Chapter 45 Patients With Special Challenges

Unit Summary

Upon completion of this chapter and related course assignments, students will be able to recognize patients with special challenges, including victims of abuse or neglect; homelessness and poverty; bariatric patients; patients who are technology dependent or require adaptive devices; hospice or terminally ill patients; patients with cognitive, developmental, or sensory impairments; and patients with chronic medical conditions. Students will be able to integrate assessment findings with principles of pathophysiology and a knowledge of psychosocial needs to both formulate a field impression and implement a comprehensive treatment plan for patients with special needs. Students will be able to identify signs and symptoms of various forms of abuse and neglect, discuss management and documentation concerns relative to these suspected cases, and describe the paramedic’s responsibilities under mandatory reporting situations. They will be able to describe specific concerns related to patients with terminal illnesses, under hospice care, and discuss situations where advance directives or do-not-resuscitate orders exist, particulary how to address issues concerning validity of the documents. The student will be able to discuss situations and concerns related to emergency management of bariatric patients, patients with communicable diseases, and those requiring medical technology or adaptive devices in the prehospital setting. Students will be able to identify and describe those medical devices and technologies encountered during interfacility transports that require additional training. Students will be able to discuss strategies for assessment, treatment, and transport of patients with cognitive, commumnication, or sensory impairments. They will be able identify chronic medical conditions encountered by paramedics, as well as discuss treatment and transport considerations for patients with chronic illnesses. Students will also be able to implement a comprehensive treatment paln for an acutely injured patient with special needs.

National EMS Education Standard Competencies

**Special Patient** **Populations**

Integrates assessment findings with principles of pathophysiology and knowledge of psychosocial needs to formulate a field impression and implement a comprehensive treatment/disposition plan for patients with special needs.

***Patients******With Special Challenges***

Recognizing and reporting abuse and neglect (pp 2123-2129)

Health care implications of:

• Abuse (see chapter, *Pediatric Emergencies*, and see chapter, *Geriatric Emergencies*)

• Neglect (see chapter, *Pediatric Emergencies*, and see chapter, *Geriatric Emergencies*)

• Homelessness (pp 2122-2123)

• Poverty (pp 2122-2123)

• Bariatrics (pp 2130-2131)

• Technology dependent (pp 2132-2147)

• Hospice/terminally ill (pp 2129-2130)

• Tracheostomy care/dysfunction (pp 2132-2135)

• Home care (pp 2129-2130)

• Sensory deficit/loss (pp 2153-2156)

• Developmental disability (p 2151)

**Trauma**

Integrates assessment findings with principles of epidemiology and pathophysiology to formulate a field impression to implement a comprehensive treatment/disposition plan for an acutely injured patient.

***Special Considerations in******Trauma***

Pathophysiology, assessment, and management of trauma in the

• Pregnant patient (see chapter, *Obstetrics* )

• Pediatric patient (see chapter, *Pediatric Emergencies* )

• Geriatric patient (see chapter, *Geriatric Emergencies* )

• Cognitively impaired patient (pp 2156-2157)

Knowledge Objectives

1. Discuss how poverty and homelessness adversely impact patient health and EMS system performance. (pp 2122-2123)
2. Identify ways to advocate for patients’ rights to health care services. (pp 2122-2123)
3. Recognize signs and symptoms of neglect and various forms of abuse, including physical abuse, neglect, sexual abuse, and emotional abuse. (pp 2123-2129)
4. Identify benign physical findings that may be confused with signs of abuse. (pp 2125-2127)
5. Discuss the unique management and documentation concerns related to suspected cases of abuse or neglect. (pp 2127-2129)
6. Describe mandatory reporting and how it relates to cases of suspected abuse. (p 2129)
7. Describe specific concerns related to patients with a terminal illness, including situations in which hospice may be involved. (pp 2129-2130)
8. Discuss situations in which advance directives and do-not-resuscitate (DNR) orders may exist, and how the paramedic should proceed in situations where the validity of such a document is in question. (p 2130)
9. Describe specific clinical and management concerns related to bariatric patients. (pp 2130-2131)
10. Discuss operational concerns related to emergency management of bariatric patients. (p 2131)
11. Describe specific concerns related to patients with a communicable disease. (pp 2131-2132)
12. Discuss medical technology and adaptive devices used in the prehospital setting, including long-term ventilators, apnea monitors, long-term vascular access devices, medication infusion pumps, insulin pumps, gastric tubes, colostomies, urinary diversion devices, dialysis shunts, surgical drains and devices, and cerebrospinal fluid shunts. (pp 2132-2147)
13. Discuss the purpose of tracheostomy tubes and how to troubleshoot problems that may occur in a patient with a tracheostomy. (pp 2132-2135)
14. Discuss the types of medical technology that may be used during interfacility transports, including hemodynamic monitoring, intra-aortic balloon pumps, and intracranial pressure monitoring. (pp 2147-2150)
15. Identify strategies for providing care to patients with cognitive impairment, including patients with development delay, Down syndrome, mental retardation, and autism. (pp 2150-2152)
16. Identify strategies for providing care to patients with communication impairment, including hearing, vision, and speech impairments. (pp 2153-2156)
17. Identify strategies for providing care to patients with sensory impairment, including paralysis, paraplegia, and quadriplegia. (p 2156)
18. Discuss concerns related to managing a cognitively impaired patient who experiences trauma. (pp 2156-2157)
19. Identify chronic medical conditions likely to be encountered by paramedics, including arthritis, cancer, cerebral palsy, cystic fibrosis, multiple sclerosis, muscular dystrophy, myasthenia gravis, spina bifida, postpolio syndrome, systemic lupus erythematosus, and traumatic brain injury. (pp 2157-2162)
20. Discuss treatment and transportation concerns for patients with a chronic illness. (pp 2157-2162)

Skills Objectives

1. Demonstrate how to suction and clean a tracheostomy. (pp 2132-2135, Skill Drill 45-1)
2. Demonstrate how to access an implantable venous access device. (pp 2137-2139, Skill Drill 45-2)
3. Demonstrate how to replace an ostomy device. (pp 2140-2141; 2142, Skill Drill 45-3)
4. Demonstrate how to catheterize an adult male patient. (pp 2143-2144, Skill Drill 45-4)
5. Demonstrate how to catheterize an adult female patient. (pp 2143-2145, Skill Drill 45-5)

Readings and Preparation

• Review all instructional materials including Chapter 45 of *Nancy Caroline’s Emergency Care in the Streets*, Seventh Edition, and all related presentation support materials.

• Review state statutes, regulations, and procedures for appropriate legal documentation requirements for the patient who wishes to limit or decline resuscitation efforts in the event of a cardiac or respiratory collapse emergency.

• Review local EMS protocols on accessing long-term vascular access devices or dialysis shunts.

• Identify any bariatric-specific equipment used by EMS agencies where students may complete clinical rotations or field internships.

• Identify types of medical technology or assist devices present in the community where students may complete clinical rotations or field internships.

• Develop patient scenario cards for use in group exercises later in the course. Incorporate a variety of special needs patient emergencies, signs/symptoms, age groups, and underlying causes.

Support Materials

• Lecture PowerPoint presentation

• Case Study PowerPoint presentation

• Skill Drill PowerPoint presentations

* Skill Drill 45-1, Cleaning a Tracheostomy Tube
* Skill Drill 45-2, Accessing an Implantable Venous Access Device
* Skill Drill 45-3, Replacing an Ostomy Device
* Skill Drill 45-4, Catheterizing an Adult Male Patient
* Skill Drill 45-5, Catheterizing an Adult Female Patient

• Skill Evaluation Sheets

* Skill Drill 45-1, Cleaning a Tracheostomy Tube
* Skill Drill 45-2, Accessing an Implantable Venous Access Device
* Skill Drill 45-3, Replacing an Ostomy Device
* Skill Drill 45-4, Catheterizing an Adult Male Patient
* Skill Drill 45-5, Catheterizing an Adult Female Patient

• Various types of tracheostomy tubes for practicing cleaning and troubleshooting, at least one per six students

• Various types of long-term vascular access devices for practicing access, at least one per six students

• Various types of ostomy devices for practicing removal and attachment, at least one per six students

• Various types of urinary catheters and placement kits for practicing catheterization, at least one per six students

• Obtain manikins that allow performance of skills and evaluation including tracheostomy manikin, implanted vacular access device manikins, ostomy manikins, and catheterization manikins (male and female), at least one per six students

• Bariatric appropriate equipment including backboards, stretchers, vascular access devices, cervical collars, and modified ambulances, when available

Enhancements

• Direct students to visit the companion website to *Nancy Caroline’s Emergency Care in the Streets*, Seventh Edition, at http://www.paramedic.emszone.com for online activities.

• Contact a local home health provider to identify a guest speaker to discuss medical technology and assist devices when dealing with the patient with special challenges and provide additional information about various types of equipment and skills, including troubleshooting tips and types of devices likely to be encountered in the community setting.

• Contact a local social service or adult protective services agency to identify a guest speaker to discuss the incidence, signs and symptoms, and mandatory reporting laws for victims of abuse or neglect and to provide additional information on the appropriate agencies and jurisdictions to be contacted when suspected.

• Contact a local hospice agency to identify a guest speaker to discuss strategies for the assessment, treatment, and management of patients with terminal illness or hospice care. Have them share opportunities for students to volunteer if available to work with these patients in an in-patient setting such as a hospice in-patient facility or long-term care facility to allow students to appreciate the challenges in dealing with these patients.

• Identify and contact local support groups for persons with cognitive, communication, or sensory disabilities to identify a guest speaker or speakers that can discuss how to recognize and better communicate with patients and caregivers when encountered in the prehospital setting. Ask that they share resources for those students interested in learning sign language or volunteering with community events for these individuals.

• Contact the local public health department to identify a guest speaker from the infectious disease reporting department to discuss legal requirements for specific types of communicable diseases as they pertain to the patient as well as protection for the EMS provider.

• Provide copies of the local protocols on accessing long-term vascular access devices or dialysis shunts.

**Content connections:** Remind students of the importance of documentation when completing patient care reports for the treatment and transport of the suspected abuse or neglect patient. Refer students to Chapter 6 to review documentation recommendations. Discuss the significance of being aware of the potential medical, legal, and ethical issues involved when dealing with the patient who may be a victim of abuse or neglect. Refer students to Chapter 4 to review this material. Communicating with patients who may have a cognitive, communication, or sensory disability can be challenging. Encourage students to read Chapter 3 to review communication techniques that may assist them while managing a patient with developmental or other disabilities. Patients exhibiting violent or combative behavior or exhibiting behavior that suggests there may be risk to the providers should be monitored closely. Remind students to avoid placing themselves in potentially dangerous situations and to maintain a route of egress when working with these patients. Students should be reminded that some emergencies involving patients with special needs may mask underlying medical conditions. They should be encouraged to complete a comprehensive history and assessment to avoid missing other signs and symptoms that would affect patient management. Refer students to Chapter 15 to consider how alterations in the bariatric patient may affect routine airway management and ventilation of the patient. Refer students to Chapter 33 and Chapter 34 to consider how alterations in the bariatric patient may affect stabilization, packaging, and transport of these patients.

**Cultural considerations:** Have students review special considerations in trauma for special populations such as the pregnant patient (Chapter 41), the pediatric patient (Chapter 43), and the geriatric patient (Chapter 44). Students should be reminded to be receptive to caregivers on how best to approach the patient with special challenges, particularly those pediatric and geriatric patients. Assessment techniques should still be age appropriate. Mental status changes are relevant to the baseline for the patient, and caregivers should be consulted for the presence of existing medical conditions. Patients of other cultures may also have specific beliefs about death and dying that should be considered in the patient with a terminal illness. Students should be reminded there are also cultural practices that can mimic signs and symptoms of physical abuse. Care should be taken when assessing these patients and a comprehensive history obtained to include alternative medical treatments that may have resulted in the physical findings.

Teaching Tips

• Students may be not be familiar with various devices used by patients with special challenges including tracheostomies, ostomy devices, long-term vascular access devices, ventilators, ventricular assist devices, apnea monitors, and renal or genitourinary assist devices including catheters, shunts, and dialysis equipment. Be prepared to provide pictures and teaching aids to assist students in becoming familiar with recognition and access to these devices.

• Students may be embarassed by the focus of discussion on male and female genitourinary structures. Consider allowing students to work in smaller same-sex groups as they practice Skill Drills for male and female catheterization.

• Students may be uncomfortable discussing hospice care or care for the terminally ill patient. Be prepared to provide information for support counseling for those students who have difficulties.

Unit Activities

**Writing activities:** Ask students to research the prevalence of poverty, homelessness, and uninsured patients in their state. Have them review information on the Affordable Care Act and submit a paper that outlines the potential for improved access and funding for health care in these patient groups.

**Student presentations:** Assign students a chronic medical condition that has been presented in the chapter as a special challenge. Ask them to research the condition, identify long-term survival rates, common medical concerns/complications, and its prevalence in the community. Have them make a presentation on the condition including activities, agencies, or support groups that assist with supporting the patients, families, and/or caregivers for their condition.

**Group activities:** Using scenario cards prepared prior to the lesson, assign one scenario to each group. Have them practice application of material learned in Chapter 45 to apply critical thinking and clinical decision making for this type of patient. Students should be able to identify potential challenges to prehospital treatment for these patients. As time permits have groups swap scenario cards to consider as many types of patients as possible.

**Visual thinking:** Display pictures of medical technology and assist devices used by patients with special challenges. Have students identify the device, concerns or implications for the paramedic who encounters the device, troubleshooting techniques, and types of patients who may require the technology or device.

**Medical terminology:** Construct a game based on the Jeopardy format for the terms presented in the chapter. Categories of terms may include Chronic Conditions, Disabilities, Assist Devices, Signs/Symptoms, and Medical Technology. Remind students to construct their response in the form of a question.

Pre-Lecture

**You are the Medic**

 “You are the Medic” is a progressive case study that encourages critical-thinking skills.

**Instructor Directions**

Direct students to read the “You are the Medic” scenario found throughout Chapter 45.

• You may wish to assign students to a partner or a group. Direct them to review the discussion questions at the end of the scenario and prepare a response to each question. Facilitate a class dialogue centered on the discussion questions and the Patient Care Report.

• You may also use this as an individual activity and ask students to turn in their comments on a separate piece of paper.

Lecture

I. Introduction

A. Patients may have a wide variety of special challenges.

1. To provide optimal care, it may be necessary to modify communications, assessments, treatment, or transport for patients with a:

a. Chronic medical condition

b. Sensory impairment

c. Cognitive or emotional disorder

d. Other anomaly

2. Impairments may include:

a. Mental retardation (1% to 3% of population)

b. Autism (slightly less than 1% of children)

c. Some form of developmental disability (13% of children)

3. Many life-sustaining therapies are now handled outside the hospital by families and patients.

a. Mechanical ventilation

b. IV medication administration

4. EMS is often called as last resort when:

a. Patient cannot otherwise access health care services.

b. Attempts to manage medical condition without assistance fails.

5. Caregiver abuse or neglect further complicates patient care.

a. Need to be able to recognize signs and cues of abuse or neglect

B. General strategies for patients with special challenges

1. Many times, patient and caregivers are experts in their condition or impairment.

a. EMS personnel should:

i. Have an open mind and willingness to listen

ii. Demonstrate confidence in enlisting patient expertise to determine best ways to provide optimal care.

(a) Helps provide optimal care

(b) Minimizes the risk of mistakes, complications, or injuries

b. Patients/caregivers with special issues often know more than EMS personnel about their condition, devices, or techniques.

i. It is a mistake to claim more knowledge than you have.

ii. Paramedics may know important nuances that would be helpful to the patient/caregiver.

2. Resources can be invaluable when faced with unfamiliar conditions, technology, or situations.

a. Online medical control

b. Electronic medical reference materials

c. Coworkers’ experience

II. EMS, Health Care, and Poverty

A. EMS providers and emergency departments must often deal with the economic and health care crisis in the United States.

1. Nearly 50 million people did not have health insurance in the United States in 2010.

a. Many with insurance are still forced to use government health programs.

2. US Census Bureau report *Income, Poverty, and Health Insurance in the United States 2010* states that 46.2 million people were in poverty in the United States in 2010.

a. Definition of poverty calculated by factors:

i. How many people in the household

ii. Their ages

iii. Household’s combined total income

3. Poverty and lack of health insurance affect a person’s health habits.

a. Stop seeking or receiving preventative health services

b. Incidence and severity of disease increases significantly.

c. Health care often delayed until an emergency

4. Chronic medical conditions require ongoing medication to control the disease.

a. Patients may not get needed medications or care because of lack of insurance or poverty.

i. May have to choose between medical care and food, clothing, or shelter

ii. Interruptions of medication can lead to medical complications.

iii. Loss of job or depletion of savings during economic hardships may lead to loss of health care services.

5. Homelessness is a complicated economic and social problem, with homeless people prone to:

a. Numerous chronic medical conditions

b. Mental illness

c. Substance abuse

6. Medical care for homeless is more difficult because of:

a. Environmental exposure

b. Crime/violence

c. Malnutrition

d. Lack of hygiene

7. In homeless people, there are high rates of:

a. Pregnancy

b. Infectious disease

c. Mental illness

8. EMS and ED assistance sought if chronic medical condition becomes severe or no other options for chronic health care

a. By federal law, EDs must stabilize patients in emergencies or in labor, regardless of their ability to pay.

b. Significant stress placed on ED

i. Many EDs closed in recent years because of financial pressure and changes in health care industry

(a) May be forced to transport patients farther or experience longer delays when turning patients over to EDs

9. In some cases EMS providers may realize patients do not need transport, but feel obligated to do so because of fear of legal liability or regulations against patient abandonment.

a. Patient may request EMS services to get “free ride” to hospital or to bypass overcrowded ED waiting rooms

b. Even if other health care settings may be more appropriate, must be extremely careful to avoid legal liability

i. When people call for assistance, even if paramedics do not feel it is needed, the safest thing to do is provide assistance.

ii. Never refuse to transport if requested, unless EMS system and medical director specifically authorize the refusal.

10. Some health care organizations have come up with various creative approaches to providing health care services outside EDs for those with limited financial resources.

a. EDs well suited for patients in crisis but less optimal for issues of chronic medical conditions, such as:

i. Medication monitoring

ii. Prescription refills

iii. Diagnostic testing

iv. Referrals

v. Coordination among specialists

vi. Assistance with social needs and lifestyle modification

vii. Long-term care

b. May see changes in education and scope of practice, with EMS providers offering:

i. More primary care services

ii. Transport of 9-1-1 patients to health care settings other than EDs

11. Government agencies and private organizations provide health care services through a variety of community-based health care facilities.

a. Many immunizations are provided at little or no cost.

b. Hospitals are frequently able to provide:

i. Financial assistance

ii. Payment plans

iii. Low-cost health care services

iv. Help enrolling eligible people in government insurance programs

III. Care of Patients With Suspected Abuse and Neglect

A. Paramedics often provide care for victims of abuse or neglect.

1. Caring for these patients is often difficult because of:

a. Emotional concerns

b. Legal concerns

c. Regulatory concerns

2. Care is frequently complicated by interactions with possible perpetrator(s).

a. Effective care must be provided while taking steps to protect from future harm.

3. Groups particularly susceptible to abuse by caregivers include:

a. Children

b. Dependent elderly

c. Adults with medical, cognitive, or emotional impairments

B. Epidemiology

1. Reported cases of abuses in the United States each year include:

a. Six million children

b. Up to two million elderly adults

2. Infants and young children more likely to be victims of abuse or neglect.

a. Of abused or neglected children, approximately 80% who die are younger than 4 years.

b. Boys and girls are abused at roughly equal rates.

c. Approximately 70% of cases involve substance abuse by the perpetrator.

d. Children with disabilities or chronic medical conditions are twice as likely to be abused or neglected.

3. Abuse and neglect occur with varied frequency across race and socioeconomic status.

a. Can be committed by anyone with care, custody, or control of the child, including:

i. Parents

ii. Step-parents

iii. Foster parents

iv. Babysitters

v. Relatives

b. Abusive parents get little enjoyment from parenting and tend to be isolated.

i. Have unrealistic expectations of their child

ii. Try to control the child through negative and authoritarian means

iii. Afraid to or emotionally unable to ask for help

iv. Most were abused as children themselves.

4. Determination of abuse and neglect can be difficult when presented with factors such as:

a. Poverty

b. Religious beliefs about medical treatment

c. Autonomy of mature minors

d. Potential victims with concomitant emotional or behavioral disorders

C. Definitions

1. Physical abuse

a. Intentional act that results in physical impairment or injury:

i. Throwing

ii. Striking

iii. Hitting

iv. Kicking

v. Burning

vi. Biting

b. Approximately 650,000 children are victims of physical abuse each year.

c. Considered physical abuse if caregiver places child in circumstances that create substantial risk of harm.

2. Neglect

a. Roughly four times more common than physical abuse

b. Children, dependent elderly, and certain vulnerable or impaired adults require assistance of caregivers to provide basic necessities.

i. Neglect occurs when caregivers fail to provide such protection so that health and well-being are negatively affected.

c. Signs are often subtle and require awareness to spot them.

3. Sexual abuse and sexual exploitation

a. Sexual abuse or sexual exploitation includes:

i. Sexual contact

ii. Forced prostitution

iii. Inappropriate undressing

iv. Suggestive photography

v. Forcing victim to watch sexual acts or pornography

b. Almost 10% of reported child abuse or neglect involve sexual abuse or exploitation.

i. Vastly unreported

c. Elder sexual abuse statistics not readily available.

d. Signs suggestive of sexual abuse include:

i. Certain behavioral cues

ii. Genital trauma

iii. Presence of sexually transmitted disease

4. Emotional abuse

a. Impacts children, dependent elderly, and other vulnerable adults

b. Causes a substantial change in a victim’s:

i. Behavior

ii. Emotional response

iii. Cognitive function

c. May be verbal in the form of:

i. Ridicule

ii. Threats

iii. Blaming

iv. Humiliation

d. May be nonverbal:

i. Caregiver ignores victim.

ii. Caregiver isolates victim from others.

5. Caregiver substance abuse

a. Laws are enacted in various states to address substance abuse by caregiver, including:

i. Fetus harmed by pregnant woman using:

(a) Alcohol

(b) Illicit drugs

(c) Other harmful substances

ii. Providing alcohol or drugs to a child

iii. Manufacturing or selling drugs in presence of a child

iv. Becoming impaired by alcohol or drugs while caring for a child or other vulnerable person

v. Driving while intoxicated with a child in the car

vi. Allowing a child to become the designated driver for an intoxicated caregiver

6. Abandonment

a. Occurs when a child or vulnerable adult suffers harm because the caregiver fails to maintain adequate contact

i. Leaving a young child home alone

ii. Allowing a child to wander unsupervised

D. Recognizing abuse or neglect

1. Health care providers have a duty to recognize and report suspected abuse or neglect.

2. Variety of caregiver behavioral cues and physical findings should prompt suspicion of abuse and neglect

a. Caregiver is intoxicated (by alcohol or other substance).

i. Agitation

ii. Slurred speech

iii. Bloodshot eyes

iv. Speech alteration

v. Unsteady gait

vi. Other unexplained abnormality

b. Caregiver tries to interfere with physical examination of child or vulnerable adult:

i. Refusing to allow a physical examination

ii. Looming over health care provider during the examination

iii. Preventing paramedic from removing clothing during physical examination

iv. Offering unsolicited explanation for abnormal physical findings

v. Interrupting or otherwise stopping patient from answering questions about illness or injury

3. Paramedics should not confront a suspected perpetrator.

a. Report suspected abuse to the hotline and ED physician.

4. Pay particular attention when a caregiver provides history of present illness/injury (HPI) or describes events leading to the EMS call.

a. Story from caregiver may not make sense in relation to the patient’s:

i. Age

ii. Capability

iii. Medical condition

b. Story may frequently change with each subsequent discussion

c. Explanation differs significantly from patient explanation

d. Caregiver may self-report facts highly suggestive of abuse of neglect:

i. “I lost my temper.”

ii. “I couldn’t get her to stop crying.”

iii. “I did it to teach him a lesson.”

5. Child or vulnerable adult may demonstrate wide range of behaviors, symptoms, or physical signs suggestive of abuse or neglect.

a. Look for suspicious behavioral signs from the patient:

i. May not become agitated when caregiver leaves the room or may not look to the parent for reassurance

ii. May cry excessively or not at all

iii. May be wary of physical contact

iv. May appear apprehensive

b. Discuss abnormal behavioral cues or findings with receiving health care providers.

6. Physical signs suggestive of nonaccidental trauma include:

a. Bruises on the torso, ears, proximal arms, and buttocks

b. Closed head injury in absences of realistic mechanism

c. Burns (especially symmetric or without splash marks) and ligature marks

d. Bruise patterns resembling finger marks, shoes, or other common items

e. Seizure activity without prior history in an afebrile child

E. Benign physical findings

1. Some physical findings mimic signs of physical abuse.

a. Ambulatory toddlers are prone to bruising or minor injuries as psychomotor skills develop.

b. Scald burns from a toddler grabbing an unguarded pot appear different from submersion injuries from intentional physical abuse.

c. Possible for toddlers and young children to sustain bites or scratches from playmates

d. When odd injuries appear, keep an open mind when assessing for physical abuse.

2. Mongolian spots are lesions that resemble bruises and are present at birth on many infants of Asian or African origin.

a. Often present on buttocks or back

b. Gradually fade and are not associated with other soft-tissue trauma signs

3. Some Asian cultures practice techniques in Eastern medicine for a variety of symptoms or conditions:

a. Coining: coin with warm oil is rubbed vigorously across the torso, causing superficial skin trauma in a linear pattern

b. Cupping: inside of a small glass cup is heated, then applied to the patient’s skin, creating a vacuum as the vessels cools.

i. Creates round red marks or bruising

c. Marks from these techniques are highly suggestive of physical abuse, but they are actually healing techniques not associated with malice or mistreatment.

4. Health care providers in some cultures apply citrus or vegetable juices to the skin for healing purposes.

a. If exposed to sunlight, phytophotodermatitis (redness of the skin) may develop, resembling splash burns or other injury.

5. EMS personnel may encounter physical findings suggestive of sexual abuse that may actually be caused by:

a. Poor hygiene

b. Masturbation

c. Skin irritation from cleaning products

d. Poorly fitting undergarments

e. Various infections

F. Management of suspected abuse or neglect

1. Likely to evoke powerful response in EMS and other health care providers

a. Emotions may undermine patient care and worsen the situation for the patient.

2. Assessment process

a. First priority: Establish and maintain the safety of emergency responders.

i. Other forms of domestic violence accompany 30% to 50% of child abuse cases.

ii. Request law enforcement assistance if threat of continued violence is present.

b. Second priority: Provide optimal clinical care to a patient with suspected abuse or neglect.

i. Life-sustaining intervention and prompt transport are the most appropriate treatment for critical illness or injury.

ii. If time permits, perform a thorough patient assessment that includes:

(a) History of present illness

(b) Head-to-toe examination

(c) Relevant medical and psychosocial history

iii. Balance value of full-patient exposure with privacy needs of patient who may already be traumatized.

c. Make no assumptions regarding identity of alleged perpetrator or circumstances.

i. The caregiver present may also be a victim of abuse.

ii. Use careful judgment when allowing a parent or caregiver to remain or travel with a patient.

(a) Separating an ill or injured child from a trusted caregiver can cause additional stress.

(b) If the caregiver is the violent perpetrator, the patient may continue to be threatened.

d. Attempt to remain nonjudgmental when providing care.

i. Remain professional and provide best care possible.

ii. Hostility toward the caregiver will only complicate the situation.

3. Documentation

a. Expect that patient care reports and related documentation will be reviewed by:

i. Law enforcement officers

ii. Social service agencies

iii. Court officials

b. Documentation errors will undermine credibility of the documentation and paramedic.

c. Document:

i. Physical findings

ii. Whether assessment of particular body areas was accomplished or deferred

d. Use objective descriptions and measurements whenever possible.

e. Carefully document timing or time frame of particular injury or event.

i. Subsequent changes in reported timing may substantiate abuse or neglect suspicions.

f. Avoid labeling a person as a victim or perpetrator.

g. Cite specific sources when charting history of present illness.

h. Avoid photography unless a formal policy exists at the EMS agency.

i. It is very easy for a well-intentioned paramedic to violate HIPPA or other patient privacy rules.

4. Mandatory reporting and legal involvement

a. Health professionals have a mandatory obligation to report suspected child abuse and neglect.

i. If EMS personnel fail to report suspected child abuse or neglect, they may be subject to civil, criminal, or regulatory penalties.

b. Many states have statues specifically addressing mandatory reporting of abuse of elderly and incapacitated adults.

i. Consult applicable state laws and EMS regulations.

c. Reports are made to state or government social services agency of a particular jurisdiction.

i. Titles vary, but are similar to:

(a) Adult Protective Services (APS)

(b) Department of Youth Services

(c) Children Youth and Family Division

ii. Most states have central hotline telephone numbers available for abuse or neglect reports.

iii. Agencies evaluate the circumstances of a report and determine if an investigation is indicated.

(a) Investigation is determined by:

(1) Circumstances of the case

(2) Severity of the alleged abuse or neglect

iv. Interventions range from providing support to an at-risk family to removal of the victim from the home or facility.

d. Law enforcement personnel frequently become involved.

i. May respond simultaneously with EMS

ii. May discover abuse or neglect while engaged in other law enforcement activities

iii. May be requested by health care providers, EMS responders, or social service agency

e. Law enforcement officers’ roles in abuse or neglect include:

i. Intervene when there is an immediate threat to health or safety of child or vulnerable adult.

(a) Typically empowered to take custody for a short time until appropriate agency can intervene or the immediate threat resolves

ii. Conduct an investigation into potential criminal activity associated with suspected abuse or neglect.

(a) If a death results, cases are referred to the medical examiner for autopsy.

f. EMS personnel may benefit from emotional support following cases involving suspected abuse or neglect.

i. Many areas have trained crisis intervention personnel to help emergency responders manage enormous emotional stress related to these situations.

IV. Care of Patients With Terminal Illness

A. EMS providers often encounter patients with terminal illnesses.

1. Many may forgo uncomfortable, invasive, and marginally effective medical treatment for their disease.

2. May decline aggressive medical intervention for otherwise treatable conditions

3. Terminal illness is a disease process expected to cause death within 6 months, verified by a physician.

a. Common terminal conditions:

i. Cancer

ii. Heart failure

iii. Pulmonary disease

iv. Liver failure

v. AIDS

vi. Alzheimer disease

vii. Amyotrophic lateral sclerosis (ALS; Lou Gehrig disease)

b. When treating these patients, be prepared to alter or forego lifesaving interventions.

4. Patients with terminal illness may receive continued medical care.

a. Some continue aggressive medical treatment, hoping for a statistically improbable recovery (curative care).

b. As disease worsens, patients may transition to comfort care, or palliative care.

i. Focus changes to improving quality of time left

ii. Medical care continues, but aggressive, invasive and uncomfortable interventions cease.

iii. Patients receiving this type of care frequently continue to receive:

(a) Analgesic medications

(b) Oxygen

(c) IV fluids

(d) Fever treatment

(e) Antibiotic medications

c. EMS usually are only called for supportive care in these instances.

5. Patients with terminal illness and caregivers often know the best way to manage sudden discomfort increases.

a. Pain assessment and management are often EMS primary tasks.

b. Assess for pain using techniques depending on:

i. Patient’s age

ii. Ability to communicate

iii. Cognitive function

c. Obtain a history that includes patient’s use, effectiveness of, and adverse reactions to different pain medications.

d. Patient assessment should include:

i. Level of consciousness

ii. Vital signs

iii. Past medical history

iv. Pain medication history

e. Follow standing protocols or contact medical control to administer pain medication.

6. Hospice treatment: A program and philosophy attempting to help the patient maximize quality of remaining life

a. Provide social and emotional support.

b. Treat discomfort with both pharmacologic and nonpharmacologic approaches.

c. Help patients and families cope with impending death.

B. Advance directives

1. Signed either by the patient or surrogate decision maker

a. Surrogate decision maker: Someone legally authorized to make health care decisions for the patient when that patient cannot make or communicate the decision themselves)

2. Forms instruct health care providers on medical decisions for the patient when the patient is incapacitated.

a. Can specify:

i. Which medical interventions are authorized in particular situations

ii. Who is authorized to make decisions on behalf of the patient

b. Patients with decision-making capacity can revoke a prior advance directive.

c. Contact medical control if:

i. Any confusion regarding documentation

ii. The patient’s surrogate decision maker is contradicting a written advance directive.

3. Do-not-resuscitate (DNR) orders: Physician orders instructing health care providers to withhold some or all resuscitation efforts in case of respiratory or cardiovascular collapse

a. May be generic or specifically discuss what methods are indicated or withheld

b. State EMS agencies may require a specific DNR form be provided

i. Other possible indicators of DNR status include wristbands and bracelets.

ii. EMS regulations may specify if a DNR status symbol is sufficient to withhold resuscitation efforts.

iii. Consult EMS regulations for a particular state for DNR orders and advance directives specific requirements

V. Care of Bariatric Patients

A. When treating and transporting profoundly obese patients, paramedics must overcome clinical and logistical hurdles.

1. Bariatrics: Medical specialty dedicated to prevention and treatment of obesity

a. More than 1/3 of American adults are considered obese:

i. Obese: BMI of greater than 30 kg/m2

ii. Morbidly obese: BMI between 40 and 49.9 kg/m2

iii. Extreme obesity: BMI above 50 kg/m2

2. Causes of obesity include:

a. Lifestyle

b. Genetics

c. Metabolism

d. Environment

3. Obesity causes or worsens (among others):

a. Heart disease

b. Cerebrovascular accident

c. Diabetes

d. Hypertension

e. Some cancers

f. Asthma

4. Overweight and obese persons are prone to:

a. Physical injury

b. Variety of musculoskeletal problems

B. Clinical concerns for the bariatric patient

1. Routine procedures for obese patients are extremely complicated.

a. Airway procedures are more difficult because of:

i. Larger tongue

ii. Larger patient head size

iii. Limited neck mobility

b. Bag-mask ventilation may be ineffective with patients in supine position.

c. Diminished respiratory reserve decreases the window to perform airway procedures before hypoxia.

d. To avoid endotracheal intubation, the patient will often need bag-mask ventilations with:

i. Positive end-expiratory pressure

ii. Continuous positive airway pressure

iii. Bi-level positive airway pressure

2. Peripheral IV access often problematic.

a. Large neck mass may obscure landmarks for:

i. External jugular IV line placement

ii. Surgical cricothyrotomy

b. Conventional IM needles may not be able to reach IM space through excess adipose tissue.

c. Absorption and distribution may be altered for lipophilic medications.

d. Auscultation may be more difficult through extra abdominal and chest wall mass.

C. Operational concerns for the bariatric patient

1. Obese patients are often too heavy for two-person EMS crews to transport safely or effectively.

a. Additional lifting assistance frequently is necessary.

b. Small rooms and narrow staircases may limit using additional lifting personnel.

c. If weight is extreme, may exceed carrying capacity of:

i. Stretchers

ii. Backboards

iii. Stair chairs

d. Careful planning and proper body mechanics are essential to avoiding injury.

2. Need to advocate for EMS equipment capable of safely transporting obese patients

3. Providing the best care possible for this group includes:

a. Careful planning

b. Understanding the challenges involved

c. Proper equipment

VI. Care of Patients With Communicable Diseases

A. Communicable diseases (contagious diseases): Medical conditions that can be passed from one person to another

1. Severity ranges from completely undetectable to causing death within days or weeks.

2. Safety precautions should always be followed.

a. Gloves and eye protection should be mandatory.

b. Gowns, masks, other protective measures as warranted

3. Significant psychosocial implications:

a. Emotional toll on patient, family, other loved ones

b. Associated lifestyle choices not accepted by others

c. People suspected of having a communicable disease may face:

i. Discrimination

ii. Stigmatization

iii. Threats

iv. Hostile treatment

4. Respect and privacy by paramedics is essential.

a. Assessment and communication should be conducted in private.

i. Unnecessary release of private information to bystanders could adversely affect the patient.

ii. May be legal consequences for violation of privacy rules

b. Patients may have acquired the disease, without participating in any high-risk behavior, through:

i. Occupational exposure

ii. Sexual assault

iii. Blood transfusion

iv. Close family contact

v. Other methods

c. Assumptions based on stereotypes may undermine patient care efforts.

VII. Medical Technology in the Prehospital Setting

A. Many invasive, unusual, or life-sustaining therapies are used in patient homes and long-term care facilities.

1. Chronically ill patients are cared for at home by a range of caregivers, including:

a. Family members

b. Unlicensed caregivers

c. Licensed nonprofessional caregivers

d. Licensed professionals

e. A combination of the above

2. Many family members are medically knowledgeable and a paramedic’s best source for information and care guidelines.

a. Medical technology and adaptive devices during an EMS response or interfacility patient transport may simplify, complicate, or have no affect on patient care.

b. May need to troubleshoot devices

B. Tracheostomy tubes

1. Function as long-term replacement for endotracheal tubes and are used for:

a. Long-term ventilator support

b. Frequent tracheal suctioning

c. Airway protection resulting from numerous medical conditions

2. Unexpected loss of tracheostomy tube from occlusion or accidental removal may or may not create an emergency.

a. May tolerate ventilator support interruptions for a period of time

b. Others are completely dependent on the ventilator, and its loss of function may be an immediate threat to life.

3. Can be placed emergently by health care providers in cases of profound upper airway obstruction

a. May be electively placed in patients:

i. Already receiving mechanical ventilation by ET tubes

ii. With slowly evolving upper airway obstruction or tumor

4. Passes directly from opening in anterior neck into the trachea

a. Speech is not possible unless expired air is allowed to pass around the tube and through the larynx.

b. Tube bypasses nasal passages that filter, warm, and humidify inspired air

i. Will need humidification and heated inspired air when possible

c. Will need frequent deep suctioning with appropriately sized suction catheter

5. Tracheostomy tubes consist of:

a. Outer cannula—larger tube that passes from the anterior neck surface into the trachea

i. Has a flange that helps stabilize the tube on the skin of the neck and gets secured with ties or strap

ii. May have a cuff similar to an ET tube cuff

(a) Necessary for bag-mask or ventilator assistance in adults

b. Inner cannula—tube that runs inside the outer cannula

i. Can usually be removed for cleaning

ii. Has a 15-mm port that can be attached to a bag-mask or ventilator circuit

c. Obturator—a removable solid plug with rounded tip that extends out the bottom inside end of the trachea

i. Only used for reinserting the outer cannula if it becomes dislodged

ii. If traditional mask-to-mouth ventilations are performed on a patient with T tube (rare), obturator is inserted to keep air from escaping out the tracheostomy tube.

6. Tubes may be fenestrated—holes or openings present in outer cannula or both inner and outer cannulas.

a. Allow patient to speak, breathe, or clear secretions from upper airway.

b. Used for:

i. Patients being evaluated for tube removal

ii. Patients requiring intermittent ventilator support

c. Essential that cuffs are deflated before a fenestrated tube is capped

7. Patients and family are likely to be familiar with tracheostomy tube problems.

a. Accept assistance with tubes.

b. Needed equipment is likely close by if the patient is at home or in long-term care facility.

8. Tracheostomy tube troubleshooting is similar to troubleshooting endotracheal tube problems.

a. Follow the DOPE acronym:

i. Dislodged/displaced/disconnected

ii. Obstruction

iii. Pneumothorax

iv. Equipment

b. Dislodged/displaced/disconnected

i. Possible for tube to end up in a false lumen (outside the trachea) after removal and reinsertion or partial removal.

ii. False lumen can be detected by placing endotracheal suction catheter into tracheostomy tube

iii. If there is resistance immediately beyond the expected end of the tube, consider placement into a false lumen.

(a) Remove, then reinsert, the outer cannula.

iv. Continuous end-tidal capnography monitoring will show any unexpected dislodging, displacement, or disconnect during transport.

c. Obstruction

i. Can be cleared by:

(a) Removing inner cannula, then using a suction catheter to push out the mucous plug

(b) Using a combination of tube suctioning and mechanical ventilation

ii. If only available tracheostomy tube is lost or unusable:

(a) Carefully insert appropriately sized endotracheal tube into tracheostomy tube opening (stoma).

(b) Techniques to ensure correct placement include:

(1) Bougie

(2) Gloved finger

(3) Hemostat guidance

(c) Placement is confirmed with a combination of:

(1) End-tidal CO2

(2) Breath sounds

(3) Ventilation compliance

(4) Chest rise

(5) Clinical improvement

9. To properly clean a tracheostomy tube, refer to ***Skill Drill 45-1***.

C. Long-term ventilators

1. Patients may be on long-term ventilators at home for many reasons, including:

a. Spinal cord injury

b. Neuromuscular disease

c. Lung injury

2. Primary assessment should include determining if the ventilator is working effectively.

a. Normal oxygen level for patients with long-term ventilators may be below what is considered normal for others.

b. Some medical conditions can be made worse by overly aggressive oxygenation and ventilation.

c. If the ventilator does not appear to be working effectively for the patient:

i. Work with the patient or caregiver to adjust ventilator settings.

(a) Understand clinical impact of ventilator changes before attempting adjustments.

ii. Disconnect the ventilator completely.

3. CPAP and BPAP or BiPAP devices offer noninvasive options for oxygenation and ventilation support.

a. Plastic mask is usually connected to the device, then attached over the face or nose by straps.

b. Many with sleep apnea use CPAP machines during sleep.

4. Diaphragm and phrenic nerve stimulators (pacemakers) allow some patients to breathe without ventilator assistance.

a. External electrical impulses cause the diaphragm to contract, then passively relax

b. Movement creates enough tidal volume for effective respiration.

c. If devices fail, you can use conventional bag-mask techniques.

d. Asynchrony may occur between mechanical ventilations and patient breathing if device is activated while patients are receiving bag-mask or ventilator assistance.

D. Ventricular assist devices (VADs)

1. Provide life-saving bridge for patients with severe heart failure.

a. In a hospital setting, VADs are placed in a patient’s chest during or after heart surgery to help a failing heart perform.

b. Now portable, and can be used by people in the community

2. Used by patients who:

a. Are awaiting heart transplant

b. Need long-term treatment when not candidates for heart transplantation

3. Surgery connects the pump to the left, right, or both heart ventricles.

a. Blood exits heart ventricle into large diameter tubing

b. Tubing connected to a pump sends blood into either the aorta or pulmonary artery.

c. Pumps are connected to an external power supply or battery pack by a wire that exits through the abdominal wall.

4. Complications include:

a. Bleeding

b. Infection

c. Device failure

5. Few interventions available for EMS:

a. Correcting problems with battery or power supply

b. Providing supportive treatment

c. Providing immediate transport

E. Apnea monitors

1. Used for:

a. Infants with a high risk for sudden infant death syndrome or other causes of apnea

b. Diagnosis and evaluation of sleep apnea

2. Monitors vary depending on purpose.

a. Infant monitors usually record an ECG tracing and respirations based on transthoracic electrical impedance.

i. Will detect central apnea but may or may not detect apnea caused by airway obstruction

b. Many home apnea devices do not display numeric values or ECG and respiratory waveforms.

i. Essential that ALS resuscitation equipment be used for patients requiring EMS assistance

F. Long-term vascular access devices

1. Placed for a number of reasons, including:

a. Inadequate or impossible peripheral IV access

b. Medication administration that irritates smaller blood vessels

c. Vasopressor medication infusion

d. Chemotherapy

e. Frequent blood draws

f. Long-term antibiotic therapy

g. Dialysis

2. *Warning: Many of these devices are maintained with the anticoagulant heparin, some in dangerously high concentrations.*

a. Obtain additional training and medical director authorization prior to use.

3. May be the only IV access in some emergency situations.

a. Contact online medical control for guidance.

b. To remove any heparin, catheters require up to 10 mL of blood to be removed and discarded before giving any:

i. Flush

ii. Medication push

iii. Infusion

c. Contaminated catheters can cause serious bloodstream infections.

4. Common long-term vascular access devices include:

a. Peripherally inserted central catheter (PICC)

i. Long intravenous catheter usually placed in either arm

ii. Follows peripheral veins into superior vena cava

iii. May be in place up to 1 year

iv. Smaller diameter and longer catheter length may increase resistance during rapid infusion.

v. May or may not be flushed with heparin after use

b. Midline catheter

i. Placed into an upper extremity

ii. Not as long as PICC catheter (does not reach central circulation)

iii. Longer than traditional peripheral IV catheters

iv. Better suited for irritating medications

v. Typically contain heparin

c. Double or triple lumen central catheter

i. Placed through skin in relatively close proximity to a large central vein

ii. Most common vein sites:

(a) Femoral

(b) Internal jugular

(c) Subclavian

iii. Placed in acute care settings, but may still be in place a short time following discharge or transfer

iv. Contain heparin when not being used for ongoing infusions

d. Hickman, Broviac, and Groshong catheters

i. Tunneled under the skin into the superior vena cava

ii. Typically contain heparin when not in use and look similar to a dialysis catheter

iii. Ports may be colored red, blue, or green

iv. Do not use clamps or hemostats on the catheter itself.

e. Implanted ports (Port-a-Cath or similar)

i. Placed completely under the skin and tunneled into a central vein

ii. Ports similar in size and shape to one or two large hazelnuts

iii. Top of implanted ports is flat or slightly rounded with palpable edge.

iv. Ports are accessed with a needle bent 90° with plastic wings to hold while inserting.

v. Contain heparin when not in use

f. Dialysis catheter (Vas-Cath/Permcath)

i. Usually placed in the neck or groin for dialysis

ii. Thick-walled, high-volume catheters

iii. Often only dialysis nurses or specially trained RNs have access or use these catheters.

iv. Stored with high-dose heparin

v. May allow significant bleeding if not capped and clamped properly

5. To properly access an implantable venous access device, refer to ***Skill Drill 45-2***.

G. Medication infusion pumps

1. IV medication categories include:

a. Inotropic medications for heart failure

b. IV nutrition

c. Chemotherapy

d. IV antibiotics

e. Other substances

2. Many IV medications are administered with infusion pumps.

a. If pumps fail while receiving certain vasoactive medications, a life-threatening emergency can occur.

3. Problems with medication infusion pumps often trigger EMS assistance requests.

a. Underlying medical condition may worsen despite a properly functioning infusion system

i. Continue current medication infusion while contacting medical control.

ii. Most situations will not require titration or infusion pump manipulation.

4. Problems may occur with long-term vascular access devices.

a. Devices have a limited life span.

i. Become clogged with blood clots

ii. Harbor infections

b. Mechanical failure or accidental removal may occur.

i. May need to reestablish alternative vascular access

5. May be necessary to troubleshoot an infusion system

a. Electrical outage or battery depletion may be a life-threatening emergency.

b. Device malfunction may cause sudden, unexpected loss of pump

c. Solutions:

i. Using ambulance inverter to provide external power

ii. Backup devices

iii. Calculating drip rate of IV tubing if pump cannot be immediately repaired or placed

iv. Collaborating with patient or caregiver for creative solutions

H. Insulin pumps

1. Electronic devices allowing diabetic patients to titrate exogenous insulin needs to activity, body stress, and dietary intake

a. Small needle is inserted into subcutaneous tissue and connected by tubing to an insulin pump

b. Patients can adjust insulin to effectively control glucose levels.

2. Potential to complicate EMS treatment of patients with insulin-dependent diabetes who develop hypoglycemia

a. Pumps may continue to infuse insulin even after profound hypoglycemia occurs.

b. Pump must then be disconnected or turned off to keep more insulin from being delivered.

i. Deactivation steps differ among different models and brands.

ii. Take care to avoid needle sticks if the needle must be removed from the patient.

c. Look for insulin pumps during physical examination of diabetic patients with hypoglycemia.

I. Tube feeding

1. Flexible catheters that go into the patient’s stomach or small intestine can be placed:

a. Through nose or mouth

b. Directly through the skin

2. Allows nourishment and water to enter digestive system directly, without chewing or swallowing

a. Can decrease risk of aspiration if patients cannot swallow effectively or protect the airway

3. Tube types that go into the stomach:

a. Nasogastric—placed in the nose

b. Orogastric—placed in the mouth

4. Other tubes:

a. Nasoduodenal—goes from the nose to the duodenum

b. Nasojejunal—goes from the nose to the jejunum of the small intestine

c. Gastrostomy (G) tubes—surgically inserted through the skin into the patient’s stomach

d. Jejunostomy (J) tubes—surgically placed through the skin directly into the jejunum of the small intestine

e. Percutaneous endoscopic gastrostomy (PEG) and percutaneous endoscopic jejunostomy (PEJ) tubes are placed using endoscopic surgical technique.

5. EMS personnel do not often need to troubleshoot or manipulate feeding tubes during a response.

a. May need to monitor continuous tube feedings during interfacility transports for:

i. Pump malfunction

ii. Signs of vomiting or aspiration

b. Keep patient’s head elevated during and after tube feeding.

c. If complications develop:

i. Stop feeding.

ii. Possibly flush catheter with tap water to prevent clogging.

6. To properly replace an ostomy device, refer to ***Skill Drill 45-3***.

J. Colostomy

1. Surgical procedure directing the large intestine through a stoma

2. Colostomy bag—plastic bag with hard, circular opening attached around the stoma by an adhesive ring

a. Stool and intestinal liquid collects in the bag for disposal.

3. EMS personnel are not often called for colostomy problems, but a few include:

a. Bag separates from abdominal wall, requiring replacement or temporary reinforcement with tape.

b. Bag becomes full and patient needs assistance in emptying it

i. Clamp located at bottom of bag opens to allow contents to drain into a suitable collection device

ii. Abdominal gas may accumulate in the bag, requiring periodic release during longer transports

K. Urostomy/urinary diversion

1. Urinary diversion is required for certain medical conditions, such as:

a. Bladder cancer

b. Congenital anomalies

c. Massive urinary tract obstructions

2. Urostomy: Procedure in which part of the urinary system is diverted through a stoma (an opening in the anterior abdominal wall)

a. EMS interventions are similar to those for colostomy.

i. Occasional emptying

ii. Reinforcement

iii. Reattachment

L. Urinary catheterization

1. Used when patients cannot urinate on their own

a. May remain in place (indwelling catheters such as Foley catheters)

b. May be used intermittently (straight catheters)

2. To properly catheterize an adult male patient, refer to ***Skill Drill 45-4***.

3. To properly catheterize an adult female patient, refer to ***Skill Drill 45-5***.

M. Dialysis

1. A replacement for failed or failing kidneys (renal failure)

a. Kidney failure may be primary condition or a consequence of another medical problem, such as:

i. Cardiovascular disease

ii. Septic shock

iii. Liver failure

iv. Some toxic chemicals or medications

v. Diabetes

vi. Other chronic or acute conditions

b. As kidney function declines, substances accumulate in the body.

i. Fluids

ii. Excess electrolytes

iii. Toxins

c. If untreated, these substances may cause death.

d. Late signs of kidney failure, requiring prompt intervention, include:

i. Coma

ii. Cardiac dysrhythmia

iii. Circulatory overload

2. Two types of dialysis:

a. Hemodialysis

i. Removes blood from patient through a catheter or fistula (a surgical connection between artery and vein)

ii. Two needles are placed through the patient’s skin on either side of the fistula.

iii. Blood leaves the body through one needle and returns to the body through the other.

iv. Blood cycles through a machine that removes toxins, electrolytes, and extra fluid before returning the blood to the body.

b. Peritoneal dialysis

i. A special solution is sent through a catheter into the patient’s abdomen.

(a) Draws toxins, electrolytes, and other fluids from the body, through the peritoneal membrane.

ii. Substances are removed along with the original solution through the catheter.

3. Complications possible during or following dialysis treatment include:

a. Incorrect calculation of the large volumes of fluid moved in and out of the patient’s body can create massive fluid and electrolyte abnormalities.

b. Hypovolemia and fluid overload are possible during and after dialysis.

c. Infection can occur.

d. Complications with fistulas:

i. Severe, life-threatening hemorrhage if fistula is damaged or catheter improperly removed

ii. Thrombosis (blood clot)

iii. Stenosis (narrowing)

4. Use caution when treating patients who receive dialysis.

a. Overload can occur from small volumes of IV fluids, particularly in susceptible patients.

b. Monitor IV fluids carefully and titrate to patient response.

5. Patients with renal failure are prone to:

a. Electrolyte abnormalities (hyperkalemia)

b. Elevated blood potassium concentration

6. Avoid medications known to increase serum potassium levels:

a. Succinylcholine (Anectine)

b. Digoxin

c. Beta-adrenergic blockers

7. Use caution when patient has a dialysis fistula because they are prone to clots and infection.

a. Avoid using the same arm for:

i. Blood pressure measurements

ii. Blood draws

iii. IV access

8. If responding to an emergency at a dialysis center:

a. Determine if patient has already received the treatment or if the treatment is still in progress.

i. A significant amount of the patient’s blood may still be in the dialysis machine.

ii. Carefully coordinate with the dialysis center staff to remove the patient from the machine if dialysis is still in progress.

N. Surgical drains and devices

1. A variety of drains and devices are used after surgery to monitor and assist wound healing or closure.

a. Wound drains prevent fluid from collecting at surgical site, while allowing monitoring of draining fluid for:

i. Volume

ii. Appearance

iii. Composition

b. Other devices use mechanical forces to stabilize the surgical site and promote healing.

2. Outside EMS scope of practice to manipulate many of these devices or drains

a. Can cause significant complications, including:

i. Hemorrhage

ii. Infection

iii. Need for more surgery

b. Contact medical control if additional guidance is needed.

3. Other devices paramedics should not manipulate include:

a. Orthotic devices

b. Prosthetic limbs

c. Braces

O. Cerebrospinal fluid shunts

1. Hydrocephalus: An excess volume of cerebrospinal fluid (CFS) around the brain

a. CSF is produced in the brain to:

i. Protect and cushion.

ii. Provide nourishment.

iii. Remove waste products from brain and spinal cord.

b. If the brain becomes injured, swelling can be offset by CSF volume reduction to maintain lower intracranial pressure (ICP).

c. Approximately 500 mL of CSF is produced daily by choroid plexus of the brain.

i. As it is produced, it is constantly being reabsorbed by the bloodstream.

2. Excess CSF causes increased ICP, leading to signs and symptoms including:

a. Headaches

b. Visual disturbances

c. Unsteady gait

d. Nausea and vomiting

e. Seizures

f. Altered mental status

g. Numerous other effects

h. Relatively malleable skulls in fetuses, infants, and young children

3. Treatment involves surgical placement of a cerebrospinal fluid shunt to drain excess CSF from the central nervous system.

a. Shunt consists of:

i. Inflow (proximal) catheter

(a) Typically placed into the ventricle of the brain

(b) Connected to valve

ii. Valve

(a) May have fixed opening and closing pressure, or these may be adjustable

(b) Newer valves can be adjusted by a physician using a magnet placed near the valve.

iii. Outflow (distal) catheter

(a) Commonly placed in the peritoneal cavity (ventriculoperitoneal [VP] shunt)

4. Often substantial clinical improvement following CSF shunt placement

5. Patients and caregivers must monitor for complications.

a. Most occur in the immediate postoperative period, often from surgery itself.

b. Periodic revisions are needed as children grow and bodies change.

c. Increased ICP is suggestive of:

i. Infection

ii. Shunt valve malfunction

iii. Mechanical damage to either catheter

d. Suspect shunt malfunction if patient exhibits:

i. Headache

ii. Visual disturbances

iii. Seizures

iv. Altered mental status

VIII. Medical Technology Used During Interfacility Transport

A. Paramedics often perform interfacility patient transport.

1. Follow state EMS regulations and individual service medical directors to determine which medications and procedures can be used.

B. Hemodynamic monitoring

1. Movement and various forces applied to blood within the human body

a. Cursory hemodynamic monitoring includes assessment of:

i. Patient blood pressure

ii. Pulse rate

iii. Urinary output over time

iv. Skin temperature

v. end-tidal CO2

vi. Mental status

b. Provides information regarding perfusion effectiveness.

2. Need invasive hemodynamic monitoring when specific cardiovascular system effectiveness needs to be evaluated, or to carefully guide fluid administration

a. Monitoring continues as:

i. Medications are administered.

ii. Procedures are performed to improve body function or increase chances of survival after:

(a) Critical illness

(b) Traumatic injury

(c) Major surgery

b. Invasive monitoring includes values such as:

i. Continuous arterial blood pressure

ii. Central venous pressure or right arterial pressure

iii. Pulmonary artery pressure

iv. Direct or indirect measurements of left atrial and left ventricular pressure

v. Systemic vascular and pulmonary vascular resistance

3. Majority of current hemodynamic monitoring involves placement of different catheter types into different parts of the cardiovascular system, such as:

a. Arteries

b. Central veins

c. Various heart chambers

4. Catheter is connected to special tubing usually filled with normal saline or a heparinized solution.

a. Solution is placed on a pressure bag to prevent blood from being pushed out of the body through the catheter and tubing

b. Tubing is connected to a transducer that converts this fluid pressure changes into electrical impulses.

c. Impulses are interpreted by the monitor and displayed as waveforms and numeric values.

d. Invasive monitoring will:

i. Identify impending heart failure.

ii. Guide fluid resuscitation.

iii. Demonstrate effectiveness of CPR compressions.

iv. Differentiate various shock states.

v. Provide useful information in high-risk patients.

5. Arterial pressure monitoring—component of hemodynamic monitoring

a. Arterial lines (A-lines) are used to:

i. Monitor blood pressure.

ii. Provide continuous access for frequent blood tests or arterial blood gas sampling.

b. Conditions requiring frequent blood tests include:

i. Sepsis

ii. Respiratory failure

iii. Diabetic ketoacidosis

iv. Salicylate overdose

6. Larger arterial sheaths may have been placed for cardiac catheterization.

a. Placed in a femoral artery

b. Provide a route to cardiac blood vessels.

c. Occasionally left in place after diagnostic cardiac catheterization if patient is to be transported to another hospital for further invasive cardiac care

d. Patients should remain supine with legs straight during placement, and for a time after placement.

7. Bleeding from displaced arterial catheter or sheath can be immediately life-threatening.

a. Must be continuously monitored

b. Large quantities of blood can become lodged in the groin area and stretcher linens before being seen.

C. Intra-aortic balloon pumps (IABPs)

1. Used to decrease cardiac workload and augment perfusion in patients with:

a. Cardiogenic shock

b. Structural abnormalities in the heart

c. Myocardial infarction

d. Cardiac surgery

2. Unlikely that paramedic will be solely responsible for care, but may accompany a critical care transport team.

3. IABPs consist of:

a. Relatively large machine

b. Connecting tubing

c. Monitor cables

d. Balloon catheter

i. A cylindrical balloon is inserted through the femoral artery into the aorta.

ii. Tubing connects the catheter to the machine.

iii. Monitor leads from the machine are connected to the patient.

4. Movement of both patient and machine requires careful planning and coordination.

5. The balloon is inflated and deflated at precise times during the cardiac cycle.

a. Balloon inflates during diastole, pushing blood forward into systemic circulation.

b. Balloon actively deflates during systole, creating a brief vacuum and reducing cardiac afterload.

6. Process works to:

a. Decrease myocardial oxygen demand.

b. Reduce cardiac workload.

c. Improve systemic circulation.

7. IABP is bulky and difficult to move and secure in an ambulance.

a. Need additional straps to prevent machine from moving in event of a crash

b. Be careful when handling and securing the connecting tube.

i. Accidental removal of the balloon catheter often creates a life-threatening emergency.

D. Intracranial pressure monitor

1. An ICP monitor or drain may be placed in patients with:

a. Intracranial hemorrhage

b. Severe head trauma

c. Have undergone neurosurgery

2. Devices allow:

a. ICP monitoring

b. Evaluation of the appearance of CSF

c. Drainage of CSF to maintain a lower ICP

3. Monitoring ICP is similar to hemodynamic monitoring.

a. Transducer of drainage system typically aligned at same height as the patient’s ear canal.

i. May be difficult in crowded ambulance

ii. Drainage system positioning is extremely important.

(a) Improper placement can cause large volumes of CSF to quickly enter or leave the patient’s nervous system.

IX. Care of Patients With Cognitive, Sensory, or Communication Impairment

A. Developmental disability

1. Defined by CDC as a diverse group of severe chronic conditions due to mental and/or physical impairments

a. Impairments appear prior to age 22

i. Usually continue throughout lifetime

b. Numerous human attributes may be adversely impacted:

i. Communication

ii. Movement

iii. Learning

iv. Behavior

v. Ability to care for oneself

vi. Prospect for employment

c. Profound vision or hearing impairment can disrupt other developmental issues, leading or contributing to a developmental disability.

d. Certain conditions have uncertain causes (autism, for example).

B. Developmental delay

1. An infant or child’s failure to reach a particular developmental milestone by the expected time, including:

a. Gross and fine motor skills

i. Crawling

ii. Walking

iii. Hand-eye coordination

b. Cognitive skills

i. Reaching

ii. Object permanence

iii. Problem solving

c. Social skills

i. Interactions with others

ii. Forming relationships with others

d. Language milestones

i. Talking

ii. Listening

iii. Comprehending

2. Signs of problems may be in one developmental area or in multiple areas.

3. Delays are linked to many causes of developmental disabilities

4. Down syndrome and autism are associated with potentially significant developmental delay signs.

5. Depending on causes, delays may:

a. Persist into adulthood

b. Resolve as medical or social situation improves

6. Early intervention is important and may allow children recovery of previously missed milestones.

7. Cues from patient and caregiver help determine the best way to interact and communicate.

a. Approaches used while treating younger children may be useful when dealing with older children and adults who are developmentally delayed.

b. May need additional time while:

i. Assessing the patient

ii. Performing procedures

iii. Preparing for transport

C. Down syndrome

1. An inherited genetic disorder responsible for:

a. Developmental delay

b. Cognitive impairment

c. Pattern of unusual physical features

i. Flattened face and nose

ii. Short neck

iii. Upward slanting eyes

iv. Protruding tongue

v. Single crease on hand palms

2. Known as trisomy 21

a. Normal human cells have 23 pairs of chromosomes

b. In Down syndrome, an extra chromosome attaches to the 21st pair (third chromosome 21, or trisomy 21)

3. Risks include:

a. Sibling or mother with Down syndrome

b. Older maternal age at time of conception

4. Chromosomal changes may cause:

a. Structural heart defects

b. Seizures

c. Numerous gastrointestinal problems

d. Speech alterations

e. Hearing loss

f. Many other abnormalities

5. May have a shorter life expectancy

6. Cognitive deficits range from barely noticeable to profound impairment.

7. May function relatively independently or require constant assistance with basic tasks

D. Mental retardation

1. Cognitive disorder appearing during childhood, accompanied by lack of adaptive behaviors including:

a. Ability to live and function independently

b. Interact successfully with others

2. A variety of tests are available, but intelligence quotient (IQ) below 70 is a defining characteristic.

3. Clinical presentation and symptom severity varies dramatically.

E. Autism

1. A condition involving developmental delay

2. Increased rates of diagnosis in the United States, possibly due to:

a. Better awareness and screening

b. Actual increase in occurrence

3. A wide variety of symptoms relating to:

a. Communication

b. Social interaction

c. Sensation of discomfort

d. Ability to purposefully shift attention

e. Ability to play

4. May be completely nonverbal throughout their lifetime or during periods of stress

5. Developmental regression with no other cause should raise concern.

6. Cognitive function varies significantly.

a. Some may have impaired cognitive function meeting criteria for mental retardation.

b. Some may have savant-like abilities in mathematics, puzzles, memory, or art.

7. When treating patients with autism, be extremely careful while attempting to communicate or initiating physical contact.

a. Patients may react bizarrely or aggressively to commotion and excess stimuli.

b. Physical contact should be:

i. Preceded with careful explanation

ii. Done from distal to proximal

c. Questions to the patient should be repeated in a variety of ways to ensure consistent response.

d. Patients may show minimal reactions to pain or great discomfort to minor physical contact or injuries.

8. Helpful to include caregivers in:

a. Assessment

b. Treatment

c. Transport

F. Mental/emotional impairment

1. A person’s mental status can influence physical well-being, and vice versa.

2. May be difficult to assess an emotionally or mentally impaired patient because of the body’s normal stress response, altering their:

a. Respiratory rate

b. Pulse rate

c. Perception of physical illness

3. Calmly determine the chief complaint, and treat accordingly.

4. Patients demonstrating conversion disorder (hysteria) may be particularly challenging.

a. May present with focal neurologic abnormalities from stress that manifest physically, such as:

i. Blindness

ii. Paralysis

iii. Impaired speech

b. Manifestations are not voluntary, and the patient is not faking the signs and symptoms.

c. Diagnosis and treatment is beyond the scope of EMS personnel.

d. If disorder is suspected:

i. Maintain professional demeanor.

ii. Continue to assess for other causes of the sign or symptoms.

G. Hearing impairment

1. Hearing loss can:

a. Inhibit communication.

b. Limit social interaction.

c. Interfere with infant development.

d. Render many safety and warning devices ineffective.

2. Can be congenital or acquired

a. Genetic factors cause 50% of congenital hearing loss in children.

b. Remaining 50% of congenital hearing loss is caused by factors including:

i. Maternal infection

ii. Rh incompatibility

iii. Hypoxia

iv. Maternal diabetes

v. Pregnancy-induced hypertension

c. Majority of acquired hearing loss is from excessive exposure to loud noise.

i. Other causes include:

(a) Various infections (otitis media and viral infections)

(b) Tumors (acoustic neuroma)

(c) Ototoxicity of many medications

(d) Diseases such as Meniere disease

(e) Degenerative processes of aging

3. Types of hearing loss

a. Conductive hearing loss: inability of sound to travel from outer ear through to the inner ear

b. Sensorineural hearing loss: problems with uptake of sound through tiny hairs within the ear and subsequent conduction of nerve impulses.

c. Hearing loss can be either one or the other or a combination of the two.

d. Central auditory processing disorder (CAPD): An auditory process deficit characterized by difficulty interpreting speech when background noises are present

e. Auditory neuropathy (auditory dyssynchrony)—a condition with normal function of ear structures without a corresponding stimulation of auditory centers of the brain, linked to:

i. Prematurity

ii. Congenital anomalies

iii. Other neurologic conditions

4. Patients with profound or total hearing loss (deafness) may use sign language or written words to communicate.

a. Cursory sign language may be very helpful to EMS personnel.

b. Writing on notepads or electronic devices can assist paramedics in communicating with hearing-impaired patients who can read or write.

c. If patients have minimal or partial hearing loss, slow, deliberate, and repetitive speech can help communication.

5. Hearing aids

a. A device to make sound louder

b. Types of hearing aids

i. Behind-the-ear—all parts contained in plastic case resting behind the ear

ii. Conventional body type—typically used by those with profound hearing loss

iii. In-the-canal and completely in-the-canal—contained in a tiny case fitting partly or completely in the ear canal

iv. In-the-ear—all parts contained in a shell fitting in the outer part of the ear

v. Implantable hearing aids—an option for patients with less profound hearing loss

c. To insert a hearing aid:

i. Follow the natural shape of the ear.

ii. Needs to fit snugly without forcing

iii. If there is a whistling sound, may not be in far enough to create a seal or the volume may be too loud.

(a) Reposition the hearing aid.

(b) Remove it, and turn the volume down

iv. If after two tries, the hearing aid cannot be made to fit properly:

(a) Place it in the box.

(b) Take it with you on transport.

(c) Document the transport and transfer of hearing aids to hospital personnel.

v. Do not try to clean the hearing aid or get it wet.

d. If a hearing aid is not working, troubleshoot the problem.

i. Make sure it is turned on.

ii. Try a fresh battery, and check that the tubing is not twisted or bent.

iii. Check the switch to make sure it is set on M (microphone).

iv. If a body aid, try a spare cord.

v. Check that the ear mold is not plugged with wax.

H. Visual impairment

1. Can be caused by a variety of congenital and acquired conditions

a. Genetic factors may predispose to vision loss later in life.

b. Congenital causes include:

i. Fetal exposure to cytomegalovirus

ii. Hypoxia during delivery

iii. Albinisms

iv. Hydrocephalus

v. Retinopathy of prematurity

(a) Diseases of the retina of the eye that do not involve inflammation

(b) Has been linked to high levels of supplemental oxygen given to infants during the neonatal period

c. Acquired causes include:

i. Trauma

ii. Cerebrovascular accident

iii. Age-related macular degeneration

iv. Glaucoma (increased pressure within the eye)

v. Cataracts (lens of the eye becomes opaque)

vi. Uncontrolled hypertension

vii. Diabetic retinopathy

viii. Degeneration of the eyeball, optic nerve, or nerve pathway

ix. Vitamin A deficiency in many developing countries

d. Impaired vision may also be from optic nerve hypoplasia—congenital condition where the optic nerve fails to completely develop

e. Optic nerve atrophy may occur following:

i. Cerebrovascular accident

ii. Brain tumor

iii. Certain toxic chemical exposure

iv. Trauma

v. A variety of other causes

2. Visual impairment can present in several notable patterns.

3. Hysterical blindness—old term for the mental health condition of conversion disorder

a. Blindness is a physical manifestation of an extreme psychological stressor.

b. Diagnosis and treatment is often difficult.

4. Acute angle-closure glaucoma (AACG)—a true ocular emergency

a. Suspect in patients who exhibit sudden onset of unilateral eye or periorbital pain and visual changes.

b. Prompt recognition and transport is imperative.

5. Explain before physically contacting patients with profound visual impairments.

a. Warn patients before palpating a body region or performing a procedure such as starting an IV line.

b. Discuss with the patient any needed movement or transport before doing so.

I. Speech impairment

1. Impaired speech may be associated with:

a. Neurologic injury

b. Toxicologic exposure

c. Anatomic abnormalities of the face or neck

d. Numerous other conditions

2. Divided into disorders impacting:

a. Articulation—involve forming particular words or sounds incorrectly

i. Lisps

ii. Trouble with specific sounds

b. Voice production—alter pitch, volume, or tone of voice

i. Voice may sound muffled, raspy, or unusually high or low.

c. Fluency—speech patterns affected

i. Unusual pauses or patterns of speech

ii. Particular words or phrases are prolonged, repeated, or avoided.

d. Language—impair the manner that ideas, thoughts, and feelings are expressed or understood

i. Patient may cognitively understand what they want to say, but cannot decide which words to use or phrases to use.

3. Other speech disorders:

a. Language-based learning disability—difficulty with reading, spelling, or writing causing a person to fall behind for a given age

b. Phonologic process disorders—affects the ability to produce sounds that combine into spoken words

c. Semantic-pragmatic disorder of speech—often found in patients with autism

i. Characterized by delayed language developmental milestones

ii. Repeated use of irrelevant phrases out of context

iii. Confusing word pairs (I, you)

iv. Trouble following conversations of others

v. Affects both reception of communication and the ability to express his or her own thoughts

d. Dysarthria—failure of neurotransmission between nervous system and muscles of the face and throat, causing impaired speech

i. Characterized by consistent repetition of the same impairment

e. Apraxia—neurologic impairment in the brain that inconsistently activates muscles used to form particular sounds or words

i. Patient may understand what they are trying to say but muscle activation is more or less random, making it difficult to make the correct sounds.

4. Exercise patience and deliberation when communicating with patients who have speech impairment.

a. Enlist help of family and caregivers.

J. Paralysis, paraplegia, and quadriplegia

1. Paralysis: Inability to move

a. Muscles in affected body areas may become flaccid or fail to move because of continued spasm (spastic paralysis).

b. Long-term paralysis can be caused by many numerous medical conditions:

i. Head trauma

ii. Cerebrovascular accident (CVA, stroke)

iii. Spinal cord injury

iv. Malignancy

v. Other neuromuscular diseases

c. Types include:

i. Paraplegia: paralysis affects lower extremities but not upper extremities

ii. Quadriplegia: paralysis affects both upper and lower extremities

d. Often accompanied by:

i. Sensory deficits

ii. Loss of bowel or bladder control

2. Often have serious complications:

a. Respiratory muscle paralysis

i. Patients are completely dependent on mechanical ventilator or similar device.

b. Pressure ulcers

i. Frequent position changes needed by either mechanical devices or caregivers

ii. Tissue perfusion to the coccyx and over bony prominences causes pressure sores with external pressure applied for long periods of time.

iii. Infection from pressure ulcers is a significant cause of mortality

c. Autonomic dysreflexia

i. A risk for patients with paralysis from spinal cord injury

ii. A body stressor triggers a release of catecholamines from the ANS.

(a) Causes vasodilation above the spinal cord injury and massive arterial vasoconstriction

(1) Causes dangerously high blood pressure

3. External devices (halo rings, vests) are often used to stabilize structures of the spine.

a. Require additional consideration and coordination during movement of patients

i. Halo rings and vests have substantial weight.

ii. Necessary to support devices without applying force to the device during patient movement

iii. Remove only in the event of cardiac arrest for chest compressions.

4. Particularly susceptible to environmental extremes

a. Often impossible to regulate perfusion to the skin

b. Fluctuations of the ANS cause risk for both hypothermia and hyperthermia.

5. There is not always a loss of sensation.

a. Patient may have normal sensation or hyperesthesia (increased sensitivity).

b. Conversely, pressure that would be felt normally may not register.

c. Some male patients with severe spinal cord injury will have priapism (prolonged penile erection, not related to sexual arousal).

6. Many patients require urinary catheterization; if regular bladder emptying is not done, the following may occur:

a. Urinary infection

b. Urinary reflux

c. Autonomic dysreflexia

7. Total lifting assistance is usually required.

a. May or may not need additional lifting assistance regarding other devices:

i. Tracheostomy tube

ii. Indwelling urinary catheter

iii. Colostomy

iv. Ventilator

K. Trauma in cognitively impaired patients

1. Most impairments will be problematic during a traumatic event.

a. Isolated sensory or communication impairments can cause:

i. Additional anxiety

ii. Confusion

iii. Delays

iv. Disruption of patient care or transport

b. Patients with severe cognitive impairments may also present with abnormal behavioral responses.

c. EMS personnel may need to modify:

i. Communication

ii. Assessment

iii. Interventions

iv. Patient transport

2. Effective communication with a traumatized patient who is developmentally disabled may be almost impossible.

a. The patient may not be able to provide a thorough or meaningful medical history.

b. If caregiver is not available, rely on physical or behavioral cues of the patient.

c. Environmental clues may provide hints of the nature of the disability:

i. Group home

ii. School (of the deaf, for example)

iii. Lettering on vehicle

d. Many people with profound cognitive impairment may have:

i. Altered or decreased pain sensation

ii. Concomitant neurologic disorders

iii. Atypical presentation of physical signs and symptoms

e. Patients with autism may have unusual communication patterns or exaggerated reaction to physical contact.

3. Medical treatment consent may be uncertain.

a. Adults with profound impairment may not have decision-making capacity to consent or refuse medical treatment

i. May need to:

(a) Locate a valid surrogate decision maker.

(b) Initiate treatment under the doctrine of implied consent in emergency situations.

4. Patient assessment techniques may need modification.

a. Patients may present with education level at 6th grade or below.

b. May have difficulty understanding or communicating timing or relationship of events

c. Use of open-ended questions may give clues regarding patient’s cognitive ability and decision-making capacity.

d. Have patient paraphrase information back to the paramedic, especially when obtaining patient consent or refusal.

5. Caregivers can be a valuable resource following a traumatic event by relaying:

a. How the patient normally communicates

b. Level of awareness and understanding

c. Physical abilities (motor skills or activity)

d. Additional information such as sleep patterns and eating habits.

6. Consider allowing the caregiver to stay with the patient during the physical exam.

a. Consider deferring vital sign measurement in patients showing sufficient oxygenation, ventilation, and perfusion until patient is calmer and cooperative.

7. Interventions may require additional time, explanation, and assistance.

a. Management of traumatic injuries is generally the same as for other patients.

b. Expect concomitant neurologic disorders such as:

i. Seizures

ii. Delirium

iii. Weakness

iv. Muscle spasm

c. Also common are:

i. Psychiatric disorders

ii. Gastrointestinal abnormalities

iii. Chronic or frequent infections

8. Assess for and treat preexisting injuries and check for signs of abuse and neglect.

X. Other Notable Chronic Medical Conditions

A. Arthritis

1. An inflammation of joints between bones that causes:

a. Pain

b. Stiffness

c. Swelling

d. Redness

e. Discomfort

2. May be caused by:

a. Excessive use of joint or limb

b. Infection

c. Autoimmune process

d. Site of previous fracture

3. Types of arthritis include:

a. Osteoarthritis (most common)

i. Caused by cartilage loss or abnormal bone growth

ii. Usually in response to trauma or excessive use over time

iii. Treatment includes:

(a) Medication for analgesia and inflammation

(b) Topical creams

(c) Injections directly into affected joint

(d) Joint replacement in severe cases

b. Rheumatoid arthritis (RA)

i. Systemic inflammatory disease affecting joints and other body systems

ii. Can be mild and nonprogressive or full-blown and fatal

iii. Significant bone erosion at affected joints makes them susceptible to fractures and dislocations.

4. Remain alert when treating or transporting patients with arthritis associated with systemic lupus erythematosus (SLE), gout, or RA.

a. Discomfort may be accompanied by other medical concerns.

b. Symptoms include:

i. Chest pain

ii. Sensory changes or deficits

iii. Skin changes

5. During EMS response:

a. Administer analgesia medication.

b. Attempt to maintain limb or joint in most comfortable position.

c. Assess current long-term medications to avoid problematic interactions.

d. Backboards and splints may require additional padding or support.

e. Immobility of joints will interfere with physical examination.

B. Cancer

1. Various conditions resulting from excessive growth and division of abnormal cells within the body

2. Cancer frequently targets organs and body systems:

a. Brain

b. Breast

c. Skin

d. Blood

e. Stomach

f. Liver

g. Immune (lymphatic) system

h. Colon

3. Abnormal cells cause critical illness and death by:

a. Multiplying within a particular organ or body system

b. Metastasizing to another body area

4. Signs, symptoms, presentation, and treatment depend on present location of cancer or primary site of origin.

a. Cancer is typically treated, alone or in combination (depending on site and severity), by:

i. Radiation

ii. Chemotherapy

iii. Surgical removal

b. Treatment may increase susceptibility to other, unrelated medical conditions.

5. Chemotherapy medications are notorious for causing:

a. Nausea and vomiting

b. Anorexia

c. Discomfort

d. Immune system compromise

i. Otherwise routine infections can become emergencies.

6. Patients often receive chemotherapy, analgesic medications, and blood product replacement through implanted ports or other long-term vascular access devices.

a. Reduce patient discomfort.

b. Prevent irritation of smaller blood vessels while allowing reliable frequent access.

7. For patients diagnosed with or being treated for cancer, you may need to:

a. Correct dehydration issues.

b. Administer pain or antiemetic medications.

i. Ask and inspect for transdermal patches before administering medications

8. Ask about patient’s wishes regarding resuscitation.

a. If applicable, obtain copies of advance directives or DNR paperwork.

C. Cerebral palsy

1. Nonprogressive neurologic disorder from injury to brain tissue that may occur during:

a. Fetal development

b. Labor and delivery

c. First 2 years of life

2. Can be caused by:

a. Genetic defects

b. Maternal infections

c. Fetal CVA (stroke)

d. Excessive fetal bilirubin (kernicterus) or hemolysis

e. Hypoxia before or during birth

f. Infant infection (postpartum encephalitis, meningitis)

g. Head trauma

3. Usually produces altered skeletal muscle function or contractions

a. Poorly controlled muscles, may be:

i. Unusually contracted

ii. Flaccid

iii. Paralyzed

b. Severity ranges from:

i. Almost unnoticeable

ii. Profoundly devastating with:

(a) Paralysis of arms and legs

(b) Severe mental retardation

c. Those more severely affected may present with chronic signs and symptoms including:

i. Seizure disorders

ii. Hearing loss

iii. Variety of neurological disorders

d. May primarily affect only certain body regions or the body overall

i. Hemiplegia—one side of the body

ii. Paraplegia—either the arms or the legs

iii. Spastic tetraplegia—affecting all four limbs

e. Movement disorders include:

i. Tremors

ii. Unsteady gait (ataxia)

iii. Athetosis (involuntary writhing movement)

f. Severe cases may present with:

i. Seizures

ii. Loss of bladder control

iii. Inability to swallow

iv. Joint contractures

v. Impaired respiratory function

4. Careful movement and positioning is essential during treatment and transport.

a. Significant musculoskeletal changes may make assessment and safe movement difficult.

D. Cystic fibrosis (mucosviscidosis)

1. A genetic disorder characterized by increased mucus production in the lungs and digestive tract.

a. Caused by defective recessive gene inherited from each parent that makes it difficult for chloride to move through cells

i. Causes unusually high sodium loss

b. Mild cases are often undetected until adulthood.

c. The following may also be affected:

i. Sweat glands

ii. Reproductive glands

iii. Other body systems

d. Increased mucus may:

i. Impair respiration.

ii. Disrupt food digestion.

iii. Become life-threatening emergency in severe situations.

2. Suspected in newborn infants who present with:

a. Meconium

b. Odd-smelling or appearing stool (usually pale, greasy-looking and foul-smelling)

3. Gastrointestinal symptoms include:

a. Nausea

b. Anorexia

c. Constipation

d. Pancreatitis

e. Distended abdomen

f. Bowel obstruction

g. Ileus (loss of gastrointestinal motility)

h. Impaired release of pancreatic enzymes that digest and absorb fats in the intestine

4. Pulmonary manifestations include:

a. Pneumonia

b. Pneumothorax

c. Cough

d. Respiratory distress

e. Respiratory failure

5. Other symptoms include:

a. Malnutrition and poor growth rate

b. Failure to thrive

c. Infertility

d. Chronic sinus congestion

e. Bone mineral loss

6. The use of medical devices may include:

a. Long-term vascular access devices for frequent or continuous IV antibiotic treatment

b. Devices promoting lung function and removal of mucus

c. Intermittent or continuous home oxygen

7. Patients may have long, complex medical history and many clinical abnormalities.

a. May require additional assessment time

b. May have minimal to profound respiratory or gastrointestinal compromise

c. Expect to:

i. Administer oxygen.

ii. Provide frequent deep suctioning.

iii. Assist ventilation.

8. Usually diagnosed in infants and children

a. Diagnosis requires specialized testing not available in prehospital settings.

b. Alert receiving facility if CF is suspected.

E. Multiple sclerosis

1. A severe, incurable degenerative disorder involving the brain and spinal cord (nervous system)

a. Immune cells attack the myelin sheath of certain nerve fibers, preventing nerve transmission to other body tissues.

b. Cause is unclear, although some sources see a connection between:

i. Genetic predisposition

ii. Environmental factors

iii. Nutrition

iv. Exposure to a particular virus

c. Strikes women in their 20s to 40s two to three times more often than men.

d. Affects approximately 350,000 Americans, some with serious handicaps.

2. Presentation typically includes problems related to:

a. Muscle coordination

b. Muscle tone

c. Altered sensation

d. Gait disturbances

e. Periods of varied improvement followed by relapse and disease progression

3. Signs and symptoms related to neurologic function include:

a. Problems with musculoskeletal system

b. Clumsiness and ataxia

c. Constipation or bladder incontinence

d. Fatigue

e. Decreased sexual performance

f. Extremities feeling heavy or weak

g. Altered sensations (dizziness/vertigo)

h. Numbness or tingling in the body

i. Cognitive impairment

j. Disruption of speech or swallowing

k. Visual impairment

l. Skin breakdown from immobility or poor positioning

4. Patients with severe manifestations may be bedridden and incontinent.

5. Symptoms can present in combination and last from several days to months, with periods of absent or reduced symptoms in between.

6. Managed with:

a. Medications

b. Physical therapy

c. Counseling

7. No specific EMS treatment

a. Allow extra time for assessment.

b. Patient may lack sense of feeling, so it may be difficult to interpret physical examination.

c. Supportive measures include:

i. IV hydration

ii. Analgesic or muscle-relaxing medications

iii. Careful patient positioning

iv. Assisted ventilation when needed

F. Muscular dystrophy

1. A category of incurable genetic diseases causing a slow, progressive degeneration of muscle fibers

a. Specific diseases can be diagnosed by:

i. Certain genetic markers

ii. Age at time of onset

iii. Rate of disease progression

iv. Gender of patient (in certain cases)

b. Children may present with:

i. Obvious facial muscle changes

ii. Altered gait

iii. Delayed psychomotor developmental milestones

iv. Changes in posture

c. Severe manifestations of certain specific diseases in this group include:

i. Cardiomyopathy

ii. Cognitive impairment

iii. Respiratory compromise

d. May show obvious signs when infant is born or have onset as late as adulthood

2. Duchenne muscular dystrophy (DMD)—most common type

a. Caused by sex-lined recessive gene

b. Chiefly affects boys

c. Characterized by:

i. Enlarged heart muscle (dilated cardiomyopathy)

ii. Heart dysrhythmias

iii. Scoliosis of the spine

iv. Gait disturbances

v. Often required use of wheelchair by age 15

3. EMS treatment is primarily limited to:

a. Careful positioning

b. Supportive treatment

c. Assisted ventilation in severe cases

G. Myasthenia gravis

1. A rare autoimmune disorder suddenly or gradually affecting neuromuscular transmission, causing muscles to weaken and tire easily

a. Affects all ethnic groups and both sexes, although most commonly found in:

i. Women younger than 40 years (typical between 20 and 30 years)

ii. Men older than 60 years

b. Ocular myasthenia gravis: localized to eyelids and extraocular muscles

c. Generalized: affecting respiratory and a variety of skeletal muscles

d. Often patients have difficulty in:

i. Speaking

ii. Chewing

iii. Swallowing

e. Myasthenic crisis: respiratory failure from respiratory muscle fatigue, occurring if patient’s respiratory muscles are damaged by:

i. Infection

ii. Stress

iii. Side effects of medications

iv. Menstruation

2. Signs and symptoms fluctuate over time and include:

a. Drooping eyelids

b. Double vision

c. Difficulty speaking, chewing, or swallowing

d. Muscle weakness in the extremities

3. EMS may be called for complications of disease or for unrelated issues.

a. Possible for symptoms to resolve with rest or during transient remission

b. Treatment is generally supportive and based on presentation.

c. A myasthenic crisis may require airway protection and assisted ventilation.

H. Myelomeningocele (spina bifida)

1. Birth defect caused by improper development of the fetal neural tube (brain and spinal cord)

a. A defect in the vertebral column causes an opening, exposing the spinal cord and meninges.

b. Corresponding defect in the overlying skin exposes spinal cord and meninges to the outside environment.

2. May be accompanied by:

a. Negative impact on bowel and urinary elimination

b. Scoliosis

c. Other orthopedic disorders

3. Surgical treatment usually occurs within 1 to 2 days of birth, although some facilities may repair it while still in the mother’s uterus.

4. Two scenarios for EMS provider care to patients with spina bifida:

a. Prehospital delivery of fetus with diagnosed or undiagnosed spina bifida

i. Typically diagnosed by routine prenatal ultrasound

ii. Once fetus is delivered, cover smaller spinal cord openings with a moist, sterile dressing.

(a) Cover larger openings with sterile occlusive dressing to prevent neonatal hypothermia.

iii. Place newborn in prone or lateral position.

iv. Promptly transport to a facility specializing in critical newborn care.

b. May encounter infants, children, and adults who have already received surgical correction of spina bifida who present with issues related to or completely unrelated to the disorder.

i. Likely to need careful positioning because of vertebral column and orthopedic abnormality

5. Wide range of clinical manifestations:

a. Some degree of bladder dysfunction (neurogenic bladder) requiring frequent urinary catheterization

b. Scoliosis

c. Associated neurologic conditions

i. Seizure disorder

ii. Hydrocephalus

iii. CP

iv. Mental retardation

d. Complete or partial leg paralysis

e. Abnormalities of various bones or joints

6. Severity will determine type and amount of interventions necessary.

I. Poliomyelitis/postpolio syndrome

1. Viral infection causing significant morbidity and mortality throughout the world

a. Aggressive vaccination campaigns since the 1950s have eradicated the polio virus in many countries, including the United States.

b. Even without new cases, more than 500,000 live with the aftereffects of polio.

2. Humans are the only known hosts.

3. Initially presents similar to a common viral syndrome, with:

a. Headache

b. Sore throat

c. Fever

d. Malaise

e. Vomiting

4. As it progresses, other symptoms appear:

a. Back pain

b. Diarrhea

c. Leg pain

d. Continued fever

e. Muscle discomfort or stiffness

5. Two forms:

a. Nonparalytic—recovery is complete.

b. Paralytic—muscle weakness evolves to:

i. Paralysis of various muscles (usually legs and lower trunk)

ii. Muscle spasm

iii. Respiratory distress

iv. Drooling

v. Difficulty swallowing

6. Complications include:

a. Hypertension

b. Respiratory failure

c. Myocarditis

d. Shock

e. Loss of intestinal function

f. Death

7. Survivors are at risk for postpolio syndrome, characterized by:

a. Progressive or sudden worsening of muscle weakness previously caused by the polio virus

b. Muscle atrophy

c. Renewed risk of respiratory insufficiency or respiratory failure

d. Difficulty swallowing

e. Impaired speech

f. Significant pain or fatigue

8. Long-term prognosis is favorable for:

a. Subclinical polio—brief, mild symptoms lasting less than 72 hours

b. Polio that did not initially involve brain or spinal cord

9. Treatment is primarily supportive.

a. Assisted ventilation and oxygenation for actual or impending respiratory failure

b. Movement and traditional EMS equipment are likely to cause significant discomfort.

i. Assist patients with transfer or movement.

ii. Careful positioning and padding is essential.

iii. Lower body paralysis may require urinary catheterization.

J. Systemic lupus erythematosus (lupus, SLE)

1. Chronic autoimmune disorder causing widespread inflammation of body tissues

a. Antibodies attack normal cells in the:

i. Brain

ii. Kidneys

iii. Joints

iv. Digestive tract

v. Skin

vi. Variety of other organs and body systems

b. Exact cause unknown, but may be linked to factors including:

i. Genetic

ii. Environmental

iii. Hormonal

c. More common in:

i. Women

ii. Asian and African Americans

d. Most common presentations include:

i. Joint swelling and discomfort

ii. Pleuritic-type chest discomfort

iii. Fevers

iv. Photosensitivity

v. Swollen lymph nodes

vi. Mouth sores

e. Severe manifestations include:

i. Cardiac dysrhythmias

ii. Seizures

iii. Respiratory distress

iv. Hemoptysis

2. No specific prehospital treatment except for supportive care

a. Monitor for potentially life-threatening conditions from different body systems.

b. Possible interventions include:

i. IV hydration

ii. Analgesia medications

iii. Assisted ventilation

iv. Dysrhythmia management

v. Careful monitoring

K. Traumatic brain injury (TBI)

1. Potentially devastating condition with many serious short- and long-term complications

2. Patients may show a wide assortment of disorders, including:

a. Cognitive

b. Emotional

c. Behavioral

d. Sensory

e. Communication

3. Depending on location and severity of TBI, patients may present with:

a. Seizures

b. Impaired movement

c. Gastrointestinal dysfunction

d. Urinary retention

e. Paralysis

4. Be prepared to encounter patients with wide range of impairments or complications.

a. Location or severity may make assessment and transport difficult.

b. Caregiver’s assistance is often essential for:

i. Patient interaction

ii. Differentiation between new and preexisting signs and symptoms

c. Patients may not be able to give a meaningful history or history of present illness.

d. Patients may not understand or allow a physical examination or interventions.

i. Patient restraint may be needed if safety of patient or EMS providers is at risk.

XI. Summary

A. Paramedics encounter patients with a variety of economic, psychological, and medical challenges.

B. Patients with special challenges and their caregivers are usually experts on their condition or impairment.

C. Poverty and lack of health insurance have a direct impact on EMS services nationwide. Such people may not receive preventative health services or purchase needed medications, which increases the incidence and severity of disease and make emergencies more likely.

D. Homeless and low-income patients are more likely to have numerous chronic medical conditions.

E. Federal laws require emergency departments to stabilize patients in an emergency or active labor, regardless of the ability to pay. Become familiar with health care resources for low-income and homeless people.

F. Abuse, neglect, and assault occur at all levels of society. Because maltreatment and assault often result in EMS calls, it’s important to recognize signs and symptoms of abuse.

G. Child abuse includes improper or excessive action that injures or otherwise harms a child or infant, including physical abuse, sexual abuse, neglect, and emotional abuse.

H. Some benign physical findings may look like child abuse. Toddlers are more prone to bruising and minor injuries as they develop psychomotor skills. Older children are more likely to get injuries from sports and recreational activities. Infants of Asian or African origin may have Mongolian spots on the buttocks or back. Some practices may visually look like child abuse, including coining and cupping.

I. Paramedic safety is priority number one when encountering an abusive situation. These situations can cause powerful emotions; remain calm and neutral while providing optimal clinical care. Treating life threats takes priority over collecting history.

J. Careful, objective documentation of potential abuse or neglect is essential. Reporting child abuse or neglect is mandatory in most states, and failure to report may lead to a variety of penalties.

K. Terminal illness cannot be cured. EMS personnel will sometimes be called to assist patients that are facing imminent death. Always ask if there is an advance directive or DNR order.

L. Obese (bariatric) patients present significant clinical and logistical hurdles for EMS providers. Airway procedures and IV access are physically more difficult to perform, and the patients may be too heavy for traditional EMS crews to transport safely and effectively. Careful planning and proper body mechanics are essential to avoid injury to emergency responders or the patient; special equipment may be needed.

M. Patients with communicable diseases deserve respect and dignity during treatment like any other patient.

N. Many patients require physical support and care of chronic illness, which may take place in the home setting. Paramedics may need to troubleshoot devices when they malfunction, or incorporate the technology into prehospital patient care.

O. Family members who care for chronically ill patients are often the best source of information and care guidelines.

P. EMS personnel are likely to encounter medical technology: tracheostomy tubes, long-term ventilators, apnea monitors, long-term vascular devices, medical infusion pumps, insulin pumps, nasogastric or orogastric feeding tubes, colostomy, urostomy, dialysis, surgical drains/devices, and cerebrospinal fluid shunts.

Q. Patients with tracheostomy tubes may have emergencies related to occlusion or accidental removal; these may be immediately life threatening. Follow the DOPE acronym for trouble-shooting tracheostomy tube problems (Dislodged/displaced/disconnected, Obstruction, Pneumothorax, Equipment).

R. Patients may be on long-term ventilators at home for many reasons, including spinal cord injury, neuromuscular disease, and lung injury. EMS personnel must ensure that long-term ventilators are working effectively. A patient may be severely injured by improperly adjusting his or her ventilator. It is usually best to leave a ventilator connected to a patient and unchanged if it appears to be adequate.

S. Long-term vascular access devices require guidance from medical control before removal, replacement, or flushing.

T. IV fluid administration requires careful monitoring; use caution when treating patients who receive dialysis.

U. Do not manipulate orthotic devices, prosthetic limbs, or braces; this equipment should always accompany the patient to the hospital.

V. When assisting with interfacility transport, EMS personnel may encounter hemodynamic monitoring, intra-aortic balloon pumps, or intracranial pressure monitors.

W. When transporting a patient with an arterial sheath, use extreme caution because associated bleeding may be life threatening.

X. Special challenges may include cognitive, sensory, or communication impairment in patients.

Y. Developmental delay covers a spectrum of cognitive impairment, but early intervention may allow these children to recover previously missed developmental milestones. Use the same approaches used for working with young children.

Z. Autism is a developmental delay with verbal and nonverbal symptoms related to communications and the ability to purposefully shift attention. Autistic patients require a mindful approach to communication and physical contact. They may have minimal or exaggerated reaction to pain or minor physical contact.

AA. Learning sign language can help paramedics communicate with hearing-impaired patients.

BB. Giving a more detailed explanation of physical contact or intervention before it occurs may be of help to patients who are visually impaired.

CC. Speech impairment can occur for many reasons and may be unrelated to cognitive impairment.

DD. Some patients may have spastic paralysis, paraplegia, or quadriplegia. Respiratory muscle paralysis may make a patient dependent on a ventilator. Paralyzed patients are prone to pressure ulcers and will likely require total lifting assistance.

EE. If cognitively impaired patients have experienced trauma, they may not be able to give a reliable medical history. A valid surrogate decision maker must be located, and interventions may take additional time, explanation, and holding assistance.

FF. Chronic conditions that EMS providers may see include arthritis, cancer, cerebral palsy, cystic fibrosis, multiple sclerosis, muscular dystrophy, myasthenia gravis, poliomyelitis, spina bifida, systemic lupus erythematosus, and traumatic brain injury. EMS providers need to be familiar with these to be able to recognize and manage emergencies in patients with these conditions.

Post-Lecture

This section contains various student-centered end-of-chapter activities designed as enhancements to the instructor’s presentation. As time permits, these activities may be presented in class. They are also designed to be used as homework activities.

## Assessment in Action

This activity is designed to assist the student in gaining a further understanding of issues surrounding the provision of prehospital care. The activity incorporates both critical thinking and application of paramedic knowledge.

### Instructor Directions

**1.** Direct students to read the “Assessment in Action” scenario located in the Prep Kit at the end of Chapter 45.

**2.** Direct students to read and individually answer the quiz questions at the end of the scenario. Allow approximately 10 minutes for this part of the activity. Facilitate a class review and dialogue of the answers, allowing students to correct responses as may be needed. Use the quiz question answers noted below to assist in building this review. Allow approximately 10 minutes for this part of the activity.

**3.** You may wish to ask students to complete the activity on their own and turn in their answers on a separate piece of paper.

### Answers to Assessment in Action Questions

**1.** **Answer:** C. Remove the child from the ventilator, and attempt to ventilate with a bag-mask device.

 **Rationale:** By removing the ventilator and manually ventilating the patient with a bag-mask device, you are able to assess not only the patency of the tracheostomy tube but lung compliance; this will help you troubleshoot the problem. Recall the mnemonic DOPE for troubleshooting ventilation difficulties with intubated patients. It works for patients with tracheostomies too!

**2.** **Answer:** B. Below the cricoid ring

 **Rationale:** A planned surgical procedure is used to create an opening in the trachea below the cricoid ring.

**3.** **Answer:** D. The pediatric tracheostomy tubes are one piece.

 **Rationale:** Pediatric tracheostomy tubes are usually a single-cannula device unlike the adult tubes that have both an inner and an outer cannula. Most pediatric tracheostomy tubes do not have a distal cuff unless it is specifically required for the child. Similar to adult tracheostomy tubes, pediatric tubes are rigid to prevent airway obstruction due to kinking or collapse.

**4.** **Answer:** A. Attempt to ventilate the patient with a bag-mask device.

 **Rationale:** If a tracheostomy tube becomes occluded or plugged, the best course of action is to attempt ventilation by deflating the cuff on the tube (if applicable), covering the nose and mouth with a mask, and using a bag-mask device.

**5.** **Answer:** C. Hypotension

 **Rationale:** Positive-pressure ventilation works opposite of the body. With normal breathing, a negative pressure is created in the thoracic cavity as a person draws air into his or her lungs. This negative pressure helps blood return to the heart from the body. Positive-pressure ventilation forces air into the lungs compressing the vena cava, thereby decreasing blood return to the heart and lowering blood pressure.

**6.** **Answer:** A. Coughing as the ventilator delivers a breath

 **Rationale:** The high pressure alarm is a good safety feature if used properly. By alerting the health care provider to increased pressure within the circuit at any time, problems such as a pneumothorax can be prevented. Factors that can trigger the high pressure alarm include the patient coughing or biting down on the endotracheal tube, secretions in the endotracheal tube, bronchospasm, pneumothorax, and water in the circuit.

### Additional Questions

**7. Rationale:** Walking into a house and finding your patient surrounded by machines typically found in an intensive care unit can be extremely anxiety provoking! Family members will be your best resource for information regarding your patient. Children who depend on these resources have multiple health problems that can make assessing them slightly more difficult than normal. Ask the family member what has changed from the child’s baseline status. Family members are also extremely familiar with all of the equipment that is used for the care of the child. If you have any questions about an IV pump, ventilator, or feeding tube, do not hesitate to ask. Take the time to listen and incorporate their feedback into your assessment findings to help guide your treatment.

## Assignments

A. Review all materials from this lesson, and be prepared for a lesson quiz to be administered (date to be determined by instructor).

B. Read Chapter 46, *Transport Operations*, for the next class session.

## Unit Assessment Keyed for Instructors

1. Describe the importance of keeping an open mind and listening when dealing with patients with special healthcare needs or their families.

 **Answer:** Most patients and caregivers have received substantial information about their illness/disease, device, or special techniques needed for their health care conditions or impairments. Creating alliances with the patient and/or caregiver will help optimize patient care and reduce the risk of mistakes, complications, or injuries to the patient or others. Patients may be able to identify the best location for starting an IV line, provide essential information for a ventilator, or identify components/accessories necessary to move special equipment during transport. Paramedics who present with more familiarity than they actually have can reduce or undermine the trust that might have been present with the caregiver and/or patient when it is recognized. Paramedics should learn from encounters with unfamiliar conditions, technology, or situations.

 (p 2122)

2. Identify various forms of abuse and neglect including the vulnerable populations that may be affected by them.

 **Answer:** Abuse or neglect may occur in a variety of ways, and several groups of people are particularly susceptible. Infants and young children are more likely to be victims than older children, while those who are disabled or have a chronic medical condition are twice as likely compared to healthy children. Vulnerable adults include those with medical, cognitive, or emotional impairments, including those with special challenges or the dependent elderly. Physical abuse includes intentional acts that result ina physical impairment or injury. It also occurs when a caregiver places the person in a situation that creates substantial risk of harm. Neglect is four times more common than abuse and is present when caregivers fail to protect the health or well-being of a vulnerable person. Sexual abuse or exploitation can include outright sexual contact, forced prostitution, inappropriate undressing, suggestive photography, or forced watching of sexual acts or pornography. Emotional abuse may be verbal in the form of ridicule, threats, blaming, or humiliation, while nonverbal abuse occurs when the victim is ignored or isolated. Caregivers may also be prosecuted in various states for substance abuse or abandonment.

 (p 2123-2125)

3. Describe general signs and symptoms of abuse and neglect as well as the paramedic’s responsibility for assessment, documentation, and adherence to mandatory reporting laws.

 **Answer:** Paramedics, as well as other health care providers have a duty to recognize and report suspected abuse or neglect in the vulnerable populations including children and the elderly. There are a variety of behavioral and physical clues that can alert you to the potential that the patient is a victim of abuse or neglect. However, it is important to be aware that there are other physical findings that may appear to be suggestive of abuse but are benign and should be ruled out during further investigation. Any encounters with caregivers who appear to be under the influence of alcohol or other intoxicating substance, agitated, offer information that is inconsistent with physical or scene findings relevant to the patient’s condition, self-report facts that suggest abuse or neglect, or disrupt/prevent the paramedic from assessing the patient should be considered suspicious. The patient may have awide range of behaviors, symptoms, or physical signs that can suggest abuse or neglect. Some unusual behaviors in children may include inappropriate response for age to parents or physical contact, extremes in behavior, acting inappropriately mature or infantile, and suicide or self-harm attempts. Physical signs suggestive of abuse in children may include fractures; burns that are symmetric, circumferential, or without splash marks; and bruises in patterns that resemble finger marks, shoes, or other common items located in areas such as the torso, ears, proximal arms, abdomen, or buttocks. Closed head injuries that do not appear to have a realistic mechanism of injury may also be suggestive, as well as seizures with no history in an afebrile child. When documenting, ensure that all information is accurate, correctly spelled or written, and avoid inaccurate terms when an area has not been adequately assessed. Document timing and time frame. As a mandatory reporter, the paramedic must report the circumstances to the appropriate child welfare agency or adult protective services type agency for the jurisdiction of the patient if he or she has reasonable suspicion that abuse or neglect has occurred.

 (p 2125-2129)

4. Explain what is meant by comfort or palliative care and the role of the paramedic in providing care for these patients.

 **Answer:** When patients receive comfort or palliative care, the focus of care has changed from prolonging life to improving the quality of life for the remaining time the patient has left. This is typically seen in patients who have been determined to have a terminal illness but may also be seen in patients who decline aggressive medical intervention in otherwise potentially treatable conditions. Patients who have a terminal illness, defined as a disease process that is expected to cause death within 6 months as verified by a physician, often have conditions that include cancer, heart failure, pulmonary disease, liver failure, AIDS, Alzheimer disease, and amyotrophic lateral sclerosis (ALS/Lou Gehrig Disease). What is most needed by patients at a scene where death is imminent is compassion, understanding, and sensitivity as opposed to aggressive, lifesaving interventions. Some patients with terminal illness still choose to undergo curative care or aggressive treatments intended to prolong life as much as possible. Hospice programs are programs that will assist patients with a verified terminal illness and may include pain management or sedation for patient comformt. When encountering these patients, the paramedic should identify who is legally authorized to make health care decisions for the patient when the patient is not capable of making them or unable to communicate the decisions. This may be a surrogate decision maker, and there should be a document who identifies this person. Patients may also have advanced directives that will specify which medical interventions may be used or who can make the decisions on behalf of the patient. Hospice patients, as well as others, may have do-not-resuscitate (DNR) orders that are physician orders instructing other health care providers to withhold some or all resuscitation efforts in the event of cardiovascular or respiratory collapse. The paramedic should be familiar with state requirements for these types of legal orders and contact online medical control if there is any confusion regarding the documentation provided or in situations where the surrogate decision maker contradicts a written advanced directive.

 (p 2129, 2130)

5. Identify primary and secondary causes of obesity, and discuss clinical and operational concerns for treatment and/or transport of the bariatric patient.

 **Answer:** Obesity as an epidemic is worsening and creating difficulties for both EMS and other health care providers to provide optimal care for this population. Bariatrics, or the medical specialty dealing with obesity, has emerged due to the widespread and profound incidence in the adult and pediatric population. Obesity is adding annually to overall health care costs primarily due to the causing or worsening of serious medical conditions such as heart disease, cerebrovascular accident, diabetes, hypertension, asthma, and some cancers. The obese patient has a higher risk of physical injury and a variety of musculoskeletal problems, as well as an increased likelihood of premature death. Primary causes of obesity include poor dietary choices, excessive food intake, and lack of exercise. Secondary causes can include hormonal causes, inadequate sleep, low basal metabolic rate, environmental toxins, genetic predisposition, declining smoking, and a widespread dependence on air conditioning. Clinically, what would normally be routine procedures in patient care may become more complicated. Airway procedures are made difficult due to larger tongues, patient head size, and limited neck mobility. These patients have diminished respiratory reserve that decreases the window of time for performing airway procedures before hypoxia occurs. Peripheral IV access is harder to obtain, and landmarks for insertion of external jugular IV lines or performing a surgical cricothyrotomy are obscured. Normal intramuscular and introsseous needles may not have adequate length to reach muscle tissue or bone, and the medications injected may not be able to be absorbed or distributed properly. Additional chest and abdominal mass can make auscultation difficult. Operationally, EMS crews are not able to package and safely transport these patients with two persons. Equipment capacity is exceeded, necessitating the use of both specialized equipment for the obese patient as well as creative solutions for transport such as doors, tarps, or plywood. Using alternative solutions is not safe and increases liability as well of risk of injury to providers and the patient. Careful planning and understanding of the challenges in treatment and transport of the bariatric patient using the proper equipment increases the paramedic’s ability to provide the best care for these patients.

 (p 2130, 2131)

6. Describe types of medical technology found in the prehospital setting including additional skills needed by the paramedic to address these devices.

 **Answer:** As patients with complex medical needs are no longer confined to the acute health care settings, paramedics are encountering invasive, unusual, or life-sustaining therapies that were once only seen in hospitals. Caregivers for these patients may include unlicensed individuals such as family members, as well as licensed nonprofessional caregivers or licensed professionals. These caregivers are important sources of information for these patients and are often more medically knowledgeable about the patient’s needs and care guidelines. The paramedic may need to troubleshoot these devices when they malfunction or incorporate the technology into traditional prehospital care. Tracheostomy tubes are a long-term replacement for endotracheal tubes and may be in patients requiring ventilator support, frequent suctioning, or airway protection as a result of a medical condition. Loss of this airway may be due to occlusion or accidental removal, but the type of emergency it may or may not present is dependent on the reason why the patient has the tube. The paramedic should have an understanding of types of tracheostomy tubes, proper placement, components of the device, as well as how to clean, replace, or remove the device. Troubleshooting can be performed using the DOPE acronym. Patients with tracheostomy tubes often have long-term ventilator support. Ventilator performance may need to be assessed, but if the issue is unable to be identified and resolved, it is important to remove the device and proceed to provide routine airway support until the device may be safely reapplied. A life-saving bridge for patients with severe heart failure is the ventricular assist device (VAD). This device is temporarily placed in the patient’s chest during surgery and augments a failing heart’s performance. These devices produce limitations and assessment changes for the patient such as not performing cardiac compressions as well as the lack of peripheral pulses. Troubleshooting is limited to correcting battery or power supply issues, and patients should receive supportive treatment and transport to an appropriate facility for definitive intervention. There are a variety of long-term vascular access devices seen in the prehospital setting. Common to these devices is the need to maintain sterile technique when accessing, cleansing the port thoroughly, and limited use to emergency situations where no other IV access is available. In addition to the long-term vascular access devices, patients may be on medication infusion pumps, such as those providing inotropic medications for heart failure, IV nutrition, chemotherapy, pain medication, and IV antibiotics. Insulin pumps deliver insulin through small needles inserted in the subcutaneous tissue. Gastrourinary devices may include tube feedings with an infusion pump or for use with a tube feeding syringe, colostomies or other types of draining collection depending on location in the intestinal tract, urostomy or urinary catheters, and dialysis shunts or dialysis machine. Peritoneal dialysis may be performed in the patient’s home and involves the instillation and withdrawal of fluid through the peritoneal membrane. Paramedics should be aware of the types of electrolyte abnormalities seen in the dialysis patient. Patients may also be discharged home with surgical drains or devices, orthotics, or cerebrospinal fluid shunts. Paramedics should not try to manipulate these devices, but should contact medical control in the event that additional guidance is needed.

 (p 2132-2147)

7. Identify types of skills and devices not commonly used by the paramedic without additional specialized training as well as their purposes.

 **Answer:** Some paramedics may function in environments outside of routine prehospital care. In these siutations, additional skills and devices may be encountered, but paramedics should receive additional training before using these. It is useful to understand this technology if requested to assist in the interfacility transport setting. Hemodynamic monitoring that is invasive is used to evaluate the effectiveness of specific components of the cardiovascular system or to carefully guide fluid administration. It typically involves the placement of different types of catheters into areas of the cardiovascular system such as arteries, central veins, and various chambers of the heart. Heparinized or normal saline solution is used when connected to these catheters by special tubing and pressure bags. There are transducers that convert subtle changes in pressure of the fluid into electrical impulses that are interpreted by the monitor and displayed as both waveforms and numeric values. These values allow for careful titration of medications for patient response. Paramedics may see a similar setup when dealing with patients who have intracranial hemorrhage, severe head trauma, or have had neurosurgery where an intracranial pressure monitor or drain has been placed. These setups require precise positioning of the transducer or drainage system to prevent large volumes of CSF to quickly enter or leave the patient’s CNS. Some interfacility transports may involve patients who are being treated with an intra-aortic balloon pump (IABP), which is used to decrease cardiac workload and augment perfusion in patients with cardiogenic shock, structural abnormalities of the heart, myocardial infarction, or following cardiac surgery. There are specialized teams who care for these patients, but the paramedic should be familiar with the general handling and securing of the machine and tubing during transport.

 (p 2147-2150)

8. Discuss the effect of cognitive or mental/emotional impairments on treatment and transport of these patients for the paramedic.

 **Answer:** Patients who have a cognitive or mental/emotional impairment may require creative approaches for the paramedic to provide effective patient care. Unique challenges may present as the paramedic attempts to assess, treat, or provide transport for these patients. Patients and their caregivers can be valuable resources for the paramedic during treatment and transport. Developmental disabilities can include a variety of mental and/or physical impairments that result in severe chronic conditions. These impairments typically continue throughout the person’s lifetime. Developmental delays exist when an infant or child fails to reach a particularly developmental milestone by the anticipated time. This may include both gross and fine motor skills, as well as language or social skills. Developmental delays may persist and can be linked to many causes of developmental disabilities. The potential severity of these may encompass the entire spectrum. Additional time may be needed for assessment of these patients, to perform procedures, or to prepare for transport. Down syndrome is an inherited genetic disorder that may be identified by certain features of the patient’s head, face, and neck. Cognitive defects vary and may allow the patient to function relatively independently or require constant assistance. The patient with Down syndrome may also have structural heart defects, as well as other alterations or abnormalities and may have a shorter life expectancy. Mental retardation is a cognitive disorder appearing during childhood and is accompanied by a lack of adaptive behaviors such as the ability to live and function independently or interact successfully with others. Autism involves a developmental delay and demonstrates a wide variety of symptoms that can relate to communication, social interaction, sensation of discomfort, the ability to purposefully shift attention, and the ability to play. When treating and assessing the patient with autism, be mindful of your actions, communication, and physical contact. Other mental or emotional impairments can arise in healthy people in the form of mental illness. Conversion disorder was previously referred to as hysteria and may present with focal neurologic abnormalities as physical manifestations of an underlying mental illness. Experienced mental health providers are required to diagnose and treat conversion disorder.

 (p 2150-2152)

9. Describe specific challenges and considerations when assessing and treating patients with sensory impairments.

 **Answer:** Sensory impairments can present unique challenges for the paramedic when assessing, communicating with, and treating these patients. Hearing impairments may be congenital or acquired. Other causes may include various infections, tumors, ototoxicity of medications,or degenerative processes associated with aging. Some patients with hearing impairments may be able to communicate with sign language; however, many will be able to write on paper, while others may use electronic devices that assist communications with hearing-impaired patients. The patient may have hearing aids that make sounds louder but cannot restore hearing to normal. There are several types. For those patients with hearing aids that have batteries or on/off switches, troubleshooting may include making sure the device is on or changing the battery. The paramedic should also check the ear mold for wax plugs. If you are unable to to insert the hearing aid or troubleshoot the problem, place it in the box, take it with you, and document the transport and transfer to hospital personnel. Do not wet it or try to clean it. Visual impairments may also be caused by a variety of congenital or acquired conditions. Vision loss later in life may be the result of genetic predisposition. There are a variety of impairments that are common, and limitations can vary. These patients will appreciate explanations before physical contact is made, warning in advance of performing procedures, and discussing the movement or transfer of the patient before beginning. Speech impairments are divided into disorders that affect language, voice production, fluency, and articulation. It can adversely affect the ability to gain information during the assessment and treatment of the patient. Family or caregivers familiar with the patient’s unusual speech pattern can be important when specific information is needed from the patient. Patients who have some form of paralysis can present unique challenges for assessment and ability to move. These patients are also predisposed to complications with respiratory muscles, skin integrity, and body functions. Paramedics should be familiar with these complications and any common assist devices used by the patient. Additional lifing assistance may be needed to manage these patients.

 (p 2153-2156)

10. Discuss the impact of chronic conditions encountered in patients during EMS response and interfacility transport.

 **Answer:** Patients often present with conditions that are complicated by other medical conditions. Arthritis may be the result of degenerative changes due to excessive use of a particular limb or joint, infection, autoimmune process, or the site of previous fractures. During transport, it may be necessary to consider long-term medications and potential interactions to medications used in the prehospital setting, stabilize limbs or joints into the most comfortable position possible, or administer analgesics. Cancer patients may have additional medical needs as a result of dehydration issues, pain control, vascular access limitations, the need for antiemetics, medication interactions with transdermal medication patches, as well as resuscitation decisions. Other chronic conditions that may require careful movement and positioning of the patient include cerebral palsy, cystic fibrosis, multiple sclerosis, muscular dystrophy, myasthenia gravis, myelomeningocele (spina bifida), poliomyelitis, traumatic brain injury, and systemic lupus erythematosus. Many of these conditions also have the potential to present with challenges to airway maintenance or protection, pain control, seizures, and infections. Those conditions with associated neurologic conditions may also present challenges related to comprehension of assessment and treatment or the patients may become combative.

 (p 2157-2162)

## Unit Assessment

1. Describe the importance of keeping an open mind and listening when dealing with patients with special health care needs or their families.

2. Identify various forms of abuse and neglect including the vulnerable populations that may be affected by them.

3. Describe general signs and symptoms of abuse and neglect as well as the paramedic’s responsibility for assessment, documentation, and adherence to mandatory reporting laws.

4. Explain what is meant by comfort or palliative care and the role of the paramedic in providing care for these patients.

5. Identify primary and secondary causes of obesity, and discuss clinical and operational concerns for treatment and/or transport of the bariatric patient.

6. Describe types of medical technology found in the prehospital setting including additional skills needed by the paramedic to address these devices.

7. Identify types of skills and devices not commonly used by the paramedic without additional specialized training as well as their purposes.

8. Discuss the effect of cognitive or mental/emotional impairments on treatment and transport of these patients for the paramedic.

9. Describe specific challenges and considerations when assessing and treating patients with sensory impairments.

10. Discuss the effect of chronic conditions encountered in patients during EMS response and interfacility transport.