

# Kansas Emergency Medical Services Education Instructional Guidelines

## EMERGENCY MEDICAL RESPONDER

# Preparatory EMS Systems

Uses knowledge of the Emergency Medical Services (EMS) system, safety/well-being of the Emergency Medical Responder (EMR), and medical/legal issues at the scene of an emergency.

## I. The Emergency Medical Services (EMS) System

### A. The Current EMS Systems

1. Types of systems in EMS
  - a. Fire-based
  - b. Third party service
  - c. Hospital-based
2. Delivery may be different but the goal is the same – based upon community needs/resources

### B. National Highway Traffic Safety Administration (NHTSA) Is Lead Coordinating Agency

### C. Access to the Emergency Medical Services

1. Public Safety Access Point (PSAP)
2. Most communities access through 9-1-1

### D. Education

1. National Scope of Practice Model
  - a. Description of the profession
  - b. Prehospital personnel levels
2. National EMS Education Standards

### E. Authorization to Practice

1. State EMS office
  - a. Determines scope of practice
  - b. Licenses/certifies prehospital personnel
2. Medical oversight
  - a. Protocols
  - b. Quality improvement
  - c. Administrative
3. Local credentialing
4. Employer policies and procedures

## II. Roles, Responsibilities, and Professionalism of EMS Personnel

### A. Roles and Responsibilities

1. Maintain equipment readiness
2. Safety
  - a. Personal
  - b. Patient
  - c. Others on scene
3. Provide scene evaluation and summon additional resources as needed

4. Gain access to the patient
5. Perform patient assessment
6. Administer emergency medical care while awaiting arrival of additional resources
7. Provide emotional support
  - a. Patient
  - b. Patient family
  - c. Other responders
  - d. Bystanders
8. Maintain continuity of care
  - a. Definition
  - b. EMR is the first step in the EMS care ladder
9. Maintain medical and legal standards and assure patient privacy
10. Maintain community relations

## B. Professionalism

1. Characteristics of professional behavior
  - a. Integrity
  - b. Empathy
  - c. Self-motivation
  - d. Appearance and hygiene
  - e. Self-confidence
  - f. Knowledge of limitations
  - g. Time management
  - h. Communications
  - i. Teamwork
  - j. Respect
  - k. Tact
  - l. Patient advocacy
  - m. Careful delivery of care
2. Maintaining certification
  - a. Personal responsibility
  - b. Continuing education
  - c. Skill competency
  - d. Criminal implications
  - e. Fees

## III. Quality Improvement

### A. Dynamic System for Continually Evaluating and Improving Care

1. Patient safety
2. Significant – one of the most urgent health care challenges
3. How errors happen
  - a. Skills/knowledge-based failure
  - b. Rules-based failure
4. How you can help reduce errors
  - a. Debrief calls
  - b. Constantly question assumptions
  - c. Use decision aids/Ask for help

# Preparatory Research

Uses knowledge of the EMS system, safety/well-being of the EMR, and medical/legal issues at the scene of an emergency.

## I. Impact of Research on EMR Care

A. Research Findings Are Important to Identify What Should Be Changed in EMS Assessment and Management and to Improve Patient Care and Outcome

B. Quality Assurance Research for an EMS System Can Improve Service Delivery

C. Data Collection

# Preparatory

## Workforce Safety and Wellness

Uses knowledge of the EMS system, safety/well-being of the EMR, and medical/legal issues at the scene of an emergency.

### I. Standard Safety Precautions

#### A. Baseline Health Assessment

1. Before working in health care, complete a physical examination to determine health status
2. Immunizations should be current while practicing in health care
  - a. Tetanus
  - b. Hepatitis B
  - c. Measles/mumps/rubella (German measles)
  - d. Chicken pox (varicella)
  - e. Influenza
3. Screening for tuberculosis may be required locally

#### B. Hand washing

#### C. Adherence to Standard Precautions/OSHA Regulation

#### D. Safe Operation of EMS/Patient Care Equipment

#### E. Environmental Control

#### F. Occupational Health and Blood borne Pathogens

1. Immunizations
2. Sharps

### II. Personal Protective Equipment

#### A. Standard Precautions Reduce the Risk of Exposure to Diseases Spread Through Blood or Body Fluids or by Respiratory Droplets

#### B. Standard Precautions

1. Hand hygiene
  - a. The most important measure to prevent the spread of infection
  - b. Wash your hands after gloves are removed
  - c. Hand cleansing
    - i. soap and water
    - ii. alcohol-based hand rub
  - d. Cleanse hands with soap, and dry thoroughly
  - e. Cleanse hands and other exposed skin immediately after exposure to blood and body fluids or after personal use of the toilet
2. Gloves
  - a. Wear gloves during patient contacts

- b. If latex allergy is concern, use an alternative type of glove
- 3. Eye protection or face shield
  - a. Goggles or full-face shield
  - b. Use if risk of splash or spray of blood or body fluids
    - i. goggles reduce risk of contamination of eyes; full-face shield reduces risk of contamination of eyes, nose, or mouth
    - ii. use for care of patients who are
      - a) bleeding profusely
      - b) delivering a baby
      - c) vomiting
      - d) coughing up sputum
      - e) have urinated or defecated on self
- 4. Masks
  - a. High-efficiency particulate air (HEPA) or N95 mask for EMR
  - b. Surgical mask for patient
- 5. Gown
  - a. Disposable gowns should be worn if there is a potential for large amounts of blood or body fluids
  - b. If clothing becomes contaminated
    - i. remove as soon as possible
    - ii. shower as soon as possible
    - iii. do not wash contaminated clothes with other personal or family clothing
    - iv. preferably complete i-iii at work
- 6. Sharps (needles, lancets)

#### C. If an exposure occurs

- 1. Clean contaminated area thoroughly with soap and water
- 2. If eyes are involved, flush with water for a minimum of 20 minutes
- 3. Report exposure to the EMS providers who take over care of the patient
- 4. Report exposure to appropriate person identified in your department infection control plan
- 5. Seek immediate follow-up care as identified in your department infection control plan
- 6. Document
  - a. Time and date of exposure
  - b. Circumstances of exposure
  - c. Actions taken after exposure
  - d. Other information required by your agency

#### D. Soiled equipment, sharps, or vehicles

- 1. Cleaning
- 2. Disinfection
- 3. Disposal

## II. Stress Management

### A. Many EMS Situations Can Be Stressful for EMS Personnel

- 1. Dangerous situations
- 2. Physical and psychological demands
- 3. Critically ill or injured patients
- 4. Dead and dying patients

5. Overpowering sights, smells, and sounds
6. Multiple-patient situations
7. Angry or upset patients, family, and bystanders

#### B. EMR Should Be Supportive

#### C. During and Immediately After a Stressful Incident

1. Administer appropriate medical care
2. Cooperate with other personnel
  - a. Law enforcement
  - b. Other EMS providers
  - c. Other emergency responders (i.e., fire, utilities, etc.)
3. Be calm, supportive, and nonjudgmental
4. Allow patients to express feelings, unless behavior is harmful to themselves or others

#### D. Recognize the Warning Signs of Personal Stress

1. Difficulty sleeping and nightmares
2. Irritability with coworkers, family, and friends
3. Feelings of sadness, anxiety, or guilt
4. Indecisiveness
5. Loss of appetite
6. Loss of interest in sexual activity
7. Isolation
8. Loss of interest in work
9. Physical symptoms
10. Feelings of hopelessness
11. Alcohol or drug misuse or abuse
12. Inability to concentrate

#### E. Strategies to Manage Personal Stress

1. Talk about your feelings
2. See a professional counselor
3. Lifestyle changes can reduce stress
  - a. dietary changes
  - b. limit caffeine and alcohol intake
  - c. exercise
  - d. use relaxation techniques

#### F. Dealing with Death and Dying

1. Attempt to resuscitate patients without a pulse or not breathing unless:
  - a. Do Not Resuscitate (DNR) order that meets local guidelines is presented at scene
  - b. Obvious signs of death are present
    - i. tissue decay (putrefaction)
    - ii. rigor mortis
      - a) stiffening of joints that occurs after death
      - b) assess two or more joints to verify
    - iii. injuries not compatible with life
  - c. Attempting resuscitation would endanger your life
2. How to assist grieving patients or family members

- a. Responses to death and dying are very individual
- b. The following may be experienced in any order or some may not be experienced at all
  - i. denial
  - ii. anger
    - a) patient/family projects anger toward others, especially to whom they are closest
    - b) do not take anger personally, even though it may seem directed at you
    - c) be alert to anger that may become physical and endanger you or others
  - iii. bargaining
    - a) patient/family may attempt to negotiate with a spiritual being or EMS providers in an effort to extend life
    - b) be non-judgmental
  - iv. depression
    - a) patient or family exhibits sadness and grief
    - b) affected person is usually withdrawn, sad, and may cry continually
    - c) allow affected person to express feelings and help to understand these are normal feelings associated with death
  - v. acceptance
    - a) patient/family accepts situation and incorporates experience into the activities of daily living in an effort to survive
    - b) use good listening skills and a non- judgmental attitude in this phase

### III. Prevention of Response-Related Injuries

#### A. Exposure to Infectious Diseases

- 1. How infectious diseases are spread
  - a. Through the air by coughing
  - b. Direct contact with infected blood or body fluid
  - c. Needle sticks
  - d. Contaminated food
  - e. Sexually transmitted
- 2. Exposure
  - a. Contact with blood or body fluids of a person with an infectious disease
    - i. patient's blood gets into a cut on your hand or a hangnail
    - ii. you are stuck with a needle used by a patient
    - iii. bloody saliva splashes into your eyes or mouth
  - b. Close contact with a person with an airborne disease (e.g., influenza, tuberculosis, etc.)

#### B. Injury Prevention

- 1. Good personal habits
  - a. Sleep
  - b. Nutrition
  - c. Current immunization status
  - d. Fitness
- 2. Safe response to vehicle collisions
  - a. Traffic hazards
  - b. Deployment of air bags
  - c. Power lines
  - d. Vehicle stability



- e. Other hazards
  - i. fire
  - ii. leaking fluids
- f. Violent or potentially violent persons
- g. Risk factors for violence
- h. Safe response
  - i. law enforcement
  - ii. awareness
  - iii. restraint
- 3. Hazardous material
  - a. Definition
  - b. Assess the scene for signs of hazardous materials if suspected
    - i. binoculars
    - ii. look for placards
    - iii. notify dispatch
  - c. Do not approach the scene if you suspect a hazardous material release
    - i. remain uphill and upwind a safe distance from the scene
    - ii. await specialized resources

#### IV. Lifting and Moving Patients

##### A. Body Mechanics

1. Keep back straight, arms close to body
2. Maintain a firm grip on stretcher or patient
3. Avoid twisting of the body
4. Maintain firm footing
5. Communicate next move clearly to partner or team
6. Use good posture

##### B. Know Your Own Physical Limitations

1. Safe lifting of cots and stretchers
  - a. Power lift
  - b. Squat lift
2. Carrying
  - a. Determine the weight to be lifted
  - b. Communicate with partner or team
  - c. Keep the weight close to your body
  - e. Flex at hips and bend at knees, not waist
3. Reaching
  - a. General guidelines
  - b. Correct reaching for log rolling
4. Pushing and pulling techniques

##### C. Emergency Moves

1. Immediate danger to the patient
  - a. Fire or danger of fire
  - b. Close proximity of explosives or other imminent hazards
  - c. To gain access to others who need lifesaving care
  - d. Cardiac arrest patient

2. Types of emergency moves
  - a. Pull toward the long axis of the body if possible
  - b. Clothing drag
  - c. Blanket drag
  - d. Firefighter's drag
  - e. Firefighter's carry
3. Urgent moves
  - a. Patients with altered mental status
  - b. Inadequate breathing or shock
  - c. Other situations potentially dangerous to the patient
4. Techniques
  - a. Direct ground lift
  - b. Extremity lift
  - c. Moving patients from a bed to stretcher
    - i. direct carry
    - ii. draw sheet

#### D. Positioning Patients

1. Position of comfort
  - a. Indications for use
  - b. Techniques
2. Recovery position
  - a. Indications for use
  - b. Techniques
3. Supine
  - a. Indications for use
  - b. Techniques

#### E. Restraint

1. Consider medical or trauma as cause for altered mental status
2. Restrain only if patient is a danger to self or others
  - a. When using restraints have police present if possible
  - b. Get approval from medical direction
  - c. Follow local protocols
3. If restraints must be used:
  - a. Have adequate help/Plan your activities
  - b. Use only the force necessary for restraint
  - c. Estimate range of motion of patient's arms and legs and stay beyond range until ready
  - d. Once decision has been made, act quickly
  - e. Have one EMR talk to patient throughout restraining
  - f. Approach with four persons, one assigned to each limb, all at the same time
  - g. Secure limbs with equipment approved by medical direction
  - h. Never secure a patient face down – have access to the airway at all times
  - i. Consider the use of oxygen by non-rebreather mask
  - j. Reassess airway, breathing, and circulation frequently
  - k. Document indication for restraining patient and technique of restraint
  - l. Avoid unnecessary force
4. Types of restraints

# Preparatory Documentation

Uses knowledge of the EMS system, safety/well-being of the EMR, and medical/legal issues at the scene of an emergency.

## I. Recording Patient Findings

### A. Prehospital Care Report

1. Functions
2. Continuity of care
3. Administrative
4. Legal

### B. Document

1. Time of events
2. Assessment findings
3. Emergency medical care provided
4. Changes in the patient after treatment
5. Observations at the scene
6. Disposition
  - a. Refused care
  - b. Patient care released to

# Preparatory EMS System Communication

Uses knowledge of the EMS system, safety/well-being of the EMR, and medical/legal issues at the scene of an emergency.

## I. Communications

### A. Call for Resources

### B. Transfer Care of Patient

1. When other EMS personnel arrive on scene, identify yourself and give a verbal report
  - a. Current patient condition
  - b. Patient's age and gender
  - c. Chief complaint
  - d. Brief, pertinent history of what happened
  - e. How you found the patient
  - f. Major past illnesses
  - g. Vital signs
  - h. Pertinent findings of the physical exam
  - i. Emergency medical care given and response to care

### C. Interact Within the Team Structure

1. Communicate issues concerning the patient and scene to
  - a. Law enforcement
  - b. Other responders

# Preparatory Therapeutic Communication

Uses knowledge of the EMS system, safety/well-being of the EMR, and medical/legal issues at the scene of an emergency.

## I. Principles of Communicating with Patients in a Manner That Achieves a Positive Relationship

### A. Factors for Effective Communication

1. Introduction
  - a. Self
  - b. Partners/team
  - c. Patient introduction
2. Privacy
3. Interruptions
4. Physical environment
  - a. Lighting
  - b. Noises and outside interference
  - c. Distracting equipment
  - d. Distance
  - e. Equal seating, eye level
5. Note-taking

### B. Interviewing Techniques

1. Using questions
  - a. Open-ended questions
  - b. Closed or direct questions
  - c. One question at a time
  - d. Choose language the patient understands
2. Hazards of interviewing
  - a. Providing false assurance or reassurance
  - b. Giving advice
  - c. Leading or biased questions
  - d. Talking too much
  - e. Interrupting
  - f. Using “why” questions

# Preparatory Medical/Legal and Ethics

Uses knowledge of the EMS system, safety/well-being of the EMR, and medical/legal issues at the scene of an emergency.

## I. Consent

### A. Conditions for Consent

1. Decision-making capacity
  - a. Intellectual capacity
  - b. Age of majority (18 years old in most States)
  - c. Ability to make decisions
  - d. May be impaired in cases of
    - i. intoxication (alcohol/drugs)
    - ii. serious injury or illness
    - iii. mental incompetence
    - iv. legal incompetence

### B. Expressed

1. Patient gives permission for care
  - a. Informed consent
  - b. Understanding implications of actions

### C. Implied

1. Inability to consent arising from medical condition
2. Pediatrics

### D. Emancipated Minor

1. Civil rights obtained by person below age of majority (i.e. marriage)
2. Economic self-sufficiency
3. Military service

### E. Pediatrics

1. Parental control
2. Courts assume parental control

### F. Refusal of Care

1. Patients with decision-making capacity of legal age have a right to refuse care
2. Follow local policies related to refusal of care
3. If care is refused, tell the patient
  - a. Treatment that is needed
    - i. why it is needed
    - ii. alternative treatments
  - b. Risks of refusing care
  - c. That EMS may be called again if the patient changes their decision
  - d. Follow local protocols related to refusal under supervision of EMR
4. Notify
  - a. Responding EMS providers
  - b. Medical direction (if required in your local policies)
5. Document the refusal according to local policy
  - a. Have patient sign refusal documentation
  - b. Have witness sign refusal document to patient's signature

## II. Confidentiality

### A. Obligation to Protect Patient Information

### B. Health Information Portability and Accountability Act (HIPAA)

1. Description
2. Protected health information (PHI)
  - a. Identifies the patient
  - b. Relates to physical health, mental health, and treatment
  - c. Can be written or verbal
3. Permitted disclosures of PHI without written patient consent
  - a. Treatment, payment, and operations
  - b. Special situations
    - i. mandatory reporting
    - ii. public health
    - iii. law enforcement (specific situations only)
    - iv. certain legal situations

## III. Advanced Directives/End of Life Issues

### A. Do Not Attempt Resuscitation (DNAR) Order

1. Terminal disease
2. Medical futility (as discussed in the current International Liaison Committee on Resuscitation [ILCOR] consensus statement)
3. Limited resuscitation

### B. Living Wills

1. Advance directives indicating a patient's wishes
2. May not address the EMR in your State

### C. Surrogate Decision-Makers

1. Durable power of attorney for healthcare
2. Healthcare proxy
3. Next of kin

### D. Organ donation

## IV. Types of Court Cases

### A. Civil (Tort)

1. Abandonment
2. Negligence
  - a. A failure to follow the standard of care causes or worsens the patient's injury or illness.
    - i. Four elements must be proven
      - a) duty to act
      - b) breach of duty
        - i) definition
        - ii) failure to provide care needed
        - iii) performed care incorrectly

- c) harm (damage to patient)
- d) proximate causation

### 3. Abandonment

#### B. Criminal

- 1. Assault
- 2. Battery

### V. Evidence Preservation

- A. Emergency medical care of the patient is the EMR's priority
- B. Do not disturb any item at the scene unless emergency medical care requires
- C. Observe and document anything unusual at the scene
- D. Do not cut through bullet or knife holes in clothing
- E. Work closely with appropriate law enforcement authorities

### VI. Statutory Responsibilities

#### A. Scope of Practice

- 1. Definition
- 2. Authority to practice (Medical Practice Act as applicable)
- 3. Professional responsibility
- 4. Duties to patient, medical director, and public
- 5. Government and medical oversight
  - a. Intended to protect public
  - b. Role of medical oversight
    - i. on-line medical direction
    - ii. off-line medical direction

### VII. Mandatory reporting

#### A. Varies by State

#### B. Follow State requirements

#### C. Legally Compelled to Notify Authorities

- 1. Abuse or neglect (child, elder, domestic)
- 2. Some infectious diseases
- 3. Certain crimes

#### D. Legal Liability for Failure to Report

#### E. Fully Document Objective Findings

### VIII. Ethical Principles



A. Defined

1. Morals – concept of right and wrong
2. Ethics – branch of philosophy or study of morality
3. Applied ethics – use of ethical values

B. Decision-Making Models

1. Do no harm
2. In good faith
3. Patient's best interest

DRAFT - 8/19/10

# Anatomy and Physiology

Uses knowledge of anatomy and physiology of the upper airway, heart, vessels, blood, lungs, skin, muscles, and bones as the foundation of emergency care.

## I. Anatomy and Body Functions

### A. Standard Anatomic Terms

1. Patient-oriented directions (patient's left and patient's right)
2. Anterior and posterior
3. Midline, medial, lateral, inferior, superior
4. Distal, proximal

### B. Skeletal System

1. Components
  - a. Skull/Face
  - b. Vertebral column
  - c. Thorax – Ribs and Breastbone
  - d. Pelvis
  - e. Upper extremities
  - f. Lower extremities
2. Joints

### C. Muscular System

1. Function

### D. Respiratory System

1. Upper airway
  - a. Nose
  - b. Mouth/teeth
  - c. Tongue/jaw
  - d. Throat/pharynx
  - e. Voice box/larynx
  - f. Epiglottis
2. Lower airway
  - a. trachea/windpipe
  - b. bronchi
  - c. lungs and bronchioles
  - d. alveoli
3. Structures that support ventilation
  - a. chest wall
  - b. diaphragm
  - c. intercostal muscles
4. Function
  - a. ventilation
  - b. respiration
  - c. alveolar/capillary gas exchange

## E. Circulatory System

1. Heart
  - a. chambers
  - b. coronary arteries
2. Blood vessels
  - a. arteries
  - b. veins
  - c. capillaries
3. Blood
  - a. red blood cells
  - b. other blood cells
  - c. plasma
4. Function
  - a. blood flow
  - b. tissue/cell gas exchange
  - c. blood clotting

## F. Skin

1. Structures
  - a. epidermis
  - b. dermis
  - c. subcutaneous layer
2. Functions of the skin
  - a. protection
  - b. temperature control

## II. Life Support Chain

### A. Fundamental Elements

1. Oxygenation
  - a. Alveolar/capillary gas exchange
  - b. Cell/capillary gas exchange
2. Perfusion
  - a. Oxygen
  - b. Glucose
  - c. Removal of carbon dioxide and other waste products
3. Cells need oxygen and glucose to make energy to perform their functions

### B. Issues Impacting Fundamental Elements

1. Composition of ambient air
2. Patency of the airway
3. Mechanics of ventilation
4. Regulation of respiration
5. Transport of gases
6. Blood volume
7. Effectiveness of the heart as a pump
8. Blood vessel size and resistance

## III. Age-Related Variations for Pediatrics and Geriatrics

# Medical Terminology

Uses medical and anatomical terms.

## I. Medical Terminology

### A. Recognizes Simple Medical Prefixes, Suffixes, and Combining Words Such As

1. Cardio-
2. Neuro-
3. Hyper-
4. Hypo-
5. Naso-
6. Oro-
7. Arterio-
8. Hemo-
9. Therm-
10. Vaso-
11. Tachy-
12. Brady-

# Pathophysiology

Uses knowledge of shock and respiratory compromise to respond to life threats.

## I. Respiratory Compromise

### A. Impaired Airway, Respiration, or Ventilation

#### 1. Airway

a. Movement of oxygenated air into and out of lungs is blocked

b. Possible causes

- i. foreign body airway obstruction
- ii. tongue in unconscious patient
- iii. blood or secretions
- iv. swelling
- v. trauma to the neck

#### 2. Respiration

a. Inadequate oxygen breathed in

b. Possible causes

- i. low oxygen environment
- ii. poison gases
- iii. infection of the lungs
- iv. illness or disease that narrows the airway and causes wheezing
- v. excess fluid in the lungs
- vi. excess fluid between the lungs and blood vessels
- vii. poor circulation

#### 3. Ventilation

a. Rate or depth of breathing is not adequate

b. Insufficient volume of air moved in and out of lungs

c. Possible causes

- i. unconscious or altered level of consciousness
- ii. injury to the chest
- iii. poisoning or overdose
- iv. diseases

## II. Shock

### A. Impaired Blood Flow to the Organs and Cells

#### 1. Heart

a. Rate is too slow or very fast

b. Contractions are too weak

c. Related to heart disease, poisoning, excessive rate, or depth of artificial ventilation

#### 2. Blood vessels

a. Unable to constrict

b. Related to neck fractures with spinal cord injury, infection, or anaphylaxis

#### 3. Blood

a. Decrease in the amount of blood or blood components in the blood vessels

b. Related to bleeding, vomiting, diarrhea, or burns

# Life Span Development

Uses knowledge of age-related differences to assess and care for patients.

## I. Infancy (Birth to 1 Year)

### A. Physiology

1. Vital signs
  - a. Normal heart rate in newborns is between 140-160
  - b. Normal respiratory rate in newborns is 40-60 and drops to 30-40 after 1st few minutes of life
  - c. Average systolic blood pressure increases from 70<sub>mmHg</sub> at birth to 90<sub>mmHg</sub> at 1 year
2. Weight
  - a. Normally 3.0-3.5 kg at birth
3. Pulmonary system
  - a. Airways more easily obstructed
  - b. Infants primarily nose breathers until 4 weeks
  - c. Rapid respiratory rates lead to rapid heat and fluid loss
4. Nervous system
  - a. Strong, coordinated suck and gag reflexes
  - b. Well flexed extremities
  - c. Extremities move equally when infant is stimulated

## II. Toddler (12 to 36 Months) and Pre-School Age (3 to 5)

### A. Physiological

1. Vital signs
  - a. Normal heart rate is 80-130 beats per minute in toddlers and 80-120 beats/minute in preschool-age children
  - b. Normal respiratory rate is 20-30 breaths/minute in toddlers and preschool-age children
  - c. Normal systolic blood pressure is 70-100<sub>mmHg</sub> in toddlers and 80-110<sub>mmHg</sub> in preschool-age children
  - d. Normal temperature is 96.8 - 99.6 degrees Fahrenheit
2. Nervous system

## III. School-Age Children (6 to 12)

### A. Physiological

1. Vital signs
  - a. Normal heart rate is 70 - 110 beats per minute
  - b. Normal respiratory rate is 20 - 30 breaths per minute
  - c. Normal systolic blood pressure is 80 - 120 mmHg
  - d. Normal temperature is 98.6 degrees Fahrenheit
2. Bodily functions
  - a. Loss of primary teeth and replacement with permanent teeth begins

#### IV. Adolescence (13 to18)

##### A. Physiological

1. Normal heart rate is 55 - 105 beats per minute
2. Normal respiratory rate is 12 - 20 breaths per minute
3. Normal systolic blood pressure is 80 - 120 mmHg

#### V. Early Adulthood (20 to 40)

##### A. Physiological

#### VI. Middle Adulthood (41 to 60)

##### A. Physiological

1. Normal heart rates average 70 beats per minute
2. Normal respiratory rate average 16 to 20 breaths per minute
3. Normal blood pressure average 120/80 mmHg
4. Vision and hearing become less effective
5. Cardiovascular health becomes a concern
6. Cancer strikes in this age group often
7. Weight control becomes more difficult
8. Menopause in women in late forties and early fifties

##### B. Psychological

1. Approach problems more as challenges than threats
2. Empty-nest syndrome
3. Often burdened by financial commitments to elderly parents and young adult children

#### VII. Late Adulthood (61 and Older)

##### A. Physiological

1. Normal vital signs are dependent on the patient's physical and health status
2. Cardiovascular function changes
  - a. Circulation efficiency decreases
  - b. Tachycardia not well tolerated
  - c. Functional blood volume decreases
3. Respiratory system
  - a. Chest wall weakens
  - b. Gas exchange through alveoli is diminished
  - c. Lung capacity is diminished

# Public Health

Has knowledge of local public health resources and the role EMS personnel play in public health emergencies.

## I. Basic Principles of Public Health

### A. EMS Interface With Public Health

1. EMS is a public health system
  - a. EMS provides a critical public health function
  - b. Collaborations with other public health agencies
2. Roles for EMS in public health
  - a. Health prevention and promotion
    - i. primary prevention-preventing disease development
      - a) vaccination
      - b) education
    - ii. secondary prevention-preventing complications and/or progression of disease
    - iii. health screenings
  - b. Disease surveillance
    - i. EMS providers are first line care givers
    - ii. patient care reports may provide information on epidemics of disease
3. Injury prevention
  - a. Safety equipment
  - b. Education
    - i. car seat safety
    - ii. seat belt use
    - iii. helmet use
    - iv. driving under the influence
    - v. falls
    - vi. fire

## Pharmacology



# Principles of Pharmacology

Uses knowledge of the medications that the EMR may self-administer; administer to a peer; or administer to or assist a patient in taking, in an emergency situation.

## I. Medication safety

## II. Kinds of Medications Used in an Emergency

### A. Forms of Medication administered or assisted administration by the EMR

1. Solid
  - a. Tablets – compressed powders
  - b. Powder – inhalation
2. Liquids
  - a. Enteral (ingested)
  - b. Parenteral (injected)
3. Gases; aerosols – inhalation

### B. Routes of Medication Administration

1. Enteral (ingested)
  - a. Sublingual (e.g., nitroglycerin)
  - b. Oral (e.g., glucose)
2. Parenteral (injected and inhaled)
  - a. Inhaled (e.g., oxygen)
  - b. Injection (e.g., epinephrine)
  - c. Methods of injection
    - i. intramuscular-auto injector

## III. Basic Medication Terminology

### A. Drug Name

1. Generic
2. Trade

### B. Drug Profile

1. Actions
  - a. Pharmacodynamics – impact of age and weight upon medication administration
  - b. Indication
  - c. Intended effects
2. Contraindications
3. Side effects
4. Dose
5. Route

# Medication Administration

Uses knowledge of the medications that EMR may self-administer; administer to a peer; or administer to or assist a patient in taking, in an emergency.

## I. Self-Administration (Intramuscular Injection by Auto injector)

- A. Advantages
- B. Disadvantages
- C. Techniques

## II. Peer Administration (Intramuscular Injection by Auto injector)

- A. Advantages
- B. Disadvantages
- C. Techniques

## III. Assist/Administer Medications to a Patient

### A. Administration versus Assistance of Medications

- 1. Assisting patients in taking prescribed medications
- 2. Administering medication
- 3. Medical Direction
  - a. Off-line; standing orders, written protocols
  - b. On-line; verbal order
    - a) Confirmation – echo technique
    - b) Confusion – clarification

### B. Medication Administration Procedure

- 1. The “rights” of drug administration
  - a. Right patient – prescribed to patient
  - b. Right medication – patient condition
  - c. Right route – patient condition
  - d. Right dose – prescribed to patient
  - e. Right time – within expiration date

### C. Techniques of Medication Administration

- 1. Oral
  - a. Advantages
  - b. Disadvantages
  - c. Techniques

- 2. Sublingual/Buccal

- a. Advantages
- b. Disadvantages
- c. Techniques
- 3. Intramuscular injection by Auto injector
  - a. Advantages
  - b. Disadvantages
  - c. Techniques
- 4. Inhalation
  - a. Advantages
  - b. Disadvantages
  - c. Techniques

D. Reassessment

- 1. Data – indications for medication
- 2. Action – medication administered
- 3. Response – effect of medication

E. Documentation

# Emergency Medications

Uses knowledge of the medications that the EMR may self-administer; administer to a peer; or administer to or assist a patient in taking, in an emergency.

The EMR must know names, effects, indications, routes of administration, and dosages for all of the following emergency medications.

## I. Specific Medications (i.e. Chemical Antidote Auto injector Devices)

### A. EMR – Administer Medications

1. Aspirin – with Medical Direction ONLY
2. Oral glucose
3. Oxygen
4. Epinephrine - Auto injector

### B. EMR – Assisted Medications

1. Metered dose inhaled bronchodilators
2. Nitroglycerin
  - a. tablets
  - b. spray

### C. EMR – Self & Peer

1. Mark I
2. Duo Dote

# Airway Management

Applies knowledge (fundamental depth, foundational breadth) of anatomy and physiology to assure a patent airway, adequate mechanical ventilation, and respiration for patients of all ages.

## I. Airway Anatomy

### A. Upper Airway Tract

1. Nose
2. Mouth and oral cavity
  - a. Alternate airway, especially in emergency
  - b. Entrance to the digestive system
  - c. Also involved in the production of speech
  - d. Tongue
3. Jaw
4. Throat/pharynx
  - a. Oropharynx
  - b. Epiglottis
  - c. Larynx/voice box
    - i. vocal cords
    - ii. thyroid cartilage
    - iii. cricoid cartilage

### B. Lower Airway Tract

1. Trachea/windpipe
  - a. Hollow tube which passes air to the lower airways
  - b. Supported by cartilage rings
2. Bronchi
  - a. Hollow tubes which further divide into lower airways of the lungs
  - b. Supported by cartilage
3. Lungs
  - a. Bronchioles
    - i. thin hollow tubes leading to the alveoli
    - ii. remain open through smooth muscle tone
  - b. Alveoli
    - i. the end of the airway
    - ii. millions of thin walled sacs
    - iii. each alveolus surrounded by capillary blood vessels
    - iv. site where oxygen and carbon dioxide (waste) are exchanged

## II. Airway Assessment

### A. Signs of Adequate Airway

1. Airway is open, can hear and feel air move in and out
2. Patient is speaking in full sentences
3. Sound of the voice is normal for the patient

### B. Signs of Inadequate Airway

1. Unusual sounds are heard with breathing (i.e. stridor or snoring)
2. Awake patient is unable to speak or voice sounds hoarse
3. No air movement
4. Apnea
5. Airway obstruction
  - a. Tongue
  - b. Food
  - c. Vomit
  - d. Blood
  - e. Teeth
  - f. Foreign body

### C. Swelling Due to Trauma or Infection

## III. Techniques of Assuring a Patent Airway (refer to current American Heart Association guidelines)

### A. Manual Airway Maneuvers

1. Head tilt/chin lift
  - a. Purpose
  - b. Indications
  - c. Contraindications
  - d. Complications
  - e. Procedure
  - f. Limitation
2. Jaw thrust maneuver
  - a. To open airway when cervical spine injury is suspected
  - b. Procedure
  - c. If jaw thrust maneuver does not work, use head tilt/chin lift maneuver
3. Modified chin lift
  - a. Purpose
  - b. Indications
  - c. Contraindications
  - d. Complications
  - e. Procedure
  - f. Limitation

### B. Mechanical Airway Devices

1. Oropharyngeal
  - a. Purpose
  - b. Indications
  - c. Contraindications
  - d. Complications
  - e. Procedure
  - f. Limitation
2. Nasopharyngeal
  - a. Purpose
  - b. Indications
  - c. Contraindications
  - d. Complications

- e. Procedure
- f. Limitation

C. Relief of Foreign Body Airway Obstruction (refer to current American Heart Association guidelines)

D. Upper Airway Suctioning

- 1. Purpose
- 2. Indications
- 3. Contraindications
- 4. Complications
- 5. Procedure - soft and rigid suction catheters
  - a. mechanically powered suction devices
    - i. purpose
    - ii. indication
    - iii. contraindications
    - iv. complications
    - v. procedure
    - vi. limitation
  - b. hand-powered suction
    - i. purpose
    - ii. indication
    - iii. contraindications
    - iv. complications
    - v. procedure
    - vi. limitation
  - c. bulb syringe – Meconium Aspiration ONLY
    - i. purpose
    - ii. indication
    - iii. contraindications
    - iv. complications
    - v. procedure
    - vi. limitation
- 6. Limitation

IV. Consider Age-Related Variations in Pediatric and Geriatric Patients

## Airway Management, Respiration, and Artificial Ventilation

# Respiration

Applies knowledge (fundamental depth, foundational breadth) of anatomy and physiology to assure a patent airway, adequate mechanical ventilation, and respiration for patients of all ages.

## I. Anatomy of the Respiratory System

A. Includes All Airway Anatomy Covered in the Airway Management Section

B. Additional Respiratory System Anatomy

1. Chest cage (includes ribs and muscles)
  - a. Intercostal muscles
  - b. Diaphragm

C. Vascular Structures That Support Respiration

1. Pulmonary capillaries
  - a. Picks up oxygen from the alveoli
  - b. Releases carbon dioxide (waste) to the alveoli
2. Heart and blood vessels
  - a. Circulates unoxygenated blood to lungs to pick up oxygen
  - b. Circulates oxygenated blood from lungs through heart to cells of the body

## II. Physiology of Respiration

A. Pulmonary Ventilation

1. Ventilation is defined as the movement of air into and out of the lungs
2. Patients with adequate ventilation are moving normal or near-normal volumes of air

B. Oxygenation

1. Refers to the amount of oxygen dissolved in blood and body fluids
2. Blood that is almost fully saturated with oxygen is described as well-oxygenated blood

C. Respiration

1. The process by which the body captures and uses oxygen and disposes of carbon dioxide
2. External respiration
3. Internal respiration
4. Cellular respiration
  - a. Each cell of the body performs a specific function
  - b. Oxygen and sugar are essential to produce energy for cells to perform their function
  - c. Produce carbon dioxide as a waste product

## III. Pathophysiology of Respiration

A. Pulmonary Ventilation

1. Interruption of nervous control
  - a. Drugs
  - b. Trauma



- c. Muscular dystrophy
- 2. Structural damage to the thorax
- 3. Bronchoconstriction
- 4. Disruption of airway patency
  - a. Infection
  - b. Trauma/burns
  - c. Foreign body obstruction
  - d. Allergic reactions
  - e. Unconsciousness (loss of muscle tone)

#### B. Oxygenation

#### C. Respiration

- 1. External respiration
  - a. Deficiencies due to closed environments
  - b. Deficiencies due to toxic or poisonous environments
- 2. Internal respiration
- 3. Cellular respiration
  - a. Ineffective Circulation
    - i. shock
    - ii. cardiac arrest

#### IV. Assessment of Adequate/Inadequate Respiration (refer to current American Heart Association Guidelines)

##### A. Unresponsive Patient

- 1. Medical patients
  - a. Open and maintain the airway using head-tilt, chin-lift technique
- 2. Trauma patients
  - a. Open and maintain airway using modified jaw thrust technique while maintaining manual cervical stabilization

##### B. Responsive Patient

- 1. If the patient speaks, the airway is functional but may still be at risk
  - a. Foreign body or substances in the mouth may impair the airway and must be removed
    - i. finger sweep (solid objects)
    - ii. suction (liquids)
- 2. If upper airway becomes narrowed, inspiration may produce a high-pitched whistling sound known as stridor
  - a. Foreign body
  - b. Swelling
  - c. Trauma
- 3. Airway patency must be continually reassessed
- 4. Breathing status
  - a. Normal adult breathing
  - b. Abnormal adult breathing
    - i. characteristics
      - a) the respiratory rate is too fast or too slow for the age of the patient
    - ii. management
      - a) administer oxygen to all patients with abnormal breathing

- b) consider assisting breathing with bag-mask and supplemental oxygen if
  - i) unresponsive
  - ii) skin is blue (cyanotic) in color
- c) rate issues
  - i) breathing is too fast for the age of the patient
  - ii) breathing is too slow for the age of the patient
    - (a) verbal/painful stimulus increases rate to normal?
    - (b) assist with bag-mask and supplemental oxygen
    - (c) treat patients, occasionally gasping, as if not breathing
  - iii) breathing is absent
  - iv) assist ventilation with pocket mask or bag-mask with supplemental oxygen
- d) bag-mask ventilations administered via airway adjuncts inserted by higher trained attendants
  - i) blind insertion airway adjuncts
  - ii) endotracheal tubes
- iii. chest rise and fall is shallow
- iv. breathing is noisy
  - a) gurgling noise without secretions in the mouth
  - b) wheezing
- v. effort of breathing
  - a) accessory muscles
    - i) neck
    - ii) between ribs
    - iii) abdomen
  - b) nasal flaring
  - c) tripod position

## V. Management of Adequate and Inadequate Respiration

A. Assure Patent Airway (techniques described in Airway Management section)

B. Techniques for Assuring Adequate Respirations

## VI. Supplemental Oxygen Therapy

A. Portable Oxygen Cylinder

1. Cylinder size
  - a. D – 350 liters
  - b. E – 625 liters
2. Regulators
3. Assembly and use of cylinders
4. Changing a cylinder
  - a. Safe residual for operation is 200 psi
5. Securing and handling cylinders

B. Oxygen Delivery Devices

1. Nasal cannula
  - a. Purpose
  - b. Indications
  - c. Procedure
  - d. Limitation
2. Non-Rebreather (NRB) Mask
  - a. Purpose
  - b. Indications
  - c. Procedure
  - d. Limitation
3. Partial Rebreather Mask
  - a. Purpose
  - b. Indications
  - c. Procedure
  - d. Limitation
4. Simple Face Mask
  - a. Purpose
  - b. Indications
  - c. Procedure
  - d. Limitation
5. Blow by Oxygen Therapy
  - a. Purpose
  - b. Indications
  - c. Procedure
  - d. Limitation
6. Humidifiers
  - a. Purpose
  - b. Indications
  - c. Procedure
  - d. Limitation

VII. Consider Age-Related Variations in Pediatric and Geriatric Patients

# Airway Management, Respiration, and Artificial Ventilation

## Artificial Ventilation

Applies knowledge (fundamental depth, foundational breadth) of anatomy and physiology to assure a patent airway, adequate mechanical ventilation, and respiration for patients of all ages.

### I. Assessment of Adequate and Inadequate Ventilation

#### A. Adequate

1. Respiratory rate is normal
2. Respiration depth is normal
3. Effort of breathing is normal

#### B. Inadequate

1. Abnormal work (effort) of breathing
  - a. Muscles between ribs pull in on inhalation
  - b. Nasal flaring
  - c. Excessive use of abdominal muscles to breathe
  - d. Sweating
  - e. Sitting upright and leaning forward (tripod position)
  - f. Fatigue from work of breathing
2. Abnormal breathing sounds
  - a. Stridor
  - b. Wheezing heard when patient breathes
3. Depth of breathing
  - a. Shallow
  - b. Markedly increased
4. Rate of breathing
  - a. Very slow
  - b. Very fast
5. Chest wall movement or damage
  - a. Paradoxical
  - b. Splinting
  - c. Penetrating
  - d. Asymmetric
6. Irregular respiratory pattern

### II. Oxygenation

#### A. Adequate

1. Mental status considered normal for patient
2. Skin color normal

#### B. Inadequate

1. Ambient air is abnormal
  - a. Enclosed space
  - b. High altitude

- c. Poison gas
- 2. Mental status considered abnormal or altered for patient
- 3. Skin color/mucosa is not normal
  - a. Cyanosis
  - b. Pallor
  - c. Mottling

### III. Management of Adequate and Inadequate Ventilation

#### A. Patients with Adequate Ventilation

#### B. Patients with Inadequate Ventilation

- 1. May be conscious or unconscious
- 2. Assist ventilation during respiratory distress/failure
  - a. Pocket mask
    - i. purpose
    - ii. indications
    - iii. procedure
    - iv. limitation
    - v. pocket mask with oxygen outlet
      - a) advantages
      - b) oxygen flow rate
  - b. Bag-valve-mask with reservoir
    - i. purpose
    - ii. indications
    - iii. procedure
    - iv. limitation
    - v. indications
      - a) apnea
      - b) cardiac arrest
    - vi. procedure
      - a) see manufacturer's instructions for the specific device
      - b) explain the procedure to the patient
      - c) place the mask over the patient's nose and mouth
      - d) initially assist at the rate at which the patient has been breathing
      - e) squeeze the bag each time the patient begins to inhale
      - f) adjust the rate and the delivered tidal volume
    - vii. limitations
      - a) requires oxygen
      - b) difficult to maintain adequate mask seal with one rescuer operation
      - c) must have bag-valve-mask device available
      - d) may interfere with timing of chest compressions during CPR
      - e) must monitor to assure full exhalation
      - f) inadequate mask seal
      - g) difficult to accomplish in combative/hypoxic patients
  - c. Barrier device
    - i. purpose
    - ii. indications
    - iii. procedure

- iv. limitation
- d. Mouth to mouth
  - i. purpose
  - ii. indications
  - iii. procedure
  - iv. limitation
- e. Mouth to nose
  - i. purpose
  - ii. indications
  - iii. procedure
  - iv. limitation
- f. Mouth to stoma
  - i. purpose
  - ii. indications
  - iii. procedure
  - iv. limitation
- g. Sellick's maneuver (cricoid pressure)
  - i. use during positive pressure ventilation
  - ii. reduces amount of air in stomach
  - iii. procedure
    - a) identify cricoid cartilage
    - b) apply firm backward pressure to cricoid cartilage with thumb and index finger
  - iv. do not use if
    - a) patient is vomiting or starts to vomit
    - b) patient is responsive
    - c) breathing tube has been placed by advanced level providers

#### IV. Ventilation of an Apneic Patient

##### A. To Oxygenate and Ventilate the Patient

##### B. Indications

1. No breathing is noted
2. Occasional gasping breathing is noted

##### C. Monitoring Patient

##### D. Limitation

#### V. Differentiate Normal Ventilation from Positive Pressure Ventilation

##### A. Air Movement

1. Normal ventilation
  - a. Creates negative pressure inside the chest
  - b. Air is sucked into lungs
2. Positive pressure ventilation with pocket mask or bag-mask

##### B. Blood Movement

1. Normal ventilation
  - a. Blood returns to the heart from the body
  - b. Blood is pulled back to the heart during normal breathing
2. Positive pressure ventilation
  - a. Blood return to the heart is decreased when lungs are inflated
  - b. Less blood is available for the heart to pump
  - c. Amount of blood pumped out of the heart is reduced

C. Esophageal Opening Pressure

1. Normal ventilation
  - a. Esophagus remains closed during normal breathing
  - b. No air enters the stomach
2. Positive pressure ventilation with a pocket mask or bag-mask
  - a. Air is pushed into the stomach during ventilation
  - b. Excess air in stomach may lead to vomiting

D. Excess rate or depth of ventilation using pocket mask or bag-mask can harm patient. Ventilating too fast or too deep may cause decreased blood pressure, vomiting, or decreased blood flow when the chest is compressed during CPR

VI. Consider Age-Related Variations in Pediatric and Geriatric Patients

# Patient Assessment

## Scene Size-Up

Use scene information and patient assessment findings to identify and manage immediate life threats and injuries within the scope of practice of the EMR.

### I. Scene Safety

#### A. Common Scene Hazards

1. Environmental
2. Hazardous substances
  - a. Chemical
  - b. Biological
3. Violence
  - a. Patient
  - b. Bystanders
  - c. Crime scenes
4. Rescue
  - a. Motor-vehicle collisions
    - i. extrication hazards
    - ii. roadway operation dangers
  - b. Special situations

#### B. Evaluation of the Scene

1. Is the scene safe?
  - a. Yes -- establish patient contact and proceed with patient assessment.
  - b. No -- is it possible to quickly make the scene safe?
    - i. Yes -- assess patient
    - ii. No -- do not enter any unsafe scene until minimizing hazards
  - c. Request specialized resources immediately

### II. Scene Management

#### A. Impact of the Environment on Patient Care

1. Medical
  - a. Determine nature of illness
  - b. Hazards at medical emergencies
2. Trauma
  - a. Determine mechanism of injury
  - b. Hazards at the trauma scene
3. Environmental considerations
  - a. Weather or extreme temperatures
  - b. Toxins and gases
  - c. Secondary collapse and falls
  - d. Unstable conditions



## B. Addressing Hazards

1. Protect the patient
  - a. After making the scene safe, the safety of the patient becomes the next priority
  - b. If conditions cannot be alleviated that represent a health or safety threat to the patient, move the patient to a safer environment
2. Protect the bystanders
  - a. Minimize conditions that represent a hazard for bystanders
  - b. If hazards cannot be minimized, remove bystanders from the scene
3. Request resources
  - a. Multiple patients need additional ambulances
  - b. Fire hazard need fire department
  - c. Traffic or violence issues need law enforcement
4. Scan the scene for information related to
  - a. Mechanism of injury
  - b. Nature of the illness

## C. Violence

1. EMRs should not enter a scene or approach a patient if the threat of violence exists
2. Park away from scene and wait for appropriate law enforcement officials to minimize danger

## D. Need for Additional or Specialized Resources

1. A variety of specialized protective equipment and gear is available for specialized situations
  - a. Chemical and biological suits can provide protection against hazardous materials and biological threats of varying degrees
  - b. Specialized rescue equipment may be necessary for difficult or complicated extrications
  - c. Ascent or descent gear may be necessary for specialized rescue situations
2. Only specially trained responders should wear or use the specialized equipment

## E. Standard Precautions

1. Overview
  - a. Principle that all blood, body fluids, secretions, excretions (except sweat), non-intact skin, and mucous membranes may contain transmissible infectious agents
  - b. Includes prevention practices that apply, regardless of infection status
  - c. Universal precautions were developed for protection of healthcare personnel
  - d. Standard precautions focus on protection of patients
2. Implementation
  - a. The extent of standard precautions used is determined by anticipated exposure
    - i. hand washing
    - ii. gloves
    - iii. gowns
    - iv. masks
    - v. protective eyewear
3. Personal protective equipment
  - a. Personal protective equipment provides limited protection
  - b. Wear PPE appropriate for the potential hazard
    - i. steel-toe boots
    - ii. helmets
    - iii. heat-resistant outerwear

- iv. self-contained breathing apparatus
- v. leather gloves

#### F. Multiple-Patient Situations

- 1. Number of patients and need for additional support
  - a. How many patients?
  - b. Does the dispatch suggest the need for additional support?
  - c. Protection of the patient
    - i. weather or extreme temperatures
    - ii. unstable conditions
  - d. Protection of bystanders
    - i. remove
    - ii. isolate
    - iii. barricade
- 2. Need for additional resources
  - a. Incident Command System (ICS or IMS)
  - b. Consider if this level of commitment is required

# Patient Assessment

## Primary Assessment

Use scene information and patient assessment findings to identify and manage immediate life threats and injuries within the scope of practice of the EMR.

### I. Primary Survey/Primary Assessment

A. Primary Survey Quickly Attempts to Identify Conditions That Represent an Immediate Threat to the Patient's Life

B. Initial General Impression – Based on the Patient's Age-Appropriate Appearance

1. Appears stable
2. Appears stable but potentially unstable
3. Appears unstable Level of Consciousness

C. Level of Consciousness

1. While approaching or making contact with the patient, establish level of consciousness
  - a. Speak to the patient and determine the level of response
  - b. EMR should identify himself or herself
  - c. EMR should explain that he or she is there to help
2. Patient response
  - a. Alert
    - i. the patient appears to be awake
    - ii. the patient acknowledges the presence of the EMR
  - b. Responds to verbal stimuli
    - i. the patient opens his/her eyes in response to the EMR's voice
    - ii. the patient responds appropriately to a simple command
  - c. Responds to painful stimuli
    - i. the patient does not acknowledge presence or EMR nor respond to loud voice
    - ii. patient responds only when the EMR applies some form of irritating stimulus
      - a) irritating stimulus should cause the patient to either attempt to move away from the stimulus or attempt to move the stimulus away from them
      - b) acceptable irritating stimuli
        - i) pinch the patient's ear
        - ii) trapezius squeeze
        - iii) others
  - d. Unresponsive (patient does not respond to any stimulus)

C. Airway Status (refer to the current American Heart Association Guidelines)

1. Unresponsive patient
  - a. Medical patients
    - i. open and maintain the airway with head-tilt, chin-lift technique
    - ii. see the current American Heart Association guidelines for steps in performing this procedure for victims of all ages

- b. Trauma patients
  - i. open and maintain airway with modified jaw thrust technique while maintaining manual cervical stabilization
  - ii. see the current American Heart Association guidelines for the steps in performing this procedure for victims of all ages
- 2. Responsive patient
  - a. If patient speaks, airway is functional but may still be at risk – foreign body or substances in the mouth may impair the airway and must be removed
    - i. finger sweep (solid objects)
    - ii. suction (liquids)
  - b. If upper airway becomes narrowed, inspiration may produce a high-pitched whistling sound known as stridor
    - i. foreign body
    - ii. swelling
    - iii. trauma
  - c. Airway patency must be continually reassessed

#### D. Breathing Status

- 1. Patient responsive
  - a. Breathing is adequate (rate and quality)
    - i. breathing will produce a visible chest rise and fall
    - ii. breathing will be quiet (non-noisy)
    - iii. the adult will not be expending much energy to breath
  - b. Breathing is too fast ( >24 breaths per minute)
  - c. Breathing is too slow (<8 breaths per minute)
  - d. Breathing absent (choking)
- 2. Patient unresponsive
  - a. Breathing is adequate (rate and quality)
  - b. Breathing is inadequate
  - c. Breathing is absent
- 3. Abnormal adult breathing
  - a. Characteristics
  - b. Management
    - i. administer oxygen to all patients with abnormal breathing
    - ii. consider assisting breathing with a bag-mask with supplemental oxygen if
      - a) unresponsive
      - b) skin is blue (cyanotic) in color
    - iii. rate issues
      - a) breathing is too fast for the age of the patient
      - b) breathing is too slow for the age of the patient
        - i) does verbal or painful stimulus increase the rate to normal?
        - ii) assist breathing with a bag-mask with supplemental oxygen
        - iii) treat occasionally gasping patients as if they were not breathing
      - c) breathing is absent
        - i) assist ventilation with a pocket mask or bag-mask with supplemental oxygen
  - c. Chest rise and fall is shallow
  - d. Breathing is noisy
    - i. gurgling noise without secretions in the mouth

- ii. wheezing
- e. Effort of breathing
  - i. accessory muscles
    - a) neck
    - b) between ribs
    - c) abdomen
  - ii. nasal flaring
  - iii. tripod position

#### E. Circulatory Status

1. Is a radial pulse present?
  - a. Yes
    - i. normal - adult heart rate 60-100/min
    - ii. fast - adult heart rate > 100/min
    - iii. slow - adult heart rate < 60/min
    - iv. irregular rate
  - b. Radial pulse absent – assess for carotid pulse
    - i. if carotid pulse present, lay patient flat and elevate feet 8-12 inches
    - ii. no carotid pulse, begin CPR
2. Is any major bleeding present?
  - a. Yes – control the bleeding
  - b. No
3. Is the patient maintaining adequate blood flow (perfusion status)
  - a. Skin color (assess palms of hands in dark-skinned patients)
    - i. pink
    - ii. pale skin may indicate
      - a) low body temperature
      - b) blood loss
      - c) shock (poor blood flow)
      - d) poor blood flow to a body part
    - iii. blue (cyanotic skin) may indicate
      - a) problem with airway, ventilation, respiration
      - b) poor blood flow
  - b. Skin temperature
    - i. cool skin may indicate
      - a) low body temperature
      - b) shock
  - c. Skin moisture
    - i. dry or slightly moist
    - ii. wet or sweaty skin may indicate
      - a) physical exertion
      - b) severe pain
      - c) shock
  - d. Capillary refill (children)
    - i. press on the skin and release
    - ii. color should return to area depressed within two seconds
    - iii. color return in more than two seconds may indicate shock
4. Treat for shock in primary survey if
  - a. Unresponsive to verbal

- b. Heart rate too fast or too slow
- c. Skin signs of shock are present
- 5. Management of shock
  - a. Administer oxygen by non-rebreather mask at 15 liters per minute (if available)
  - b. Lay patient flat

F. Identifying Life Threats

- 1. Assess patient and determine if the patient has a life-threatening condition
  - a. Unstable: treat life-threatening condition is found – treat immediately
  - b. Stable: assess nature of illness or mechanism of injury

G. Assessment of Vital Functions

II. Integration of Treatment/Procedures Needed to Preserve Life

III. Evaluating Priority of Patient Care and Transport

A. Primary Assessment: Stable

B. Primary Assessment: Potentially Unstable

C. Primary Assessment: Unstable

# Patient Assessment

## History-Taking

Use scene information and patient assessment findings to identify and manage immediate life threats and injuries within the scope of practice of the EMR.

### I. Mechanism of Injury or Nature of Illness

#### A. Mechanism of Injury

1. Forces that caused an injury
2. May help predict presence of injuries

#### B. Nature of Illness

1. Ask patient, family, or bystanders why EMS was called
2. Look for clues in environment
  - a. Hot or cold environment
  - b. Presence of drugs or poisons

### II. Determining the Chief Complaint

#### A. The Chief Complaint Is a Very Brief Description of the Reason for Summoning EMS to the Scene

1. The patient may be able to answer all questions about their own chief complaint and history
2. If not, this information may be obtained from
  - a. Family/Friends
  - b. Bystanders
  - d. Public safety personnel
  - e. Medical identification jewelry or other medical information sources
3. How reliable is the data?

#### B. History of the Present Illness

1. Detailed evaluation of the chief complaint
2. Provides a full, clear, chronological account of the signs and symptoms

#### C. Associated Signs and Symptoms

1. Ask the Patient to Describe the Current Problem
  - a. Sign – any medical or trauma finding that can be seen, felt, or heard by the EMR
    - i. Listening to blood pressure
    - ii. Seeing an open wound
    - iii. Feeling skin temperature
  - b. Symptom – any condition that is described to the EMR by the patient
    - i. “I’m having trouble breathing”
    - ii. “I have a headache”
    - iii. “My chest hurts”

#### D. Events Leading to the Illness or Injury

### II. Components of a Patient History

### A. Statistical and Demographic

1. Obtain and accurately document all dates and times
2. Identifying data
  - a. Age
  - b. Gender
  - c. Race/Ethnicity

### B. Past Medical History (pertinent to the Medical Event)

1. Medical, trauma, surgical
2. Consider medical identification tag

### C. Current Health Status (Pertinent to the Medical Event)

1. Focuses on present state of health
2. Environmental conditions
3. Individual factors
  - a. Current medications
  - b. Allergies
  - c. Tobacco use
  - d. Alcohol, drugs, and related substances
  - e. Diet
  - f. Screening tests
  - g. Immunizations
  - h. Environmental hazards
  - i. Use of safety measure (in and out of the home)
  - j. Family history

## III. Techniques of History Taking

### A. Setting the Stage

1. Environment – personal space
2. EMS personnel demeanor and appearance
  - a. Be aware of body language
  - b. Clean, neat, and professional
3. Note-taking
  - a. Difficult to remember all details
  - b. Most patients comfortable with note-taking

### B. Learning About the Present Illness

1. Refer to the patient by name
  - a. Refer to the patient by their last name with the proper title
    - i. Mr., Mrs., or Ms.
    - ii. if they inform you to address them by their first name, do so
  - b. Avoid the use of unfamiliar or demeaning terms such as “granny” or “honey”

### C. Determine Chief Complaint

1. Use a general, open-ended question
2. Follow the patient’s lead
  - a. Facilitation
    - i. posture, actions, or words should encourage the patient to say more



- ii. making eye contact or saying phrases such as “go on” or “I’m listening” may help the patient to continue
- b. Reflection
  - i. repeating the patient’s words encourages additional responses
  - ii. typically does not bias the story or interrupt the patient’s train of thought
- c. Clarification – used to clarify ambiguous statements or words
- d. Empathetic responses – use techniques of therapeutic communication to interpret feelings and your response
- e. Confrontation – may require you to confront patients about their feelings
- f. Interpretation – goes beyond confrontation, requires you to make an inference

#### D. History of the Present Illness

1. Location (where is it?)
2. Onset (when did it start?)
3. Provocation, palliative, and positioning
  - a. What makes it worse?
  - b. What makes it better?
  - c. What position is the patient comfortable?
4. Quality (what is it like?)
5. Radiation (does it move anywhere?)
6. Severity
  - a. Attempt to quantify the pain
  - b. Utilize the scale, 1-10
7. Time
  - a. Duration
  - b. When did it start?
  - c. How long does it last?
8. Associated signs and symptoms
9. Pertinent negative(s)
10. For trauma patients, determine the mechanism of injury

#### E. Assess Past Medical History (Pertinent to the Medical Event)

1. Pre-existing medical conditions or surgeries
2. Medications
3. Allergies
4. Family history
5. Social history; travel history

#### F. Current Health Status

1. Tobacco use
2. Use of alcohol, drugs, and other related substances
3. Diet

### IV. Standardized Approach to History-Taking

#### A. SAMPLE History

1. S = Signs and symptoms
2. A = Allergies
  - a. Medication

- b. Environmental
- 3. M = Medications
  - a. Over the counter (OTC)
  - b. Prescribed
  - c. Vitamins and herbal
  - d. Birth control / erectile dysfunction
  - e. Other people's medication
  - f. Recreational drugs
- 4. P = Past pertinent medical history – relevant information concerning the illness or injury
- 5. L = Last oral intake
  - a. Fluids
  - b. Food
  - c. Other substances
- 6. E = Events leading to the illness or injury
  - a. What were you doing just prior to the illness or injury?

#### B. OPQRST History

- 1. O = Onset – time the signs or symptoms started
- 2. P = Provocative, palliative, and positioning
  - a. What makes it worse?
  - b. What makes it better?
  - c. Positioning
    - i. in what position is the patient found?
    - ii. should the patient remain in that position?
- 3. Q = Quality of the discomfort
  - a. Patient's ability to describe the type of discomfort
    - i. burning
    - ii. stabbing
    - iii. crushing
- 4. R = Radiation
  - a. Does the discomfort move in any direction?
- 5. S = Severity
  - a. Pain scale
- 6. T = Time
  - a. Relating to onset, however, more definitive in regards to initial onset in the history

#### V. Taking History on Sensitive Topics

##### A. Alcohol and Drugs

##### B. Physical Abuse or Violence

##### C. Sexual History

##### D. Special Challenges

- 1. Silent patient
  - a. Silence is often uncomfortable
  - b. Be alert for nonverbal clues of distress
  - c. Silence may be the result of the interviewer's lack of sensitivity

2. Overly talkative patients
  - a. Give the patient free reign for the first several minutes
  - b. Summarize frequently
3. Patient with multiple symptoms
4. Anxious patient
  - a. Anxiety is natural
  - b. Be sensitive to nonverbal clues
  - c. Reassurance
5. Angry and hostile patient
  - a. Understand that anger and hostility are natural
  - b. Often the anger is displaced toward the EMR
  - c. Do not get angry in return
6. Intoxicated patient
  - a. Be accepting, not challenging
  - b. Do not attempt to have patient lower voice or stop cursing; this may aggravate them
  - c. Avoid trapping them in small areas
  - d. Treat with dignity, despite their intoxication
7. Crying patient may provide valuable insight
8. Depressed patient
  - a. Be alert for signs of depression
  - b. Be willing to listen and be non-judgmental
9. Patient with confusing behavior or history
10. Patient with limited cognitive abilities
  - a. Do not overlook the ability of these patients to provide you with adequate information
  - b. Be alert for omissions
11. EMR-patient language barrier-take every possible step to find a translator
12. Patient with hearing problem – if patient can write, have them write questions and answers on paper
13. Patient with visual impairment – always announce your presence and provide careful explanations of everything you are doing
14. Talking with family and friends
  - a. Some patients may not be able to provide you with all information
  - b. Try to find a third party who can help you get the whole story

## VI. Age-Related Variations for Pediatric and Geriatric Assessment and Management

### A. Pediatric

1. Assess infant pulse at brachial artery
2. Capillary refill is a reliable assessment of adequate blood flow in infants and children < six
3. Use distracting measures to gain trust
4. See Special Patient Population section (Pediatrics)

### B. Geriatric

1. Obtain eye glasses and hearing aids
2. Expect history to take more time
3. See Special Patient Population section (Geriatrics)

# Patient Assessment

## Secondary Assessment

Use scene information and patient assessment findings to identify and manage immediate life threats and injuries within the scope of practice of the EMR.

### I. Techniques of Physical Examination

#### A. General Approach

1. Examine the patient systematically
2. Place special emphasis on areas suggested by the present illness and chief complaint
3. Most patients view a physical exam with apprehension/anxiety and feel vulnerable/exposed
4. Maintain professionalism throughout the physical exam while displaying compassion towards your patient

#### B. Respiratory System

1. Expose the chest as appropriate for the environment
2. Chest shape and symmetry
3. Respiratory effort
  - a. Accessory muscle use
  - b. Retractions
4. Auscultation
  - a. Technique – medical versus trauma
  - b. Presence of breath sounds
  - c. Absence of breath sounds

#### C. Cardiovascular System

1. Pulse
  - a. Rate
  - b. Rhythm
  - c. Predictable
  - d. Adjust timing for irregularity
  - e. Strength
  - f. Location
    - i. common locations
    - ii. relation to perfusion
2. Perfusion
  - a. Blood pressure
    - i. equipment size
    - ii. placement of cuff
    - iii. position of patient
    - iv. position of arm
    - v. methods of measurement
      - a) auscultation
      - b) palpation
    - vi. relation to perfusion

#### D. Neurological System

1. Mental status

a. Appearance and behavior

i. assess for level of consciousness (AVPU)

a) alert

b) response to verbal stimuli

i) drowsiness

ii) stupor

(a) state of lethargy

(b) person seems unaware of surroundings

(c) response to painful stimuli

(d) unresponsive

i) coma

(a) state of profound unconsciousness

(b) absence of spontaneous eye movements

(c) no response to verbal or painful stimuli

(d) patient cannot be aroused by any stimuli

ii. observe posture and motor behavior

iii. facial expression

a) anxiety

b) depression

c) anger

d) fear

e) sadness

f) pain

b. Speech and language

i. rate

ii. appropriateness

a) slurred

b) garbled

c) aphasia

c. Mood

i. nature

ii. intensity

iii. suicidal ideation

d. Thought and perceptions

i. assess thought processes

a) logic

b) organization

ii. assess thought content

a) unusual thoughts

b) unpleasant thoughts

iii. assess perceptions

a) unusual

b) hearing things

c) seeing things

e. Memory and attention

i. person

ii. place

iii. time

iv. purpose

E. Musculoskeletal System

1. Pelvic region
  - a. Symmetry
  - b. Tenderness
2. Lower extremities
  - a. Overview
    - i. symmetry
    - ii. surface findings
  - b. General physical findings
    - i. range of motion
    - ii. sensory
    - iii. motor function
    - iv. circulatory function
  - c. Peripheral vascular system
    - i. tenderness
    - ii. temperature of lower legs
    - iii. distal pulses
3. Upper extremities
  - a. Overview
    - i. symmetry
    - ii. strength
    - iii. surface findings
  - b. General physical findings
    - i. range of motion
    - ii. sensory
    - iii. motor function
    - iv. circulatory function
    - v. arm drift
4. Back
  - a. Overview
    - i. symmetry
    - ii. contour
    - iii. surface findings
  - b. General physical findings
    - i. flank tenderness
    - ii. spinal column tenderness

II. Performing a Rapid Full-Body Scan

A. General Approach to the Secondary Assessment

1. Examine the patient systematically
2. Place special emphasis on areas suggested by the chief complaint
3. Patient often feels apprehension/anxiety and vulnerability/exposure during physical exam
  - a. Maintain professionalism throughout the physical exam
  - b. Display compassion towards your patient and family members

## II. Focused Assessment of Pain

A. Should Complete a Secondary Assessment on All Patients Following the Primary Assessment

B. Exam May Focus on Specific Area Based on Patient Complaint (i.e. injury or illness)

C. As Specific Signs and Symptoms are Identified Questions Should Be Asked as Described in Specific Lessons in the Medical and Trauma Sections

D. Perform a Physical Examination to Gather Additional Information

1. Compare one side of the body to the other
2. Inspect (look) and palpate (feel) for the following signs of injury
  - a. Deformities
  - b. Open injuries
  - c. Tenderness
  - d. Swelling
3. Briefly assess the body from head to toe
  - a. Head
    - i. scalp
    - ii. skull
    - iii. face
      - a) symmetry of expression
      - b) appropriate facial expression
    - iv. eyes
      - a) pupil size, shape, and response
        - i) normal – equal and reactive to light
        - ii) abnormal
          - (a) constricted
          - (b) dilated
          - (c) unequal
      - b) conjunctiva color and hydration
    - ii. ears
      - a) drainage or leakage
    - iii. nose
      - a) symmetry
      - b) fluid in nares
    - iv. mouth and pharynx
      - a) vomit, blood
      - b) teeth
        - i) presence
        - ii) condition
      - c) odor
      - d) hydration
    - v. neck
      - a) physical findings
        - i) stoma
        - ii) open wounds
        - iii) accessory muscles of breathing
        - iv) medic alert tags

- v) jugular vein distention
- vi) tracheal deviation
- b) symmetry
- c) masses
- d) arterial pulses
- vi. chest
  - a) overview
    - i) expose appropriately
    - ii) chest shape and symmetry
    - iii) respiratory effort
    - iv) accessory muscle use
    - v) open wounds
  - b) auscultation
    - i) technique – medical versus trauma
    - ii) lung sounds
      - (a) presence of breath sounds - wheezes
      - (b) absence of breath sounds
  - c) anterior chest
    - i) auscultation findings – lungs
    - ii) intercostals muscle use
    - iii) retraction
  - d) posterior chest
    - i) auscultation
    - ii) spinal column
- v. abdomen
  - a) overview
    - i) position patient for examination
    - ii) shape and size
    - iii) palpation method
      - (a) four quadrants
      - (b) palpate affected area last
  - b) physical findings
    - i) pain
    - ii) symmetry
    - iii) scars
    - iv) masses
    - v) protruding organs
    - vi) organ margins
    - vii) contour
    - viii) softness
    - ix) tenderness
    - x) findings associated with pregnancy-physical changes of contour and shape
- vi. Pelvis
- vii. All four extremities
  - a) symmetry
  - b) circulation
    - i) pulses
    - ii) color



- iii) capillary refill – Pediatrics ONLY
  - c) sensation
  - d) movement
4. Immediately treat life-threatening problems found in secondary survey

### III. Assessment of Vital Signs

A. Obtain complete set of vital signs after managing life-threatening problems found in primary survey

B. Vital Signs Provide a Starting Point for Judging the Effectiveness of Prehospital Therapy.

1. Respiratory
  - a. Rate
  - b. Rhythm
  - c. Lung sounds
    - i. presence
    - ii. absence
2. Pulse
  - a. Rate - calculation method
  - b. Rhythm
  - c. Strength
  - d. Location
    - i. common locations
    - ii. relationship of pulse to perfusion
3. Blood pressure
  - a. Measures force of blood against the walls of the artery
  - b. Reported as systolic blood pressure over diastolic blood pressure in mmHg
    - i. systolic blood pressure
      - a) force exerted against the arterial wall when the heart is contracting
      - b) normal adult systolic blood pressure
    - ii. diastolic blood pressure
      - a) force exerted against the arterial wall when the heart is not contracting
      - b) normal adult diastolic blood pressure
  - c. Technique
    - i. equipment
      - a) blood pressure cuff sizes
      - b) stethoscope
    - ii. positioning
      - a) position of the patient
      - b) position of the arm
    - iii. measurement
      - a) auscultation
      - b) palpation
      - c) non-invasive continuous
  - d. Relationship of blood pressure to perfusion
5. Pupils
  - a. measures pupil size, shape, and response
    - i. normal – equal and reactive to light
    - ii. abnormal
      - a) constricted

- b) dilated
- c) unequal

#### IV. Special Considerations for Pediatric and Geriatric Patients

A. Normal Vital Signs by Age

B. See Special Patient Populations Section

DRAFT - 8/9/10

# Patient Assessment Monitoring Devices

Applies scene information and patient assessment findings (scene size-up, primary and secondary assessment, patient history, reassessment) to guide emergency management.

The EMR Instructional Guidelines in this section include the following material:

## I. Blood Glucose Determination

### A. Purpose

1. Assess blood glucose level
2. Assess impact of interventions

### B. Indications

1. Decreased level of consciousness in the suspected diabetic
2. Decreased level of consciousness of unknown origin

### C. Procedure

1. Cleaning the site
2. Refer to manufacturer's instructions for device being used
3. Disposal of sharps

### D. Limitations

1. Lack of calibration

### E. Interpretation (see Medical Emergencies: Endocrine)

## II. Pulse Oximetry

### A. Purpose

1. Assess oxygenation
2. Assess adequacy of oxygen delivery during positive pressure ventilation
3. Assess impact of interventions

### B. Indications

### C. Procedure

1. Refer to the manufacturer's instructions for the specific device being used
2. Considered alternative measurement sites

### D. Limitations

1. General
  - a. Appropriateness of use
  - b. Does not provide a direct measurement of blood oxygen content
  - c. Does not indicate whether body cells can utilize the oxygen present

2. Specific
  - a. Hypoperfusion
  - b. Carbon monoxide
  - c. Cold extremity
  - d. Time lag in detection of respiratory insufficiency

### III. Non-Invasive Blood Pressure

#### A. Purpose

1. Obtaining blood pressure after manual blood pressure

#### B. Indication

1. Routine vital sign
2. Continuous monitoring of patient

#### C. Procedure

1. Refer to the manufacturer's instructions for the specific device being used

#### D. Limitations

1. Erroneous readings or values

# Patient Assessment

## Reassessment

Use scene information and patient assessment findings to identify and manage immediate life threats and injuries within the scope of practice of the EMR.

### I. How and When to Reassess

#### A. Identify and Treat Changes in the Patient's Condition in a Timely Manner

1. Monitor the patient's condition
2. Monitor the effectiveness of interventions
3. Identify trends in the patient's vital signs

#### B. Reassess at Regular Intervals

1. Unstable patient every 5 minutes, but more often if indicated by patient condition
2. Stable patient every 15 minutes or as deemed appropriate by the patient's condition

#### C. Reassessment includes

1. Primary assessment
2. Vital signs
3. Chief complaint
4. Interventions

#### D. Compare to the Baseline Status of That Assessment Component

1. Level of consciousness – is patient maintaining the same level of responsiveness or becoming more/less alert?
2. Airway – recheck the airway for patency
3. Breathing
  - a. Reassess the adequacy of breathing
  - b. Monitor breathing rate, depth, tidal volume and effort
4. Circulation adequacy
  - a. Checking both central and peripheral pulses
  - b. Skin color, temperature, and moisture

#### E. Vital Signs

1. Repeat vital signs as necessary
2. Attention should be paid to:
  - a. Blood pressure
  - b. Pulse
  - c. Respirations
  - d. Pupils

#### F. Chief Complaint

1. Constantly reassess the patient's chief complaint or major injury(s)
  - a. Pain remains the same
  - b. Pain getting worse
  - c. Pain getting better

2. Ask if there are new or previously undisclosed complaints

G. Interventions

1. Reassess the effectiveness of each intervention performed
2. Consider the need for new interventions or modifications to care already being provided

II. Age-Related Considerations for Pediatric and Geriatric Assessment

DRAFT - 8/19/10

# Medicine

## Medical Overview

Applies fundamental knowledge to recognize the need and provide basic emergency care based on assessment findings for an acutely ill patient.

### I. Overview of Medical Complaints

#### A. Assessment

##### 1. Follow a systematic assessment approach

- a. Scene size-up
- b. Primary assessment
- c. History-taking
- d. Secondary assessment
- e. Reassessment

#### B. Manage life-threatening problems as they are discovered

# Medicine

## Neurology

Recognizes and manages life threats based on assessment findings of a patient with a medical emergency.

### I. Review of Anatomy and Functions of the Brain, Spinal Cord, and Cerebral Blood Vessels

### II. Altered Mental Status

- A. Inadequate oxygenation or ventilation
- B. Poisoning or overdose
- C. Infection
- D. Head injury
- E. Behavioral illness
- F. Diabetic conditions

### III. Seizures

- A. Causes
- B. Assessment Findings
  1. Spasms, muscle contractions
  2. Bite tongue, increased secretions
  3. Sweating
  4. Cyanosis
  5. Unconscious gradually increasing level of consciousness
  6. Shaking or tremors and no loss of consciousness
  7. Incontinent
  8. Amnesia of event
- C. Management
  1. Safety of patient/position
  2. ABCs, consider nasopharyngeal airway
  3. Oxygen/suction
  4. Assist ventilation if indicated
  5. Emotional support

### IV. Stroke

- A. Causes
  1. Hemorrhage
  2. Clot



B. Assessment Findings and Symptoms

1. Confused, dizzy, weak
2. Decreasing or increasing level of consciousness
3. Combative, uncooperative, or restless
4. Facial droop, inability to swallow, tongue deviation
5. Double vision or blurred vision
6. Difficulty speaking or absence of speech
7. Decreased or absent movement of one or more extremities
8. Headache
9. Decreased or absent sensation in one or more extremities or other areas of body
10. Coma

C. Management of Patient with Stroke Assessment Findings or Symptoms

1. Scene safety and PPE
2. ABCs/position
3. Oxygen/suction
4. Emotional support

V. Headache

A. As a Symptom

B. As a Neurological Condition

C. Assessment Findings and Symptoms

D. Management

# Medicine

## Abdominal and Gastrointestinal Disorders

Recognizes and manages life threats based on assessment findings of a patient with a medical emergency.

### I. Define Acute Abdomen

### II. Organs of the Abdominopelvic Cavity

- A. Stomach
- B. Intestines
- C. Esophagus
- D. Spleen
- E. Urinary bladder
- F. Liver
- G. Gall bladder
- H. Pancreas
- I. Kidneys
- J. Reproductive organs

### III. Assessment and Symptoms

- A. Techniques
  - 1. Inspection
  - 2. Palpation
- B. Normal findings
  - 1. Soft
  - 2. Non-tender
- C. Abnormal findings
  - 1. Nausea, vomiting, diarrhea
    - a. Excessive
    - b. Blood in emesis or stool
  - 2. Pain
  - 3. Signs of shock
  - 4. Fever
  - 5. Rigidity

#### IV. General Management for Patients with Abdominal Pain

- A. Scene safety and PPE
- B. Airway, ventilation, and circulation
- C. Position of comfort
- D. Emotional support

#### V. Specific Acute Abdominal Conditions

##### A. Gastrointestinal Bleeding

- 1. Causes
- 2. Assessment findings and symptoms
  - a. Bloody vomit (color is red or looks like coffee grounds)
  - b. Blood in stool (color is red or black)
  - c. Signs of shock
- 3. Management
  - a. Standard precautions
  - b. Airway –
  - c. Suction if needed
  - d. Oxygenation/ventilation
    - i. administer oxygen
    - ii. assist with ventilation if indicated
  - e. Position

#### VI. Consider Age-Related Variations for Pediatric and Geriatric Assessment and Management

- A. Pediatrics -- vomiting/diarrhea can cause shock
- B. Geriatric -- abdominal pain may be related to heart attack

# Medicine

## Immunology

Recognizes and manages life threats based on assessment findings of a patient with a medical emergency.

### I. Introduction

A. Anaphylaxis Definition (allergy versus anaphylaxis)

B. Common Substances That Cause Anaphylaxis

### II. Assessment Findings

A. Respiratory system -- severe respiratory distress, wheezing

B. Cardiovascular -- rapid pulse, low blood pressure

C. Skin -- pale, red, or cyanotic; hives, itching, swelling around eyes, mouth, tongue

D. Other -- altered mental status, nausea, vomiting

### III. Management

A. Maintain Airway

B. Administer Oxygen

C. Position

D. Vitals

E. Remove Allergen If Possible

F. Ask If Patient Has Used Epinephrine Auto injector

### IV. Consider Age-Related Variations for Pediatric and Geriatric Assessment and Management

# Medicine

## Infectious Diseases

Recognizes and manages life threats based on assessment findings of a patient with a medical emergency.

### I. Infectious Disease Awareness

#### A. Definitions

1. Infectious disease
2. Communicable disease

#### B. Transmission Routes

1. Direct contact
2. Coughing and sneezing
3. Blood borne
4. Other body fluids

#### C. Standard Precautions (Review content in Preparatory: Workforce Safety)

### II. Equipment Decontamination (Review Content in Preparatory: Workforce Safety)

# Medicine

## Endocrine Disorders

Recognizes and manages life threats based on assessment findings of a patient with a medical emergency.

### I. Overview of endocrine conditions

#### A. Anatomy and Physiology-- Endocrine Glands

1. Thyroid
2. Hypothalamus
3. Pineal
4. Thymus
5. Pituitary
6. Parathyroids
7. Adrenals
8. Pancreas
9. Ovary
10. Testis

#### B. Hormones

1. Cortisol
2. Aldosterone
3. Estrogen
4. Progesterone
5. Testosterone
6. Insulin
7. Parathyroid hormone

### II. Pathophysiology, causes, incidence, morbidity, and mortality, assessment findings, management

#### A. Pancreas disorders--Diabetes mellitus--

1. Pathophysiology of diabetes
  - a. Long-term complications
  - b. Impact on prehospital assessment
2. Diabetes
  - a. Type 1 (formerly known as Juvenile or Type I)
  - b. Type 2 (formerly known as adult-onset or Type II)
  - c. Gestational
  - d. Role of glucose – fuel for body cells to produce energy
3. Drugs to manage diabetes
  - a. Insulins
  - b. Oral agents
  - c. Other hypoglycemic agents
  - d. Drugs to treat hypoglycemia
4. Hypoglycemia – Low blood glucose
  - a. History and assessment findings
    - i. onset—rapid changes in mental status

- ii. bizarre behavior, tremors, shaking
- iii. sweating, hunger
- iv. rapid full pulse, rapid shallow respirations
- v. seizures, coma late
- vi. medical identification jewelry or information
- vii. blood sugar level

b. Management

- i. ABCs
- ii. oxygen
- iii. blood glucose monitoring
- iv. oral glucose

c. Emotional support

5. Hyperglycemia - High blood glucose

a. History and Assessment findings

- i. Onset—slow changes in mental status
- ii. Rapid breathing, sweet smell on breath
- iii. Dehydration, skin pale, warm and dry
- iv. Weakness, nausea, and vomiting
- v. Weak and rapid pulse
- vi. Increased urination, appetite, thirst
- vii. Medical alert identification

b. Management

- i. ABCs
- ii. position
- iii. oxygen
- iv. emotional support
- v. blood sugar level

6. Other disorders of pancreas

B. Thyroid disorders

- 1. Hyperthyroidism
- 2. Hypothyroidism
- 3. Myxedema
- 4. Thyroid storm
- 5. Thyrotoxicosis
- 6. Grave's disease

C. Adrenal disorders

- 1. Addison disease
- 2. Cushing syndrome

D. Other endocrine disorders

II. Age-Related Variations for Pediatric and Geriatric Assessment and Management

A. Pediatrics – seizures

B. Geriatrics -- strokes

# Medicine

## Psychiatric

Recognizes and manages life threats based on assessment findings of a patient with a medical emergency.

### I. Define

### II. Assessment

A. General Appearance

B. Speech

C. Skin

D. Posture/Gait

E. Mental Status

F. Mood, Thought, Perception, Judgment, Memory, and Attention

### III. Behavioral Change

#### A. Factors That May Alter Patient's Behavior

1. Situational stresses
2. Medical illnesses
3. History
4. Psychiatric problems
5. Alcohol or drugs
6. Patient not taking psychiatric medication

#### B. Common Causes of Behavioral Alteration

1. Low blood sugar
2. Lack of oxygen
3. Shock
4. Head trauma
5. Mind altering substances
6. Psychiatric
7. Excessive cold
8. Excessive heat
9. Brain infection
10. Seizure disorders
11. Poisoning or overdose
12. Withdrawal from drugs or alcohol



### C. Behavioral Emergencies That Can Be a Danger to the EMR, Patient or Others

1. Agitation
2. Bizarre thinking and behavior (i.e. hallucinations, paranoia)
3. Danger to self—self-destructive behavior, suicide attempt
4. Danger to others—threatening behavior, violence, weapons

### D. Assessment for Suicide Risk

1. Depression
2. Risk factors/signs or symptoms
  - a. Patient has said or done anything that would indicate possible risk of suicide or violence to self or others
  - b. Certain cultural and religious beliefs
3. Important questions
  - a. How does the patient feel?
  - b. Are you thinking about hurting or killing yourself or anyone else?
  - c. Is patient a threat to self or others?
  - d. Is there a medical problem?
  - e. Is there trauma involved?
  - f. Does the patient have any weapons on self or in purse?
  - g. Interventions?

## IV. Methods to Calm Behavioral Emergency Patients

- A. Acknowledge the Person Seems Upset. Restate That You Are There to Help
- B. Inform the Patient About What You Are Doing
- C. Ask Questions in a Calm, Reassuring Voice
- D. Maintain a Comfortable Distance
- E. Encourage the Patient to State What Is Troubling Him
- F. Do Not Make Quick Moves
- G. Respond Honestly to Patient's Questions
- H. Do Not Threaten, Challenge, or Argue With Disturbed Patients
- I. Tell the Truth; Do Not Lie to the Patient
- J. Do Not "Play Along" With Visual or Auditory Disturbances of the Patient
- K. Involve Trusted Family Members or Friends
- L. Be Prepared to Stay at Scene for a Long Time; Always Remain With the Patient
- M. Avoid Unnecessary Physical Contact; Call Additional Help if Needed

N. Use Good Eye Contact

O. Avoid Threatening Postures

P. Other Assessment Techniques to Keep in Mind

1. Always try to talk patient into cooperation
2. Do not belittle or threaten patients
3. Be calm and patient
4. Reassure the patient
5. Lower distressing stimuli, if possible
6. Avoid restraints unless necessary
7. Treat the patient with respect
8. Protect the patient and yourself

V. Emergency Medical Care

A. Scene Size-Up, Personal Safety

B. Establish Rapport

1. Interviewing techniques
  - a. Acknowledge that you are listening by
    - i. nodding
    - ii. stating phrases such as, “go on” or “I understand
  - b. Be supportive and empathetic
    - i. “I understand that made you angry, sad, upset, etc.”
  - c. Limit interruptions
  - d. Respect patient’s territory, limit physical touch
2. Avoid threatening actions, statements, and questions
3. Approach slowly and purposefully

C. Patient Assessment

1. Ability to make decisions
2. Delusions, hallucinations
3. Unusual worries, fears
4. Anxiety, depression, elation, agitation

D. Calm Patient—Do Not Leave Patient Alone, Unless Unsafe Situation; Consider Need for Law Enforcement

E. Assist Other EMS Responders with Restraint If Necessary

VI. Consider Age-Related Variations for Pediatric and Geriatric Assessment and Management

A. Pediatric Behavioral Emergencies -- teenage suicide concerns

B. Geriatrics -- suicide issues/depression common

# Medicine

## Cardiovascular

Recognizes and manages life threats based on assessment findings of a patient with a medical emergency.

### I. Chest Pain

#### A. Causes

1. Decrease in blood supply to part of the heart muscle
  - a. Heart attack -- death of heart muscle
  - b. Angina -- temporary or incomplete interruption of blood supply to heart muscle
2. Assessment and management of both conditions is the same for EMR

#### B. Assessment

1. Chest discomfort/pain
2. Pain
  - a. Character and location of discomfort
    - i. Quality -- what does the discomfort feel like?
    - ii. Location -- where is the discomfort?
    - iii. Severity -- consider pain scale
  - b. Does the discomfort go anywhere else (radiate) in your body?
    - i. Arms
    - ii. Back
    - iii. Neck
    - iv. Jaw
    - v. Stomach
3. Shortness of breath may occur
  - a. During activity/exercise
  - b. At rest
  - c. Worse when lying flat
4. Skin
  - a. Cold
  - b. Wet/sweaty
5. Other findings
  - a. Nausea or vomiting
  - b. Lightheadedness
6. Vital signs
  - a. Blood pressure
  - b. Pulse
  - c. Respirations (rate of breathing)

#### C. Management

1. High-concentration oxygen
2. Place in position of comfort
3. Encourage the patient to rest
4. Ask if patient has taken any medicine for pain
  - a. Aspirin

b. Nitroglycerin

D. Special considerations

1. Electrode application for ECG monitoring

II. Consider Age-Related Variations for Pediatric and Geriatric Patients for Assessment and Management of Cardiac Compromise

A. Pediatric

1. Heart problems often related to congenital heart condition

2. Cardiac arrest is often caused by a primary respiratory problem

B. Geriatric -- may not have chest discomfort with heart attack

III. Cardiac Arrest (Refer to Shock and Resuscitation section)

# Medicine

## Toxicology

Recognizes and manages life threats based on assessment findings of a patient with a medical emergency.

### I. Introduction

#### A. Define Poisoning

#### B. National Poison Control Center

1. Role
2. When to call
3. National Telephone Number 1-800-222-1222

### II. Carbon Monoxide Poisoning

### III. Poisoning by Nerve Agents

#### A. Define Nerve Agents

#### B. Exposure Routes

1. Inhaled gas
2. Absorbed through skin
3. Ingested from liquid or food

#### C. Onset of Signs and Symptoms

#### D. Assessment Findings

1. Salivation, lacrimation (tearing), urination, defecation, emesis, pupil constriction
2. Blurred or dim vision
3. Difficulty breathing
4. Slow or fast heart rate
5. Muscle twitching, weakness or paralysis
6. Slurred speech
7. Sweating
8. Seizures
9. Loss of consciousness
10. Death

#### E. General Management Considerations

1. Scene safety/special resources
2. Remove patient from contaminated environment as soon as safely possible
3. PPE
4. Decontamination by appropriately trained personnel if indicated
5. Remove clothing
6. Airway control
7. Oxygenate and ventilate

8. Position
9. Administer nerve agent antidote auto injector to self or other rescuer if indicated

#### IV. Nerve Agent Antidote Auto injector Kit

##### A. Types

1. Mark I -- two auto injector syringes each contain a separate drug
  - a. Atropine
  - b. Pralidoxime chloride
2. DuoDote
  - a. One auto injector syringe that contains both atropine and pralidoxime chloride
  - b. FDA-approved 2007

##### B. Administer a Nerve Agent auto injector if

1. You or peer has serious signs/symptoms that indicate presence of nerve agent poisoning
2. You are authorized to do so by medical direction

##### C. Do Not Give the Nerve Agent auto injector if

1. Mild signs and symptoms such as tearing or runny nose are the only signs of nerve agent poisoning present
2. Drugs in the nerve agent auto injector kit
  - a. Atropine
    - i. Increases heart rate
    - ii. Dries secretions
    - iii. Decreases gastric upset
    - iv. Dilates pupils
  - b. 2-PAM Chloride (pralidoxime chloride)
    - i. Muscle twitching
    - ii. Difficulty breathing

##### D. Administration of MARK I™ Kit

1. Wear appropriate PPE
2. Confirm that serious signs and symptoms of nerve agent poisoning are present
3. Confirm correct drug
4. Check expiration date
5. Grasp the atropine syringe
6. Remove the protective yellow cap
7. Press the green end of the injector very firmly against the outer aspect of the patient's upper leg (thigh) at a 90 degree angle
8. Hold for 10 seconds
9. Check for the presence of a needle at the tip to ensure the drug was injected
10. Dispose of syringe appropriately
11. Grasp the pralidoxime chloride syringe
12. Remove the gray protective cap
13. Press the black end of the injector firmly against the outer aspect of the patient's upper leg (thigh) at a 90 degree angle
14. Hold for 10 seconds
15. Check for the presence of a needle at the tip to ensure the drug was injected
16. Dispose of syringe appropriately

17. Reassess the patient's signs and symptoms

E. Administration of the DuoDote™ Kit

1. Wear appropriate PPE
2. Confirm that serious signs and symptoms of nerve agent poisoning are present
3. Confirm correct drug
4. Check expiration date
5. Grasp the syringe with your dominant hand
6. Remove the gray protective cap
7. Press the green (needle) end of the injector very firmly against the outer aspect of the patient's upper leg (thigh) at a 90 degree angle
8. Hold for 10 seconds
9. Check for the presence of a needle at the green tip to ensure the drug was injected
10. Dispose of syringe appropriately
11. Reassess the patient's signs and symptoms

V. Consider Age-Related Variations for Pediatric and Geriatric Assessment and Management

A. Pediatric

1. Toddler-aged prone to ingestion of toxic substances
2. Adolescent prone to experimentation with drugs of abuse

B. Geriatric

1. Medication errors are common for many reasons
2. May cause life threatening conditions

# Medicine

## Respiratory

Recognizes and manages life threats based on assessment findings of a patient with a medical emergency.

### I. Anatomy of the Respiratory System

- A. Upper Airway
- B. Lower Airway
- C. Lungs and Accessory Structures

### II. Normal Respiratory Effort

#### A. Assessment Findings and Symptoms and Management for Respiratory Conditions

1. Respiratory distress
2. Shortness of breath
3. Restlessness
4. Increased pulse rate
5. Changes in respiratory rate or rhythm
6. Skin color changes
7. Abnormal sounds of breathing (i.e. wheezing)
8. Inability to speak
9. Accessory muscle use
10. Altered mental status
11. Abdominal breathing
12. Coughing
13. Tripod position

#### B. Management of Respiratory Distress

1. ABCs, position
2. Oxygen/suction
3. Emotional support

### III. Consider Age-Related Variations for Pediatric and Geriatric Assessment and Management

#### A. Pediatric

1. Upper airway obstruction may be caused by respiratory infections
2. Lower airway disease may be caused by birth problems or infections

#### B. Geriatrics—Pneumonia and Chronic Conditions



# Medicine

## Hematology

Recognizes and manages life threats based on assessment findings of a patient with a medical emergency.

### I. Anatomy and Physiology

#### A. Blood

1. Red blood cells
2. White blood cells
3. Platelets

#### B. Plasma

#### C. Blood-Forming Organs

1. Red cell production
2. Red cell destruction

### II. Pathophysiology of Sickle Cell

### III. Sickle Cell Crisis

#### A. General Assessment

1. Level of consciousness
2. Skin
3. Visual disturbances
4. Gastrointestinal
5. Skeletal
6. Cardiorespiratory
7. Genitourinary

#### B. General Management

1. Airway, ventilation, and circulation
2. Oxygen
3. Transport considerations
4. Psychological/communication strategies

### IV. Clotting Disorders

### V. Consider Age-Related Variations

#### A. Pediatrics

#### B. Geriatrics

# Medicine

## Genitourinary/Renal

Recognizes and manages life threats based on assessment findings of a patient with a medical emergency.

### I. Hemodialysis

#### A. Hemodialysis

1. Used to eliminate water and wastes from the body when the kidneys fail
2. Dialysis machine is connected to an access site at fistula, shunt, or access port

#### B. Special Considerations for Hemodialysis Patients

1. Do not obtain BP in the arm with the dialysis fistula or shunt

#### C. Life-Threatening Emergencies Associated With Dialysis Patients

1. Low blood pressure
2. Nausea/vomiting
3. Irregular pulse, cardiac arrest
4. Bleeding from the access site
5. Difficulty breathing

#### D. Management of a Patient with a Dialysis Emergency

1. Maintain airway
2. Administer oxygen
3. Assist ventilation if indicated
4. Stop bleeding from shunt if present
5. Position
  - a. Flat if signs of shock
  - b. Upright if difficulty breathing

# Medicine

## Gynecology

Recognizes and manages life threats based on assessment findings of a patient with a medical emergency.

### I. Vaginal bleeding

- A. Causes
- B. Assess for signs of shock
- C. Presence of pain
- D. Management
  1. Standard precautions
  2. Administer oxygen
  3. Position

# Medicine

## Non-Traumatic Musculoskeletal Disorders

Recognizes and manages life threats based on assessment findings of a patient with a medical emergency.

### I. Anatomy and physiology review

- A. Bones
- B. Muscles

### II. Pathophysiology

- A. Non-Traumatic Fractures (i.e. cancer or osteoporosis)

### III. Assessment

- A. Pain or Tenderness
- B. Swelling
- C. Abnormal or Loss of Movement
- D. Sensation Changes
- E. Circulatory Changes
- F. Deformity

### IV. Management

- A. Airway, Ventilation, and Circulation
- B. Splinting
- C. Transport Considerations
- D. Communications and Documentation

### V. Consider Age-Related Variations

- A. Pediatric
- B. Geriatric

# Medicine

## Diseases of the Eyes, Ears, Nose, and Throat

Recognizes and manages life threats based on assessment findings of a patient with a medical emergency.

### I. Nosebleed

#### A. Causes

1. Trauma
2. Medical
  - a. Dryness
  - b. High blood pressure

#### B. General Assessment Findings and Symptoms

1. Pain or tenderness
2. Bleeding from nose
3. Vomits swallowed blood
4. Can block airway if patient is unresponsive

#### C. Techniques to Stop Bleeding in Conscious Patient If No Risk of Spine Injury

1. Sit patient up and lean forward
2. Pinch the nostrils together firmly
3. Tell patient not to sniffle or blow nose

# Shock and Resuscitation

Uses assessment information to recognize shock, respiratory failure or arrest, or cardiac arrest based on assessment findings and manages the emergency.

## I. Ethical Issues in Resuscitation

- A. Withholding Resuscitation Attempts
  - 1. Irreversible death
  - 2. Do Not Resuscitate (DNR) orders

## II. Anatomy and Physiology Review

### A. Respiratory System

- 1. Fresh oxygen to enter the lungs and blood supply
- 2. Respiratory waste products to leave the blood and lungs

### B. Cardiovascular System

- 1. Heart – four chambers
  - a. When the heart contracts, a wave of blood is sent through the arteries
  - b. Pumps blood to the lungs to pick up oxygen
  - c. Pumps blood around the body
    - i. to deliver oxygen and nutrients to the tissues
    - ii. to remove waste products from the tissues
- 2. Vascular System
  - a. Arteries carry blood to tissues
  - b. Veins carry blood to heart
  - c. Heart contraction can be felt as a pulse.
    - i. carotid
    - ii. femoral
    - iii. radial
    - iv. brachial
  - d. Veins

## III. Respiratory Failure

### A. Many Causes

- 1. Respiratory infection
- 2. Heart failure
- 3. Chronic respiratory illness
- 4. Trauma

### B. If Untreated, Can Lead to Respiratory Arrest

- 1. No spontaneous respiration
- 2. If not treated, quickly leads to cardiac arrest

### C. Signs and Symptoms

- 1. Altered mental status

2. Cyanosis
3. Inadequate depth and rate of breathing

#### IV. Cardiac Arrest

- A. If the Heart Stops Contracting, No Blood Will Flow
- B. The Body Cannot Survive When the Heart Stops
  1. Brain damage begins 4-6 minutes after the patient suffers cardiac arrest
  2. Damage becomes irreversible in 8-10 minutes
- C. Cardio-pulmonary resuscitation (CPR)
  1. Artificial ventilation oxygenates the blood
  2. External chest compressions squeezes the heart and simulates a contraction
  3. Oxygenated blood is circulated to the brain and other vital organs

#### V. Resuscitation

- A. System Components to Maximize Survival
  1. Early access
    - a. Public education and awareness
      - i. rapid recognition of a cardiac emergency
      - ii. rapid notification before CPR starts – "phone first"
    - b. 911-pre-arrival instructions and dispatcher directed CPR
  2. Early CPR
    - a. Lay public
      - i. family
      - ii. bystanders
    - b. Emergency Medical Responders
  3. Early Defibrillation
  4. Early Advanced Care
- B. Basic Cardiac Life Support (refer to the current American Heart Association guidelines)
  1. Adult CPR and foreign body airway obstruction
  2. Child CPR and foreign body airway obstruction
  3. Infant CPR and foreign body airway obstruction
- C. Airway Control and Ventilation
  1. Basic airway adjuncts
  2. Ventilation
    - a. Delivery of excessive rate or depth of ventilation reduces blood return to the right side of the heart
    - b. reduces the overall blood flow that can be generated with CPR
- D. Chest Compressions
  1. Factors which decrease effectiveness
    - a. Compressions that are too shallow
    - b. Slow compression rate
    - c. Sub-maximum recoil

- d. Frequent interruptions
- 2. Devices to assist circulation
  - a. Impedance Threshold Device
  - b. Mechanical Piston Device
  - c. Load-Distributing Band or Vest CPR

VI. Automated External Defibrillation (AED) (refer to the current American Heart Association guidelines)

- A. Adult
- B. Child
- C. Infant
- D. Special AED Situations
  - 1. Pacemaker
  - 2. Wet patients
  - 3. Transdermal medication patches

VII. Post Resuscitation Support - Refer to the Current American Heart Association Guidelines

- A. Return of Spontaneous Circulation (ROSC)
  - 1. Temperature regulation
  - 2. Organ specific support
    - a. Respiratory system
      - i. ventilation rates
    - b. Cardiovascular system
      - i. monitor
      - ii. leave AED pads in place

VII. Shock (Poor Perfusion)

- A. Results From Inadequate Delivery of Oxygenated Blood to Body Tissues
- B. Can Be a Result of
  - 1. Severe bleeding or loss of fluid from the body
  - 2. Failure of the heart to pump enough oxygenated blood
  - 3. Abnormal dilation of the blood vessels
- C. Signs and Symptoms
  - 1. Extreme thirst
  - 2. Restlessness, anxiety
  - 3. Rapid, weak pulse
  - 4. Rapid, shallow respirations
  - 5. Mental status changes
  - 6. Pale, cool, moist skin
  - 7. Decreased blood pressure (late sign)



#### D. Patient Assessment

1. Complete a scene size-up
2. Perform a primary assessment
3. Obtains a relevant history
4. Perform secondary assessment
5. Perform a reassessment

#### E. Management

1. Manual in-line spinal stabilization, as needed
2. Comfort, calm, and reassure the patient while awaiting additional EMS resources
3. Do not give food or drink
4. Airway control (i.e. adjuncts)
5. Breathing
  - a. Oxygen administration (high concentration)
  - b. Assist ventilation, as needed
6. Circulation
  - a. Attempt to control obvious uncontrolled external bleeding
  - b. Position patient appropriately for all ages
  - c. Keep patient warm - attempt to maintain normal body temperature
  - d. Treat any additional injuries that may be present

# Trauma

## Trauma Overview

Uses knowledge to recognize and manage life threats based on assessment findings for an acutely injured patient. This level of provider should be able to identify and categorize trauma patients and activate the appropriate trauma system response.

### I. Identification and Categorization of Trauma Patients

#### A. Entry-level students need to be familiar with:

##### 1. National Trauma Triage Protocol

a. Centers for Disease Control and Prevention. Guidelines for Field Triage of Injured Patients: Recommendations of the National Expert Panel on Field Triage. MMWR 2008;58 RR-1:1-35.

b. <http://cdc.gov/fieldtriage> contains the National Trauma Triage Protocols and additional instructional materials.

### II. Pathophysiology of the Trauma Patient

#### A. Blunt Trauma

1. Non-bleeding
2. Multiple forces and conditions can cause blunt trauma

#### B. Penetrating Trauma -- high, medium, and low velocity

### II. Assessment of the Trauma Patient

#### A. Major Components of the Patient Assessment

1. Standard precautions
2. Scene size-up
3. General impression
4. Mechanism of injury
5. Primary assessment
6. Baseline vital signs
7. History
8. Secondary assessment
9. Re-assessment

#### B. Mechanism of Injury (MOI)

1. Significant MOI (including, but not limited to)
  - a. Multiple body systems injured
  - b. Vehicle Crashes with intrusion
  - c. Falls from heights
  - d. Pedestrian versus vehicle collision
  - e. Motorcycle crashes
  - f. Death of a vehicle occupant in the same vehicle
2. Non-significant MOI (including, but not limited to)

- a. Isolated trauma to a body part
- b. Falls without loss of consciousness (adult and pediatric)
- 3. Pediatric considerations
  - a. Falls >10 feet without loss of consciousness
  - b. Falls <10 feet with loss of consciousness
  - c. Bicycle collision
  - d. Medium- to high-speed vehicle collision (>25 mph)
- 4. Re-evaluating the MOI
- 5. Special Considerations
  - a. Spinal precautions must be initiated soon as practical based on the MOI
  - b. When practical, roll supine patient on side to allow for appropriate assessment of the posterior body
  - c. Consider the need for ALS backup for all patients who have sustained a significant MOI

### C. Primary Survey

- 1. Airway
  - a. Clear airway; jaw thrust, suction
  - b. Protect airway
- 2. Breathing
  - a. Assess ventilation
  - b. Administer high concentration oxygen
  - c. Check thorax and neck
    - i. deviated trachea
    - ii. tension pneumothorax
    - iii. chest wounds and chest wall motion
    - iv. sucking chest wound
    - v. neck and chest crepitation
    - vi. multiple broken ribs
    - vii. fractured sternum
  - d. Listen for breath sounds
  - e. Circulation
    - i. Apply pressure to sites of external bleeding
    - ii. Radial and carotid pulse locations, B/P determination
    - iii. Jugular venous distention
  - f. Hypovolemia
  - g. Disability
    - i. brief neurological exam
    - ii. pupil size and reactivity
    - iii. limb movement
    - iv. Glasgow Coma Scale
  - h. Exposure
    - i. completely remove all clothes
    - ii. logroll as part of inspection

### D. Secondary Assessment - Head-to-Toe Physical Exam

- 1. Described in detail in Patient Assessment: Secondary Survey

- E. Secondary Assessment
  - 1. Rapid Method
  - 2. Modified secondary assessment

- F. Trauma Scoring
  - 1. Glasgow Coma Score
  - 2. Revised Trauma Score

### III. Management of the Trauma Patient

- A. Rapid Transport and Destination Issues
  - 1. Scene time
  - 2. Air versus ground

- B. Destination Selection

- C. Trauma System Components
  - 1. Hospital categorizations
  - 2. Levels and qualifications

- D. Transport Considerations

DRAFT - 8/19/10

# Trauma

## Bleeding

Uses knowledge to recognize and manage life threats based on assessment findings for an acutely injured patient.

### I. Bleeding

#### A. General Considerations

1. Use standard precautions to reduce risk of exposure to blood or body fluids
2. Estimation of severity of blood loss based on
  - a. Signs and symptoms
  - b. General impression of the amount of blood loss
  - c. Usually unreliable
3. Uncontrolled bleeding or significant blood loss leads to shock and possibly death

#### B. Types of external bleeding

1. Arterial
  - a. Blood spurts from the wound
  - b. Bright, red blood
  - c. May be difficult to control because of high pressure in arteries
  - d. As blood pressure drops, spurting may decrease
2. Venous
  - a. Blood flows as a steady stream
  - b. Darker red than arterial blood
  - c. Bleeding from a vein can be severe
  - d. Normally easier to control than arterial bleeding due to lower venous pressure
3. Capillary
  - a. Blood oozes from capillaries
  - b. Bleeding often clots spontaneously

#### C. Internal Bleeding

1. Injured or damaged internal organs
  - a. May lead to extensive, concealed bleeding
  - b. May cause unexplained shock
2. Injuries to the extremities may lead to serious internal blood loss from long bone fractures
3. Signs and Symptoms
  - a. Discolored, painful, tender, swollen, or firm tissue
  - b. Increased respiratory rate
  - c. Increased pulse rate
  - d. Pale, cool skin
  - e. Nausea and vomiting
  - f. Thirst
  - g. Mental status changes
4. Specific Injuries (i.e. nosebleed)
  - a. Causes
    - i. trauma

- ii. medical
    - a) dryness
    - b) high blood pressure
  - b. General assessment findings and symptoms
    - i. pain or tenderness
    - ii. bleeding from nose
    - iii. vomit
    - iv. swallowed blood
    - v. can block airway if patient is unresponsive
  - c. Techniques to stop bleeding in conscious patient if no risk of spine injury
    - i. sit patient up and lean forward
    - ii. pinch the nostrils together firmly
    - iii. tell patient not to sniffle or blow nose
5. Management of bleeding soft tissue injuries
- a. Expose the wound
    - i. control the bleeding
      - a) apply fingertip pressure (use flats of fingers) directly on point of bleeding
      - b) large wounds may require sterile gauze and direct hand pressure if fingertip pressure does not control bleeding
      - c) consider other measures for bleeding control based on local guidelines
        - i) pressure point
        - ii) tourniquet
        - iii) positioning – Trendelberg
        - iv) pressure bandage
    - ii. prevent further contamination
    - iii. apply sterile dressing to wound and bandage securely in place with tape or roller gauze
      - a) if bleeding oozes through dressing, do not lift off; apply another gauze dressing on top of first and continue to apply pressure
  - b. Keep patient warm
  - c. Position patient flat on back
  - d. Do not give food or drink if shock is suspected
  - e. Treat other injuries

# Trauma

## Chest Trauma

Uses knowledge to recognize and manage life threats based on assessment findings for an acutely injured patient.

### I. Chest Trauma

#### A. Sucking Chest Wound

1. Open wounds of the chest
  - a. May hear gurgling sound from wound as patient breathes in
  - b. Bubbling in blood around the wound
2. Apply an air tight (occlusive dressing)
  - a. Vaseline gauze
  - b. Plastic wrap
  - c. Foil
3. Secure with tape on three sides
4. Position of comfort if no spinal injury suspected

#### B. Impaled Objects in Chest

1. Do not remove the impaled object unless it interferes with chest compressions
2. Manually secure the object
3. Expose the wound area
4. Control bleeding
5. Use a bulky dressing to stabilize the object

# Trauma

## Abdominal and Genitourinary Trauma

Uses knowledge to recognize and manage life threats based on assessment findings for an acutely injured patient.

### I. Abdominal Trauma

#### A. Eviscerations – Open Injury with Organs Sticking Out of the Wound

1. Do not replace organs
2. Cover with thick moist dressing

#### B. Impaled Objects in Abdomen

1. Do not remove the impaled object
2. Manually secure the object
3. Expose the wound
4. Control bleeding
5. Use bulky dressing to stabilize the object



# Trauma

## Orthopedic Trauma

Uses knowledge to recognize and manage life threats based on assessment findings for an acutely injured patient.

### I. Fractures and Dislocations

#### A. Fractures

##### 1. Introduction

a. Isolated fractures are not usually life-threatening; however, fractures of the pelvic bones or the femurs may result in serious blood loss

##### 2. Types

a. Open – bone that is broken and a break in the continuity of the skin has occurred either as a result of the broken bone ends or by forces which caused the fracture

b. Closed – bone that is broken but does not produce a break in the continuity of the skin

#### B. Dislocations

1. Definition – a dislocation occurs when a separation occurs between two bones at their joint

2. Can be extremely painful

#### C. Signs and Symptoms -- may be extremely difficult to distinguish a fracture from a dislocation

1. Deformity or angulation

2. Pain and tenderness

3. Grating

4. Swelling

5. Bruising (discoloration)

6. Exposed bone ends

7. Joint locked into position

8. Impaired function or circulation

#### D. Emergency Medical Care of Bone Injuries

1. After life threats are controlled, allow patient to remain in a position of comfort

2. Apply cold pack to painful, swollen, deformed extremity to reduce swelling and pain

3. Manual extremity stabilization

a. Goal is to prevent movement of the extremity

b. Support above and below an injury

c. Cover open wounds with a sterile dressing

d. Pad to prevent pressure and discomfort to the patient

e. When in doubt, manually stabilize the injury

f. Do not intentionally replace the protruding bones

4. Splint application – in position found

a. soft

i. pillow

ii. commercial

b. rigid

i. commercial

- ii. noncommercial
- c. vacuum

## II. Amputation

- A. Limb or part of a limb is severed
- B. Bleeding may be controlled easily or be difficult to control
- C. Find the severed body part to send to the hospital
- D. Place in a sealed plastic bag
- E. Place plastic bag in a bowl with ice and water
  - 1. do not allow the amputated part become saturated with water
  - 2. never place amputated part directly on ice

# Trauma

## Soft Tissue Trauma

Uses knowledge to recognize and manage life threats based on assessment findings for an acutely injured patient.

### I. Abrasion

- A. Outermost layer of skin is scraped off
- B. Painful
- C. Superficial
- D. No bleeding or small amount of blood oozes from wound

### II. Laceration

- A. Cut or Break in Skin
- B. May Occur Alone or With Other Soft Tissue Injuries
- C. Caused by Forceful Impact With Sharp Object
- D. Bleeding May Be Severe

### III. Penetration/Puncture

- A. Caused by Sharp Pointed Object
- B. May Be Little or No External Bleeding
- C. Internal Bleeding May Be Severe
- D. Exit Wound May Be Present
- E. Examples
  1. Gunshot wound
  2. Stab wound

### IV. Impaled Object

- A. Object That Creates the Puncture Wound Remains Embedded
- B. Leave in Place Unless It Is in the Cheek with Uncontrolled Bleeding
- C. Apply Pressure Around the Object and Secure in Place

## D. Avoid Movement

## V. Foreign Body in Eye

### A. Dirt, Dust, or Chemical

### B. Signs and Symptoms

1. Pain, tearing, redness
2. Vision may be blurred

### C. Treatment

1. Standard precautions
2. Lay patient flat
3. Tilt head to affected side so debris or chemical does not flow into unaffected eye
4. Hold eye lid open with gloved hand
  - a. Apply pressure to bones around the eye while holding lid open
  - b. Never press on the eye itself
5. Flush for at least 15 minutes with water or normal saline

## VI. Burns

### A. Incidence of Burn Injury

1. Morbidity/Mortality
2. Risk Factors

### B. Anatomy and Physiology of Burns

#### 1. Types of Burns

##### a. Thermal

- i. Types
- ii. Severity related to
  - a) exposure time
  - b) temperature

iii. Enclosed space versus open

iv. Scalds with unusual history patterns may be abuse

##### b. Inhalation

- i. Airway obstruction due to swelling may be very rapid
- ii. Carbon monoxide inhalation
- iii. Enclosed space vs. open space

##### c. Chemical

- i. Severity related to
  - a) type of chemical
  - b) concentration of chemical
  - c) duration of exposure
- ii. Solutions and powders are different

##### d. Electrical

- i. External burns may not indicate seriousness of burn
- ii. Entrance and exit wounds
- iii. May cause cardiac arrest
- iv. Lighting strikes may cause cardiac arrest

e. Radiation

B. Depth Classification of Burns

1. Superficial involves only the outer layer of the skin
  - a. pain
  - b. redness of the skin
  - c. swelling
2. Partial-thickness involves the outer and middle layer of the skin
  - a. deep intense pain
  - b. reddening
  - c. blisters or moist appearance
3. Full-thickness extends through all layers of the skin
  - a. white, yellow, tan, brown or charred appearance
  - b. leathery feel
  - c. no pain in those areas
    - i. Usually there is pain in surrounding areas with other depth of burns

C. Extent of burn

1. How much of the body surface is burned
2. Has a large influence on whether the patient develops
  - a. shock
  - b. other complications related to burns
3. Rule of nines

D. Special management considerations

1. Stop the burning process with brief application of clean room temperature water or saline
2. Remove smoldering clothing and jewelry
  - a. some clothing may have melted to the skin
  - b. if you meet resistance when removing clothing, leave in place
3. Continually monitor the airway and breathing
4. Burned in enclosed space or on face may be at high risk of swelling of airway or other breathing problems
5. Cover the burned area with a dry, clean dressing
  - a. do not apply any ointment, lotion, or antiseptic
  - b. do not break blisters
  - c. keep the patient warm
6. Chemical burns
  - a. scene safety
  - b. gloves and eye protection
  - c. brush off dry powder
  - d. flush with copious amounts of water
  - e. consider eye burns if splash injury and flush with water
7. Electrical burns
  - a. scene safety -- never touch a patient in contact with an electric source
  - b. often internal damage more severe than external injuries appear
  - c. patient may be in cardiac arrest when EMR arrives
8. Radiation burns
9. Thermal burns
10. Inhalation burns

## 11. Infant and child considerations

- a. skin covers greater body surface area in relation to the total body size
- b. greater fluid and heat loss
- c. keep environment warm when possible
- d. consider possibility of child abuse

## VII. Dressings and Bandages

### A. Function

1. Control bleeding
2. Absorb drainage
3. Prevent contamination

### B. Dressings

1. Usually sterile
2. Types
  - a. Sterile gauze pads
  - b. Non-stick gauze pads
  - c. Occlusive dressings
  - d. Trauma dressings

### C. Bandages

1. Hold dressings in place
2. Types
  - a. Adhesive bandages
  - b. Roller gauze
    - i. elastic
    - ii. non-elastic
  - c. Tape

### D. Application

1. Dressings
2. Bandages

# Trauma

## Head, Facial, Neck, and Spine Trauma

Uses knowledge to recognize and manage life threats based on assessment findings for an acutely injured patient.

### I. Head, Face, Neck, and Spine Trauma

#### A. Injuries to the Brain and Skull

1. Head injuries
  - a. Open injuries may present with bleeding
  - b. Closed injury may present with swelling or depression of skull bones
  - c. Brain injury may lead to altered consciousness with airway and breathing problems
2. Scalp injuries
  - a. May bleed more than expected because of the number of blood vessels in the scalp
  - b. Control bleeding with direct pressure
  - c. Severe bleeding from the scalp can cause shock in infants and young children
3. Injury to the brain
  - a. Injury of brain tissue or bleeding inside the skull may increase pressure on the brain
  - b. Altered mental status
4. Special Management Considerations
  - a. Maintain airway/ ventilation/oxygenation
  - b. Primary assessment with manual in-line spinal stabilization should be done on scene
  - c. Monitor the patient's mental status
  - d. Dress and bandage open wound as indicated in the emergency medical care of soft tissue injuries

#### B. Injuries to the Spine

1. Mechanism of injury
  - a. Motor vehicle crashes
  - b. Pedestrian – vehicle collisions
  - c. Falls
  - d. Blunt trauma
  - e. Penetrating trauma to head, neck, or torso
  - f. Motorcycle crashes
  - g. Hangings
  - h. Springboard or platform diving accidents
  - i. Unresponsive trauma patients
2. Signs and symptoms
  - a. Tenderness in the area of injury
  - b. Pain associated with moving
    - i. do not ask the patient to move to try to find a pain response
    - ii. do not move the patient to test for a pain response
  - c. Pain independent of movement or palpation
  - d. Numbness, weakness, or tingling in the arms or legs
  - e. Unable to feel or move below the suspected level of injury
  - f. Loss of feeling or movement in the upper or lower extremities

- g. Difficulty breathing or shallow breathing
- h. Loss of bladder and/or bowel control
- i. If patient can walk, move, and feel arms/legs it does not rule out the possibility of injury to the bones of the spine or the spinal cord
- 3. Assessing the patient with a possible spine injury
  - a. Responsive patient
    - i. manually stabilize head and neck in the position found
    - ii. mechanism of injury
    - iii. questions to ask
      - a) does your neck or back hurt?
      - b) what happened?
      - c) where does it hurt?
      - d) can you move your hands and feet?
      - e) can you feel me touching your fingers?
      - f) can you feel me touching your toes?
  - b. Unresponsive patient
    - i. maintain airway
    - ii. assist ventilation if inadequate
    - iii. administer oxygen
    - iv. stabilize head and neck manually in the position found
    - v. obtain information from bystanders to determine mechanism of injury and patient's mental status before your arrival
  - c. Complications
    - i. inadequate breathing effort
    - ii. paralysis
- 4. Special management consideration
  - a. Establish and maintain manual stabilization
    - i. maintain constant manual stabilization
    - ii. may be released when additional EMS resources have applied a cervical collar and properly secured patient's torso and head to a backboard
  - b. Spinal Immobilization
    - i. Suspect cervical spine injury based on mechanism of injury at scene assessment
      - a) management of patient wearing a helmet – consider helmet removal
      - b) types of helmets
    - ii. Cervical collar application
    - iii. Long spine board
      - a) supine
      - b) standing
    - iv. Short spine board/seated immobilization device
  - c. Psychological support
  - d. Effective communication and appropriate documentation
  - e. Primary assessment
    - i. when possible, airway control should be done without moving patient's head
    - ii. when possible, artificial ventilation should be done without moving head
    - iii. assess pulse, movement, and feeling in all extremities



# Trauma

## Nervous System Trauma

Uses knowledge to recognize and manage life threats based on assessment findings for an acutely injured patient.

No knowledge related to the competency is applicable at this level.

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# Trauma

## Special Considerations in Trauma

Uses knowledge to recognize and manage life threats based on assessment findings for an acutely injured patient.

### I. Pregnant Patient

#### A. Recognition

1. Pregnant women who have suffered injuries should be evaluated in the emergency room

#### B. Management

1. If the woman is having symptoms related to shock, high-concentration O<sub>2</sub> should be applied
2. Third trimester patient
  - a. Place on left side unless spinal injury is suspected
  - b. If spinal injury suspected tilt spine board to patient's left after patient is fully secured to the board

### II. Pediatric Patient

#### A. Recognition

1. Heavy head with weak neck muscles in children increase risk of cervical spine injury
2. Accessory muscle use more prominent during respiratory distress
3. Slow pulse rate indicates hypoxia
4. Normal blood pressure may be present in compensated shock
5. Shaken baby syndrome may cause brain trauma

#### B. Management

1. Manage hypovolemia and shock as for adults
2. Prevent hypothermia in shock
3. Transport to appropriate facility
4. Pad from shoulders to hips during cervical immobilization to prevent flexion neck
5. Ventilate bradycardic pediatric patient

### III. Elderly Patient

#### A. Recognition

1. Changes in pulmonary, cardiovascular, neurologic, and musculoskeletal systems make older patients susceptible to trauma
2. Circulation changes lead to inability to maintain normal vital signs during hemorrhage, blood pressure may drop sooner
3. Multiple medications are more common and may affect:
  - a. Assessment, especially vital signs
  - b. Blood clotting
4. Skeletal changes cause curvature of upper spine, may require padding during immobilization
5. Dentures may cause airway obstruction
6. Falls are often the result of medical conditions

## B. Management

1. Suctioning is important in elderly patients due to decreased cough reflex
2. Skeletal changes cause curvature of the upper spine, may require padding during spinal immobilization
3. Prevent hypothermia
4. Broken bones are common

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# Trauma

## Environmental Emergencies

Uses knowledge to recognize and manage life threats based on assessment findings for an acutely injured patient.

### I. Environmental Emergencies

#### A. Exposure to Cold

##### 1. Generalized cold emergency

###### a. Contributing factors

- i. cold environment
- ii. wet environment
- iii. wind
- iv. age (very old/very young)
- v. medical conditions
- vi. alcohol/drugs/poisons

###### b. Signs and symptoms of generalized hypothermia

- i. obvious exposure
- ii. subtle exposure
  - a) underlying illness
  - b) overdose/poisoning
  - c) ambient temperature decreased (e.g., cool home of elderly patient)
- iii. cool/cold skin temperature
  - a) place back of your hand between clothing and patient's abdomen to assess general temperature of the patient
  - b) the patient experiencing generalized cold emergency will present with cool or cold abdominal skin temperature
- iv. shivering
- v. decreasing mental status or motor function
  - a) Depends on the degree of hypothermia
  - b) Poor coordination
  - c) Memory disturbances/confusion
  - d) Reduced or loss of touch sensation
  - e) Mood changes
  - f) Less communicative
  - g) Dizziness
  - h) Speech difficulty
  - i) Stiff or rigid posture
  - j) Muscular rigidity
  - k) Poor judgment – patient may actually remove clothing
  - l) Complaints of joint/muscle stiffness

###### vi. Slow pulse

###### c. Management

- i. move to a warm environment as soon as possible
- ii. remove wet clothing
- iii. wrap patient in warm blankets

- iv. handle gently
  - v. assess pulses for 30-45 seconds to determine no pulse before starting CPR
  - vi. if AED states that shock is indicated, defibrillate
2. Local cold emergencies
- a. Freezing or near freezing of a body part
  - b. Usually occurs in fingers, toes, face, ears, and nose
  - c. Signs and symptoms of local cold injuries
  - d. Local injury with clear demarcation
    - i. early or superficial injury
      - a) blanching of skin—normal color does not return after pressure applied
      - b) loss of feeling and sensation in the injured area
      - c) skin is soft
      - d) if rewarmed, tingling sensation
    - ii. late or deep injury
      - a) white, waxy skin
      - b) firm or frozen feeling when palpated
      - c) swelling may be present
      - d) blisters may be present
      - e) if thawed or partially thawed, skin may appear flushed with areas of purple and blanching or may be mottled and cyanotic
  - e. Special management consideration
    - i. remove the patient from the cold environment.
      - a) handle the patient extremely gently
      - b) protect the patient from further heat loss
      - c) do not allow the patient to walk or exert himself
      - d) do not re-expose to the cold
      - e) remove any wet clothing and cover the patient with a blanket
    - ii. do not
      - a) break blisters
      - b) rub or massage affected area
      - c) apply heat
      - d) rewarm if any chance of refreezing
    - iii. the patient should not be given anything by mouth
      - a) coffee, tea, or smoking may worsen the condition
      - b) cover the patient with a blanket; keep the patient warm
    - iv. if early or superficial injury
      - a) manually stabilize the extremity.
      - b) cover the extremity
    - v. if late or deep cold injury
      - a) remove jewelry
      - b) cover with dry clothing or dressings

## B. Exposure to Heat

### 1. Predisposing factors

#### a. Climate

- i. high ambient temperature reduces body's ability to lose heat by radiation
- ii. high relative humidity reduces ability to lose heat through evaporation

#### b. Exercise and activity – can lose more than 1 liter of sweat per hour

#### c. Age (very old/very young)

- d. Preexisting illness and/or conditions
- e. Drugs/medications
- 2. Signs and symptoms
  - a. Muscular cramps
  - b. Weakness or exhaustion
  - c. Sweating or dry skin
  - d. Dizziness or faintness
  - e. Rapid heart rate
  - f. Altered mental status to unresponsive
- 3. Special management considerations
  - a. Administer oxygen by non-rebreather mask
  - b. Remove the patient from the hot environment
  - c. Remove excess clothing
  - d. Place in a cool environment (air conditioned)
  - e. Cool patient by fanning (may be ineffective in high humidity)
  - f. Place cool cloths or ice packs (wrapped so they don't contact patient's skin)
    - i. on neck
    - ii. under armpits
    - iii. on groin
  - g. If unconscious place in recovery position
    - i. maintain airway
    - ii. assist ventilation if breathing inadequate

### C. Submersion

- 1. Definitions
  - a. drowning—airway is surrounded by liquid that prevents breathing air; may or may not cause death
- 2. Contributing factors
- 3. Severity
- 4. Signs and symptoms
  - a. Coughing
  - b. Vomiting
  - c. Difficulty breathing
  - d. Respiratory arrest
  - e. Cardiac arrest
- 5. Special management considerations
  - a. If patient is in water be aware of personal safety
  - b. Consider possibility of spine injury
    - i. if risk of spinal injury exists, manually stabilize the neck and spine
    - ii. if no risk of spinal injury exists and patient is breathing
      - a) place in recovery position
      - b) administer oxygen
    - iii. if no risk of spinal injury exists and patient is not breathing, follow American Heart Association guidelines for CPR
  - c. Risk of vomiting is high and if patient vomits
    - i. roll on side
    - ii. suction mouth

## II. Bites and Stings

### A. Injuries of Concern

1. Spider bites
2. Snake bites
3. Hymenoptera (bees, wasps, ants, yellow jackets)

### B. Pathophysiology of Bites and Envenomations

1. Spider bites (black widow) -- inject neurotoxins
2. Snake bites -- rattlesnake is most common in United States
  - a. toxins affect blood and nervous system both at the bite site and systemically
  - b. patient age and size cause different effects
  - c. amount of toxin injected is related to toxicity (often none at all)
  - d. initial 6-8 hours of care is essential
3. Hymenoptera
  - a. Cause allergic reactions in sensitized (allergic) people
  - b. May lead to anaphylactic response

### C. Signs and Symptoms

1. Spider bite (black widow)
  - a. Localized swelling initially
  - b. Chest or abdominal pain depending on bite site
  - c. Dangerous in children, may be fatal
2. Rattlesnake bite
  - a. Time of bite to initiation of care is important
  - b. Pain at site
  - c. Progressive weakness
  - d. Nausea and vomiting
  - e. Seizures
  - f. Vision problems
  - g. Changes in level of consciousness
3. Bee, wasp, and other stings
  - a. Pain at site
  - b. Swelling
  - c. Signs of allergic reaction or anaphylaxis

### D. Unique Management Considerations of Bites and Stings

1. Spider bite (black widow)
  - a. Ice pack to area of bite
  - b. Clean wound with soap and water
  - c. Transport immediately with supportive care
2. Rattlesnake bite
  - a. Note time of bite to transport
  - b. Slow venous return
  - c. Keep patient calm
  - d. Immobilize extremity
  - e. Position extremity
  - f. Clean bite site with soap and water
  - g. Identify snake if possible

3. Bees, wasps, and other stings
  - a. Remove stinger or venom sac
  - b. If anaphylaxis develops follow protocol

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# Trauma

## Multi-System Trauma

Uses knowledge to recognize and manage life threats based on assessment findings for an acutely injured patient.

### I. Multi-System Trauma

- A. Significant Forces Increase Risk for Injuries to Multiple Organs within the Body at the Same Time
- B. Multi-Trauma Patients Are at a Greater Risk of Developing Shock
- C. Suspect Multi-Systems Trauma in Any Patient Subjected to Significant External Forces

# Special Patient Populations

## Obstetrics

Recognizes and manages life threats based on assessment findings for a patient with special needs.

### I. Anatomy and Physiology of organs related to delivery

- A. Uterus/Womb
- B. Baby/Fetus
- C. Placenta/Afterbirth
- D. Amniotic Sac/Bag of Water
- E. Vagina/Birth Canal

### II. Vaginal Bleeding in the Pregnant Patient

- A. Light Irregular Discharges of Small Amount of Blood “Spotting” May Be Normal
- B. More Bleeding May Indicate a Problem That Needs Physician’s Attention
- C. Mucus with Small Amount of Blood Late in Pregnancy May Mean Delivery Is Near
- D. Any Other Bleeding Late in Pregnancy Is a Serious Emergency
- E. General Assessment
  1. ABCs
  2. Vital signs initially and repeated periodically
  3. SAMPLE history and obstetric history
- F. General Management
  1. Standard precautions
  2. Place patient on left side
  3. Ensure the patient places a sanitary pad over the vaginal opening
  4. Provide shock care
  5. Monitor airway and administer oxygen
  6. Save blood soaked pads in a plastic bag for examination at the hospital
  7. Offer support for the patient while awaiting EMT response

### III. General Assessment and Management of the Obstetrical Patient

- A. Signs of Labor
  1. Braxton Hicks/false labor contractions
  2. Bloody show
  3. Ruptured membranes

4. Contractions regular and at closer intervals

B. Stages of Labor and Delivery

1. First stage: onset of contractions until fetus enters the birth canal
2. Second stage: fetus enters the birth canal until birth
3. Third stage: placenta delivery

C. Assessment During Labor and Delivery

1. Airway, breathing, circulation
2. SAMPLE and obstetric history
  - a. When is the baby due?
  - b. First or later pregnancy
  - c. Known complications (multiple births, etc.)
  - d. Has experienced bloody show, water broken
  - e. Contraction regularity, interval, and duration
  - f. Other medical history

IV. Vital Signs

V. Physical Examination

A. Evaluating Contractions

B. Inspect for Crowning

C. Preparation for Delivery

1. Standard precautions
  - a. Gloves
  - b. Gown
  - c. Eye protection and face shield
2. Collect supplies/OB kit
  - a. Towels
  - b. Sheets
  - c. Bulb syringe
  - d. Cord clamps
  - e. Sterile scissors or razor
  - f. Sanitary pads
  - g. Bag or basin for afterbirth
  - h. Medical hazard bag
3. Provide privacy for mother
4. Position mother on back, hips elevated, knees bent, legs apart
5. No internal vaginal examination
6. Wait for EMTs

VI. Steps If the EMR Needs to Deliver

A. If Baby's Head Is Seen at the Vaginal Opening (Crowning), Delivery Will Occur Soon

B. Someone by Mother's Head for Support

- C. Wash Hands and Put on PPE
- D. Support the Baby's Head As It Delivers
- E. If Umbilical Cord Is Around the Baby's Neck, Slip It Gently Over the Head
- F. Support the Baby As He or She Rotates
- G. The Upper Shoulder Should Deliver Next as the Head Is Guided Downward
- H. The Feet Should Deliver After That
- I. Keep the Head Lowered So Fluids Can Drain; Suction Mouth and Nose
- J. Make Note of the Birth Time
- K. Keep the Baby at the Level of the Birth Canal
- L. Clamp the Cord, Cut Only If Sterile Equipment Available
- M. Monitor the ABC's
- N. Wait for the Afterbirth Delivery

VII. Care for the Baby (see Neonatal Care)

VIII. Care for the Mother

- A. Some Bleeding is Normal
- B. Sanitary Pad Over Vaginal Opening
- C. Massage the Uterus in a Circular Motion Continuously
- D. Allow the Mother to Nurse
- E. Provide Comfort, Warmth

IX. Abnormal delivery

- A. Prolapsed cord
- B. Breech presentation
- C. Position mother
  - 1. knee-chest position

## Special Patient Populations

# Neonatal Care

Recognizes and manages life threats based on assessment findings for a patient with special needs.

## I. Initial Care of the Neonate

### A. Assessment

1. Respirations
2. Pulse
3. Color
4. Cry
5. Movement

### B. Routine Care

1. Support
2. Dry
3. Warm
4. Position
5. Airway
6. Stimulation

### C. Assessment of the newborn

1. Time of delivery
2. Normal/ abnormal vital signs
3. Airway and ventilation
  - a. Respiratory rate
  - b. Respiratory effort
4. Circulation
  - a. Heart rate
  - b. Color/ cyanosis
    - i. normal
    - ii. central versus peripheral
    - iii. mucosal membranes
  - c. End organ perfusion
    - i. compare strength of central pulses versus peripheral
    - ii. capillary refill
5. APGAR
  - a. Appearance - skin color
    - i. completely pink - 2
    - ii. body pink, extremities blue - 1
    - iii. blue, pale - 0
  - b. Pulse rate
    - i. above 100 - 2
    - ii. below 100 - 1
    - iii. absent - 0
  - c. Grimace - irritability
    - i. cries - 2

- ii. grimaces - 1
- iii. no response - 0
- d. Activity - muscle tone
  - i. active motion - 2
  - ii. some flexion of extremities - 1
  - iii. limp - 0
- e. Respiratory - effort
  - i. strong cry - 2
  - ii. slow and irregular - 1
  - iii. absent - 0

#### D. Treatment

1. Prior to delivery, prepare environment and equipment
2. During delivery, suction mouth and nose as head delivers
3. After delivery
  - a. Airway and ventilation
    - i. drying
      - a) head and face
      - b) body
    - ii. warming
      - a) appropriate techniques
      - b) minimize heat loss via head
    - iii. position
    - iv. suction
      - a) technique
        - i) mouth first, than nares
        - ii) nasal suctioning is a stimulus to breathe
      - b) equipment
        - i) bulb suction
        - ii) suction catheters
        - iii) meconium aspirator
    - v. stimulation
      - a) flicking soles of feet
      - b) stroking back
    - vi. blow-by oxygen
      - a) never withhold oxygen
      - b) oxygen should be warmed
      - c) use when
        - i) newborn is cyanotic and
        - ii) heart rate > 100 and
        - iii) adequate respiratory rate and effort
      - d) 5 liters/ minute maximum
        - i) complications due to hypothermia
        - ii) direct rather than tangential flow on face
      - e) appropriate techniques

## Special Patient Populations

# Pediatrics

Recognizes and manages life threats based on assessment findings for a patient with special needs.

## I. General Considerations

- A. Many components of the initial evaluation can be done by careful observation without touching
- B. Utilize the parent/guardian to help the infant/child be more comfortable with your exam & treatment
- C. Communicating with scared, concerned parents/family is important when caring for an ill infant/child
- D. Continue Assessment Until Care Is Transferred

## II. Assessment Process

### A. Scene Survey

- 1. Evaluate the scene for safety
- 2. Evaluate the scene for clues related to the chief complaint
  - a. Ingestions or toxic exposures: pills, medicine bottles, chemicals, alcohol, drug paraphernalia, etc.
  - b. Child abuse: injury must be consistent with history and physical/developmental capabilities of the patient
  - c. Note position and location in which patient is found
- 3. Observe caregivers' interactions with the child
  - a. Are they appropriately concerned, angry or indifferent?
  - b. Does the child seem comforted by them or scared by them?

### B. Patient Assessment

- 1. Pediatric assessment triangle – 15-30-second assessment of the severity of the illness or injury
  - a. Use prior to addressing “the ABCs”
  - b. Does not require touching the patient; just looking and listening
    - i. appearance
      - a) muscle tone
      - b) interactiveness
      - c) consolability
      - d) eye contact
      - e) speech or cry
    - ii. work of breathing
      - a) abnormal airway noise
        - i) wheezing
        - ii) stridor
        - iii) grunting
      - b) abnormal positioning (i.e. tripodding)
      - c) accessory muscle use
        - i) chest wall
        - ii) nasal flaring

- iii. assess skin to see if it is
  - a) Pale
  - b) Mottled
  - c) Cyanotic
- c. possible causes of abnormal findings above
  - i. respiratory distress or failure
  - ii. shock
  - iii. cardiopulmonary failure or arrest
  - iv. other abnormality
  - v. stable patient
- 2. Airway
  - a. Obstructed
    - i. open with airway maneuvers and airway adjuncts
    - ii. if indicated suction or remove fluids, blood, or foreign objects
  - b. Maintainable on its own
- 3. Ventilation/oxygenation
  - a. Administer oxygen if inadequate
  - b. Assist with ventilation if necessary
- 4. Circulation
  - a. Signs of shock
    - i. pulse quality: strong or weak
    - ii. extremity skin temperature and active bleeding
  - b. Position flat
  - c. Maintain warmth
- 5. Determine level of consciousness
  - a. AVPU scale
  - b. Assess pupils: dilated, constricted, reactive, or fixed
  - c. Moving all extremities equally
- 6. Exposure
  - a. Examine for additional injuries
  - b. Promptly cover to prevent hypothermia; cover head as well
- 7. Additional assessment
  - a. History
    - i. symptoms and duration
      - a) fever
      - b) activity level
      - c) recent eating, drinking, and urine output history
      - d) history of vomiting, diarrhea, or abdominal pain
    - ii. medications taking and medication allergies
    - iii. past medical problems or chronic illnesses
    - iv. key events leading to the injury or illness
  - b. Detailed physical exam—"Head to Toe"
    - i. head: bruising, swelling
    - ii. ears: drainage suggestive of trauma or infection
    - iii. mouth: loose teeth, identifiable odors, bleeding
    - iv. neck: abnormal bruising
    - v. chest and back: bruises, injuries, or rashes
    - vi. extremities: deformities, swellings, or pain on movement



### III. Respiratory Distress/Failure/Arrest

#### A. Introduction

1. Tongue is larger
2. Airways are smaller

#### B. Pathophysiology

1. Respiratory distress
2. Respiratory failure
3. Respiratory arrest

#### C. Assessment

1. History
2. Physical findings

#### D. Upper Airway Obstruction

1. Swelling of tissue
2. Foreign body
3. Secretions
4. Other

#### E. Management

1. Airway positioning (chin lift, jaw thrust)
2. If upper airway is obstructed, use age and situation-appropriate airway clearance measures (finger sweep, back blows, suctioning, and abdominal thrusts)
3. Airway adjunct (oropharyngeal airways)
4. Oxygen
5. Assisted ventilation (bag valve mask)

### IV. Shock

#### A. Causes

1. Trauma
2. Infections
3. Vomiting or diarrhea

#### B. Assessment

1. History
2. Physical findings
  - a. Rapid heart rate and respiratory rate
  - b. Weak or absent pulse
  - c. Altered mental status
  - d. Pale, cool, clammy skin

#### C. Management

1. Scene safety and standard precautions
2. Open airway (protect spine if necessary)
3. Oxygen
4. Assist ventilations if necessary

5. Chest compressions if necessary
6. Control bleeding

## V. Seizures

### A. Description

### B. Causes

1. Fever
2. Head trauma
3. Epilepsy
4. Low blood glucose
5. Poisoning

### C. Assessment

### D. Management

1. Scene safety and standard precautions
2. Place patient on the floor
3. Loosen restrictive clothing
4. Protect the patient from injury
5. Nothing in the mouth and do not hold the patient down
6. After seizure, place patient in recovery position

## VI. Sudden Infant Death Syndrome (SIDS)

### A. Introduction

1. Definition of SIDS
2. Definition of Apparent Life Threatening Event (ALTE)
3. Epidemiology and risk factors

### B. Assessment

1. Airway, breathing, pulse
2. Signs of death
3. Begin resuscitation if no indication of futility

### C. Management

1. Local EMS criteria for death in the field
2. Notification of appropriate authorities
3. Caregiver support

## Special Patient Populations

# Geriatrics

Recognizes and manages life threats based on assessment findings for a patient with special needs.

## I. Age-Associated Changes

### A. Age Dependent and Variable

### B. Sensory Changes in Older Patients

#### 1. Vision

- a. Decreased vision
- b. Inability to differentiate colors
- c. Decreased night vision
- d. Decreased ability to see close up
- e. Decreased depth perception

#### 2. Hearing

- a. Inability to hear high-frequency sounds
- b. Use of hearing aids

#### 3. Sense of touch and pain

- a. Decreased sense of balance
- b. Diminished pain perception
- c. Decreased ability to differentiate hot from cold
- d. Decreased tolerance of hot and cold

### C. Heart/Blood Vessels

1. High blood pressure
2. Increased risk of heart and stroke
3. Heart is less able to beat faster when needed

### D. Lungs and Breathing

1. Diminished breathing capacity
2. Increased risk of infection of the lungs
3. Decreased cough

### E. Stomach and Intestines

1. Difficulty with digestion
2. Difficulty chewing –
3. increased risk of foreign body airway obstruction

### F. Brain and Nervous System

1. Slower reflexes
2. Decreased recent memory

### G. Muscles and Bones

1. Decreased bone density—easier to break
2. Loss of strength and size of bone and muscles

## H. Other

1. Increased risk of infections
2. Decreased signs and symptoms of infection when present

## II. Assessment and Care Implications

### A. Assessment

#### 1. ABCs

- a. Airway may be difficult to assess and manage due to neck arthritis
  - b. Dentures should not be removed unless they obstruct airway or interfere with ventilation if rescue breathing is needed
  - c. Increased risk of airway obstructions
  - d. Pulse may be irregular due to heart rhythm problems that are common
2. Speak slowly and distinctly at patient's eye level with good lighting
  3. Give the patient time to respond unless the condition appears urgent
  4. Elderly may not show severe symptoms even if very ill
  5. Use family members if available, especially for base line mental status
  6. Reassess often as condition may deteriorate quickly

### B. Care

1. Handle gently as skin is fragile and can easily tear
2. Reassurance is important

## Special Patient Populations

# Patients with Special Challenges

Recognizes and manages life threats based on assessment findings for a patient with special needs.

## I. Recognizing and Reporting Abuse and Neglect

### A. Child Abuse

1. Types of abuse
  - a. Neglect
  - b. Physical abuse
  - c. Sexual abuse
  - d. Emotional abuse
2. Assessment
  - a. History or scene findings to concern for abuse or neglect
  - b. Caregiver's behavior
  - c. Physical findings
3. Management
  - a. Reporting
  - b. Safely transporting
  - c. Role of child/adult protective services
4. Legal aspects
5. Documentation

### B. Elder Abuse

1. Types of abuse
  - a. Neglect
  - b. Physical abuse
  - c. Sexual abuse
  - d. Emotional abuse
  - e. Financial abuse
2. Epidemiology
3. Assessment
4. Management
5. Legal aspects
6. Documentation

## EMS Operations

# Principles of Safely Operating a Ground Ambulance

Knowledge of operational roles and responsibilities to ensure patient, public, and personnel safety.

The intent of this section is to give an overview of emergency response to ensure the safety of EMS personnel, patients, and others during EMS operations. This does not prepare the entry level student to be an experienced and competent driver. Information related to the clinical management of the patient during emergency response is found in the clinical sections of the Kansas EMS Education Instructional Guidelines and the Kansas Scope of Practice Skills Guidelines for each personnel level.

## I. Risks and Responsibilities of Emergency Response

### A. Apparatus and Equipment Readiness

1. Inspect and service vehicles regularly
  - a. Tire inflation
  - b. Engine fluid levels
  - c. Warning devices in working order
2. Appropriate safety equipment available and in working order
  - a. Personal protective equipment
  - b. Safety vests

### B. Pre-Arrival Considerations

1. All personnel are properly seated and use seat belts
2. All equipment is appropriately secured
  - a. Cab area
  - b. Rear of ambulances
  - c. Compartment areas
3. Consideration of use of lights and sirens
  - a. Risk/benefit analysis
  - b. Audible warning devices
    - i. asking for right-of-way of others
    - ii. not to be used to clear traffic
  - c. Visual warning devices – consider turning off upon arrival if appropriate
4. Respond with due regard
5. High-risk situations
  - a. Intersections
  - b. Highway access
  - c. Speeding
  - d. Driver distractions
    - i. mobile computer
    - ii. global positioning systems
    - iii. mobile radio
    - iv. vehicle stereo
    - v. wireless devices
    - vi. eating/drinking
  - e. Inclement weather
  - f. Aggressive drivers

- g. Unpaved roadways (see Federal Highway Administration definition)
- h. Responding alone
- i. Fatigue

### C. Scene Safety

- 1. Personal
  - a. First priority for all EMS personnel
  - b. Appropriate personal protective equipment for conditions
  - c. Scene size-up
- 2. Patient
  - a. Keep them informed of your actions
  - b. Protect from further harm
- 3. Control traffic flow
  - a. Proper positioning of emergency vehicles
    - i. upwind/uphill
    - ii. protect scene
  - b. Use of lights and other warning devices
  - c. Setting up protective barrier
  - d. Designate a traffic control person
- 4. 360-degree assessment (traffic crashes and outdoor incidents)
  - a. Downed electrical lines
  - b. Leaking fuels or fluids
  - c. Smoke or fire
  - d. Broken glass
  - e. Trapped or ejected patients
  - f. Mechanism of injury

### D. Leaving the Scene

- 1. Ensure all hazards have been mitigated
- 2. Pick up and dispose of all equipment properly
- 3. Turn scene over to appropriate authority prior to leaving
  - a. Law enforcement
  - b. Fire suppression
  - c. Highway department
  - d. Other

# EMS Operations

## Incident Management

Knowledge of operational roles and responsibilities to ensure patient, public, and personnel safety.

Information related to the clinical management of the patient within components of the Incident Management System (IMS) is found in the clinical sections of the Kansas EMS Education Instructional Guidelines and the Kansas Scope of Practice Skills Guidelines for each personnel level.

### I. Establish and Work Within the Incident Management System

#### A. Entry-Level Students Need to Be Certified in

1. ICS-100: Introduction to ICS, or equivalent
2. FEMA IS-700: NIMS, An Introduction

#### B. This Can Be Done as a Co-requisite or Prerequisite or as Part of the Entry-Level Course



# EMS Operations

## Multiple Casualty Incidents

Knowledge of operational roles and responsibilities to ensure patient, public, and personnel safety.

The intent of this section is to give an overview of operating during a multiple casualty incident when a multiple casualty incident plan is activated. Information related to the clinical management of the patients during a multiple casualty incident is found in the clinical sections of the Kansas EMS Education Instructional Guidelines and the Kansas EMS Scope of Practice Skills Guidelines for each personnel level.

### I. Multiple-Casualty Incidents (MCI)

A. A Situation With Numerous Patients That Does Not Overwhelm the Routine Capacity of the System

### II. Triage Principles

#### A. Primary Triage Used On-Scene to Rapidly Categorize Patient's Condition

1. Document location of patient and transport needs
2. Triage tape or labels used
3. Focus on speed to sort patients quickly

#### B. Patient Priority

1. Immediate
  - a. Airway and breathing difficulties
  - b. Uncontrolled or severe bleeding
  - c. Decreased mental status
  - d. Patients with severe medical problems
  - e. Shock (hypoperfusion)
  - f. Severe burns
2. Delayed
  - a. Burns without airway problems
  - b. Major or multiple bone or joint injuries
  - c. Back injuries with or without spinal cord damage
3. Hold
  - a. Minor painful, swollen, deformed extremities
  - b. Minor soft tissue injuries
4. Deceased

#### C. Triage Tagging/Labeling

1. International agreement on color-coding and priorities
  - a. Immediate Red Priority-1 (P-1)
  - b. Delayed Yellow Priority-2 (P-2)
  - c. Hold Green Priority-3 (P-3)
  - d. Deceased Black Priority-0 (P-0)

#### D. Triage Procedures

1. Identify a triage officer (remains on-scene for duration of event)

2. Request additional resources
  - a. Personnel
  - b. Equipment
3. Perform triage of all patients
4. Assign personnel and equipment to highest priority patients

#### E. Post-Traumatic and Cumulative Stress

1. Should be part of post-incident standard operating procedure (SOP)
2. Access to defusing during the multiple casualty incident
3. Roles of debriefing for a multiple casualty incident
4. Access to debriefing

### III. Resource Management

#### A. Triage Procedures

1. Identify a triage officer (remains on scene for duration of event)
2. Request additional resources
  - a. Personnel
  - b. Equipment
3. Perform triage of all patients
4. Assign personnel and equipment to highest priority patients

# EMS Operations

## Air Medical

Knowledge of operational roles and responsibilities to ensure patient, public, and personnel safety.

The intent of this section is to give an overview of operating safely in and around a landing zone during air medical operations and transport. Information related to the clinical management of the patient being cared for during air medical operations is found in the clinical sections of the Kansas EMS Education Instructional Guidelines and the Kansas EMS Scope of Practice Skills Guidelines for each personnel level.

### I. Safe Air Medical Operations

#### A. Types

1. Rotorcraft
2. Fixed wing

#### B. Advantages

1. Specialized care – skills, supplies, equipment
2. Rapid transport
3. Access to remote areas
4. Helicopter hospital helipads

#### C. Disadvantages

1. Weather/environmental
2. Altitude limitations
3. Airspeed limitations
4. Aircraft cabin size
5. Terrain
6. Cost

#### D. Patient Transfer

1. Interacting with flight personnel
2. Patient preparation
3. Scene safety
  - a. Securing loose objects
  - b. Approaching the aircraft
  - c. Landing zone

#### E. Landing Zone Selection and Preparation

#### F. Approaching the Aircraft

#### G. Communication Issues

### II. Criteria for Utilizing Air Medical Response

#### A. Indications for Patient Transport

1. Medical
2. Trauma
3. Search and rescue

B. Activation

1. Local and State guidelines exist for air medical activation
  - a. State statutes
  - b. Administrative rules
  - c. City/county/district ordinance standards

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# EMS Operations

## Vehicle Extrication

Knowledge of operational roles and responsibilities to ensure patient, public, and personnel safety.

The intent of this section is to give an overview of vehicle extrication to ensure EMS personnel and patient safety during extrication operations. This does not prepare the entry-level student to become a vehicle extrication expert or technician. Information related to the clinical management of the patient being cared for during vehicle extrication is found in the clinical sections of the Kansas EMS Education Instructional Guidelines and the Kansas EMS Scope of Practice Skills Guidelines for each personnel level.

### I. Safe Vehicle Extrication

#### A. Role of EMS in Vehicle Extrication

1. Provide patient care
2. Perform simple extrication

#### B. Personal Safety

1. First priority for all EMS personnel
2. Appropriate personal protective equipment for conditions
3. Scene size-up

#### C. Patient Safety

1. Keep them informed of your actions
2. Protect from further harm

#### D. Situational Safety

1. Control traffic flow
  - a. Proper positioning of emergency vehicles
    - i. upwind/uphill
    - ii. protect scene
  - b. Use of lights and other warning devices
  - c. Setting up protective barrier
  - d. Designate a traffic control person
2. 360-degree assessment
  - a. Downed electrical lines
  - b. Leaking fuels or fluids
  - c. Smoke or fire
  - d. Broken glass
  - e. Trapped or ejected patients
  - f. Mechanism of injury
3. Vehicle stabilization
  - a. Put vehicle in "park" or in gear
  - b. Set parking brake
  - c. Turn off vehicle ignition
  - d. Cribbing/Chocking
  - e. Move seats back and roll down windows

- f. Disconnect battery or power source
- g. Identify and avoid hazardous vehicle safety components
  - i. seat belt pretensioners
  - ii. undeployed air bags
  - iii. other
- 4. Unique hazards
  - a. Alternative-fuel vehicles
  - b. Undeployed vehicle safety devices
  - c. HAZMAT
- 5. Evaluate the need for additional resources
  - a. Extrication equipment
  - b. Fire suppression
  - c. Law enforcement
  - d. HAZMAT
  - e. Utility companies
  - f. Air medical
  - g. Others
- 6. Extrication considerations
  - a. Disentanglement of vehicle from patient
  - b. Multi-step process
  - c. Rescuer-intensive
  - d. Equipment-intensive
  - e. Time-intensive
  - f. Access to patient
    - i. simple
      - a) try to open doors
      - b) ask patient to unlock doors
      - c) ask patient to lower windows
    - ii. complex
    - iii. tools
      - a) hand
      - b) pneumatic
      - c) hydraulic
      - d) other

E. Determine Number of Patients (implement local multiple casualty incident protocols if necessary)

## II. Use of Simple Hand Tools

A. Hammer

B. Center Punch

C. Pry Bar

D. Hack Saw

E. Come-Along

### III. Special Considerations for Patient Care

#### A. Removing Patient

1. Maintain manual cervical spine stabilization
2. Complete primary assessment
3. Provide critical interventions

#### B. Perform Rapid Extrication

#### C. Move Patient, Not Device

#### D. Use Sufficient Personnel

#### E. Use Path of Least Resistance

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# EMS Operations

## Hazardous Materials Awareness

Knowledge of operational roles and responsibilities to ensure patient, public, and personnel safety.

Information related to the clinical management of the patient exposed to hazardous materials is found in the clinical sections of the Kansas EMS Education Instructional Guidelines and the Kansas EMS Scope of Practice Skills Guidelines for each personnel level.

### I. Risks and Responsibilities of Operating in a Cold Zone at a Hazardous Material or Other Special Incident

#### A. Entry-Level Students Need to Be Certified in:

1. Hazardous Waste Operations and Emergency Response (HAZWOPER) standard, 29 CFR 1910.120 (q)(6)(i) -First Responder Awareness Level

#### B. This Can Be Done as a Co requisite or Prerequisite or as Part of the Entry-Level Course



# EMS Operations

## Mass Casualty Incidents Due to Terrorism and Disaster

Knowledge of operational roles and responsibilities to ensure patient, public, and personnel safety.

The intent of this section is to give an overview of operating during a terrorist event or during a natural or manmade disaster. Information related to the clinical management of patients exposed to a terrorist event or involved in a disaster is found in the clinical sections of the Kansas EMS Education Instructional Guidelines and the Kansas EMS Scope of Practice Skills Guidelines for each personnel level.

### I. Risks and Responsibilities of Operating on the Scene of a Natural or Man-Made Disaster

#### A. Role of EMS

1. Personal safety
2. Provide patient care
3. Initiate/operate in an incident command system (ICS)
4. Assist with operations

#### B. Safety

1. Personal
  - a. First priority for all EMS personnel
  - b. Appropriate personnel protective equipment for conditions
  - c. Scene size-up
  - d. Time, distance, and shielding for self-protection
  - e. Emergency responders are targets
  - f. Dangers of the secondary attack
2. Patient
  - a. Keep them informed of your actions
  - b. Protect from further harm
  - c. Signs/symptoms of biological, nuclear, incendiary, chemical and explosive (B-NICE) substances
  - d. Concept of “greater good” as it relates to any delay
  - e. Treating terrorists/criminals
3. 360-degree assessment and scene size-up
  - a. Outward signs and characteristics of terrorist incidents
  - b. Outward signs of a weapons of mass destruction (WMD) incident
  - c. Outward signs and protective actions of biological, nuclear, incendiary, chemical, and explosive (B-NICE) weapons
4. Determine number of patients (implement local MCI protocols as necessary)
5. Evaluate need for additional resources
6. EMS operations during terrorist, weapons of mass destruction, disaster events
  - a. All hazards safety approach
  - b. Initially distance from scene and approach when safe
  - c. Ongoing scene assessment for potential secondary events
  - d. Communicate with law enforcement at the scene of an armed attack

- e. Initiate or expand incident command system as needed
  - f. Perimeter use to protect rescuers and public from injury
  - g. Escape plan and a mobilization point at a terrorist incident
7. Care of emergency responders on scene
- a. Safe use of an auto injector for self and peers
  - b. Safe disposal of auto injector devices after activation

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