Special Patient Populations

**EMR**
Recognizes and manages life threats based on simple assessment findings for a patient with special needs while awaiting additional emergency response.

**EMT**
Applies a fundamental knowledge of growth, development, and aging and assessment findings to provide basic emergency care and transportation for a patient with special needs.

**AEMT**
Applies a fundamental knowledge of growth, development, and aging and assessment findings to provide basic and selected advanced emergency care and transportation for a patient with special needs.

**Paramedic**
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.

Obstetrics

**EMR**
Simple depth, simple breadth
Recognition and management of
- Normal delivery
- Vaginal bleeding in the pregnant patient

- Anatomy and Physiology of organs related to delivery
  - Uterus/Womb
  - Baby/Fetus
  - Placenta/Afterbirth
  - Amniotic Sac/Bag of Water
  - Vagina/Birth Canal

- Vaginal Bleeding in the Pregnant Patient
  - Light Irregular Discharges of Small Amount of Blood “Spotting” May Be Normal
  - More Bleeding May Indicate a Problem That Needs Physician’s Attention
  - Mucus With Small Amount of Blood Late in Pregnancy May Mean Delivery Is Near
  - Any Other Bleeding Late in Pregnancy Is a Serious Emergency

- General Assessment
  - ABCs
  - Vital signs initially and repeated periodically
  - SAMPLE history and obstetric history

- General Management
  - Standard precautions
  - Place patient on left side
• Ensure the patient places a sanitary pad over the vaginal opening
• Provide shock care
• Monitor airway and administer oxygen
• Save blood soaked pads in a plastic bag for examination at the hospital
• Offer support for the patient while awaiting EMT response

• General Assessment and Management of the Obstetrical Patient
  o Signs of Labor
    ▪ Braxton Hicks/false labor contractions
    ▪ Bloody show
    ▪ Ruptured membranes
    ▪ Contractions regular and at closer intervals
  o Stages of Labor and Delivery
    ▪ First stage: onset of contractions until fetus enters the birth canal
    ▪ Second stage: fetus enters the birth canal until birth
    ▪ Third stage: placenta delivery
  o Assessment During Labor and Delivery
    ▪ Airway, breathing, circulation
    ▪ SAMPLE and obstetric history
    ▪ When is the baby due?
    ▪ First or later pregnancy
    ▪ Known complications (multiple births, etc.)
    ▪ Has experienced bloody show, water broken
    ▪ Contraction regularity, interval, and duration
    ▪ Other medical history

• Vital Signs

• Physical Examination
  o Evaluating Contractions
  o Inspect for Crowning
  o Preparation for Delivery
    ▪ Standard precautions
    ▪ Collect supplies/OB kit
    ▪ Provide privacy for mother
    ▪ Position mother on back, hips elevated, knees bent, legs apart
    ▪ No internal vaginal examination
    ▪ Wait for EMTs

• Steps If the EMR Needs to Deliver
  o If Baby’s Head Is Seen at the Vaginal Opening (Crowning), Delivery Will Occur Soon
  o Someone by Mother’s Head for Support
  o Wash Hands and Put on PPE
  o Support the Baby’s Head As It Delivers
  o If Umbilical Cord Is Around the Baby’s Neck, Slip It Gently Over the Head
  o Support the Baby As He or She Rotates
  o The Upper Shoulder Should Deliver Next as the Head Is Guided Downward
  o Feet Should Deliver After That
  o Keep the Head Lowered So Fluids Can Drain; Suction Mouth and Nose
- Make Note of the Birth Time
- Keep the Baby at the Level of the Birth Canal
- Clamp the Cord, Cut Only If Sterile Equipment Available
- Monitor the ABC’s
- Wait for the Afterbirth Delivery
- Care for the Baby (see Neonatal Care)
- Care for the Mother
- Some Bleeding is Normal
- Sanitary Pad Over Vaginal Opening
- Massage the Uterus in a Circular Motion Continuously
- Allow the Mother to Nurse
- Provide Comfort, Warmth

**EMT: EMR Material Plus:**
Fundamental depth, foundational breadth
- Anatomy and physiology of normal pregnancy
- Pathophysiology of complications of pregnancy
- Assessment of the pregnant patient
- Management of
- Normal delivery
- Abnormal delivery
- Nuchal cord
- Prolapsed cord
- Breech delivery
- Third trimester bleeding
- Placenta previa
- Abruptio placenta
- Spontaneous abortion/miscarriage
- Ectopic pregnancy
- Preeclampsia/Eclampsia

The EMT Instructional Guidelines in this section include all the topics and material at the EMR level PLUS the following material:

- Introduction
  - Anatomy and Physiology Review of the Female Reproductive System
    - Uterus
    - Cervix
    - Ovaries
    - Vagina
    - Breasts
  - Female Reproductive Cycle
  - Cultural Values Affecting Pregnancy
  - Special Considerations of Adolescent Pregnancy
- Physiology
Normal Anatomical, Physiological, and Psychological Changes in Pregnancy
  - Reproductive system
  - Respiratory system
  - Cardiovascular system
  - Musculoskeletal system

Identify Normal Events of Pregnancy

Conception and Fetal Development
  - Ovulation
  - Fertilization
  - Implantation
  - Embryonic stage
  - Fetal stage

Functions of the Placenta

General System Physiology, Assessment, and Management

  Premonitory Signs of Labor
    - Lightening
    - Braxton Hicks
    - Cervical changes
    - Bloody show
    - Rupture membranes
    - Other

  Stages of Labor and Delivery
    - First stage
    - Second stage
    - Third stage

  Antepartum and Intrapartal Assessment Findings
    - Airway, breathing, circulation
    - Initial assessment
    - SAMPLE history
    - Vital signs
    - Obstetrical history
    - Physical examination

  Management of a Normal Delivery Obstetrical Patient
    - Treatment modalities

  Postpartum Care
    - Fundal massage
    - Signs of hemorrhage

Complications of Pregnancy

  Abuse
  Substance Abuse
  Diabetes Mellitus

  Bleeding: Pathophysiology, Assessment, Complications, and Management
    - Abortion
    - Ectopic pregnancy

  Placental Problems: Pathophysiology, Assessment, Complications, and Management
- Abruption placenta
- Placenta previa
  - Hypertensive Disorders: Pathophysiology, Assessment, Complications, and Management
    - Pregnancy-induced hypertension
    - Preeclampsia
    - Eclampsia
- High-Risk Pregnancy: Pathophysiology, Assessment, Complications, and Management
  - Precipitous Labor and Birth
  - Post-Term Pregnancy
  - Meconium Staining
  - Multiple Gestation
  - Intrauterine Fetal Death
- Complications of Labor: Pathophysiology, Assessment, Complications, and Management
  - Premature Rupture of Membranes
  - Preterm Labor
- Complications of Delivery: Pathophysiology, Assessment, Complications, and Management
  - Cephalic Presentation
  - Breech
  - Nuchal Cord
  - Prolapse of Cord
- Postpartum Complications: Pathophysiology, Assessment, Complications, and Management
  - Hemorrhage
    - Early
    - Late
  - Increase Risk of Embolism

**AEMT: Same as Previous Level**

**Paramedic: AEMT Material Plus:**

Complex depth, comprehensive breadth
- Anatomy and physiology of pregnancy
- Pathophysiology of complications of pregnancy
- Assessment of the pregnant patient

Psychosocial impact, presentations, prognosis, and management of
- Normal delivery
- Abnormal delivery
- Nuchal cord
- Prolapsed cord
- Breech
- Spontaneous abortion/miscarriage
- Ectopic pregnancy
- Eclampsia
• Antepartum hemorrhage
• Pregnancy induced hypertension
• Third trimester bleeding
• Placenta previa
• Abruptio placenta
• High risk pregnancy
• Complications of labor
• Fetal distress
• Pre-term
• Premature rupture of membranes
• Rupture of uterus
• Complication of delivery
• Post partum complications

Foundational depth, foundational breadth
• Hyperemesis gravidarum
• Post partum depression

The Paramedic Instructional Guidelines in this section include all the topics and material at the AEMT level PLUS the following material:

• Introduction
  o Anatomy and physiology review of the female reproductive system
    ▪ Uterus
    ▪ Cervix
    ▪ Ovaries
    ▪ Vagina
    ▪ Breasts
  o Female reproductive cycle
    ▪ female hormones
    ▪ neurohormonal basis
    ▪ ovarian cycle
    ▪ menstrual cycle
  o Cultural values affecting pregnancy
  o Special considerations of adolescent pregnancy
• Physiology
  o Normal anatomical, physiological, and psychological changes in pregnancy
    ▪ reproductive system
    ▪ respiratory system
    ▪ cardiovascular system
    ▪ gastrointestinal system
    ▪ urinary tract
    ▪ skin, hair, and eyes
    ▪ musculoskeletal system
    ▪ metabolism
• Identify normal events of pregnancy
  o Conception and fetal development
    • Ovulation
    • Fertilization
    • Implantation
    • fetal circulatory system
    • embryonic stage
    • fetal stage
  o Development and functions of the placenta
    • placental circulation
    • placental functions
    • transfer of gases
    • transport of nutrients
    • hormone production
    • protection
• General system physiology, assessment, and management of the obstetrical patient.
  o Premonitory signs of labor
    • Lightening
    • Braxton Hicks
    • cervical changes
    • bloody show
    • rupture membrane
    • other
  o Stages of labor and delivery
    • first stage
    • second stage
    • third stage
    • maternal response to labor
    • fetal response to labor
  o Assessment of the Pregnant Patient
    • airway, breathing, circulation
    • initial assessment
    • SAMPLE history
    • vital signs
    • obstetrical history
    • physical examination
    • evaluating gestational age
    • fetal movement
    • fetal heart tones
    • deep tendon reflexes
    • inspect for crowning
  o Management of a normal delivery obstetrical patient
    • Treatment modalities
  o Postpartum Care
- assessment of fundus
- quality of lochia
- signs of hemorrhage

- Complications Related to Pregnancy
  o Abuse
  o Substance abuse
  o Supine hypotensive disorder
  o Diabetes mellitus
    ▪ Pathophysiology
    ▪ Assessment
    ▪ Management
  o Various cardiac disorders
    ▪ Pathophysiology
    ▪ Assessment
    ▪ Management
  o Bleeding Related to Pregnancy: pathophysiology, assessment, complications, management
    ▪ Abortion
    ▪ Ectopic pregnancy
  o Placental problems: pathophysiology, assessment, management
    ▪ abruption placenta
    ▪ placenta previa
  o Hyperemesis gravidum
    ▪ Pathophysiology
    ▪ Assessment
    ▪ Management
  o Hypertensive disorders: pathophysiology, assessment, management
    ▪ pregnancy induced hypertension
    ▪ preeclampsia
    ▪ eclampsia
  o Rh sensitization
  o Infections
    ▪ HIV
    ▪ TORCH
    ▪ urinary tract
    ▪ vaginal
    ▪ Sexually Transmitted Infections

- High Risk Pregnancy: pathophysiology, assessment, complications, management
  o precipitous labor and birth
  o post term pregnancy
  o meconium staining
  o fetal macrosomia
  o multiple gestation
  o intrauterine fetal death
  o amniotic fluid embolism
  o hydramnios
- Cephalopelvic disproportion

- Complications of Labor: pathophysiology, assessment, complications, management
  - Premature rupture of membranes
  - Preterm labor
  - Uterus rupture
  - Fetal distress

- Complications of Delivery: pathophysiology, assessment, complications, management
  - Cephalic presentation
    - Occiput – posterior
    - Face
    - Brow
    - Military
  - Breech
    - Frank
    - Incomplete
    - Complete
    - Transverse
  - Shoulder dystocia
  - Nuchal cord
  - Prolapse of cord

- Postpartum Complications: pathophysiology, assessment, complications, management
  - Inverted uterus
  - Hemorrhage
  - Embolism
  - Postpartum depression

**Neonatal care**

**EMR**

Simple depth, simple breadth

- Newborn care
- Neonatal resuscitation

- Initial Care of the Neonate
  - Assessment
    - Respiration
    - Pulse
    - Color
    - Cry
    - Movement
  - Routine Care
    - Support
    - Dry
    - Warm
    - Position
- Airway
- Stimulation

**EMT: EMR Material Plus:**
Fundamental depth, foundational breadth
Assessment and management
- Newborn
- Neonatal resuscitation

The EMT Instructional Guidelines in this section include all the topics and material at the EMR level PLUS the following material:

- Initial Care of the Neonate
  - Physiologic Response to Birth
    - Respiratory adaptations
    - Cardiovascular adaptations
    - Temperature regulation
  - Routine care
    - Support
    - Dry
    - Warm
    - Position
    - Airway
    - Stimulation
  - Assessment

**AEMT: Same as Previous Level**

**Paramedic: AEMT Material Plus:**
Complex depth, comprehensive breadth
- Anatomy and physiology of neonatal circulation
- Assessment of the newborn

Presentation and management
- Newborn
- Neonatal resuscitation

The Paramedic Instructional Guidelines in this section include all the topics and material at the AEMT level PLUS the following material:

- Introduction
  - Newborn
    - A recently born infant; usually considered the first few hours of life
  - Neonate
  - Considered the first 28 days of life
- General pathophysiology, assessment and management
o Epidemiology
  ▪ Incidence
  ▪ Morbidity/ mortality
  ▪ Risk factors
  ▪ Treatment strategies

o Pathophysiology
  ▪ Transition from fetal to neonatal circulation
  ▪ Respiratory system must suddenly initiate and maintain oxygenation
  ▪ Infants are very sensitive to hypoxia
  ▪ Permanent brain damage will occur with hypoxemia
  ▪ Apnea in newborns
  ▪ Congenital anomalies

o Assessment of the newborn
  ▪ Time of delivery
  ▪ Normal/ abnormal vital signs
  ▪ Airway and ventilation
  ▪ Circulation
  ▪ APGAR
    ▪ Appearance - skin color
    ▪ Pulse rate
    ▪ Grimace – irritability
    ▪ Activity - muscle tone
    ▪ Respiratory – effort

o Treatment
  ▪ Prior to delivery, prepare environment and equipment
  ▪ During delivery, suction mouth and nose as head delivers
  ▪ After delivery

  • Specific situations
    o Meconium stained amniotic fluid
      ▪ Epidemiology
      ▪ Anatomy and physiology review
      ▪ Pathophysiology
      ▪ Assessment findings
      ▪ Management considerations for thick or particulate meconium

    o Apnea in the neonate
      ▪ Epidemiology
      ▪ Anatomy and physiology review
      ▪ Pathophysiology
      ▪ Assessment findings
      ▪ Management considerations

    o Diaphragmatic hernia in the neonate
      ▪ Epidemiology
      ▪ Anatomy and physiology review
      ▪ Pathophysiology
      ▪ Assessment findings
      ▪ Management considerations
o Bradycardia in the neonate
  ▪ Epidemiology
  ▪ Anatomy and physiology review
  ▪ Pathophysiology -- Primarily caused by hypoxia
  ▪ Assessment findings
  ▪ Management considerations

o Premature infants
  ▪ Epidemiology
  ▪ Anatomy and physiology review
  ▪ Pathophysiology (retinopathy of prematurity)
  ▪ Assessment findings
  ▪ Management considerations

o Respiratory distress/ cyanosis in the neonate
  ▪ Epidemiology
  ▪ Anatomy and physiology review
  ▪ Pathophysiology
  ▪ Assessment findings
  ▪ Management considerations

o Seizures in the neonate
  ▪ Epidemiology
  ▪ Anatomy and physiology review
  ▪ Pathophysiology
  ▪ Assessment findings
  ▪ Management considerations

o Fever in the neonate
  ▪ Epidemiology
  ▪ Anatomy and physiology review
  ▪ Pathophysiology
  ▪ Assessment findings
  ▪ Management considerations

o Hypothermia in the neonate
  ▪ Epidemiology
  ▪ Anatomy and physiology review
  ▪ Pathophysiology -- Increased surface-to-volume relation makes newborns extremely sensitive to environmental conditions, especially when wet after delivery
  ▪ Assessment findings
  ▪ Management considerations

o Hypoglycemia in the neonate
  ▪ Epidemiology
  ▪ Anatomy and physiology review
  ▪ Pathophysiology
  ▪ Assessment findings
  ▪ Management considerations

o Vomiting in the neonate
  ▪ Epidemiology
- Anatomy and physiology review
- Pathophysiology
- Assessment findings
- Management considerations
- Psychological support/ communication strategies
  - Diarrhea in the neonate
    - Epidemiology
    - Anatomy and physiology review
    - Pathophysiology
    - Assessment findings
    - Management considerations
  - Common birth injuries in the newborn
    - Epidemiology
    - Anatomy and physiology review
    - Pathophysiology
    - Assessment findings
    - Management considerations

### Pediatrics

**EMR**

Simple depth, simple breadth

Age-related assessment findings, and age-related assessment and treatment modifications for pediatric specific major diseases and/or emergencies

- Upper airway obstruction
- Lower airway reactive disease
- Respiratory distress/failure/arrest
- Shock
- Seizures
- Sudden Infant Death Syndrome

**General Considerations**

- Many Components of the Initial Evaluation Can Be Done by Careful Observation Without Touching the Patient
- When Appropriate, Utilize the Parent/Guardian to Help the Infant or Child Be More Comfortable With Your Exam and Treatment
- Communicating With Scared, Concerned Parents and Family Is Important When Caring for an Ill Infant or Child
- Continue Assessment Until Care Is Transferred

**Assessment Process**

- Scene Survey
  - Evaluate the scene for safety
  - Evaluate the scene for clues related to the chief complaint
  - Observe caregivers’ interactions with the child
- Patient Assessment
  - Pediatric assessment triangle -- 15- to 30-second assessment of the severity of the patient’s illness or injury
- Airway
- Ventilation/oxygenation
- Circulation
- Determine level of consciousness
- Exposure
- Additional assessment

- Respiratory Distress/Failure/Arrest
  - Introduction
    - Tongue is larger
    - Airways are smaller
  - Pathophysiology
    - Respiratory distress
    - Respiratory failure
    - Respiratory arrest
  - Assessment
    - History
    - Physical findings
  - Upper Airway Obstruction
    - Swelling of tissue
    - Foreign body
    - Secretions
    - Other
  - Management
    - Airway positioning (chin lift, jaw thrust)
    - If upper airway is obstructed, use, age- and situation-appropriate airway clearance measures (finger sweep, back blows, suctioning, abdominal thrusts)
    - Airway adjunct (oropharyngeal airways)
    - Oxygen
    - Assisted ventilation (bag valve mask)

- Shock
  - Causes
    - Trauma
    - Infections
    - Vomiting or diarrhea
  - Assessment
    - History
    - Physical findings
  - Management
    - Scene safety and standard precautions
    - Open airway (protect spine if necessary)
    - Oxygen
    - Assist ventilations if necessary
    - Chest compressions if necessary
    - Control bleeding

- Seizures
Description

Causes
- Fever
- Head trauma
- Epilepsy
- Low blood glucose
- Poisoning

Assessment

Management
- Scene safety and standard precautions
- Place patient on the floor
- Loosen restrictive clothing
- Protect the patient from injury
- Nothing in the mouth and do not hold the patient down
- After seizure, place patient in recovery position

- Sudden Infant Death Syndrome (SIDS)
  Introduction
  - Definition of SIDS
  - Definition of Apparent Life Threatening Event (ALTE)
  - Epidemiology and risk factors
  Assessment
  - Airway, breathing, pulse
  - Signs of death
  - Begin resuscitation if no indication of futility
  Management
  - Local EMS criteria for death in the field
  - Notification of appropriate authorities
  - Caregiver support

EMT: EMR Material Plus:
Fundamental depth, foundational breadth
Age-related assessment findings, age-related, and developmental stage related assessment and treatment modifications for pediatric specific major diseases and/or emergencies
- Upper airway obstruction
- Lower airway reactive disease
- Respiratory distress/failure/arrest
- Shock
- Seizures
- Sudden Infant Death Syndrome
- Gastrointestinal disease

The EMT Instructional Guidelines in this section include all the topics and material at the EMR level PLUS the following material:

- Anatomy and Physiology
  - Pediatric Head versus Adult’s
• Head is Proportionally Larger to Body Size
• Implications for Health Care Provider
  ▪ Increased incidence of blunt head trauma
  ▪ Excessive heat loss may occur from head
  ▪ Securing the airway may be difficult; to open the airway and obtain “sniffing” position may require a towel or roll under the shoulders
• Examine Fontanelles in Infants
  ▪ Bulging fontanelle in an ill-appearing non-crying infant suggests increased intracranial pressure
  ▪ Sunken fontanelle in an ill-appearing infant suggests dehydration

• Airway Compared to an Adult’s
  ▪ Smaller in Diameter and Shorter in Length
  ▪ Jaw Smaller With Infant’s Tongue Taking Up More Room in the Oropharynx
  ▪ Infants are Nasal Breathers
  ▪ Tracheal Cartilage is Softer and More Collapsible
  ▪ Epiglottis of Infants and Toddlers Long, Floppy, Narrow and Extends at a 45-Degree Angle Into Airway
• Implications for the Health Care Provider
  ▪ Essential to suction the nares of infants in respiratory distress
  ▪ Posterior displacement of the tongue may cause airway obstruction
  ▪ Smaller airways more easily obstructed by
    • Flexion or hyperextension
    • Particulate matter (including mucus)
    • Soft tissue swelling (injury, inflammation) can cause obstruction

• Chest and Lungs Compared to an Adult’s
  ▪ Ribs More Cartilaginous and Pliable
  ▪ Less Overlying Muscle and Fat to Protect Ribs and Vital Organs
  ▪ Young Children Breathe Primarily With Their Diaphragms
  ▪ Thin Chest Wall Easily Transmits Breath Sounds
• Implications for the Health Care Provider
  ▪ Effective diaphragmatic excursion essential for adequate ventilation
  ▪ Rib fractures less common due to pliability; when present represent significant energy transmission accompanied by multi-system injury (e.g., pulmonary contusion)
  ▪ Lungs prone to pneumothorax from excessive pressures while bag-mask ventilating

• Abdominal Difference
  ▪ Less-Developed Abdominal Muscles and Organs Situated More Anteriorly, Therefore Less Protection of Rib Cage
  ▪ Liver and Spleen Proportionally Larger
• Implications for the Health Care Provider
  ▪ Seemingly insignificant forces can cause serious internal injury
  ▪ Liver, spleen, and kidneys are more frequently injured
  ▪ Multiple organ injury common

• Extremities Compared to Adult’s
  ▪ Bones Softer
• Open Growth Plates Are Weaker Than Ligaments and Tendons, So Injury to Growth Plate Can Result in Length Discrepancies
  • Implications for the Health Care Provider
  • Integumentary Differences
    • Larger Surface Area to Body Mass Ratio
    • Implications for the Health Care Provider
      ▪ Skin more easily, quickly, and deeply burned
      ▪ Larger surface can lead to large fluid and heat losses
      ▪ Hypothermia can complicate resuscitative efforts
• Respiratory System Compared to an Adult’s
  • Higher Oxygen Demand per Kilogram of Body Weight (Twice That of an Adult’s)
  • Smaller Lung Oxygen Reserves
  • Implications for the Healthcare Provider
    ▪ Higher oxygen demand with less reserve increases risk of hypoxia with apnea or ineffective bagging
    ▪ Err on using a larger bag for ventilating the pediatric patient (regardless of the size of the bag used for ventilation, use only enough force to make the chest rise slightly)
• Nervous System and Spinal Column Compared to an Adult’s
  • Continually
  • Brain Tissue and Vascular System More Fragile and Prone to Bleeding From Injury
  • Subarachnoid Space Is Relatively Smaller, With Less Cushioning Effect for Brain
  • Pediatric Brain Requires Nearly Twice the Cerebral Blood Flow As Does an Adult’s
  • Brain and Spinal Cord Less Well Protected
  • Implications for the Health Care Provider
    ▪ The large cerebral blood flow requirement increases risk of hypoxia; hypoxia and hypotension in a child with a head injury can cause ongoing damage
    ▪ Head momentum may result in bruising and damage to the brain
    ▪ Spinal cord injuries less common
    ▪ Cervical spine injuries more commonly ligamentous injuries
• Metabolic Differences Compared to an Adult
  • Limited Glucose Stores
  • Newborns and Infants Less Than One Month Most Susceptible to Hypothermia
  • Implications for the Health Care Provider
    ▪ Keep the infant or child warm during treatment and transport
    ▪ Cover the head (not the face, though) to minimize heat loss
    ▪ Newborns should not be overwarmed, as this can worsen their neurologic outcomes
• Growth and Development
  • Infancy
    ▪ Birth to two months
      • Physical development
• Cognitive development
• Implications for the health care provider

  ▪ Two to six months
  • Physical development
  • Cognitive development
  • Implications for the health care provider

  ▪ Six to 12 months
  • Physical development
  • Cognitive development
  • Implications for the health care provider

○ Toddler Years
  ▪ Twelve to 18 months
  • Physical development – begin to walk and explore their environments
  • Cognitive development
  • Implications for the health care provider

  ▪ Eighteen to 24 months
  • Physical development
  • Cognitive development
  • Emotional development
  • Implications for the health care provider

○ Preschool Years (2-5 Years)
  ▪ Physical development
  ▪ Cognitive development
  ▪ Emotional development
  ▪ Implications for the health care provider

○ Middle Childhood Years (6-12 Years)
  ▪ Physical development
  ▪ Cognitive development
  ▪ Emotional development
  ▪ Implications for health care provider

○ Adolescence (12-20 Years)
  ▪ Physical development – puberty begins
  ▪ Cognitive development
  ▪ Emotional development
  ▪ Implications for the health care provider

• Assessment
  ○ General Considerations
    ▪ Many components of the initial evaluation can be done by careful observation without touching the patient
    ▪ When appropriate, utilize the parent/guardian to help the infant or child be more comfortable with your exam and therapies
    ▪ Communicating with scared, concerned parents and family is an important aspect of one’s responsibilities at the scene of an ill infant or child
Assessment is an ongoing process continuing until care is transferred to the receiving facility

- **Assessment Process**
  - Preparing for arrival
  - Scene survey
  - Patient assessment
  - Hands-on ABCs
    - Airway
    - Breathing/oxygenation
    - Circulation
    - Disability
    - Exposure
  - Additional assessment
    - Focused history
    - Detailed physical exam—“Head to Toe”

- **Specific Pathophysiology, Assessment, and Management**
  - **Respiratory Distress**
    - Introduction
    - Pathophysiology
    - Assessment
    - Upper airway obstruction
    - Lower airway disease and reactive airway disease
    - Management
  - **Shock**
    - Introduction
    - Pathophysiology
    - Assessment
    - Management
  - **Neurology**
    - Introduction
    - Pathophysiology
    - Assessment
    - Specific Conditions
    - Management
  - **Gastrointestinal**
    - Introduction – anatomic and physiologic differences in children
    - Pathophysiology
    - Assessment
    - Vomiting and diarrhea
  - **Toxicology**
    - Introduction
    - Assessment
  - **Sudden Infant Death Syndrome (SIDS)**
    - Introduction
    - Assessment
    - Management
AEMT: Same as Previous Level

Paramedic: AEMT Material Plus:
Age-related assessment findings, age-related anatomic and physiologic variations, age-related and developmental stage related assessment and treatment modifications of the pediatric specific major or common diseases and/or emergencies:

Complex depth, comprehensive breadth
- Foreign body (upper and lower) airway obstruction
- Bacterial tracheitis
- Asthma
- Bronchiolitis
- Respiratory Syncytial Virus (RSV)
- Pneumonia
- Croup
- Epiglottitis
- Respiratory distress/failure/arrest
- Shock
- Seizures
- Sudden Infant Death Syndrome (SIDS)
- Hyperglycemia
- Hypoglycemia

Fundamental depth, foundational breadth
- Pertussis
- Cystic fibrosis
- Bronchopulmonary dysplasia
- Congenital heart diseases
- Hydrocephalus and ventricular shunts

The Paramedic Instructional Guidelines in this section include all the topics and material at the AEMT level PLUS the following material:

- Pediatric Anatomical Variations and Assessment
  o Head compared to an adult’s
    ▪ Compared to the body, the head is proportionally larger in size
    ▪ The head contributes a larger portion of the body’s surface area than in adults
    ▪ Anterior and posterior fontanelles open
    ▪ Implications for the health care provider
  o Airway compared to an adult’s
    ▪ Much smaller in diameter and shorter in length
    ▪ Infant’s tongues take up more room in the oropharynx
- The jaw is proportionally smaller
- Infants are nasal breathers
- The vocal cords are higher (C 2-3) and more anterior
- In children younger than 10 years, narrowest part of the airway is below the vocal cords at the non-distensible cricoid cartilage
- Tracheal cartilage is softer and more collapsible
- The epiglottis in infants and toddlers is long, floppy, narrow, and extends at a 45-degree angle into airway
- Implications for the health care provider
  - Chest and lungs compared to an adult’s
    - Ribs are more cartilaginous and pliable
    - Less overlying muscle and fat to protect ribs and vital organs
    - Young children breathe primarily with their diaphragms; their chest muscles are immature and fatigue easily
    - Lung tissue is more fragile
    - Mediastinum (the heart and major vessels) is more mobile within the chest
    - Thin chest wall allows for easily transmitted breath sounds
    - Implications for the health care provider
  - Abdomen compared to an adult’s
    - Less developed abdominal muscles offer less protection
    - Abdominal organs are situated more anteriorly and are less protected by ribs
    - Liver and spleen are proportionally larger
    - Implications for the health care provider
  - Extremities compared to adult’s
    - Bones are softer
    - Injuries to the growth plates of long bones may result in poor bone growth
    - Open growth plates are weaker than ligaments and tendons
    - Growth plates generally disappear 2 years after girls have their first periods; in boys it is usually by mid to late high school
    - Implications for the health care provider
  - Skin and body surface area compared to an adult's
    - Thinner with less subcutaneous fat
    - Larger surface area to body mass
    - Implications for the health care provider

- Respiratory system compared to an adult’s
  - Tidal volume of breaths is smaller (10-15 mL/kg)
  - Higher oxygen demand per kilogram of body weight (2 times that of an adult)
  - Smaller lung oxygen reserves
  - Implications for the health care provider

- Nervous system and spinal column compared to an adult’s
  - Continually evolves throughout childhood allowing them to develop new abilities
  - Brain tissue is more fragile and prone to bleeding from injury
- The subarachnoid space is relatively smaller offering less cushioning to the brain
- The brain requires nearly twice the cerebral blood flow as does an adult’s
- Brain and spinal cord are less well protected by a thinner skull and spinal column
- Spinal column
- Implications for the health care provider

- Metabolic differences compared to an adult
  - Infants and children have limited glucose stores
  - Infants and children are prone to hypothermia due to increased body surface area
  - Newborns and infants less than 1 month are the most susceptible to hypothermia
  - Implications for the health care provider

- Growth and Development
  - Infancy
    - birth-2 months
      - Physical development
      - Cognitive development
      - Emotional development
      - Implications for the health care provider
    - 2-6 months
      - Physical development
      - Cognitive development
      - Emotional development
      - Implications for the health care provider
    - 6-12 months
      - Physical development
      - Cognitive development
      - Emotional development
      - Implications for the health care provider
  - Toddler years
    - 12-18 months
      - Physical development
      - Cognitive development
      - Emotional development
      - Implications for the health care provider
    - 18-24 months
      - Physical development
      - Cognitive development
      - Emotional development
      - Implications for the health care provider
  - Preschool years (2-5 years)
    - Physical development
    - Cognitive development
    - Emotional development
    - Implications for the health care provider
- Middle Childhood years (6-12 years)
  - Physical development
  - Cognitive development
  - Emotional development
  - Implications for the health care provider
- Adolescence (12-20 years)
  - Physical development -- Puberty begins
  - Cognitive development
  - Emotional development
  - Implications for the health care provider

- Pediatrics: Specific Pathophysiology, Assessment, and Management
  - Respiratory Compromise
    - Introduction
    - Pathophysiology
    - Assessment
    - Upper airway obstruction
    - Lower airway disease
    - Pneumonia
    - Foreign body lower airway obstruction
    - Pertussis
    - Cystic fibrosis
    - Bronchopulmonary dysplasia (BPD)
  - Non Cardiogenic Shock
    - Introduction
    - Pathophysiology (compensated vs. decompensated)
    - Assessment
    - Management
  - Cardiac
    - Introduction
    - Pathophysiology
    - Assessment
    - Congestive heart failure
    - Congenital heart disease
    - Arrhythmias
    - Management
  - Neurologic
    - Introduction
    - Pathophysiology
    - Assessment
    - Meningitis
    - Seizures
    - Hydrocephalus
    - Closed head injury
    - Ventricular shunts
    - Management
  - Endocrinology
Introduction
Pathophysiology
Assessment
Hyperglycemia
Hypoglycemia
Management

Hematologic/Oncologic/Immunologic
- Introduction
- Pathophysiology
- Assessment
- Sickle cell disease
- Bleeding disorders
- Leukemia/Lymphoma
- Immunocompromised
- Management
  - Sickle cell disease
  - Bleeding disorders
  - Leukemia/Lymphoma
  - Immunocompromise

Gastrointestinal
- Introduction
- Pathophysiology
- Assessment
- Vomiting
- GI Bleeding
- Neonatal Jaundice
- Management

Toxicologic
- Introduction
- Assessment
- Ingestion
- Inhalation
- Management

Abuse and Neglect
- Introduction
  - Epidemiology
  - Definitions of abuse (physical, emotional, sexual) and neglect
- Assessment
  - Elements in the history or scene concerning for abuse or neglect
  - Assessing the caregiver’s behavior
  - Physical findings concerning for abuse or neglect
  - Benign findings often confused for physical or sexual abuse
- Management
  - Role of the Prehospital Professional (scene assessment, assessment of the caregiver, communication with the caregiver, documentation, reporting suspected abuse/neglect, safely transporting one or more injured children)
Role of Child Protective Services (CPS)
Role of Medical Examiner and law enforcement

- Sudden Infant Death Syndrome
  - Introduction
    - Definition of SIDS
    - Definition of ALTE
    - Epidemiology and Risk Factors
  - Assessment
    - Cardiopulmonary status
    - Clinical signs of death
    - Evaluation for other signs of abuse
  - Management
    - Local EMS criteria for death in the field
    - Notification of appropriate authorities
    - Controversy over transport after failed advanced life support
    - Caregiver support

**Geriatrics**

**EMR**
Simple depth, simple breadth
- impact of age-related changes on assessment and care

- Age-Associated Changes
  - Age Dependent and Variable
  - Sensory Changes in Older Patients
    - Vision
    - Hearing
    - Sense of touch and pain
  - Heart/Blood Vessels
    - High blood pressure
    - Increased risk of heart and stroke
    - Heart is less able to beat faster when needed
  - Lungs and Breathing
    - Diminished breathing capacity
    - Increased risk of infection of the lungs
    - Decreased cough
  - Stomach and Intestines
    - Difficulty with digestion
    - Difficulty chewing –
    - Increased risk of foreign body airway obstruction
  - Brain and Nervous System
    - Slower reflexes
    - Decreased recent memory
  - Muscles and Bones
    - Decreased bone density—easier to break
    - Loss of strength and size of bone and muscles
Other
  - Increased risk of infections
  - Decreased signs and symptoms of infection when present

Assessment and Care Implications
  - Assessment
    - ABCs
    - Speak slowly and distinctly at patient’s eye level with good lighting
    - Give the patient time to respond unless the condition appears urgent
    - Elderly may not show severe symptoms even if very ill
    - Use family members if available, especially for base line mental status
    - Reassess often as condition may deteriorate quickly
  - Care
    - Handle gently as skin is fragile and can easily tear
    - Reassurance is important

EMR Material Plus:
Fundamental depth, foundational breadth
Changes associated with aging, psychosocial aspects of aging and age-related assessment and treatment modifications for the major or common geriatric diseases and/or emergencies
  - Cardiovascular diseases
  - Respiratory diseases
  - Neurological diseases
  - Endocrine diseases
  - Alzheimer’s
  - Dementia

The EMT Instructional Guidelines in this section include all the topics and material at the EMR level PLUS the following material:
  - Cardiovascular System Anatomical and Physiological Changes, and Pathophysiology
    - Cardiovascular Changes in the Elderly
      - Degeneration of valves
      - Degeneration of conduction system
      - Vascular changes
      - Muscular changes
      - Stroke volume
      - Cardiac output
      - Dysrhythmias
    - Myocardial Infarction
      - Associated signs and symptoms
      - Possible changes in physical assessment
      - Assessment tools
      - Treatment
    - Heart Failure – A Condition Caused by Left and Right Ventricular Failure With Accompanying Pulmonary Edema
      - Associated signs and symptoms
      - Possible changes in physical assessment
- Assessment tools – blood pressures
- Treatment

- Respiratory System Anatomical and Physiological Changes, and Pathophysiology
  - Respiratory Changes in the Elderly
    - Loss of elastic recoil in the chest wall resulting in air trapping and increase in lung capacity and residual volume
    - Loss of alveoli
    - Reduction in oxygen and carbon dioxide exchange
    - Inability to increase rate of respiratory effort
    - Decreased cough reflex
    - Decreased ability of cilia to move mucus upward
  - Pneumonia – Infection of the Lung From Bacterial Viral or Fungal Causes
    - Evaluation of pathophysiology through history and possible risk factors
    - Associated signs and symptoms
    - Possible changes in physical assessment
    - Assessment
    - Treatment
  - Pulmonary Embolism – Sudden Blockage of the Pulmonary Artery by a Venous Clot
    - Associated signs and symptoms
    - Possible changes in physical assessment
    - Assessment tools
    - Treatment

- Neurovascular System Anatomical and Physiological Changes, and Pathophysiology
  - Neurovascular Changes in the Elderly
    - Atrophy of the brain tissue
    - Deterioration of the nervous system function in controlling
    - Neuropathy
  - Dementia – A Chronic, Generally Irreversible Condition That Causes a Progressive Loss of Cognitive Abilities, Psychomotor Skills, and Social Skills
    - Demographics
    - Evaluation of pathophysiology through history, and risk factors and current medications
    - Known reversible causes of dementia
    - Associated signs and symptoms
    - Problems associated with management of patient with dementia
  - Delirium – A Sudden Change in Behavior, Consciousness, or Cognitive Processes Generally Due to a Reversible Physical Ailment
    - Mortality rates
    - Evaluation of pathophysiology through history, possible risk factors, and current medications
    - Associated signs and symptoms
    - Possible changes in physical assessment
    - Assessment tools
    - Treatment

- Gastrointestinal System Anatomical and Physiological Changes, and Pathophysiology
Gastrointestinal (GI) Changes in the Elderly
- Dental problems
- Decrease in saliva
- Poor muscle tone of smooth muscle sphincter between esophagus and stomach can cause regurgitation leading to heartburn, and acid reflux
- Decrease in hydrochloric acid in the stomach
- Alterations in absorption of nutrients
- Slowing peristalsis causing constipation
- Rectal sphincter may become weak resulting in fecal incontinence
- Liver shrinks
- Blood flow to the liver declines
- Decrease metabolism in the liver

Gastrointestinal Bleeding Caused by Disease Processes, Inflammation, Infection and Obstruction of the Upper and Lower Gastrointestinal Tract
- Associated signs and symptoms
- Possible changes in physical assessment
- Assessment tools – blood pressure
- Treatment:
  - Airway, ventilatory, and circulatory support
  - Oxygen with adjuncts appropriate to patient condition

Genitourinary System Anatomical and Physiological Changes, and Pathophysiology
- Genitourinary Changes in the Elderly
  - Reduction in renal function
  - 50 percent reduction in renal blood flow
  - Tubule degeneration
  - Decreased bladder capacity
  - Decline in sphincter muscle control
  - Decline in voiding senses
  - Increase in nocturnal voiding
  - In males benign prostatic hypertrophy

Endocrine System Anatomical and Physiological Changes, and Pathophysiology
- Endocrine Changes in the Elderly
  - Decreased metabolism of thyroxine
  - Decreased conversion of thyroxine to triiodothyronine
  - Reduction in pancreatic beta cell secretion causing hyperglycemia
  - Reduction of the hormones secreted by the hypothalamus and pituitary gland
  - Increase in secretion of antidiuretic hormone and atrial natriuretic hormone causing fluid imbalance
  - Increase in levels of norepinephrine

Hyperosmolar Hyperglycemic (Nonketotic Coma) Is a Diabetic Complication of Type 2 (Formerly NIDDM of Type II) in the Elderly; Unlike DKA the Resulting
High Blood Glucose Levels Do Not Cause Ketosis, but Rather Lead to Osmotic Diuresis, and Shift of Fluid to the Intravascular Space, Resulting in Dehydration

- Associated signs and symptoms
- Possible changes in physical assessment
- Assessment tools
- Treatment

- Musculoskeletal System Anatomical and Physiological Changes, and Pathophysiology
  - Musculoskeletal Changes in the Elderly
    - Atrophy of muscles and muscle wasting
    - Degenerative changes and loss of bone
    - Loss of strength
    - Degenerative changes in joints
    - Loss of elasticity in ligaments and tendons
    - Thinning of cartilage and thickening of synovial fluid
  - Osteoporosis Is a Bone Disease That Decreases Bone Density

- Toxicological Emergencies
  - Pathophysiological Changes That Cause the Elderly to Be Susceptible to Toxicity
    - Decreased kidney function
    - Altered gastrointestinal absorption
    - Decrease vascular flow in the liver altering metabolism and excretion
  - Non-Compliance of Medication Can Occur From Financial Inability, a Motor Inability to Open Caps, Impaired Cognitive, Vision and Hearing Ability; Medics Should Check Prescription Dates and Number of Pills Available to Access Compliance of Medication Use
  - Polypharmacy is the Use of Multiple Medications, Often Prescribed by Different Doctors That Can Cause Adverse Reactions in the Patient
  - Adverse Reactions Occur When a Drug or Drugs Taken Together Change the Pharmacokinetics or Pharmacodynamics in the Body

- Sensory Changes in the Elderly
  - Vision
    - Decreased visual acuity – inability to accommodate
    - Inability to differentiate colors
    - Decreased night vision
    - Decreased tear production
    - Development of cataracts
    - Disease processes
  - Hearing
    - Presbycusis
    - Inability to hear high frequency sounds
    - Use of hearing aids
  - Pain Perception
    - Alteration of pain perception
    - Inability to differentiate hot from cold
**AEMT: EMT Material Plus:**
Complex depth, foundational breadth
- Fluid resuscitation in the elderly

The AEMT Instructional Guidelines in this section include all the topics and material at the EMT level PLUS the following material:

- Fluid Resuscitation in the Elderly
  - Patients With Chronic Hypertension May Have Higher Blood Pressure Value Needs to Achieve the Same Level of End Organ Perfusion Than Other Patients
    - Patient may be in shock with blood pressure above 100
    - Modest amounts of blood loss can lead to shock
    - Patient less able to tolerate excessive fluids
    - Hemodilution

**Paramedic: AEMT Material Plus:**
Normal and abnormal changes associated with aging, pharmacokinetic changes, psychosocial and economic aspects of aging, polypharmacy, and age-related assessment and treatment modifications for the major or common geriatric diseases and/or emergencies

Complex depth, comprehensive breadth
- Cardiovascular diseases
- Respiratory diseases
- Neurological diseases
- Endocrine diseases
- Alzheimer’s
- Dementia
- Delirium
- Acute confusional state

Fundamental depth, foundational breadth
- Herpes zoster
- Inflammatory arthritis

The Paramedic Instructional Guidelines in this section include all the topics and material at the AEMT level PLUS the following material:

- Normal and Abnormal Changes associated with aging
  - Normal changes associated with aging primarily occur due to deterioration of organ systems;
  - Pathological changes in the elderly are sometimes difficult to discern from normal aging changes.
  - Cardiovascular
    - Inability to tolerate cardiovascular dysfunction of any kind
    - Inability to increase rate and cardiac output
    - Degeneration of valves
- Degeneration of conduction system
- More likely to have dysrhythmias
- Stroke volume decreases
- Vessel walls lose elasticity and are less flexible

- Respiratory
  - Loss of elastic recoil in the chest wall
  - Diminished respiratory muscle strength and endurance
  - Loss of alveoli
  - Reduction in oxygen and carbon dioxide exchange
  - Inability to increase rate of respiratory effort
  - Decreased cough reflex
  - Decreased ability of cilia to move mucus upward

- Neurovascular
  - Atrophy of the brain tissue
  - Deterioration of the nervous system function in controlling
  - Delayed reflexes and response times
  - Impaired balance

- Gastrointestinal
  - Dental problems
  - Decrease in saliva
  - Poor sphincter muscle tone
  - Heartburn, and acid reflux
  - Decrease in hydrochloric acid in the stomach
  - Alterations in absorption of nutrients
  - Slowing peristalsis causing constipation
  - Rectal sphincter weakens with increased incidence of fecal incontinence
  - Liver function decreases with increased potential for drug toxicity

- Genitourinary
  - Reduction in renal function due to decreased blood flow and tubule degeneration
  - Decreased bladder capacity
  - Decline in sphincter muscle control causing incontinence
  - Decline in voiding senses and nighttime voiding
  - In males, benign prostatic hypertrophy

- Endocrine
  - Increase in incidence of diabetes
  - Increase in secretion of antidiuretic hormone causing fluid imbalance
  - Decreased production of estrogen causing osteoporosis

- Musculoskeletal
  - Atrophy of muscles
  - Degenerative changes and loss of bone
  - Loss of strength
  - Degenerative changes in joints
  - Loss of elasticity in ligaments and tendons
  - Thinning of cartilage and thickening of synovial fluid

- Integumentary
- Atrophy of the epidermis, hair follicles, and sweat glands
- Lessened skin turgor
- Tenting present even when patient is hydrated
- Nails become thin and brittle
- Increased healing time
- Pigment changes
- Decreased elasticity
- Hair loss
- Reduction of subcutaneous tissue
- Skin easily torn

- Sensory changes
  - Vision
    - Decreased visual acuity -- inability to accommodate
    - Inability to differentiate colors
    - Decreased night vision
    - Decreased tear production
    - Development of cataracts
    - Disease processes
  - Hearing
    - Presbycusis
    - Inability to hear high frequency sounds
    - Use of hearing aids
  - Pain Perception -- inability to differentiate hot from cold

- Pharmacokinetic change
  - Physiological changes that impact pharmokinetics
    - Decrease in amount of body water
    - Decrease in muscle mass
    - Increase in body fat
    - Renal function deterioration
    - Liver function deterioration
    - Altered distribution of drugs
  - Implications of altered pharmacokinetics
    - Increased drug sensitivity
    - Increased adverse drug reactions
    - Increased drug toxicity
    - Dosages should possibly be decreased
  - Difficulty in compliance of drug therapy
    - Lack of money to purchase
    - Complicated drug regime
    - Forgetfulness “did I take it or not”
    - Difficulty opening containers
    - Directions for use not understood
    - Other
  - Polypharmacy
    - Multiple chronic diseases mean multiple medications
    - Drug dosages may not have been adjusted for multiple meds
Drug interactions may cause problems
Consider polypharmacy as a reason for problems

- Psychosocial and economic aspects
  - Demographics and “graying of America”
  - Psychosocial issues
    - Living environments
    - Financial issues
    - Social services

- Specific conditions that occur more frequently in the elderly
  - Myocardial infarction
    - Patient will usually have atypical chest pain or NO pain
    - May present with only dyspnea, acute confusion (delirium), syncope, weakness or nausea and vomiting
  - Congestive Heart Failure
    - A frequent condition of elderly
    - May present with dyspnea, orthopnea, or mental status alteration
    - Peripheral edema is frequently present in elderly patients with or without failure and may signify a variety of conditions
    - Fluid balances are sometimes difficulty to achieve
  - Aortic Dissection
  - Syncope
    - May have a variety of causes, usually cardiac or neurological
    - Causes to consider
  - Hypertension
  - Pneumonia
  - Pulmonary Embolism
  - Asthma
  - Emphysema and chronic bronchitis
  - Stroke
  - Transient Ischemic Attacks (TIA)
  - Alzheimer’s Disease
    - Definition
      - Stages
      - Diagnosis
      - Prognosis
    - Epidemiology
      - Population
      - early onset
    - Pathophysiology
      - Plaques
      - Tangles
    - Signs and Symptoms
      - Memory
      - Learning
      - Judgment
      - Language
• Tasks
  • Personality changes
    • Apathy
    • Irritability
    • Depression
    • Agitation
    • Psychosis
  • Normal day-to-day living
  • Management
  • Alzheimer’s treatment

  o Dementia
    • Definition
    • Causes of dementia
    • Associated signs and symptoms
    • Problems associated with management of patient with dementia

  o Delirium - a sudden change in behavior, consciousness, or cognitive processes generally due to a reversible physical ailment.
    • Mortality rates
    • Evaluation of pathophysiology through history, possible risk factors, and current medications
    • Associated signs and symptoms
    • Possible changes in physical assessment
    • Assessment tools
    • Treatment

  o GI Gastrointestinal bleeding - is caused by disease processes, inflammation, infection and obstruction of the upper and lower gastrointestinal tract.
    • Evaluation of pathophysiology through history, possible risk factors, and current medications.
    • Associated signs and symptoms
    • Possible changes in physical assessment
    • Assessment tools
    • Treatment:
      • Airway, ventilatory and circulatory support
      • Oxygen with adjuncts appropriate to patient condition
      • Venous access - care should be taken to avoid use of indwelling fistulas or shunt unless necessary in cardiac events.
      • Dysrhythmia management according to current ACLS standards or area protocol
      • Evaluation of patient treatment through reassessment
      • Definitive care of renal patients is dialysis.
      • Fever
      • Tachycardia
      • Tachypnea
      • Diffuse tenderness on palpation of abdomen, with distention, guarding, or masses; upon auscultation high pitched noises
• Hypovolemic

  Assessment tools
  • Evaluation of limb lead ECG
  • Interpretation of 12 lead ECG for signs of ischemia, injury or anomalies
  • Blood pressures, lying, sitting, and standing noting any change of 10 mm/Hg or more lower as the patient moves to an upright position
  • Pulses, lying, sitting, and standing noting any change of 10 beats per minute more higher as the patient moves to an upright position
  • Auscultation of heart to detect irregular, muffled, or extra tones
  • Auscultation of breath sounds to detect adventitious noises, or foreign bodies
  • Auscultation of bowel sounds; palpation of abdomen

Treatment:
• Management of Upper GI bleeds is not dependent upon the identifying the underlying cause; however, assessment and history are the key to successful treatment of this emergent life threatening illness.
• Airway, ventilatory and circulatory support
• Oxygen with adjuncts appropriate to patient condition
• Venous access- depending on patient presentation it may be necessary to place two large bore IVs
• Dysrhythmia management according to current ACLS standards or area protocol
• Evaluation of patient treatment through reassessment

  o Biliary disease is disorders of the liver and gallbladder.
    ▪ Evaluation of pathophysiology through history, possible risk factors, and current medications.
    ▪ Associated signs and symptoms
    ▪ Possible changes in physical assessment
    ▪ Assessment tools
    ▪ Treatment:

  o Chronic Renal Failure- is the inability of the kidneys to excrete waste, concentrate urine, or control electrolyte balance in the body.
    ▪ Evaluation of pathophysiology through history, possible risk factors, and current medications.
    ▪ Associated signs and symptoms
    ▪ Possible changes in physical assessment
    ▪ Assessment tools
    ▪ Treatment:

  o Urinary Tract Infection
    ▪ Evaluation of pathophysiology through history, possible risk factors, and current medications.
    ▪ Associated signs and symptoms
    ▪ Possible changes in physical assessment
- Assessment tools
- Treatment:
  - Endocrine
    - Diabetes Mellitus- an inability of the pancreas to produce a sufficient amount of insulin causing hyperglycemia.
    - Diabetic Ketoacidosis-is a diabetic complication of IDDM that occurs when the patient become hyperglycemic. This causes the cells to burn fat, which causes the body to create ketones and ketoacids.
    - Nonketotic Hyperglycemic-Hyperosmolar Coma –is a diabetic complication of NIDDM in the elderly. Unlike DKA the resulting high blood glucose levels do not cause ketosis, but rather lead to osmotic diuresis, and shift of fluid to the intravascular space, resulting in dehydration.
    - Hypothyroidism–is destruction of the thyroid tissue over time that causes an insufficient amount of thyroid hormone in the blood. Myxedema coma is a premorbid consequence of hypothyroidism in the elderly caused by a recent history of surgery, hypothermia, infection, hypoglycemia, and sedative use.
  - Inflammatory arthritis
  - Osteo
    - Osteoporosis-is a bone disease that decreases bone density.
    - Osteoarthritis- is a progressive disease from repetitive trauma to the joints causing destruction of the cartilage. Commonly strikes the hands, knees, hips, and spine.
    - Rheumatoid Arthritis is an autoimmune disorder that affects the joints of the body. Rheumatoid causes inflammation of the joints, resulting in pain and instability of the joints.
  - Immunological system anatomical and physiological changes, and pathophysiology
    - Immunological changes in the elderly
      - The changes in the immunological system of the elderly make them more prone to infections and exacerbations of chronic disease processes. These infections compounded by an inability, due to ageing of the hypothalamus, may not produce a fever in the face of an immunological insult such as a viral, bacterial, or occult infection.
  - Pressure Ulcers- is the decay of body tissue due to pressure on a site. This results in a lack of blood supply and oxygen to the tissues.
    - Evaluation of pathophysiology through history and possible risk factors
    - Areas of concern
    - Stages of Ulcer
  - Herpes Zoster- a highly contagious virus that is manifested by a painful rash that affects the ganglion of a nerve and appears along the affected nerve pathway.
Patients with Special Challenges

EMR
Simple depth, simple breadth
- Recognizing and reporting abuse and neglect

- Recognizing and Reporting Abuse and Neglect
  o Child Abuse
    ▪ Types of abuse
      • Neglect
      • Physical abuse
      • Sexual abuse
      • Emotional abuse
    ▪ Assessment
      • History or scene findings to concern for abuse or neglect
      • Caregiver’s behavior
      • Physical findings
    ▪ Management
      • Reporting
      • Safely transporting
      • Role of child/adult protective services
  o Elder Abuse
    ▪ Types of abuse
      • Neglect
      • Physical abuse
      • Sexual abuse
      • Emotional abuse
      • Financial abuse
    ▪ Epidemiology
    ▪ Assessment
    ▪ Management
    ▪ Legal aspects
    ▪ Documentation

EMT: EMR Material Plus:
Simple depth, simple breadth
Healthcare implications of
- Abuse
- Neglect
- Homelessness
- Poverty
- Bariatrics
- Technology dependent
- Hospice/terminally ill
- Tracheostomy care/dysfunction
- Homecare
- Sensory deficit/loss
- Developmental disability

The EMT Instructional Guidelines in this section include all the topics and material at the EMR level PLUS the following material:

- Abuse and Neglect
  - Child Abuse
    - Types of abuse
      - Neglect
      - Physical abuse
      - Sexual abuse
      - Emotional abuse
    - Assessment
    - Management
    - Legal aspects
    - Documentation
  - Elder Abuse
    - Types of abuse
      - Neglect
      - Physical abuse
      - Sexual abuse
      - Emotional abuse
      - Financial abuse
    - Epidemiology
    - Assessment
    - Management
    - Legal aspects
    - Documentation
- Homelessness/Poverty
  - Advocate for Patient Rights and Appropriate Care
  - Identify Facilities That Will Treat Regardless of Payment
  - Prevention Strategies Will Likely Be Absent, Increasing the Probability of Disease
  - Familiarity With Assistance Resources Offered in Community
- Bariatric Patients
  - Increased Risk for
    - Diabetes
    - Hypertension
    - Heart disease
    - Stroke
  - Patient Handling Issues to
    - Prevent back injuries
• Position the patient to breathe

• Technology Assisted/Dependent
  o Ventilation Devices
  o Apnea Monitoring/Pulse Oximetry
  o Long-Term Vascular Access Devices
  o Dialysis Shunts
  o Nutritional Support (i.e. gastric tubes)
  o Colostomy or Ileostomy

• Hospice Care and Terminally Ill
  o What is Hospice?
    ▪ Comfort care versus curative care
    ▪ Terminally ill as verified by physician
    ▪ Typically cancer, heart failure, Alzheimer’s disease, AIDS
  o EMS Intervention
  o DNR (Do Not Resuscitate) Orders

• Tracheostomy Care
  o Tracheostomy: Surgical Opening From the Anterior Neck Into the Trachea
  o Consists of
    ▪ Stoma
    ▪ Outer cannula
    ▪ Inner cannula
  o Routine Care
    ▪ Keep stoma clean and dry
    ▪ Suction as needed
  o Acute Care

• Sensory Deficits
  o Sight
    ▪ Service dogs
    ▪ Allow patient to take your arm
    ▪ Other
  o Hearing Impaired
    ▪ Hearing aid issues
    ▪ Communication

• Homecare
  o Common for Patients Over Age 65
  o Various Reasons for Calls

• Patient With Developmental Disability
  o Respect as With Any Other Patient
  o Family or Friends May Supply Additional Information
  o Take Special Care to Provide Explanations
AEMT: EMT Material Plus:
Fundamental depth, foundational breadth
Healthcare implications of
- Abuse
- Neglect
- Homelessness
- Poverty
- Bariatrics
- Technology dependent
- Hospice/terminally ill
- Tracheostomy care/dysfunction
- Homecare
- Sensory deficit/loss
- Developmental disability

The AEMT Instructional Guidelines in this section include all the topics and material at the EMT level PLUS the following material:

- Abuse and Neglect
  - Child Abuse
    - Types of abuse
    - Epidemiology
    - Assessment
    - Management
    - Legal aspects
    - Documentation
  - Elder Abuse
    - Types of abuse
    - Epidemiology
    - Assessment
    - Management
    - Legal aspects
    - Documentation
- Homelessness/Poverty
  - Advocate for Patient Rights and Appropriate Care
  - Identify Facilities That Will Treat Regardless of Payment
  - Prevention Strategies Will Likely Be Absent, Increasing the Probability of Disease
  - Familiarity With Assistance Resources Offered in Community
- Bariatric Patients
  - Increased Risk for
    - Diabetes
    - Hypertension
    - Heart disease
    - Stroke
  - Patient Handling Issues
- To prevent back injuries
- To position the patient to breathe

- Technology Assisted/Dependent
  - Ventilation Devices
  - Apnea Monitoring/Pulse Oximetry
  - Long Term Vascular Access Devices
  - Dialysis Shunts
  - Nutritional Support
  - Elimination Diversion

- Hospice Care and Terminally Ill
  - What Is Hospice?
    - Comfort care versus curative care
    - Terminally ill as verified by physician
    - Typically cancer, heart failure, Alzheimer’s disease, AIDS
  - EMS Intervention
  - DNR Orders

- Tracheostomy Care
  - Tracheostomy: Surgical Opening From the Anterior Neck Into the Trachea
  - Consists of
    - Stoma
    - Outer cannula
    - Inner cannula
  - Routine Care
    - Keep stoma clean and dry
    - Change outer cannula as needed
    - Suction as needed
  - Acute Care

- Sensory Deficits
  - Sight
    - Service dogs
    - Allow patient to take your arm
    - Other
  - Hearing Impaired
    - Hearing aid issues
    - Communication
  - Paralysis
    - Hemiplegia
    - Palsy
    - Paraplegia
    - Quadriplegia

- Homecare
  - Common for Patients Over Age 65
  - Various Reasons for Calls

- Patient With Developmental Disability
  - Treat Like Any Other Patient
  - Family or Friends May Supply Additional Information
Take Special Care to Provide Explanations

**Paramedic: AEMT Material Plus:**
Complex depth, comprehensive breadth
Healthcare implications of
- Abuse
- Neglect
- Poverty
- Bariatrics
- Technology dependent
- Hospice/terminally ill
- Tracheostomy care/dysfunction

The Paramedic Instructional Guidelines in this section include all the topics and material at the AEMT level PLUS the following material:

- Abuse and neglect
  - Introduction
    - Epidemiology
    - Definitions of abuse (physical, emotional, sexual) and neglect
  - History
    - Social
    - Financial
    - Ethical
    - Other
  - Assessment
    - Elements in the history or scene concerning for abuse or neglect
    - Assessing the caregiver’s behavior
    - Physical findings concerning for abuse or neglect
    - Benign findings often confused for physical or sexual abuse
  - Management
    - Role of the Prehospital Professional (scene assessment, assessment of the caregiver, communication with the caregiver, documentation, reporting suspected abuse/neglect, safely transporting one or more injured children)
    - Role of Child/Adult Protective Services
    - Role of Medical Examiner and law enforcement
  - Legal aspects
    - Abuse
    - Neglect
    - Assault
    - Sexual assault
  - Risk profile of abuse victim
  - Risk profile of the abuser/assailant
  - Documentation
    - Empirical -- Non judgmental
    - Subjective -- Patient/other description
Objective

Homelessness/Poverty
- Advocate for patient rights and appropriate care
- Identify facilities that will treat regardless of payment
- Prevention strategies will likely be absent, increasing the probability of disease
- Familiarity with assistance resources offered in community
- It is estimated that 41 million Americans and one-third of people living in poverty have no health insurance, and insurance coverage held by many others would not carry them through a catastrophic illness
- Financial challenges for health care can quickly result from loss of a job and depletion of savings
- Financial challenges combined with medical conditions that require uninterrupted treatment (e.g., TB, HIV/AIDS, diabetes, hypertension, mental disorders) or that occur in the presence of unexpected illness or injury, can deprive the patient of basic health care services
- In addition, poor health is closely associated with homelessness, where rates of chronic or acute health problems are extremely high
- Special considerations
  - People with financial challenges are often apprehensive about seeking medical care
  - When caring for a patient with financial challenges who is concerned about the cost of receiving needed health care, explain the following:
    - Patient's ability to pay should never be a factor in obtaining emergency health care
    - Federal law mandates that quality, emergency health care be provided, regardless of the patient's ability to pay
    - Payment programs for health care services are available in most hospitals
    - Government services are available to assist patients in paying for health care
    - Free (or near-free) health care services are available through local, state, and federally-funded organizations
  - In cases where no life-threatening condition exists, counsel the patient with financial challenges about alternative facilities for health care that do not require ambulance transport for emergency department evaluation
  - Consider providing an approved list of alternative health care sites (e.g., a minor-emergency center or health clinic) that can provide medical care at less cost than those charged by emergency departments

Bariatric Patients
- Definition
- Risk factors:
  - Caloric intake that exceeds calories burned
  - Low basal metabolic rate
  - Genetic predisposition for obesity
- Associated with an increased risk for the following:
  - Hypertension
- Stroke
- Heart disease
- Diabetes
- Some cancers
- Injury
  - Long-term health effects
  - Special considerations
  - Patient handling issues
    - to prevent back injuries
    - to position the patient to breathe

- Technology Assisted/Dependent
  - Ventilation devices
  - Apnea monitoring/Pulse Oximetry
  - Long term vascular access devices
  - Dialysis shunts
  - Nutritional support (i.e. gastric tubes)
  - Elimination diversion

- Hospice Care and Terminally Ill
  - What is hospice?
    - Comfort care vs. curative care
    - Terminally ill as verified by physician
    - Typically cancer, heart failure, Alzheimer’s disease, AIDS
  - EMS Intervention
    - DNR (do not resuscitate) orders

- Tracheostomy care/Dysfunction
  - Tracheostomy: surgical opening from the anterior neck into the trachea
  - Consists of
    - Stoma
    - Outer cannula
    - Inner cannula
  - Routine care
    - Keep stoma clean and dry
    - Change outer cannula as needed
    - Suction as needed
  - Acute care

- Technology Assisted Patients
  - Profile of patients requiring adaptive devices
  - Adaptive devices
    - Positive pressure ventilation devices
      - CPAP/BiLevel
      - Ventilators
      - Other
    - Negative pressure ventilation devices
      - Ventilators
      - Phrenic nerve stimulators
      - Diaphragm pacers
- Apnea monitoring/Pulse Oximetry
- Airways -- Tracheostomy tubes
- Long term vascular access devices
  - Midlines
  - PICC lines
  - Central lines
  - Implanted ports
  - Other
- Medication administration systems
- Ventricular assist devices
- CerebroSpinal Fluid (CFS) shunts
- Hemodialysis
- Peritoneal dialysis
- Nutritional support
- Elimination
- Braces
- Mobility
- Wounds
- Other

  - Assessment
  - Management approach

- Pediatrics Developmental Disabilities
  - Impaired or insufficient development of the brain that causes an inability to learn at the usual rate (developmental delay)
  - Causes include the following:
    - Unsatisfactory parental interaction
    - Severe vision or hearing impairment
    - Mental retardation
    - Brain damage
    - Severe diseases of body organs and systems
    - Congenital anomalies
  - Signs of developmental delay
    - Walking upright
    - Fine hand-eye coordination
    - Listening, language, and speech
    - Social interaction
  - Accommodations that may be necessary when providing patient care include allowing adequate time for obtaining a history, performing assessment and patient management procedures, and preparing the patient for transport
  - Down’s Syndrome
    - Features of the patient with Down syndrome:
      - Cellular etiology
        - Results in a triplet of chromosomes 21
        - Extra number 21 chromosome
        - Increased maternal age
        - Family history of Down syndrome
Special considerations
- Life expectancy
- Caregiver interactions
- Common associated disorders
- Cognitive ability of the downs patient

- Autism
  - Features of the patient with Autism:
  - Etiology
  - Special considerations
    - Caregiver interactions
    - Cognitive ability of the autistic patient

- Emotionally impaired
  - People with emotional impairments include those with the following:
    - Neurasthenia (nervous exhaustion)
    - Anxiety neurosis
    - Compulsion neurosis
    - Hysteria
  - Special considerations
    - Signs and symptoms that may result from emotional impairment
    - Complete history and examination
    - Prehospital Management
    - Emotionally/mentally impaired (EMI)

- Physical Needs/Challenges
  - Hearing Impairments
    - Deafness
      - Etiology
      - Types of deafness
    - Sensorineural deafness
  - Hearing impairments
    - Prolonged exposure to loud noise
    - Disease (e.g., Meniere's disease)
    - Tumors
    - Medications
    - Viral infections
    - Natural degeneration of the cochlea and/or labyrinth in old age
    - Auditory process deficits
    - Auditory dyssynchrony
    - Conductive hearing loss
    - Mixed hearing loss
    - Sensorineural hearing loss
  - Special considerations
    - Use of hearing aids

- Visual Impairments
  - Normal vision
  - Visual impairments
- Special considerations
  - Speech impairments
    - Speech impairments include disorders of language, articulation, voice production, or fluency (blockage of speech), all of which can lead to an inability to communicate effectively
  - Speech
    - Language disorders.
    - Language learning disabilities.
    - Language processing disorders.
    - Semantic-pragmatic disorders.
    - Articulation disorders.
    - Phonological process disorders.
    - Motor speech diso
  - Paraplegia/Quadriplegia
    - Define Paraplegia
    - Define Quadriplegia
    - Causes:
      - Motor vehicle crash
      - Sports injury
      - Fall
      - Gunshot wound
      - Medical illness
    - Both paraplegia and quadriplegia are accompanied by a loss of sensation and may have loss of urinary and or bowel control
  - Special considerations
  - Patients with Communicable Diseases
    - Overview
      - Exposure to some infectious diseases can pose a significant health risk to EMS providers
      - It is important to ensure personal protection on every emergency response
      - Required precautions will depend on the mode of transmission and the pathogen's ability to create pathological processes
    - Special considerations
      - Some infectious diseases (e.g., AIDS) will take a toll on the emotional well-being of affected patients, their families, and loved ones
      - Psychological aspects of providing care to these patients include an emphasis on the following:
  - Terminally Ill Patients
    - Overview
      - Paramedics will care for terminally ill patients (patients with advanced stages of disease with an unfavorable prognosis and no known cure)
      - These will often be emotionally-charged encounters that will require a great deal of empathy and compassion for the patient and his or her loved ones
      - If EMS has been summoned to assess late stages of a patient's terminal illness or a change in the patient's condition, gather a complete history and
to ask the patient or family about advance directives and the appropriateness of resuscitation procedures

- Hospice Care—the goal of hospice care is comfort during the end of a terminal illness

  - Special considerations
    - Care of a terminally ill patient will often be primarily supportive and limited to calming and comfort measures, and perhaps transport for physician evaluation
    - Pain assessment and management are important in caring for these patients
    - Following an assessment of the patient's vital signs, level of consciousness, and medication history, medical direction may recommend the administration of analgesics or sedatives to ensure the patient's comfort

- Mental Needs/Challenges

  - Mental illness refers to any form of psychiatric disorder
  - Psychoses
    - Comprises a group of mental disorders in which the individual loses contact with reality
    - Thought to be related to complex biochemical disease that disorders brain function
    - Examples
      - Schizophrenia
      - Bipolar disorder (manic-depressive illness)
      - Organic brain disease
  - Neuroses
    - Refers to diseases related to upbringing and personality in which the person remains "in touch" with reality
    - Neurotic symptoms generally do not limit work or social activity and tend to fluctuate in intensity with stress
    - Examples
      - Depression
      - Phobias
      - Obsessive-compulsive behavior
  - Special considerations
    - Recognizing a patient who is mentally challenged may be difficult, especially when caring for mildly neurotic patients whose behavior may be unaffected
    - Patients with more serious disorders may present with signs and symptoms consistent with mental illness
    - When obtaining the patient history, do not be hesitant to ask about:
      - History of mental illness
      - Prescribed medications
      - Compliance with prescribed medications
      - Concomitant use of alcohol or other drugs
  - If the patient appears to be paranoid or shows anxious behavior, ask the patient's permission before beginning any assessment or performing any procedure
Once rapport and trust have been established, care should proceed in the same manner as for a patient who does not have mental illness (unless the call is related specifically to the mental illness)

- These patients experience illness and injury like all other patients

### Specific Challenges Created by Chronic Conditions

#### Arthritis
- Inflammation of a joint, characterized by pain, stiffness, swelling, and redness
- Has many forms and varies widely in its effects
- Two common forms:
  - Osteoarthritis results from cartilage loss and wear and tear of the joints (common in elderly patients)
  - Rheumatoid arthritis is an autoimmune disorder that damages joints and surrounding tissues

#### Assessment
- Management and transportation strategies
- Consider the patient's limited mobility
- Equipment (e.g., backboards, splints) must be adjusted to "fit the patient" (not vice versa) by supplying adequate padding to fill all voids

#### Cancer
- A group of diseases that allow for an unrestrained growth of cells in one or more of the body organs or tissues
- Malignant tumors most commonly develop in major organs, e.g., the lungs, breasts, intestine, skin, stomach, and pancreas, but may also occur in cell-forming tissues of the bone marrow, and in the lymphatic system, muscle, or bone

#### Special considerations
- Signs and symptoms depend on the cancer's primary site of origin
- Many cancer patients take anticancer drugs and pain medications through surgically implanted ports (e.g., Mediports)
- Transdermal skin patches that contain analgesic agents are common

#### Cerebral Palsy (CP)
- General term for nonprogressive disorders of movement and posture
- Results from damage to the fetal brain during later months of pregnancy, during birth, during the newborn period, or in early childhood

#### Causes
- Produces abnormal stiffness and contraction of groups of muscles
- Child may be categorized as having one of the following conditions:
  - Diplegia—affecting all four limbs, the legs more severely than the arms
  - Hemiplegia—affecting limbs only on one side of the body; the arm usually more severely than the leg
  - Quadriplegia—affecting all four limbs severely; not necessarily symmetrically
  - Athetosis—producing involuntary writhing movements
• Ataxia—producing a loss of coordination and balance
• Hearing defects, epilepsy, and other CNS disorders are commonly present with the disease
• Special considerations
  ▪ Some children with mild CP attend regular schools
  ▪ Those with more severe forms of the disease never learn to walk or effectively communicate, and require lifelong skilled nursing care

  o Cystic Fibrosis (CF) (mucoviscidosis)
    ▪ Inherited metabolic disease of the lungs and digestive system that manifests itself in childhood
    ▪ Caused by a defective recessive gene inherited from each parent
    ▪ Predisposes the individual to chronic lung infections

  o Multiple Sclerosis (MS)
    ▪ Progressive and incurable autoimmune disease of the CNS, in which scattered patches of myelin in the brain and spinal cord are destroyed
    ▪ Cause of MS is unknown; however, it may have a heritable or viral component
    ▪ Disease usually begins early in adult life. MS may develop and progress continually or it may become active for a brief time, and then resume years later
    ▪ Symptoms vary with the affected areas of the CNS and may include:
      • Brain involvement
      • Fatigue
      • Vertigo
      • Clumsiness
      • Muscle weakness
      • Slurred speech
      • Ataxia
      • Blurred or double vision
      • Numbness, weakness or pain in the face
      • Tingling, numbness, or feeling of constriction in any part of the body
      • Extremities that feel heavy and become weak
      • Spasticity
      • Incontinence
      • Symptoms of MS may occur singly or in combination, and may last from several weeks to several months
      • Some patients become disabled, bedridden, and incontinent early in middle life
      • Disabled patients also often suffer from painful muscle spasms, constipation, urinary tract infection, skin ulcerations, and mood swings
      • Disease is managed with medications, physical therapy, and counseling
      • Special considerations
Muscular Dystrophy
- Inherited muscle disorder that results in a slow but progressive degeneration of muscle fibers
- Classified according to the following:
  - Age that symptoms first appear
  - Rate at which the disease progresses
  - Way in which it is inherited
- Muscular dystrophy is incurable
- Most common form of the disease is Duchenne muscular dystrophy

Special considerations
- Young children will be relatively easy to examine and prepare for transport
- Older patients may require additional manpower and resources to assist with moving the patient to the ambulance
- Respiratory support may be indicated in severe cases

Poliomyelitis (polio)
- Infectious disease caused by poliovirus hominis
- Virus is spread through direct and indirect contact with infected feces and by airborne transmission
- Incidence has declined since the Salk and Sabin vaccines were made available in the 1950s
- Signs and symptoms of polio in both the nonparalytic and paralytic forms include the following:
  - Fever
  - Malaise
  - Headache
  - Intestinal upset
- Often, people with the nonparalytic form of polio recover completely
- In the paralytic form, extensive paralysis of muscles of the legs and lower trunk can occur

Special considerations

Previously head-injured patients
- Traumatic brain injury can result from many mechanisms of trauma
- These injuries can affect many cognitive, physical, and psychological skills

Special considerations

Spina Bifida
- Congenital defect in which part of one or more vertebrae fails to develop, leaving part of the spinal cord exposed
- Condition ranges in severity from minimal evidence of a defect to severe disability
- In severe cases, the legs of some children may be deformed with partial or complete paralysis and loss of sensation in all areas below the level of the defect
- Associated abnormalities may include:
  - Hydrocephalus with brain damage
• Cerebral palsy
• Epilepsy
• Mental retardation

○ Special considerations

  ○ Myasthenia Gravis
    ▪ Autoimmune disorder in which muscles become weak and tire easily
    ▪ Damage occurs to muscle receptors that are responsible for transmitting nerve impulses, commonly affecting muscles of the eyes, face, throat, and extremities
    ▪ Rare disease that can begin suddenly or gradually
    ▪ Can occur at any age, but usually appears in women between age 20 and 30, and in men between 70 and 80 years of age
    ▪ Classic signs and symptoms include:
      • Drooping eyelids, double vision
      • Difficulty in speaking
      • Difficulty in chewing and swallowing
      • Difficult extremity movement
      • Weakened respiratory muscles
    ▪ Affected muscles become worse with use, but may recover completely with rest
    ▪ May be exacerbated by infection, stress, medications, and menstruation
    ▪ Can often be controlled with drug therapy to enhance the transmission of nerve impulses in the muscles
    ▪ Special considerations