Special Healthcare Needs

Pea Ridge Fire Department EMS refresher

Introduction

- Patients may have a wide variety of special challenges.
  - May be necessary to modify:
    - Communications
    - Assessments
    - Treatment
    - Transport

Introduction

- Many life-sustaining therapies are handled by families and patients.
- EMS is often the last resort.

Table 45-1 Home Care Patients in the United States, 2013 and 2014

Age	Average Percentage of Long-Term Care Services Users
Under 65	16%
65–74	18%
75–84	29%
85 and over	37%

Data from: Harris-Kojetin L, Sengupta M, Park-Lee E, et al. Long-term care providers and services users in the United States: data from the national study of long-term care providers, 2013–2014. National Center for Health Statistics. *Vital Health Stat.* 2016;3(38):36-37. https://www.cdc.gov/nchs/data/series/sr_03/sr03_038.pdf. Accessed May 4, 2017.

General Strategies for Patients With Special Challenges

- Patients and caregivers are often experts in their condition or impairment.
  - Enlist patient expertise.
- Invaluable resources include:
  - Online medical control
  - Electronic medical reference materials
  - Coworkers' experience

EMS, Health Care, and Poverty

- EMS providers and EDs often deal with economic and health care crises.
  - Nearly 43.1 million people in poverty in the United States in 2015
- Poverty and lack of health insurance affect a person's health habits.

EMS, Health Care, and Poverty

- Homeless people are prone to:
  - Numerous chronic medical conditions
  - Mental illness
  - Substance abuse
- Medical care is difficult because of:
  - Environmental exposure
  - Crime/violence
  - Malnutrition
  - Lack of hygiene

EMS, Health Care, and Poverty

- EMS and ED assistance may be sought if:
  - A chronic medical condition becomes severe
  - There are no other health care options
- In some cases, patients do not need transport.
  - Never refuse to transport if requested.

EMS, Health Care, and Poverty

- Health care services are provided through a variety of community-based facilities.
- Hospitals are frequently able to provide:
  - Financial assistance
  - Payment plans
  - Low-cost health care services
  - Help enrolling in insurance programs

Care of Patients When Abuse or Neglect Is Suspected

- Care for victims of abuse and neglect is often difficult.
- Groups particularly susceptible include:
  - Children
  - Dependent older adults
  - Impaired adults

Epidemiology of Abuse and Neglect

- Infants and young children are more likely to be victims of abuse or neglect.
- Abuse and neglect occur with varied frequency across race and socioeconomic status.
- Determination can be difficult.

Definitions of Abuse and Neglect

- Physical abuse
  - Intentional act that results in physical impairment or injury
- Neglect
  - Caregivers fail to provide protection so that health and well-being are affected.
  - Signs are often subtle and require awareness on the part of EMS personnel.

Definitions of Abuse and Neglect

- Sexual abuse and sexual exploitation
  - Includes:
    - Sexual contact
    - Forced prostitution
    - Inappropriate undressing
    - Suggestive photography
    - Forcing the victim to watch sexual acts or pornography

Definitions of Abuse and Neglect

- Emotional abuse
  - Causes substantial change in the victim's:
    - Behavior
    - Emotional response
    - Cognitive function
  - May be verbal or nonverbal

Definitions of Abuse and Neglect

- Caregiver substance abuse
  - Includes:
    - Fetus harmed by a pregnant woman
    - Providing alcohol or drugs to a child
    - Manufacturing or selling drugs in the presence of a child
    - Becoming impaired while caring for a child
    - Driving while intoxicated with a child in the car
    - Allowing a child to become a designated driver

Definitions of Abuse and Neglect

- Abandonment
  - A child or vulnerable adult suffers harm because the caregiver fails to maintain adequate contact.

Recognizing Abuse or Neglect

- A variety of behavioral cues and findings should prompt suspicion.
  - The caregiver is intoxicated.
  - The caregiver tries to interfere with the physical examination of a child or vulnerable adult.

Recognizing Abuse or Neglect

- Do not confront a suspected perpetrator.
- The caregiver's story may not match the patient's:
  - Age
  - Capability
  - Medical condition

Recognizing Abuse or Neglect

- Physical signs:
  - Bruises
  - Closed head injury
  - Burns and ligature marks
  - Bruise patterns
  - Seizure activity without prior history in an afebrile child

Benign Physical Findings

- Some physical findings mimic signs of physical abuse.
  - Bruises as psychomotor skills develop
- Mongolian spots resemble bruises.
  - Lesions present at birth on many Asian and African American infants

Benign Physical Findings

- Some healing practices cause marks that look like abuse.
  - Coining
  - Cupping

Benign Physical Findings

- Physical findings suggestive of sexual abuse may actually be caused by:
  - Poor hygiene
  - Masturbation
  - Skin irritation from cleaning products
  - Poorly fitting undergarments
  - Various infections

Management of Suspected Abuse or Neglect

- Emotions may undermine patient care and worsen the situation for the patient.
- Focus on priorities during the assessment process.
  - First priority: Safety of emergency responders
  - Second priority: Provide optimal clinical care

Management of Suspected Abuse or Neglect

- Documentation
  - Patient care reports/other documentation will be reviewed by:
    - Law enforcement officers
    - Social service agencies
    - Court officials

Management of Suspected Abuse or Neglect

- Document:
  - Physical findings
  - Whether assessment of particular body areas was accomplished or deferred
  - Timing or time frame of the injury or event

Management of Suspected Abuse or Neglect

- Mandatory reporting and legal involvement
  - Health professionals are obligated to report suspected child abuse and neglect.
  - Reports are made to the state or government social services agency of a particular jurisdiction.
- Law enforcement frequently becomes involved.

Care of Patients With Terminal Illness

- Terminal illness is a disease process expected to cause death within 6 months.
- Many patients will forgo invasive and marginally effective medical treatment.

Care of Patients With Terminal Illness

- Patients may transition from curative care to palliative care.
  - The focus changes to improving the quality of time left.
  - Medical care continues, but aggressive interventions cease.

Care of Patients With Terminal Illness

- The patient and caregiver often know the best way to manage sudden discomfort.
  - Assess for pain using techniques based on the patient's:
    - Age
    - Ability to communicate
    - Cognitive function

Care of Patients With Terminal Illness

- Assessment should include:
  - Level of consciousness
  - Vital signs
  - Medical history
  - Pain medication history
- Follow standing protocols for medications.

Care of Patients With Terminal Illness

- May enter hospice programs near end of life
  - Provide social and emotional support.
  - Treat discomfort.
  - Help the patient and family cope with impending death.

Advance Directives

- Signed by the patient or surrogate decision maker
- Instruct health care providers on medical decisions for when the patient is incapacitated
- Can be revoked if the patient has decision-making capacity

Advance Directives

- Do not resuscitate orders
  - Physician orders to withhold resuscitation efforts in case of respiratory or cardiovascular collapse
  - May be generic or specifically discuss what methods are indicated or withheld

Care of Bariatric Patients

- More than one-third of American adults are obese.
  - Obese: BMI greater than 30 kg/m^2
  - Morbidly obese: BMI between 40 and 49.9 kg/m^2
  - Extremely obese: BMI above 50 kg/m^2

Care of Bariatric Patients

- Causes of obesity:
  - Lifestyle
  - Genetics
  - Metabolism
  - Environmental causes
- Prone to:
  - Physical injury
  - Musculoskeletal problems

Clinical Concerns for the Bariatric Patient

- Airway procedures are more difficult.
  - Bag-mask ventilation may be ineffective with patients in the supine position.
  - Diminished respiratory reserve decreases the window to perform airway procedures.
- Ramped positioning has a positive impact.

Data from: Miller RD, Cohen NH, Erikkson LI, et al. Chapter 55: Airway management in the adult. In: *Miller's Anesthesia*. 8th ed.Philadelphia, PA: Elsevier; 2015:1666.

Clinical Concerns for the Bariatric Patient

- Peripheral IV access is often problematic.
  - Large neck mass may obscure landmarks.
  - Conventional IM needles may not be able to reach IM space.
  - Absorption and distribution may be altered.

Operational Concerns for the Bariatric Patient

- Often too heavy for two-person EMS crews to transport
  - Additional lifting assistance may be necessary.
  - Small rooms and narrow staircases may limit using additional lifting personnel.
  - Weight may exceed the equipment's carrying capacity.

Care of Patients With Communicable Diseases

- Communicable diseases are infectious diseases that can be passed from one person to another
- Safety precautions should be followed.
- Respect and privacy are essential.
- Assumptions based on stereotypes may undermine care.

Medical Technology in the Prehospital Setting

- Many invasive, unusual, or life-sustaining therapies are used in homes and long-term care facilities.
- Family members may be a paramedic's best source for information and care guidelines.

Tracheostomy Tubes

- Long-term replacement for ET tubes, used for:
  - Long-term ventilatory support
  - Frequent tracheal suctioning
  - Airway protection

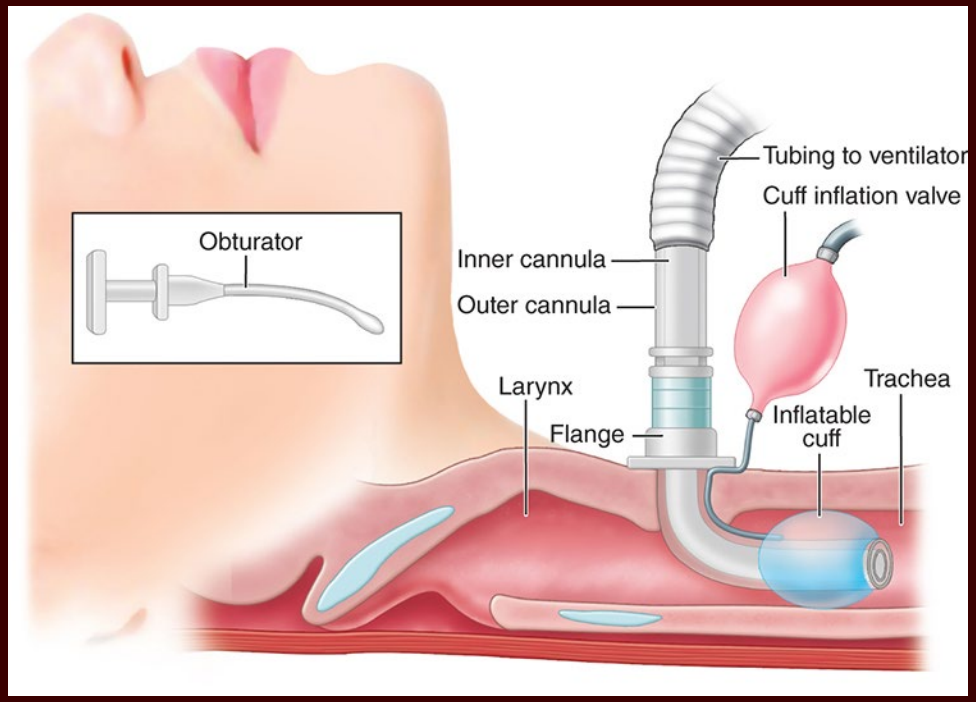
Portex® Blue Line® Ultra Tracheostomy courtesy of Smiths Medical.

Tracheostomy Tubes

- Unexpected loss of the tube may or may not create an emergency.
- Tubes can be placed emergently by health care providers in cases of profound upper airway obstruction.

Tracheostomy Tubes

- Passes directly from opening in anterior neck into trachea
- Consist of:
  - Outer cannula
  - Inner cannula
  - Obturator



Tracheostomy Tubes

- May be fenestrated
  - Used for patients:
    - Being evaluated for tube removal
    - Requiring intermittent ventilator support

Tracheostomy Tubes

- Follow DOPE acronym for troubleshooting:
  - Dislodged/displaced/disconnected
  - Obstruction
  - Pneumothorax
  - Equipment

Long-Term Ventilators

- May be used for:
  - Spinal cord injury
  - Neuromuscular disease
  - Lung injury

Long-Term Ventilators

- The primary assessment includes determining if the ventilator is working effectively.
- CPAP and BiPAP devices offer noninvasive options for oxygenation and ventilation support.

Long-Term Ventilators

- Diaphragm and phrenic nerve stimulators allow some patients to breathe without ventilator assistance.
  - If devices fail, use conventional bag-mask technique.

Ventricular Assist Devices

- Provide a life-saving bridge for patients with severe heart failure
- Few interventions available for EMS:
  - Correcting problems with battery or power
  - Supportive treatment
  - Immediate transport

Apnea Monitors

- Apnea monitors are used for:
  - Infants with high risk of SIDS or apnea
  - Diagnosis and evaluation of sleep apnea
- Monitors vary depending on purpose.

Long-Term Vascular Access Devices

- Placed for a number of reasons.
- Many are maintained with heparin.

Long-Term Vascular Access Devices

- Common devices include:
  - Peripherally inserted central catheters
  - Midline catheters
  - Double or triple lumen central catheters
  - Hickman, Broviac, and Groshong catheters
  - Implanted ports
  - Dialysis catheters

Medication Infusion Pumps

- Problems may occur with long-term vascular access devices.
  - Devices have a limited life span.
  - Mechanical failure or accidental removal may occur.

Tube Feeding

- Allows nourishment and water to enter the digestive system directly
- Tube types that go into the stomach:
  - Nasogastric
  - Orogastric

Tube Feeding

- Other tubes:
  - Nasoduodenal
  - Nasojejunal
  - Gastrostomy
  - Jejunostomy
  - Percutaneous endoscopic gastrostomy
  - Percutaneous endoscopic jejunostomy

Tube Feeding

- EMS personnel do not often need to troubleshoot or manipulate feeding tubes.
  - May need to monitor during interfacility transport
  - If complications develop:
    - Stop feeding.
    - Flush catheter with tap water.

Colostomy

- Surgery directing large intestine through a stoma
  - Colostomy bag collects stool and intestinal liquid for disposal.

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Urostomy/Urinary Diversion

- Required for certain medical conditions.
  - Bladder cancer
  - Congenital anomalies
  - Massive urinary tract obstructions

Urinary Catheterization

- Used when patients cannot urinate on their own
  - May remain in place (indwelling catheters)
  - May be used intermittently (straight catheters)

Dialysis

- Replacement for failed or failing kidneys
  - As kidney function declines, substances accumulate in the body.
  - If untreated, these substances may cause death.

Dialysis

- Hemodialysis and peritoneal dialysis may be performed in a hospital, free-standing dialysis clinics, or at home.

Dialysis

- Complications of dialysis include:
  - Massive fluid and electrolyte abnormalities
  - Hypovolemia and fluid overload
  - Infection
- Complications of fistulas include:
  - Life-threatening hemorrhage
  - Thrombosis
  - Stenosis

Dialysis

- If responding to a dialysis center:
  - Determine if treatment has already been received or is still in progress.
  - Coordinate with staff to remove the patient from the machine if treatment is still in progress.

Surgical Drains and Devices

- A variety of drains and devices are used after surgery.
  - Prevent fluid from collecting at the surgical site

Surgical Drains and Devices

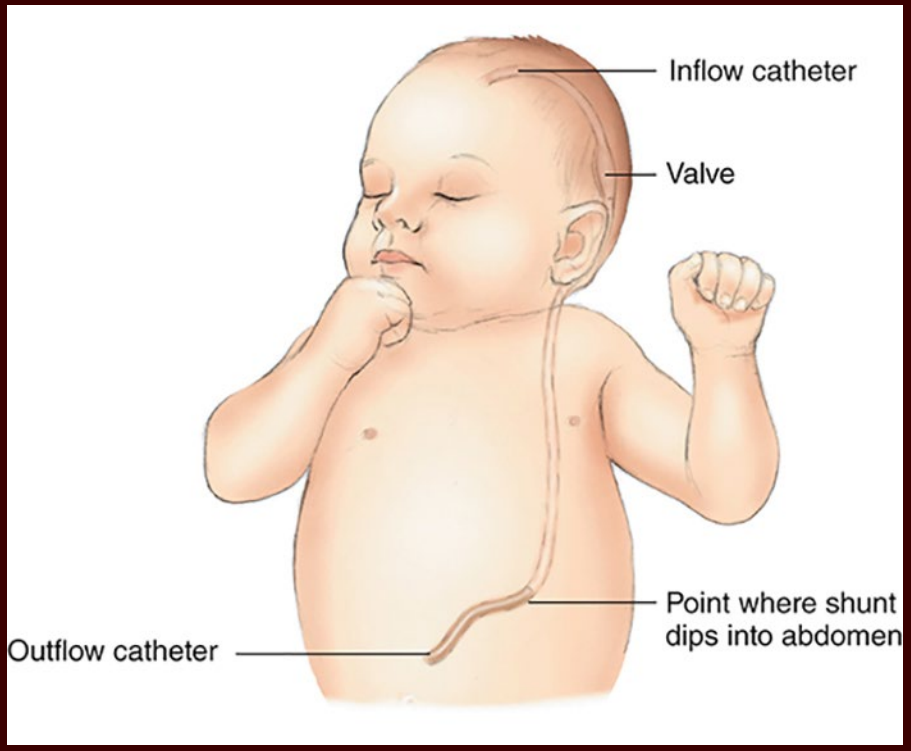
- Outside of EMS scope of practice to manipulate most of these devices and drains
  - Can cause significant complications, including:
    - Hemorrhage
    - Infection
    - Need for more surgery

Cerebrospinal Fluid Shunts

- Hydrocephalus: excess volume of CSF around the brain
- Leads to:
  - Headaches
  - Visual disturbances
  - Unsteady gait
  - Nausea, vomiting
  - Seizures
  - Altered mental status

Cerebrospinal Fluid Shunts

- Drains excess CSF.
- Shunt consists of:
  - Inflow catheter
  - Valve
  - Outflow catheter



Cerebrospinal Fluid Shunts

- Increased ICP suggests:
  - Infection
  - Shunt valve malfunction
  - Catheter damage
- Suspect shunt malfunction if:
  - Headache
  - Visual disturbances
  - Seizures

Hemodynamic Monitoring

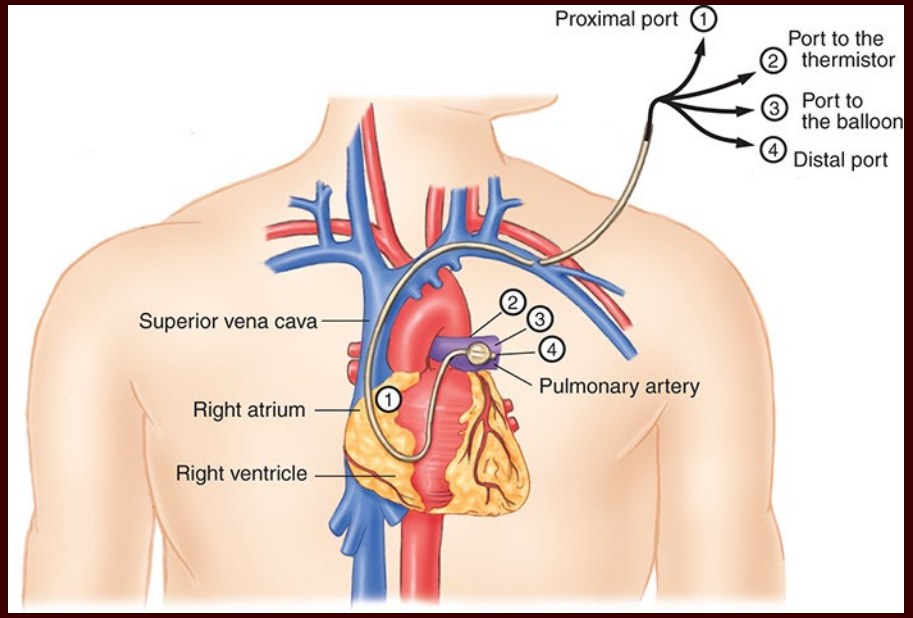
- Cursory hemodynamic monitoring assesses:
  - Patient blood pressure
  - Pulse rate
  - Urinary output over time
  - End-tidal CO_2
  - Mental status

Hemodynamic Monitoring

- Needed for:
  - Evaluating cardiovascular effectiveness
  - Carefully guiding fluid administration
- Includes values such as:
  - Continuous arterial blood pressure
  - Central venous or arterial pressure
  - Systemic vascular and pulmonary vascular resistance

Hemodynamic Monitoring

- Monitoring involves placement of catheters into the cardiovascular system.
- The catheter is connected to special tubing filled with normal saline or heparinized solution.



Hemodynamic Monitoring

- Invasive monitoring will:
  - Identify impending heart failure.
  - Guide fluid resuscitation.
  - Demonstrate CPR effectiveness.
  - Differentiate various shock states.
  - Provide information in high-risk patients.

Hemodynamic Monitoring

- Arterial pressure monitoring
  - Monitors blood pressure
  - Provides access for frequent blood tests for:
    - Sepsis
    - Respiratory failure
    - Diabetic ketoacidosis
    - Salicylate overdose

Hemodynamic Monitoring

- Larger arterial sheaths may have been placed for cardiac catheterization.
  - Patients should remain supine during placement and for a time after placement.
  - Bleeding from a displaced catheter or sheath can be immediately life threatening.

Intra-aortic Balloon Pumps (IABPs)

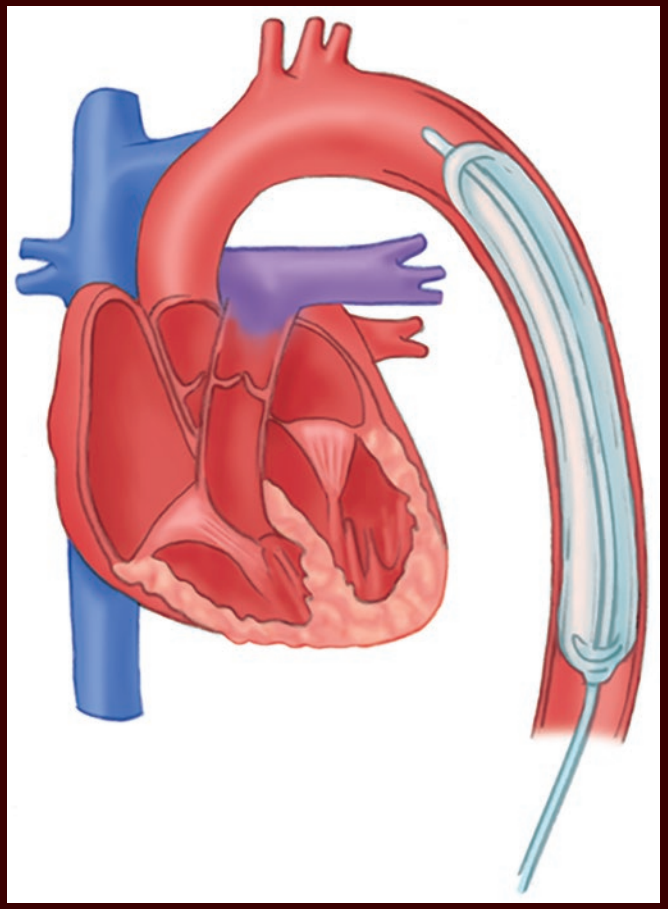
- Used to decrease cardiac workload and augment perfusion in patients with:
  - Cardiogenic shock
  - Structural abnormalities of the heart
  - Myocardial infarction
  - Cardiac surgery

Intra-aortic Balloon Pumps (IABPs)

- IABPs consist of:
  - Large machine
  - Connecting tubing
  - Monitor cables
  - Balloon catheter
- Movement requires careful planning and coordination.

Intra-aortic Balloon Pumps (IABPs)

- Balloon is inflated and deflated at precise times.
  - Decreases myocardial oxygen demand
  - Reduces cardiac workload
  - Improves systemic circulation



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Intracranial Pressure Monitor

- ICP monitor or drain placed in patients with:
  - Intracranial hemorrhage
  - Severe head trauma
  - Recent neurosurgery
- Devices allow:
  - ICP monitoring
  - Evaluation of CSF appearance
  - CSF drainage to maintain lower ICP

Doppler Devices

- Use ultrasound waves to detect heartbeats and blood flow where palpation and auscultation are not effective.
- Waves are converted into sounds that allow confirmation of underlying movement.
- Move the probe slowly until you detect the underlying flow or movement.

Developmental Disability

- Diverse group of severe chronic conditions due to mental or physical impairments
- Adversely impacts:
  - Communication
  - Movement
  - Learning
  - Behavior
  - Ability to care for oneself
  - Employment prospects

Developmental Delay

- Failure to reach a developmental milestone
  - Gross and fine motor skills
  - Cognitive skills
  - Social skills
  - Language milestones

Developmental Delay

- The problem may be in one or multiple areas.
- Early intervention may allow children recovery of previously missed milestones.
- Cues from the patient and caregiver help determine the best way to interact.

Down Syndrome

- Inherited genetic disorder causing:
  - Developmental delay
  - Cognitive impairment
  - Pattern of unusual physical features

Down Syndrome

- Known as trisomy 21
  - Extra chromosome attached to 21st pair of chromosomes
- Risks include:
  - Sibling or mother with Down syndrome
  - Older maternal age at time of conception

Down Syndrome

- Chromosomal changes may cause:
  - Structural heart defects
  - Seizures
  - Gastrointestinal problems
  - Speech alterations
  - Hearing loss
  - Other abnormalities

Intellectual Disability

- Cognitive disorder with a lack of adaptive behaviors including:
  - Ability to live and function independently
  - Interacting successfully with others
- IQ of 65 to 75

Autism and Autism Spectrum Disorders

- Condition involving developmental delay
- A wide variety of symptoms relating to:
  - Communication
  - Social interaction
  - Sensation of discomfort
  - Ability to purposefully shift attention
  - Ability to play

Autism and Autism Spectrum Disorders

- Cognitive function varies significantly.
- When treating patients, be extremely careful while attempting to communicate or initiating physical contact.
  - Helpful to include caregivers

Mental/Emotional Impairment

- Patients with conversion disorder may present with focal neurologic abnormalities.
  - Beyond the scope of EMS personnel
  - If disorder is suspected:
    - Maintain professional demeanor.
    - Continue to assess for other causes.

Hearing Impairment

- Congenital
  - Genetic factors
  - Maternal infection
  - Rh incompatibility
  - Hypoxia
  - Maternal diabetes
  - Pregnancy-induced hypertension
- Acquired
  - Excessive exposure to loud noise
  - Various infections
  - Tumors
  - Ototoxicity
  - Diseases
  - Aging

Hearing Impairment

- Types of hearing loss:
  - Conductive hearing loss
  - Sensorineural hearing loss
  - Central auditory processing disorder
  - Auditory neuropathy (auditory dyssynchrony)

Hearing Impairment

- Hearing aids
  - Types:
    - Behind the ear
    - Conventional
    - Partly in the canal and completely in the canal
    - In the ear
    - Implantable

Hearing Impairment

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Hearing Impairment

- Hearing aids (cont'd)
  - To insert:
    - Follow the natural shape of the ear.
    - It needs to fit snugly without being forced.
  - If there is a whistling sound:
    - Reposition the hearing aid.
    - Remove it and turn the volume down.

Hearing Impairment

- Hearing aids (cont'd)
  - Troubleshooting:
    - Make sure it is turned on.
    - Try a fresh battery; check that the tubing is not bent.
    - Check to make sure it is set on M.
    - If a body aid, try a spare cord.
    - Check that it is not plugged with wax.

Visual Impairment

- Congenital causes:
  - Fetal exposure to cytomegalovirus
  - Hypoxia in delivery
  - Albinism
  - Hydrocephalus
  - Retinopathy of prematurity
- Acquired causes:
  - Trauma
  - Degeneration
  - Glaucoma
  - Cataracts
  - Hypertension
  - Diabetic retinopathy
  - Vitamin A deficiency

Visual Impairment

- Explain before physically contacting patients with profound visual impairments.
- Discuss with the patient any needed movement or transport before doing so.

Speech Impairment

- Impaired speech may be associated with:
  - Neurologic injury
  - Toxicologic exposure
  - Anatomic abnormalities of the face or neck
  - Numerous other conditions

Speech Impairment

- Divided into disorders impacting:
  - Articulation
  - Voice production
  - Fluency
  - Language

Speech Impairment

- Other speech disorders:
  - Language-based learning disability
  - Phonologic process disorders
  - Semantic-pragmatic disorder of speech
  - Dysarthria
  - Apraxia

Paralysis, Paraplegia, and Quadriplegia

- Paralysis: inability to move
- Caused by many medical conditions:
  - Head trauma
  - Cerebrovascular accident
  - Spinal cord injury
  - Malignancy
  - Other neuromuscular diseases

Paralysis, Paraplegia, and Quadriplegia

- Types:
  - Paraplegia: affects lower extremities
  - Quadriplegia: affects upper and lower extremities
- Often accompanied by sensory deficits and loss of bowel or bladder control

Paralysis, Paraplegia, and Quadriplegia

- Can have serious complications:
  - Respiratory muscle paralysis
  - Pressure ulcers
  - Autonomic dysreflexia

Paralysis, Paraplegia, and Quadriplegia

- External devices are often used to stabilize spinal structures.
  - Require additional consideration in patient movement

Paralysis, Paraplegia, and Quadriplegia

- Particularly susceptible to environmental extremes
- Patients may require:
  - Urinary catheterization
  - Total lifting assistance

Trauma in Cognitively Impaired Patients

- Isolated sensory or communication impairments can cause:
  - Additional anxiety
  - Confusion
  - Delays
  - Disruption of patient care or transport

Trauma in Cognitively Impaired Patients

- Effective communication may be almost impossible.
  - If a caregiver is not available, rely on physical or behavioral cues of the patient.

Trauma in Cognitively Impaired Patients

- Medical treatment consent may be uncertain.
  - May need to:
    - Locate a valid surrogate decision maker
    - Initiate treatment under the doctrine of implied consent

Trauma in Cognitively Impaired Patients

- Patient assessment techniques may need modification.
- Caregivers can be a valuable resource.
- Consider allowing the caregiver to stay during the physical exam.

Trauma in Cognitively Impaired Patients

- Interventions may require additional time, explanation, and assistance.
- Management is generally the same.
- Check for signs of abuse and neglect.

Cancer

- Results from excessive growth and division of abnormal cells
- Typically treated by:
  - Radiation
  - Chemotherapy
  - Surgical removal

Cancer

- Chemotherapy medications may cause:
  - Nausea and vomiting
  - Anorexia
  - Discomfort
  - Immune system compromise

Cancer

- Patients often have implanted ports or other long-term vascular access devices.
- You may need to:
  - Correct dehydration issues.
  - Administer pain or antiemetic medications.
- Ask about wishes regarding resuscitation.

Cerebral Palsy

- Nonprogressive neurologic disorder from brain injury that may occur during:
  - Fetal development
  - Labor and delivery
  - First 2 years of life

Cerebral Palsy

- Can be caused by:
  - Genetic defects
  - Maternal infections
  - Fetal cerebrovascular accident
  - Excessive fetal bilirubin or hemolysis
  - Hypoxia before or during birth
  - Infant infection
  - Head trauma

Cerebral Palsy

- Cerebral palsy produces altered skeletal muscle function or contractions.
- Those severely affected may present with:
  - Seizure disorders
  - Hearing loss
  - A variety of neurologic disorders

Cerebral Palsy

- May affect certain body regions or overall body
  - Hemiplegia
  - Paraplegia
  - Spastic tetraplegia

Cerebral Palsy

- Movement disorders include:
  - Tremors
  - Unsteady gait
  - Athetosis
- Severe cases may present with:
  - Seizures
  - Loss of bladder control
  - Inability to swallow
  - Joint contractures
  - Impaired respiratory function

Congenital Heart Disease in Adults

- Abnormalities of the heart or great blood vessels that develop before birth.
- Significant physiologic stressors may complicate stable CHD.
- Consider undiagnosed CHD with heart murmur accompanied by signs and symptoms of heart failure.

Cystic Fibrosis

- Genetic disorder characterized by increased mucus productions
  - A defective recessive gene makes it difficult for chloride to move through the cells.
    - Causes unusually high sodium loss

Cystic Fibrosis

- May also affect:
  - Sweat glands
  - Reproductive glands
  - Respiration
  - Food digestion
- Suspected in newborns with:
  - Meconium
  - Odd-smelling or odd-appearing stool

Cystic Fibrosis

- Gastrointestinal symptoms:
  - Nausea
  - Anorexia
  - Constipation
  - Pancreatitis
  - Bowel obstruction
  - Ileus
- Pulmonary symptoms:
  - Pneumonia
  - Pneumothorax
  - Cough
  - Respiratory distress or failure

Cystic Fibrosis

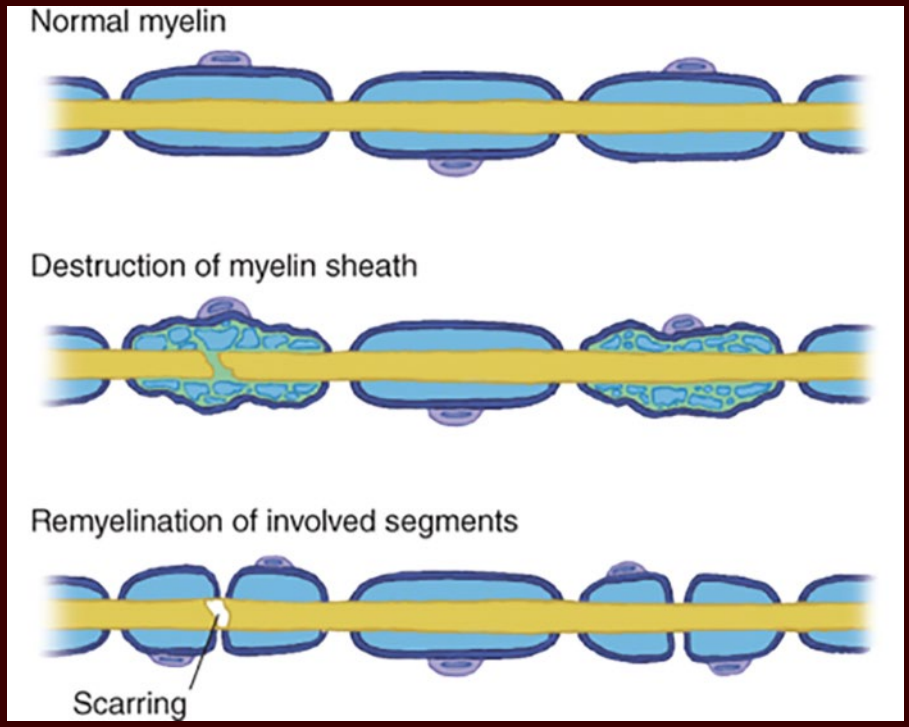
- Other symptoms:
  - Malnutrition
  - Poor growth rate
  - Failure to thrive
  - Infertility
  - Chronic sinus congestion
  - Bone mineral loss

Cystic Fibrosis

- Patients may have a long, complex medical history and many clinical abnormalities.
- Expect to:
  - Administer oxygen.
  - Provide frequent deep suctioning.
  - Assist ventilation.

Multiple Sclerosis

- A severe, incurable degenerative disorder involving the nervous system.
- Immune cells attack myelin sheath, preventing nerve transmission.



Multiple Sclerosis

- Cause is unclear but seems to be connected to:
  - Genetic factors
  - Environmental factors
  - Nutrition
  - Exposure to a particular virus
- Presentation includes problems related to:
  - Muscle coordination
  - Muscle tone
  - Altered sensation
  - Gait disturbances

Multiple Sclerosis

- Neurological signs and symptoms include:
  - Musculoskeletal problems
  - Constipation, bladder incontinence
  - Altered sensations
  - Cognitive impairment
  - Disruption of speech or swallowing
  - Visual impairment

Multiple Sclerosis

- There is no specific EMS treatment.
- Supportive measures include:
  - IV hydration
  - Analgesic or muscle-relaxing medications
  - Careful positioning
  - Assisted ventilation

Muscular Dystrophy

- Incurable genetic diseases causing slow, progressive degeneration of muscle fibers.
- Specific diseases can be diagnosed by:
  - Genetic markers
  - Age at onset
  - Rate of progression
  - Gender of patient

Muscular Dystrophy

- Children may present with:
  - Obvious facial muscle changes
  - Altered gait
  - Delayed psychomotor developmental milestones
  - Changes in posture

Muscular Dystrophy

- Duchenne muscular dystrophy
  - Caused by sex-lined recessive gene
  - Characterized by:
    - Enlarged heart muscle
    - Heart dysrhythmias
    - Scoliosis of the spine
    - Gait disturbances

Muscular Dystrophy

- EMS treatment is primarily limited to:
  - Careful positioning
  - Supportive treatment
  - Assisted ventilation

Myasthenia Gravis

- Rare autoimmune disorder affecting neuromuscular transmission
  - Ocular: localized to eyelids and extraocular muscles
  - Generalized: affecting respiratory and skeletal muscles

Myasthenia Gravis

- Patients often have difficulty:
  - Speaking
  - Chewing
  - Swallowing
- Myasthenic crisis: respiratory failure from respiratory fatigue

Myasthenia Gravis

- Signs and symptoms include:
  - Drooping eyelids
  - Double vision
  - Difficulty speaking, chewing, or swallowing
  - Muscle weakness in the extremities

Myelomeningocele (Spina Bifida)

- Birth defect caused by improper development of fetal neural tube
- Causes exposure of the spinal cord and meninges

Myelomeningocele (Spina Bifida)

- May be accompanied by:
  - Negative impact on bowel and urinary elimination
  - Scoliosis
  - Other orthopedic disorders
- Surgical treatment usually occurs within 2 days of birth.

Myelomeningocele (Spina Bifida)

- Two scenarios for EMS provider care:
  - Prehospital delivery of the fetus
  - Encountering infants, children, and adults who have received surgical correction but present with issues related to or unrelated to the disorder

Myelomeningocele (Spina Bifida)

- Clinical manifestations include:
  - Bladder dysfunction
  - Scoliosis
  - Neurologic conditions
  - Complete or partial leg paralysis
  - Abnormalities of various bones or joints

Poliomyelitis/Postpolio Syndrome

- Poliomyelitis is a viral infection with significant morbidity and mortality.
- Aggressive vaccination campaigns have eradicated the virus in many countries.
- Humans are the only known hosts.

Poliomyelitis/Postpolio Syndrome

- Initially presents with:
  - Headache
  - Sore throat
  - Fever
  - Malaise
  - Vomiting
- Progresses to:
  - Back pain
  - Diarrhea
  - Leg pain
  - Continued fever
  - Muscle discomfort/ stiffness

Poliomyelitis/Postpolio Syndrome

- Nonparalytic: Recovery is complete.
- Paralytic: Muscle weakness evolves to:
  - Paralysis of various muscles
  - Muscle spasm
  - Respiratory distress
  - Drooling, difficulty swallowing

Poliomyelitis/Postpolio Syndrome

- Complications include:
  - Hypertension
  - Respiratory failure
  - Myocarditis
  - Shock
  - Loss of intestinal function
  - Death

Poliomyelitis/Postpolio Syndrome

- Survivors are at risk for postpolio syndrome:
  - Worsening of muscle weakness
  - Muscle atrophy
  - Renewed risk of respiratory insufficiency/failure
  - Difficulty swallowing, impaired speech
  - Significant pain or fatigue

Poliomyelitis/Postpolio Syndrome

- Long-term prognosis is favorable for:
  - Subclinical polio
  - Polio that did not involve the brain or spinal cord
- Treatment is primarily supportive.
  - Assisted ventilation and oxygenation for actual or impending respiratory failure

Thank you !

Please continue to the next section