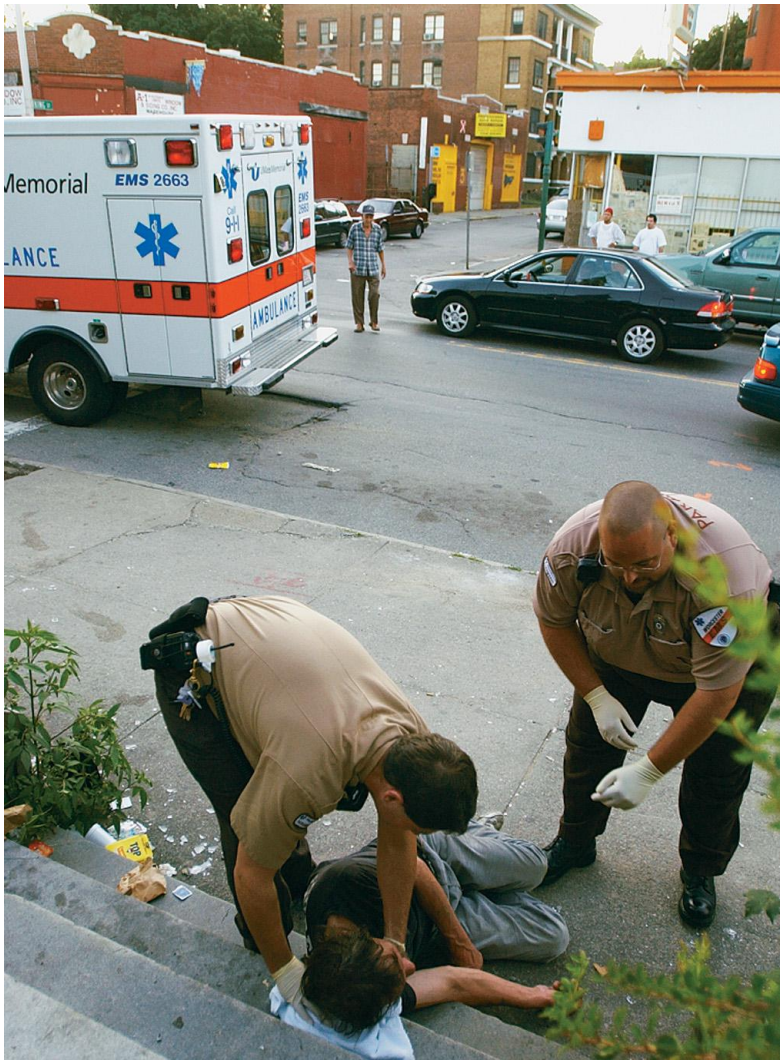
EMS is often summoned to street corners and other public places to care for a homeless patient. (© Mark C. Ide)



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Homelessness and Poverty

- Places where the homeless may find refuge
  - Abandoned buildings
  - Public places such as parks, train or bus stations, airports, college campuses
  - Vehicles

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Homelessness and Poverty

- Places where the homeless may find refuge
  - Outdoors in improvised shacks or on the ground with sleeping bags
  - In an unoccupied house
  - Homeless shelters

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Homelessness and Poverty

- The homeless are at increased risk of emergencies, even with minor injury or illness.
  - Environmental exposure
  - Lack of preventive care and medication
  - Poor nutrition
  - Vulnerability to violence

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Homelessness and Poverty

- Patients in poverty face many of the same issues as the homeless.
  - Accidental trauma
  - Physical abuse
  - Crime
  - Chronic medical conditions
  - Limited access to health care and medications

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People who fall below the poverty level are at great risk for illness and injury from the environment they are in and the lack of resources to seek primary medical care. (© Mark C. Ide)

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Homelessness and Poverty

- Accommodations for the homeless and poor
  - Do not be judgmental; display respect.
  - Be an advocate; realize the patient needs your help.
  - Become familiar with resources in your community.

Abuse

- Abuse is any action or failure to act that results in unreasonable suffering, harm, or misery to a person, whether physical or mental.
- Abuse transcends all age, gender, race, and socioeconomic groups.
- Children, elders, and domestic/intimate partners are some of those who may be abused.

Click on the problem that is least likely to be associated with homelessness.

A. Increased risk of violence

B. Increased risk of environmental emergencies

C. Increased risk of obesity

D. Increased risk of accidental trauma

Technology Dependence

- Many patients who once required hospital care can now be cared for at home, in part due to medical technology.
- Technology may be life-enhancing or life-sustaining.

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Technology Dependence

- Reasons EMS may be summoned
  - Failed equipment
  - Change in patient's clinical condition
  - The patient experiences some other emergency.

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Technology Dependence

- EMTs must have a basic understanding of technology.
- You will often have to rely on the patient or his caregivers for specific information about the equipment.

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The patient's primary health care provider can usually provide information about the equipment the patient relies on.

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Technology Dependence

- Questions to ask about technology
  - Where can I get information about this device?
  - What does this device do for the patient?
  - Can I replicate its function if it fails?
  - Will the device have an effect on how I assess the patient or the assessment findings?

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Technology Dependence

- Questions to ask about technology
  - Has this problem ever occurred before? If so, how was it fixed?
  - Has anyone attempted to remedy the problem?
  - Are there specific considerations for moving and transporting the patient?

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Technology Dependence

- Focus on these tasks:
  - Keep the airway open.
  - Establish and maintain adequate ventilation.
  - Maintain adequate oxygenation.
  - Support circulation, as needed.

Case Study

Alice and Tristan find an alert 23-year-old who is ventilator-dependent, but who can speak by plugging his tracheostomy tube. The patient's skin is hot, and as the EMTs begin their assessment, the high-pressure alarm goes off on the ventilator.

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Case Study

- What does the high-pressure alarm signify?
- What are possible causes of the high-pressure alarm?
- How can the EMTs assess the patient and his device for those causes?
- What should the EMTs do with the ventilator as they prepare the patient for transport?

Airway and Respiratory Devices

- Home oxygen equipment is similar to what you are used to.
- Oxygen may be supplied from a cylinder, oxygen concentrator, or liquid oxygen system.

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TABLE 40-2 Common Technical Problems with Oxygen Systems

Problem	Possible Cause	Corrective Action
Oxygen not flowing freely	Faulty tubing	Check for obstruction or replace tubing.
	Dirty or plugged humidifier	Remove from oxygen supply, clean, and refill with sterile water or replace with prefilled bottle.
Buzzer goes off on oxygen concentrator	Unit unplugged	Check plug.
	Power failure	Check fuses, circuit breaker, or, in cases of power outages, use backup oxygen tank until power is restored. (Or call EMS as necessary to make use of oxygen administration from the ambulance or at the hospital.)
Oxygen tank empties too quickly or hisses	Leak in tank	Open all windows, extinguish all flames, and summon help from the fire department, EMS, and/or supplier.

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Airway and Respiratory Devices

- Apnea monitors
  - Designed to constantly monitor the patient's breathing and emit a warning signal should breathing cease
  - May also monitor heart rate
  - Used for some infants, especially premature infants

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Airway and Respiratory Devices

- Apnea monitors
  - Determine how long the monitor has been alerting.
  - Determine whether the caregivers have performed any interventions.

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Airway and Respiratory Devices

- Apnea monitors
  - Even if the patient is found to have adequate breathing, transport him for evaluation.
  - If the patient is not breathing adequately, ensure an open airway, provide ventilation, and ensure adequate oxygenation.

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Airway and Respiratory Devices

- Pulse oximetry
  - May be used at home by patients with apnea monitors or respiratory problems
  - Treat the patient for the presenting problem.
  - Apply the pulse oximeter from the ambulance.

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Airway and Respiratory Devices

- Tracheostomy tubes
  - A tracheostomy is a surgical opening into the trachea to provide an alternative route for airflow, bypassing the nose and mouth.
  - A tracheostomy may be temporary or permanent.
  - A permanent opening is a stoma.

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Airway and Respiratory Devices

- Tracheostomy tubes
  - A tracheostomy tube is placed into the tracheostomy to keep it patent.
  - The tube may be single-lumen or double-lumen.

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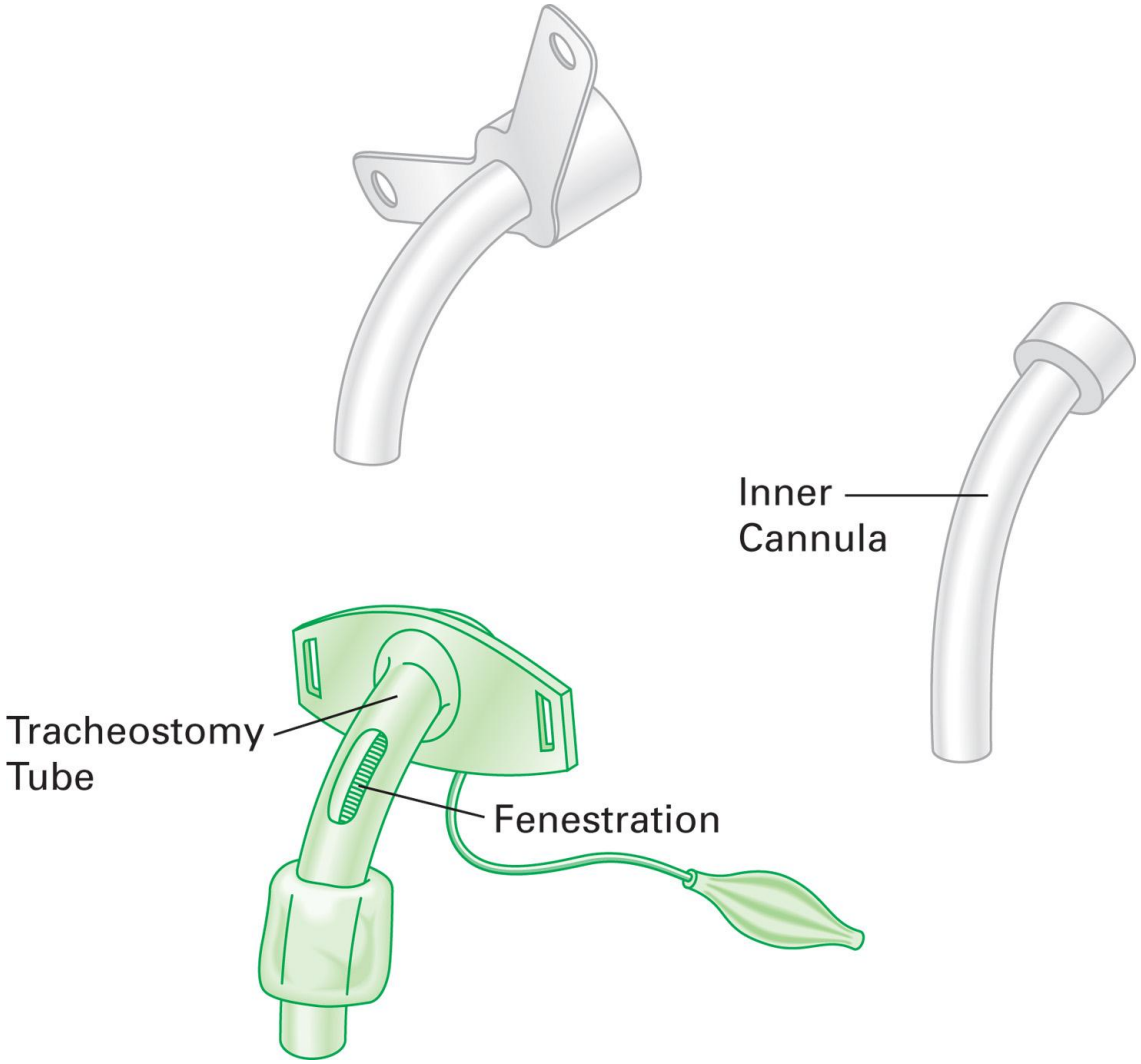
A tracheostomy tube for older children and adults has an outer cannula and an inner cannula.



Airway and Respiratory Devices

- A patient with a tracheostomy may or may not be able to speak.
- Emergencies include obstruction of the tube by mucus and a dislodged inner cannula.

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Airway and Respiratory Devices

- To suction:
  - Measure the depth of insertion for the suction catheter by comparing it to the tracheostomy tube obturator.
  - Apply suction; slowly withdraw the catheter while twisting it between your fingers.

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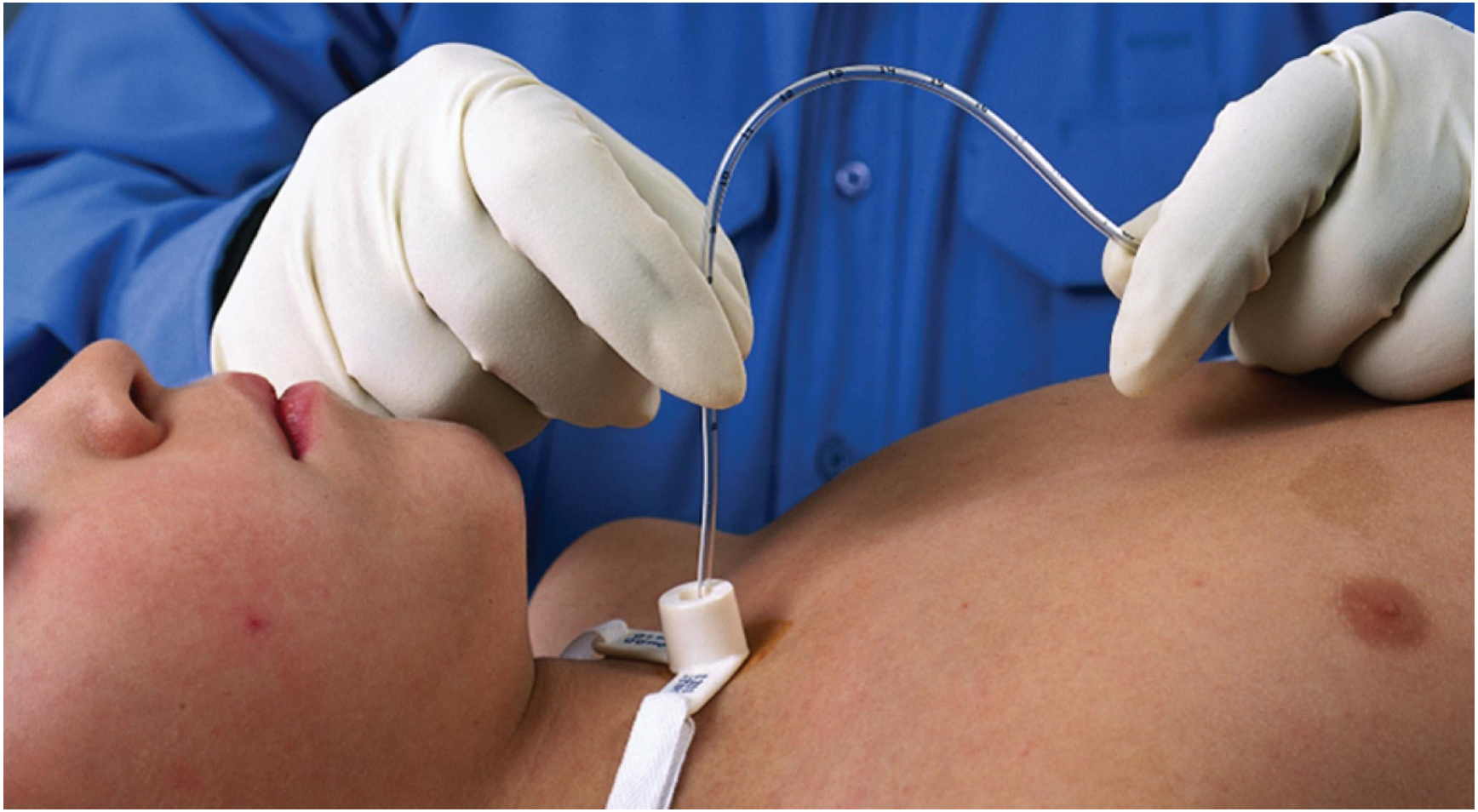
Use a soft suction catheter to clear blood or secretions from the tracheostomy tube.



Airway and Respiratory Devices

- To suction:
  - Do not suction for longer than 10–15 seconds in an adult, and 5 seconds in a pediatric patient.
  - Oxygenate between attempts.
  - Rinse the suction catheter with sterile water between attempts.

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Airway and Respiratory Devices

- CPAP and BiPAP
  - Continuous positive airway pressure/bilevel positive airway pressure
  - Both provide therapeutic back-pressure during respiration.

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Airway and Respiratory Devices

- CPAP and BiPAP
  - Keep the bronchioles open during exhalation, which improves oxygenation and ventilation and decreases the work of breathing
  - Commonly used by patients with COPD or sleep apnea

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Airway and Respiratory Devices

- Mechanical ventilators
  - Patients may depend on a ventilator because of nervous system disorders, neuromuscular disease, or other problems.
  - Home units vary in size.

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Airway and Respiratory Devices

- Mechanical ventilators
  - Settings include rate, tidal volume, and in some cases, the amount of oxygen provided.
  - The tubing, called a ventilator circuit, attaches to the patient's tracheostomy tube.

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Airway and Respiratory Devices

- A high-pressure alarm is activated when the pressure needed for lung inflation exceeds the present value.
  - Causes include:
    - Secretions occluding the tracheostomy tube
    - Kinked ventilator circuit
    - Tracheotomy tube movement

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Airway and Respiratory Devices

- A high-pressure alarm is activated when the pressure needed for lung inflation exceeds the present value.
  - Causes include:
    - Bronchospasm, coughing
    - Decreased lung compliance from pneumothorax, pneumonia, pulmonary edema, or alveolar collapse

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Airway and Respiratory Devices

- A low-pressure alarm is activated when the tidal volume falls 50–100 mL below the set tidal volume.
  - This indicates a problem in the breathing circuit, such as a disconnected segment or a leak in the tracheostomy tube cuff.

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Airway and Respiratory Devices

- Apnea alarm
  - Some patients on a ventilator may have some respiratory effort, and the ventilator is set to trigger when the patient takes a breath.
  - The apnea alarm triggers when the patient stops breathing.

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Airway and Respiratory Devices

- A low FiO_2 alarm occurs when the oxygen source is disconnected or depleted.

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Airway and Respiratory Devices

- Ventilator alarms can represent a change in the patient's clinical condition or a problem with the ventilator.
- Troubleshoot the patient and the ventilator.

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Airway and Respiratory Devices

- Accommodations for patients with airway or respiratory devices
  - Because the device is used to support or replace a lost function, you must assess its adequacy in doing so.
  - You also will perform your usual primary assessment, history, and physical exam.

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Airway and Respiratory Devices

- Accommodations for patients with airway or respiratory devices
  - You may need to suction a tracheostomy tube.
  - For patients with ventilators, troubleshoot both the device and the patient.

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Airway and Respiratory Devices

- Accommodations for patients with airway or respiratory devices
  - If the ventilator provides adequate ventilation, allow it to do its job.
  - If the ventilator does not provide adequate ventilations, you will need to use a bag-valve-mask device.
  - Ensure you have adequate help to move the patient and the ventilator.

You can ventilate a patient with a tracheostomy by attaching the bag-valve device to the tracheostomy tube's 15/22 mm adapter.

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Vascular Access Devices

- Patients may have a vascular access device (VAD) for chemotherapy, dialysis, total parenteral nutrition, or antibiotic therapy.
- VADs may be placed in a variety of locations.
- The device may have an external catheter portion, or may be a port implanted under the skin.

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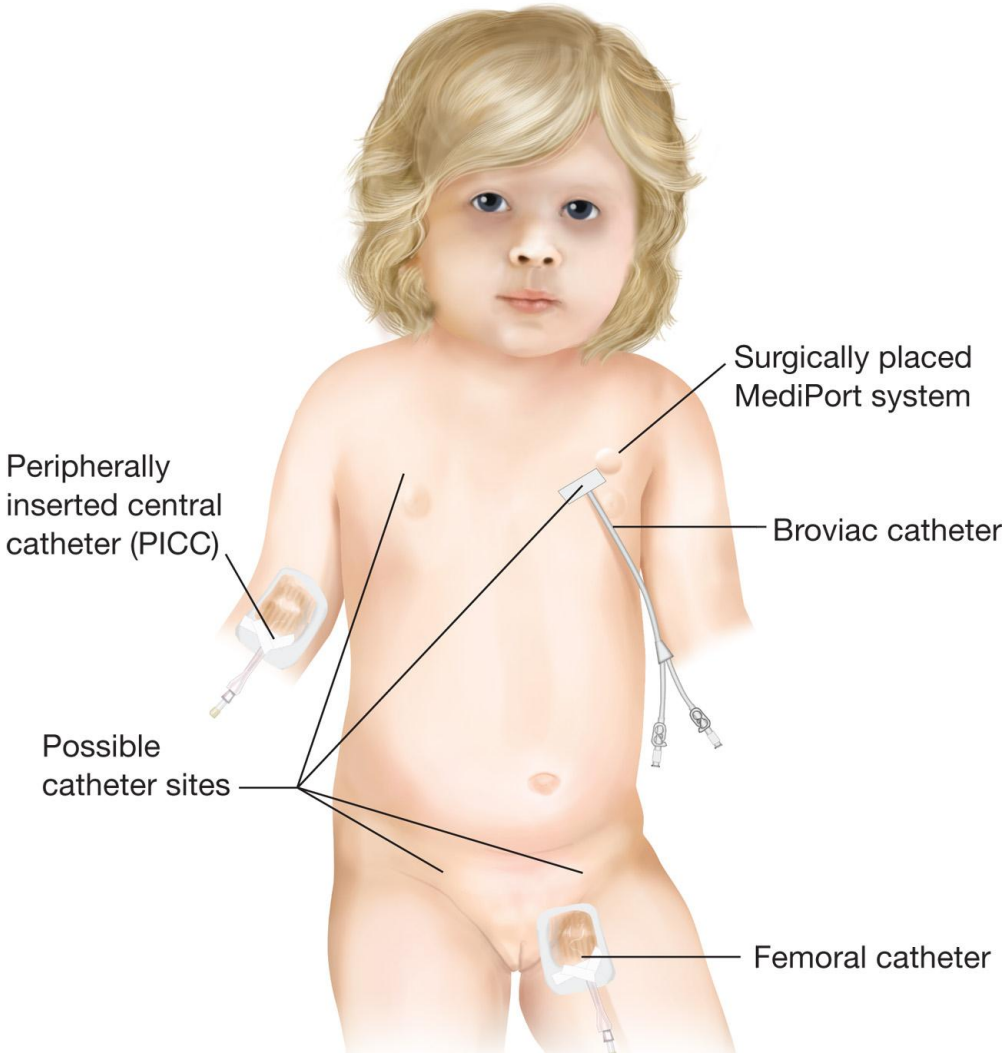
Vascular access devices include central IV catheters such as a PICC line, central venous lines such as the Broviac catheter, and implanted ports such as the MediPort system.



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Vascular Access Devices

- Accommodations for patients with VADs
  - Obstruction by a blood clot may occur.
  - Patients may take anticoagulants.
  - Air embolism may occur.
  - Note any bleeding or signs of infection.

Renal Failure and Dialysis

- Acute renal failure (ARF) occurs when there is a rapid loss of renal function.
- ARF is often reversible.
- Chronic renal failure (CRF) occurs when there is a progressive loss of kidney function over a period of months to years.

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Renal Failure and Dialysis

- Dialysis removes the buildup of toxins that occurs when the kidneys can no longer filter them out.

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Renal Failure and Dialysis

- Hemodialysis
  - Blood is extracted from the body and sent through a machine called a dialyzer.
  - Performed in a dialysis center
  - Requires a dialysis shunt to remove blood from the body and return it

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Renal Failure and Dialysis

- Peritoneal dialysis
  - Fluid is placed in the peritoneal cavity through a port, where it acts to remove wastes, and is then emptied from the peritoneal cavity.
  - Less effective, but can be performed at home

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Renal Failure and Dialysis

- Accommodations for patients on dialysis
  - If a patient is receiving dialysis at a facility and is still attached to the dialysis machine, do not attempt to remove the patient prematurely.
  - Only dialysis center staff should remove the patient from the machine.

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Renal Failure and Dialysis

- Accommodations for patients on dialysis
  - Do not obtain a blood pressure in an extremity with a shunt, fistula, or graft.
  - A damaged or injured shunt, fistula, or graft can bleed excessively.
  - Use continuous direct pressure to control bleeding; treat for shock.

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Renal Failure and Dialysis

- Accommodations for patients on dialysis
  - Patients with peritoneal dialysis may develop peritonitis or inflammation at the insertion site, or the catheter may be dislodged.

Gastrointestinal and Genitourinary Devices

- Feeding tubes are used to provide nutrition to patients who cannot chew or swallow.
- Feeding tubes include nasogastric tubes, orogastric tubes, gastric tubes, and jejunal tubes.

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For long-term nutritional support, a feeding tube may be surgically inserted through the abdominal wall and directly into the gastrointestinal system.

Gastrointestinal and Genitourinary Devices

- Ostomy bags
  - A surgical opening through the abdominal wall to which a section of bowel is diverted so that fecal material is directed outside the body into the bag

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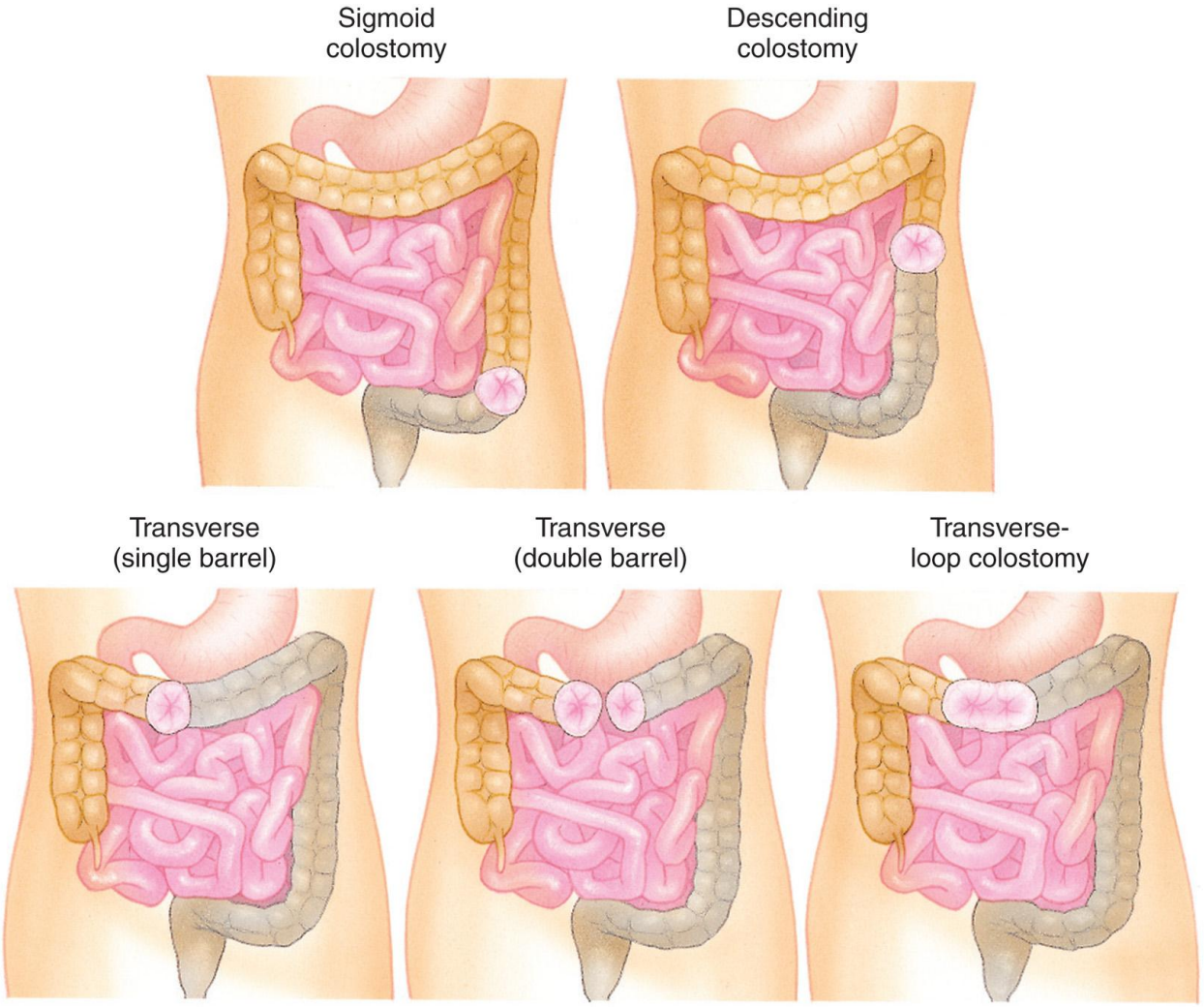
Ostomy stomas may be found at various abdominal locations.



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Gastrointestinal and Genitourinary Devices

- A urinary catheter is used to empty the bladder when there is urinary tract dysfunction.

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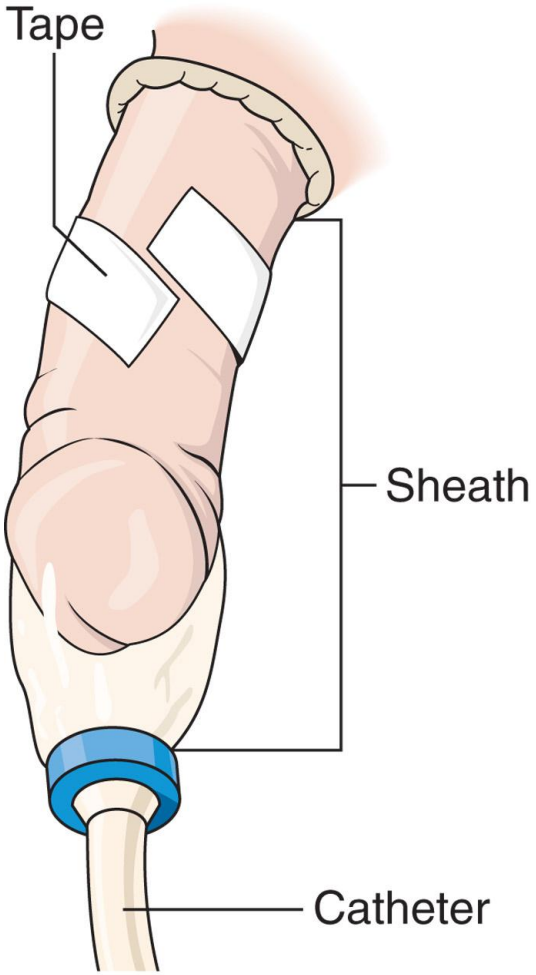
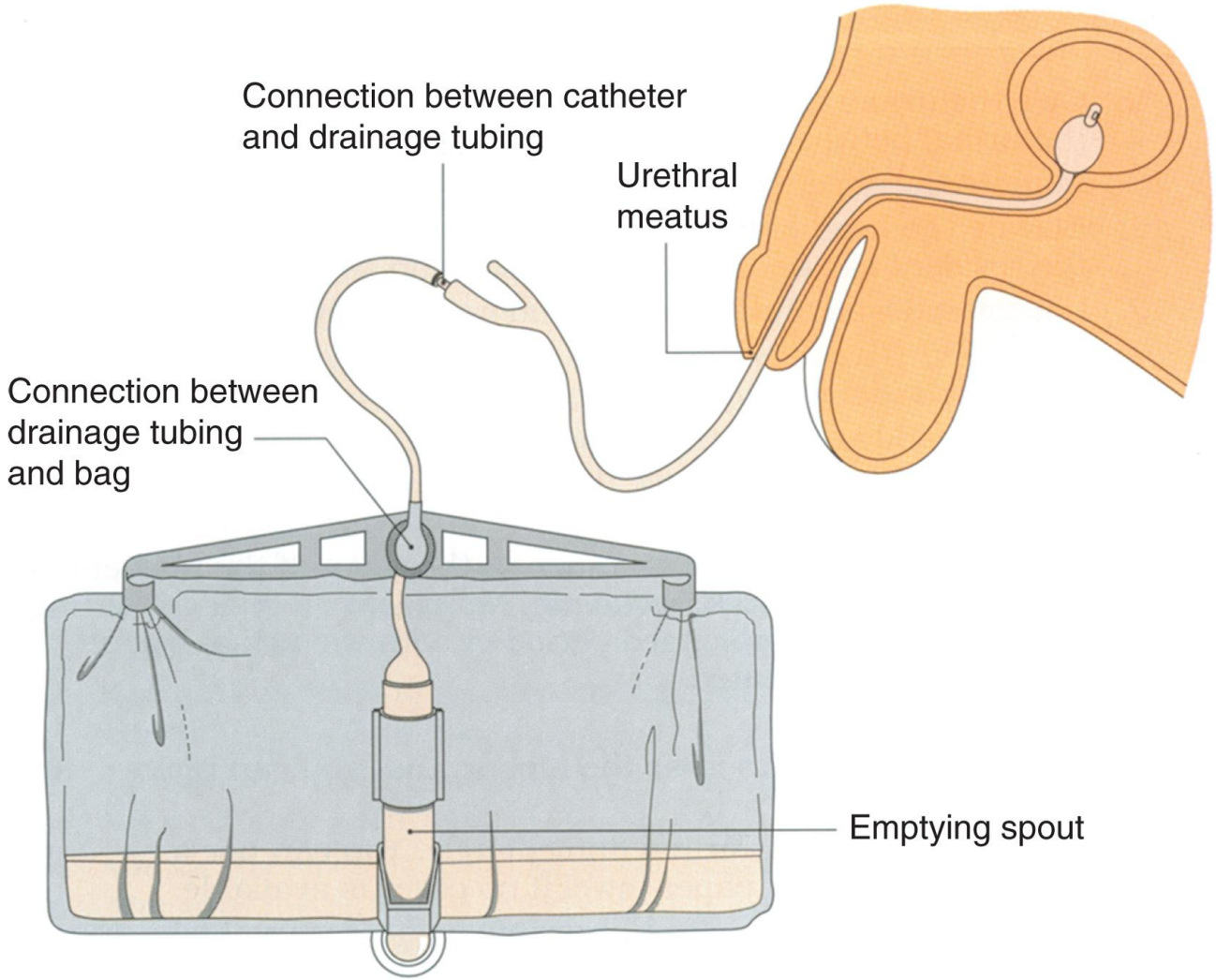
An external urinary catheter.



An internal urinary catheter with balloon.



Gastrointestinal and Genitourinary Devices

- Accommodations for patients with gastrointestinal and genitourinary devices
  - Problems include obstruction, infection, and displacement.
  - If a device is dislodged, do not attempt to replace it.

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Gastrointestinal and Genitourinary Devices

- Accommodations for patients with gastrointestinal and genitourinary devices
  - Drain catheter bags prior to transport and document the appearance and amount of urine.
  - Keep the catheter bag lower than the site of insertion.

Intraventricular Shunts

- Hydrocephalus occurs when excess cerebrospinal fluid accumulates, which can cause increased intracranial pressure.
- An intraventricular shunt allows the excess fluid to drain.

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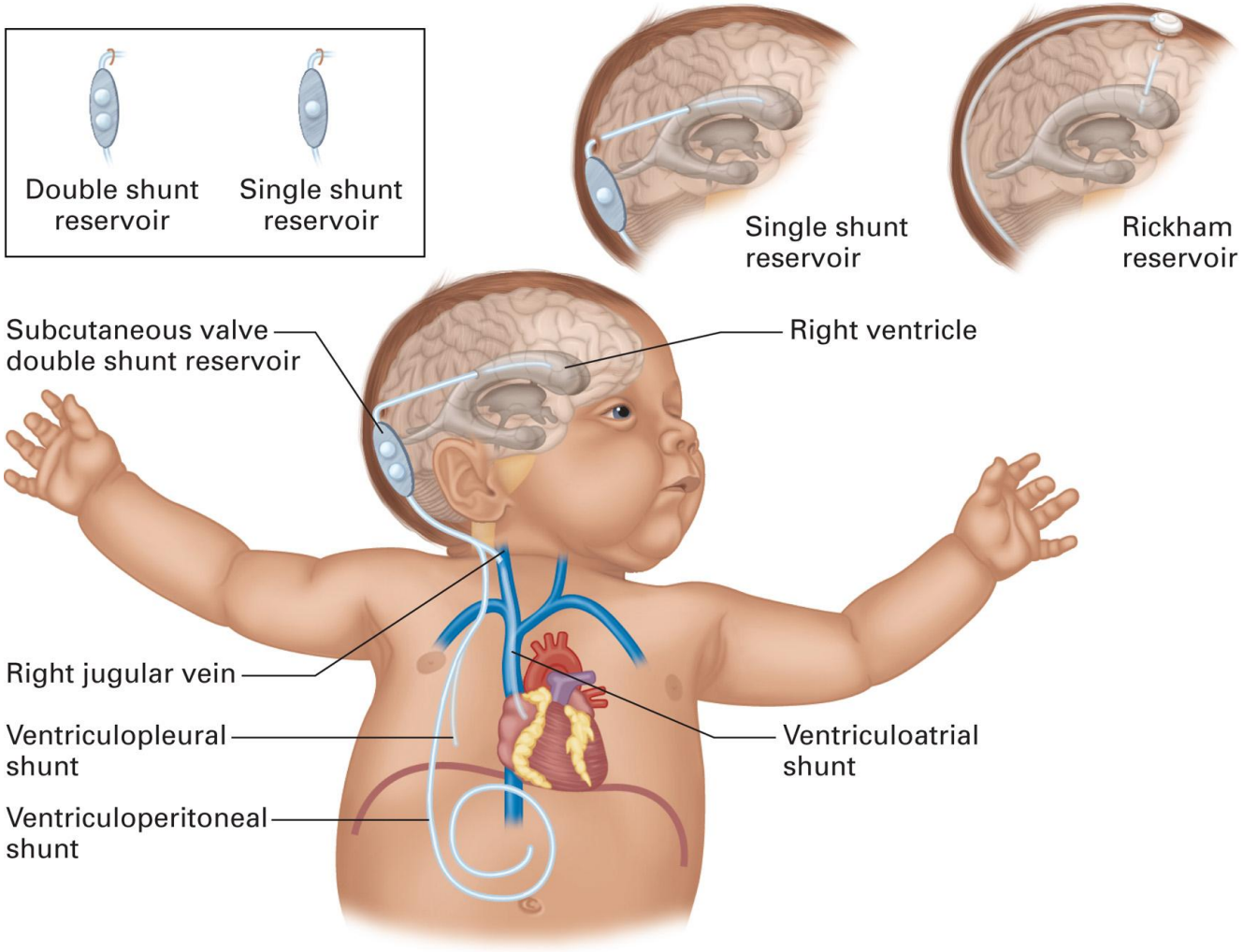
Intraventricular shunts allow excess cerebrospinal fluid to drain from the brain to a site in the neck, heart, pleural space, or abdomen, or into a reservoir beneath the scalp.



Intraventricular Shunts

- Complications include infection, shunt occlusion, and subdural bleeding.
- Infection may present with malaise, fever, and headache.

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Intraventricular Shunts

- With obstruction, the patient may present with signs of increased intracranial pressure:
  - Headache
  - Vomiting
  - Altered mental status
  - Seizures

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Intraventricular Shunts

- With obstruction, the patient may present with signs of increased intracranial pressure:
  - Sensory or motor dysfunction
  - Respiratory depression
  - Pupil changes
  - Increased blood pressure

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Intraventricular Shunts

- Accommodations for patients with intraventricular shunts
  - Initial complaints include confusion, difficulty with simple tasks, and headaches.
  - Manage the airway and if the breathing is inadequate, provide positive pressure ventilation with oxygen.

Terminally Ill Patients

- The life expectancy of a terminally ill patient is generally 6 months or less.
- Patients may receive palliative care.
- Hospice is a philosophy of care aimed at palliation of symptoms for patients and support for their families.

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Terminally Ill Patients

- Patients receiving hospice care often are ill with:
  - Cancer
  - AIDS
  - Alzheimer's disease
  - Cystic fibrosis
  - Congestive heart failure
  - COPD

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Terminally Ill Patients

- Accommodations for terminally ill patients
  - Provide emotional support.
  - If there is confusion, determine the patient's and family's intent.
  - A desire not to be resuscitated does not mean the patient does not want comfort care.

Case Study Conclusion

The patient has a pulse oximetery reading of 90%. Alice checks the ventilator circuit, and finds no obstruction, and the patient's mother reports that she just suctioned the tracheostomy tube. Alice listens to the patient's lung sounds, and determines that they are diminished on the right side, with some crackles and wheezes in the right lower lobe.

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Case Study Conclusion

The patient's ventilator does not have an FiO_2 setting. The EMTs leave the ventilation rate and tidal volume in their settings.

When the engine crew arrives, the EMTs temporarily disconnect the ventilator and ventilate the patient by bag-valve-mask as they move him to the ambulance, where they plug in and reconnect the ventilator.

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Case Study Conclusion

They transport the patient to the hospital, where he is admitted and treated for pneumonia.

Lesson Summary

- Patients can present with a variety of challenges, such as sensory impairment, obesity, poverty, and homelessness.
- You must understand the needs of these patients and variations in assessment findings and emergency care.

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Lesson Summary

- Home medical devices are becoming more commonplace.
- Use patients and caregivers as resources for information.
- Support the patient's lost functions and intervene with the equipment only if there is a malfunction.