AEMT

NATIONAL CONTINUED COMPETENCY PROGRAM

AEMT EDUCATION UPDATE

National Registry of
Emergency Medical Technicians®
THE NATION'S EMS CERTIFICATION™

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1. Decreases cardiac output
2. Decreases vital organ perfusion

iv. For adults, artificial ventilatory rates greater than 12 times per minute (one ventilation every 5-6 seconds) decrease cardiac output and perfusion
1. Do not exceed a ventilatory rate of 10-12 times per minute (one ventilation every 5-6 seconds).
2. High artificial ventilatory rates (greater than 12 times per minute, one breath every 5-6 seconds) result in poor patient outcomes

III. Respiratory distress vs. failure
a. Respiratory conditions are dynamic
i. Range from minor respiratory distress to respiratory arrest
ii. Can be acute, chronic, or chronic with acute exacerbation
iii. Signs/symptoms are dynamic and may change over time depending on the state of patient's disease process
b. Many patients with respiratory diseases need only comfort care
c. Important to know when exactly to provide an intervention (such as artificial ventilation) in order to increase the likelihood of patient improvement
d. In respiratory failure, inadequate alveolar ventilation exhibited by
i. Decrease in or excessively high respiratory rate
1. Reduces tidal volume and amount of air available for alveolar gas exchange
ii. Decrease in tidal volume (or both)
iii. Patients in respiratory failure are severely ill
e. Must recognize the transition of a respiratory disease from distress to failure
i. Deterioration in mental status , confusion, loss of gag reflex
ii. Accessory muscle use, head bobbing, grunting, nasal flaring
iii. Decrease in SpO_2
iv. Cyanosis
v. Hypercarbia

IV. Airway adjuncts
a. Oropharyngeal (OPA)
i. Indications
1. Respiratory distress/failure
2. Unconscious, unresponsive patient
ii. Contraindications
1. Gag reflex
2. Presence of oral trauma (broken teeth, recent oral surgery, etc.)
b. Nasopharyngeal (NPA)
i. Indications
1. Respiratory distress/failure
ii. Contraindications
1. Presence of head, facial trauma
2. Presence of skull fracture
c. Supraglottic
i. Examples
1. Laryngeal mask airway (e.g., LMA™)
2. Esophageal-tracheal tube (e.g., Combitube™)
3. Laryngeal tube (e.g., King LT™)
4. I-Gel™
ii. Advantages
1. Does not require visualization of the glottis (blind insertion)

AEMT POST RESUSCITATION SKILLS	none

ii. Mechanical clot disruption iii. Clot extraction

AEMT STROKE SKILLS	none

warning signs and tell them if any are present, to seek medical attention
    a. One pupil larger than the other
    b. Drowsiness or cannot be awakened
    c. A headache that gets worse and does not go away
    d. Weakness, numbness, or decreased coordination
    e. Repeated vomiting or nausea
    f. Slurred speech
    g. Convulsions or seizures
    h. Difficulty recognizing people or places
    i. Increasing confusion, restlessness, or agitation
        i. Unusual behavior
    j. Loss of consciousness (even brief)

d. "Return to play" considerations and criteria for sports
    i. [7]CDC—*HEADS UP*: "Sports Concussion Policies and Laws"
    ii. Requires specialized assessments that are usually considered beyond the scope of EMS providers. Consult local protocols and standards of practice

e. Discuss the current research and practices for the use of selective spinal immobilization.
    i. [5]EMS Spinal Precautions and the use of the Long Backboard, 2013
    ii. [9]Resource Document to the Position Statement of the National Association of EMS Physicians and the American College of Surgeons Committee on Trauma, 2014

AEMT CNS SKILLS	none

IV. Common equipment EMS providers may encounter
- a. Tracheostomy tube
  - i. Surgical opening in the trachea (stoma)
    1. Keep clean and dry
    2. Suction as needed
  - ii. Oxygen delivery
    1. Blow-by
    2. Face mask/non-rebreather mask
    3. BVM
       a. May need an adapter
- b. Indwelling central venous catheters
  - i. Can provide nutrition or medications parenterally
  - ii. Potential for infection or occlusion
- c. Feeding tubes
  - i. Provide nutrition to patients who are unable to eat by mouth
  - ii. Common complications
    1. Infection
    2. Occlusion
    3. Malpositioned/dislodged tube
    4. May need transport to ER for tube replacement
    5. Tube deterioration
- d. Cerebrospinal fluid (CSF) shunts
  - i. Device used to drain excess CSF from the brain
  - ii. Hydrocephalus
    1. Shunt runs from a ventricle in the brain, under the skin, and down the neck into either the peritoneum of the abdomen or the right atrium
  - iii. Common complications
    1. Brain infection
    2. Obstruction, which may lead to increased ICP
    3. Peritonitis
- e. Dialysis shunts
  - i. Peritoneal Dialysis
  - ii. Hemodialysis
    1. Fistula
  - iii. Indwelling abdominal catheter
  - iv. Common complications
    1. Catheter infection
    2. Peritonitis
- f. Urinary Catheters
  - i. Foley catheters
  - ii. Suprapubic catheters
- g. GI Bags
  - i. Colostomy
    1. Divert stool away from colon or large intestine
- h. Ileostomy
  - i. Diverts stool from the ileum into an external bag
  - ii. Contents do not pass through large intestine at all
  - iii. Content is liquid or semisoft with green appearance

V. Cognitive Impairments
- a. Cognitively impaired or non-communicative patients may still be aware of your actions and words.

b. Despite their apparent age, cognitively impaired patients might still need a caregiver.
c. Common difficulties encountered in emergency medicine when dealing with cognitively impaired patients in the EMS setting is obtaining an accurate and complete history.
    i. Accommodations may be necessary when providing patient care.
    ii. Allow adequate time for
        1. Gathering a history
        2. Performing an assessment
        3. Patient management procedures
        4. Preparing the patient for transport.

VI. Common Cognitive Impairments
a. Intellectual developmental disorder
    i. Generalized disorder appearing before adulthood characterized by significantly impaired cognitive functioning and deficits in 2 or more adaptive behaviors
    ii. Syndromic mental retardation - intellectual deficits associated with other medical and behavioral signs and symptoms
    iii. Non-syndromic mental retardation - intellectual deficits that appear without other abnormalities

VII. Down Syndrome (Down)
a. A complex of symptoms associated with mental retardation caused by chromosomal abnormalities
b. Common physical signs
    i. Intellectual developmental disorder
    ii. Decreased muscle tone at birth
    iii. Upward slanting eyes with small skin folds in the corner
    iv. Small, abnormally shaped ears
    v. Flat facial features, small nose
    vi. Wide, short hands with short fingers
    vii. Hyperflexibility
    viii. Known cardiac issues
    ix. C-spine instability
    x. Large Tongue
    xi. Thyroid issues
    xii. Visual problems
    xiii. 15-20 times more likely to develop leukemia
c. Common mental and social complications
    i. Wandering or running off
    ii. Obsessive/compulsive behaviors
    iii. Stubborn/oppositional behavior
    iv. Impulsive behavior
    v. Poor judgment
    vi. Short attention span
    vii. Slow learning

VIII. Cerebral Palsy (CP)
a. A group of chronic, non-progressive disorders caused by damage to the motor centers of the brain in the early stages of life
b. Most of these problems occur in the womb, but can happen any time during the first 2 years of life while the brain is developing
c. Characterized by
    i. Abnormal muscle tone and posture
    ii. Muscular spasms
    iii. Hearing and vision problems

iv. Seizures
v. Some communication difficulty

d. Cause is difficult to determine
   i. May be caused by
      1. Low levels of oxygen
      2. Infection
      3. Head injury
      4. RH incompatibility
      5. Infections in the mother (e.g. Rubella, Herpes Simplex)
e. Transport assistive devices such as walkers or wheelchairs with the patient
f. Do not assume cognitive disability based on physical disability. Many CP patients have normal or mildly decreased cognition.

IX. Assessing patients with Autism Spectrum Disorder (ASD)
a. Know that autistic patients are aware of what is happening
b. Explain your actions
c. Include caregivers in the assessment
d. No sudden movements
e. Show the patient what you will do (demonstrate on caregiver if available)

AEMT SPECIAL HC NEEDS SKILLS	none

ii. "Turtle sign"- head delivers but retracts back into the perineum because the shoulders are trapped.
iii. Management
1. McRoberts maneuver- (buttocks off the end of the bed with thighs flexed upward) and apply firm pressure with your hand above the pubic symphysis
2. Transport immediately (even if delivery attempt is unsuccessful)

f. Nuchal cord
i. Cephalic presentation but the umbilical cord is around the neck
ii. Common finding during delivery and rarely associated with adverse outcomes
iii. Management
1. Attempt to slip the cord over the infant's head.
2. If unable to slip the cord up and over the head, clamp and carefully cut the cord

II. Neonatal resuscitation
a. Assessment
i. If "yes" is answered to these three questions, the infant stays with the mother, and standard care continues, including maintaining the newborn's temperature
1. Full term gestation?
2. Good muscle tone?
3. Breathing or crying adequately?
ii. If "no" is answered to ANY of the above assessment questions, resuscitation efforts should be attempted in this sequence:
1. First 30 seconds postpartum
a. Dry the infant, then, warm and maintain normal temperature
b. Position airway
c. Clear secretions
d. Stimulate
2. 30-60 seconds postpartum
a. Heart rate below 100 /min or gasping/apnea
i. Initiate positive pressure ventilation and monitor SpO_2
b. Labored breathing or persistent cyanosis
i. Position and clear the airway, monitor SpO_2, supplementary O_2 as needed
3. After one (1) minute postpartum
a. Heart rate >100/min
i. Provide post resuscitation care
b. Heart rate <100/min
i. Check chest movement
ii. Correct ventilations as needed
1. Laryngeal mask or appropriate supraglottic airway
c. Heart rate <60/min
i. Begin chest compressions coordinated with PPV and 100% O_2
ii. Place on ECG monitor
iii. Considerations
1. IO line or emergency umbilical vein cannulation (UVC)
2. Advanced airway

III. 2015 AHA/ECC Guidelines for Neonatal Resuscitation when meconium is present:

a. Suctioning in the presence of meconium staining
    i. Vigorous neonates with good respiratory effort and muscle tone born through meconium stained amniotic fluid
        1. Do not benefit from suctioning
        2. Should stay with the mother to receive the initial steps of newborn care
        3. Gentle clearing of meconium from the mouth and nose with a bulb syringe may be done if necessary
    ii. Presence of fetal distress, poor muscle tone, respiratory compromise when born through meconium-stained amniotic fluid
        1. Immediately initiate resuscitation efforts
        2. Initiate PPV if heart rate less than 100/min

IV. Umbilical Cord Management
a. Delayed cord clamping
    i. Reference: [13]American Heart Association-Part 13-Neonatal Resuscitation
    ii. Wait 30 seconds after delivery to clamp the cord
        1. Reduces intraventricular hemorrhage
        2. Increases blood pressure/blood volume
        3. Reduces need for transfusion after birth
        4. Reduces necrotizing enterocolitis
    iii. Adverse findings
        1. Increased level of bilirubin

AEMT OB SKILLS	none

2. Selected based on forecasts from CDC
3. Seasonal flu vaccine is usually trivalent (three component)
    a. Each component selected to protect one of three main flu viruses

III. Sepsis and Septic Shock
- a. The body's response to infection.
    - i. Life threatening
    - ii. Tissue damage
    - iii. Organ failure
- b. Septic shock
    - i. Sepsis with refractory hypotension or signs of hypo perfusion despite adequate fluid resuscitation
        1. End organ dysfunction
        2. Oliguria
        3. Altered mental status
- c. SOFA or quick SOFA Score (calculation tool)
    - i. Evaluates for poor outcomes in infected patients based on:
        1. Altered mental status
        2. Respiratory rate
        3. Blood pressure

IV. Emerging Infectious Diseases
- a. Incidence in humans has increased in past two decades
- b. Threatens to continue increasing
- c. Knows no national boundaries
- d. New infections resulting from changes or evolution of existing organisms
- e. Known infections spreading to new geographic areas or populations
- f. Previously unrecognized infections appearing in areas undergoing ecologic transformation
- g. Past infections reemerging
    - i. Result of antimicrobial resistance in known agents or breakdowns in public health measures

AEMT INFECTIOUS DISEASE SKILLS	none

ii. Elevation
iii. Ice
iv. Padding of spinal immobilization

IV. Pediatric pain management
a. Reference: [17]ACEP—Reducing Pediatric Pain and Anxiety
i. Optimizing the environment
1. Combat anxiety and reduce pain by improving the physical environment
ii. Assessing pain
1. Self-reporting pain scale examples
a. Wong-Baker FACES®
b. FACES and FACES revised
c. OUCHER®
2. Non-self-reporting pain scale examples
a. FLACC Scale
i. Faces, Legs, Activity, Cry, Console
ii. Utilizes presenting history and physical exam
b. Non-invasive pain management
i. Multidisciplinary/complimentary methods
ii. Distraction

V. Neo-natal pain management
a. Reference: [17]ACEP—Reducing Pediatric Pain and Anxiety

AEMT PAIN MANAGEMENT SKILLS	none

3. Manic
4. Anxious
5. Angry
6. Agitated
7. Fearful
8. Guilty

vii. Area of thought
1. Racing thoughts
2. Hallucinations
a. Auditory
b. Visual
c. Somatic (strange body sensations)
3. Obsessive
4. Delusions (false beliefs)
5. Suicidal
6. Unconnected
7. Disturbed or distorted

viii. Once you have completed a mental status examination, you should report
1. General appearance
2. Speech
3. Mood
4. Area of thought

II. Restraint techniques
a. Physical restraints
i. Attempt verbal de-escalation prior to physical restraint, if safe
ii. Provider safety
1. Ensure scene safety
2. Leave the scene if weapons are present
iii. Restrain only those who can be overpowered with the physical forces available to you
iv. Use only the force necessary to maintain control and prevent injury to all involved
v. Five people should be available to apply full body restraint
1. one for each limb and one for restraint application
vi. Pre-plan each provider's role during restraint
1. Know your communication signals or verbal cues
vii. Swift, coordinated action is most effective
viii. Talk to the patient continually
ix. Do not remove restraints in the out-of-hospital setting
x. Thoroughly document restraints
1. Legal considerations
a. In law enforcement custody
b. Age
xi. Transportation
1. Ensure continued ability to restrain
2. Ensure adequate personnel and equipment
xii. Principles of restraining motion
1. Understand normal range of motion
2. Restraining range of motion
3. Understand muscle groups
xiii. Patient considerations

1. Pregnant
2. Pediatric
3. Geriatric

b. Environmental restraint
   i. Stabilize the environment (calm patient via therapeutic communication techniques)
   ii. Separate stimulus from environment
      1. (e.g., separate two fighting people, remove law enforcement from direct view)

III. Agitated Delirium/Excited Delirium
   a. Reference: [18]*White Paper Report on Excited Delirium Syndrome*
   b. Reference: [19]*National Library of Medicine—Excited Delirium*
   c. Stay calm, and do not cause more harm to the patient
   d. Characterized by a sudden onset of extreme agitation and extremely irrational or combative behavior
      i. Bizarreness, aggressiveness, agitation, ranting, hyperactivity, paranoia, panic
      ii. Reported to result from substance intoxication, psychiatric illness, alcohol withdrawal, head trauma, or a combination of these
      iii. Patient may exhibit hypertension, tachycardia, diaphoresis, dilated pupils, tachypnea, abnormal tolerance to pain, hyperthermia, noncompliance, and endless endurance and strength
      iv. May lead to respiratory and cardiac arrest
         1. Restraints may increase the risk

IV. Suicide/Depression (refer to the resources in the instructor preparations section)
   a. [20]Risk Factors For Suicide
      i. History of depression and other mental disorders
      ii. Previous suicidal gestures/attempts
      iii. History of family/child abuse (non-accidental trauma)
      iv. Feelings of hopelessness
      v. Unwillingness to seek mental health care (stigma attached)
      vi. Feeling of being isolated from others
      vii. History of impulsive or aggressive behavior
      viii. Inability to access mental health
      ix. Recent diagnosis of a serious illness, especially an illness that signals a loss of independence
      x. Recent loss of a loved one, job, money or social loss
      xi. Access to firearms
      xii. PTSD
      xiii. Alcohol or drug abuse
      xiv. Loss of relationship
      xv. Gives away personal belongings/cherished possessions
      xvi. Physical or mental stress
      xvii. Major physical stress such as surgery and long periods of sleep deprivation
      xviii. Expression of a clear plan for committing suicide
      xix. Ability of the mechanisms to carry out suicide

IV. Tetrahydrocannabinol (THC)
    a. Natural
        i. Weed, bud, doobie, Mary Jane, pot, blunt, herb, hemp, grass, etc.
        ii. A green, brown or gray mixture of dried, shredded leaves, stems, seeds, and flowers of the hemp plant
        iii. Usually smoked in a cigarette or pipe
    b. Synthetic
        i. Characterized by mimicking natural THC
        ii. Can cause psychosis
        iii. K2, spice, black mamba, Bombay blue, genie, zohai
        iv. Similar appearance to natural THC
    c. Effects of THC
        i. Impaired short term memory
        ii. Decreased concentration and attention
        iii. Impaired balance and coordination
        iv. Increased heart rate and blood pressure
        v. Increased appetite

V. Opioids
    a. Synthetic or semi-synthetic opioids act on the Central Nervous System as a depressant to:
        i. Decrease the perception of pain
        ii. Decrease the reaction to pain
        iii. Increase pain tolerance
    b. May be prescribed for acute pain, debilitating pain, or chronic pain as part of palliative care
    c. May be abused to induce euphoria
    d. Prolonged use may lead to tolerance and/or addiction
    e. Common effects:
        i. Respiratory depression
        ii. Drowsiness
        iii. Constipation
        iv. Constricted pupils
        v. Dry mouth
        vi. Itching
        vii. Nausea and vomiting
    f. Common opioids
        i. Heroin
        ii. Morphine
        iii. Oxycodone (Percocet®)
        iv. Codeine
        v. Fentanyl
        vi. Hydrocodone (Vicodin®)
        vii. Hydromorphone (Dilaudid®)
        viii. Meperidine (Demerol®)
        ix. Methadone
    g. Treatment for opioid emergencies
        i. Naloxone (Narcan®)
            1. Opioid antagonist
            2. Reverses CNS and respiratory depression caused by opioid overdose
            3. NOT effective against non-opioid drugs
            4. Available intranasally or auto-injector
                a. First responders and bystanders may have administered prior to

f. Infection
g. Hypoxia
h. TBI
i. Alcohol or drug withdrawal
j. Stroke
k. Hypoglycemia
l. Eclampsia
m. Seizure disorder
n. Electrolyte disturbances
o. Poisoning

IV. Assessment findings

p. Spasms/muscle contractions/shaking or tremors
q. Sweating
r. Cyanosis during seizure activity
s. Increased secretions
t. Incontinence
u. Postictal state

V. Management

v. Protect from further injury; position on side to protect airway
w. Ensure open airway, adequate ventilations, and oxygenation
    i. Consider using an NPA
x. Provide emotional support; reduce stimulants that may trigger more seizures

AEMT NEUROLOGICAL/SEIZURE SKILLS	none

- b. Sweating
- c. Hunger
- d. Rapid pulse
- e. Rapid, shallow respirations
- f. Seizures, come (late)
- g. Bizarre behavior (sudden onset and abnormal for patient)

IV. Hypoglycemia management
- a. Ensure an open airway, adequate breathing, circulation, and ability to swallow
- b. Determine blood glucose level
- c. Check for and deactivate insulin delivery device (insulin pump)
    - i. Administer medication as appropriate
        1. Oral glucose
        2. Dextrose (IV)
        3. Glucagon
- d. Supportive care

V. Hyperglycemia
- a. Slow onset and changes in mental status
- b. Rapid breathing, sweet breath odor
- c. Dehydration, pale, warm, dry
- d. Weakness, nausea, vomiting
- e. Weak, rapid pulse
- f. Polyuria, polydipsia, polyphagia

VI. Hyperglycemia management
- a. Ensure an open airway, adequate breathing and circulation
- b. Determine the blood glucose level (if available)
- c. Supportive care
    - i. Blood sugar needs to be lowered slowly and monitored closely, usually in the ICU
    - ii. Field management should focus on ABC's and counteracting dehydration
- d. Transport

VII. Insulin Pumps
- a. Pager or smart phone appearance
- b. Secrete short acting insulin over 24 hours
- c. Attached subcutaneously by catheter
- d. Suspend pump administration or disconnect when treating a patient with hypoglycemia
- e. Tracks/stores helpful information that may assist in determining when and why a hypoglycemic episode occurred

VIII. Metabolic syndrome
- a. Named for a group of risk factors that increase the risk for coronary artery disease, stroke and type 2 diabetes
    - i. Central obesity
        1. Extra weight around the middle and upper parts of the body
        2. Often described as "apple-shaped"
    - ii. Insulin resistance
        1. Body uses insulin less effectively than normal
        2. Insulin is needed to help control the amount of sugar in the body.
            a. Blood sugar and fat levels rise
    - iii. Increased long-term risk for developing
        1. Heart disease
        2. Type 2 diabetes
        3. Stroke

iii. Head
iv. Back and buttocks
v. Breasts
vi. Abdomen (Increases during pregnancy)
vii. Genitals

c. Victims may be repeatedly
i. Injuries in different stages of healing

IV. Indications of trafficking victims
a. Training resource: [27]Human Trafficking
b. Bruises in various stages of healing caused by physical abuse
c. Scars, mutilations, or infections due to improper medical care
d. Urinary difficulties, pelvic pain, pregnancy, or rectal trauma
e. Chronic back, hearing, cardiovascular, or respiratory problems as a result of forced manual labor in unsafe conditions
f. Poor eyesight and/or eye problems due to dimly lit work sites
g. Malnourishment and/or serious dental problems
h. Disorientation, confusion, phobias, or panic attacks
i. Results of daily mental abuse, torture, and culture shock

V. EMS professionals' actions and considerations with at-risk patients
a. Assessment challenges
i. Unreliable historians
ii. Difficulty in relaying information
1. Previous medical history
2. Medications
3. Other current therapies
iii. Reliance on caregivers
iv. Proper interpretation of the patient's verbal and non-verbal communication
1. Interpretation of physical examination findings often drive care
v. Assess the environment in which patient was found and the need for additional follow-up

b. Treatment
i. Provide supportive care
ii. Treat injuries and illnesses as usual
iii. Document findings
iv. Know whether state law requires mandatory reporting of abuse

AEMT AT-RISK POPULATION SKILLS	none

d. 12% non-occupant
2. Of the injuries:
a. 17% ambulance driver
b. 29% ambulance passenger
c. 54% occupant of other vehicle

d. Limitations of data
i. Only includes crashes that occur on a road way customarily open to the public
ii. Not all vehicle crashes in the country are reported to the police
iii. Police may not record ambulances accurately on crash report
iv. Does not distinguish between ambulance types
v. Does not determine when the crash occurred (en-route to scene, en-route to hospital)
vi. Does not collect data showing the proportion of time an ambulance is on the road
vii. Does not currently differentiate ambulance occupants in the passenger seat or patient compartment of the ambulance
viii. In the future Model Minimum Uniform Crash Criteria (MMUCC) will improve data collection and lead to better analyses.

e. Specific factors that contributed to injuries and fatalities during ambulance crashes
i. References:
1. [30]NHTSA Advances Ground Ambulance Safety by Tracking and Investigating Crashes
2. [33]Infographic—When Ambulances Crash: EMS Provider and Patient Safety
ii. Statistics
1. 84% were unrestrained EMS providers
2. Unsecured patients (both shoulder and lateral restraints)
a. 33% were secured by both restraints
3. 44% of patients were ejected from the cot in serious crashes
4. 61% of patients were restrained with lateral belts only
5. 38% had shoulder harnesses available but were unused

f. Evaluate the policies and procedures at each participant's own EMS service related to protecting patient and provider safety during ground ambulance transport
i. Participants should consider and discuss the following questions:
1. What are your agency's current policies/guidelines regarding securing a patient to the cot during transport?
a. Are those adequate to prevent injury in the event of an ambulance crash?
2. What changes would you recommend to reduce the risk of patient injury in the event of an ambulance crash?
3. What are your agency's current policies/guidelines regarding securing EMS providers in the patient compartment during transport?
a. Are those adequate to prevent injury in the event of an ambulance crash?
4. What changes would you recommend to reduce the risk of EMS provider injury in the event of an ambulance crash?
5. What are your agency's policies/guidelines regarding securing equipment and supplies in the patient compartment?
a. Are those adequate to prevent patient and/or EMS provider injury in the event of an ambulance crash (or during transport)?
6. What preventative measures does your agency have in place regarding driving an ambulance to decrease the risk of ambulance crashes?

AEMT AMBULANCE SAFETY SKILLS	none

v. HIV
vi. Rhinoviruses

b. Eye protection devices
i. Goggles
ii. Face Shields
iii. Safety glasses
iv. Full-face respirators

V. Vaccinations for healthcare providers
a. Reference: [38]CDC—Vaccines: Healthcare Provider/Professionals
b. Recommended vaccines (not exhaustive)
i. Hepatitis B
ii. Influenza
iii. MMR (measles, mumps and rubella)
iv. Varicella
v. Pertussis
vi. Consider vaccines recommended for disaster response
c. Vaccines
i. Help prevent transmission of certain diseases
ii. Some are attenuated (weakened or killed) viruses
iii. Some mimic certain diseases
1. Produce antibodies in the blood
iv. Some provide antibodies directly

AEMT HYGIENE SKILLS	none

1. Injuries
2. Illnesses
3. Incidents

d. EMS Education Initiatives
   i. Safety starts with EMS leaders and educators and involves everyone
   ii. Initial EMS programs must encourage a culture of safety throughout the program
   iii. Continuing education and new employee onboarding must infuse culture of safety throughout the curricula

e. EMS safety standards
   i. Safety standards for patient and responder safety must be developed using data and evidence
   ii. EMSSRC can coordinate the efforts to combine work and data completed by various EMS stakeholders and projects

f. Requirements for reporting and investigation
   i. Mandates for reporting safety are necessary so a common language and data set can be created to improve responder and patient safety
      1. Steps may include:
         a. Determining what data are already mandated and available
         b. Determining what data are necessary and useful
         c. Learning from those with hands-on experience
         d. Assigning and obtaining authorization for an investigative body
         e. Identifying existing best practices

III. Consider these questions in regards to the policies, practices, and daily operations in your organization/agency:
   a. What changes are needed to encourage the development of a culture of safety?
   b. How are mistakes handled if one is made during a patient care encounter?
   c. How should it be handled if applying the concept of Just Culture?

AEMT CULTURE OF SAFETY SKILLS	none

c. Situation 4: For a child whose condition requires spinal immobilization and/or lying flat
    i. Secure the child to a size appropriate spine board
    ii. Secure the spine board to the cot
        1. Head first, with a tether at the foot (if possible) to prevent forward movement
        2. Use three horizontal restraints across the torso (chest, waist, and knees)
        3. Use a vertical restraint across each shoulder
d. Situation 5: For a child or children who require transport as part of a multiple patient transport (newborn with mother, multiple children, etc.)
    i. When possible, transport each as a single patient according to the guidance shown for Situations 1through 4.
    ii. Transport in the forward-facing EMS provider's seat in a size-appropriate child restraint system that complies with FMVSS No. 213
    iii. For mother and newborn, transport the newborn in an approved size-appropriate child restraint system that complies with the injury criteria of FMVSS No. 213
        1. In the rear-facing EMS provider seat that prevents both lateral and forward movement
        2. Transport the mother on the cot
        3. Do not use a rear-facing only seat in the rear-facing EMS provider's seat
        4. Consider using an integrated child restraint system certified by the manufacturer to meet the injury criteria of FMVSS No. 213.

III. Discuss the ongoing initiatives to increase the safety of children during ambulance transport
a. NASEMSO leads the Safe Transport of Children Committee with the following goals:
    i. To recommend the criteria or specifications for proper restraint of children in ambulances. Such criteria will be evidence-based and will consider safety of both patients and providers
    ii. To have the recommended criteria adopted by one or more accredited standard setting organizations.
    iii. To develop a strategy and resources for educating EMS providers on safely transporting children in ground ambulances based on the recommended criteria or standards.

IV. Discuss the limitations of the current recommendations
a. Available research on child- restraint systems only rates the safety in normal use, not in ambulances
b. Not enough evidence from research on simulated ambulance crashes involving child restraint systems to recommend evidence-based guidelines
c. All child restraint systems are only as effective as the manner in which they are secured to a cot and in an ambulance

AEMT PEDI-TRANSPORT SKILLS	none

National Registry of Emergency Medical Technicians®
THE NATION'S EMS CERTIFICATION™

ADVANCED EMTS
OPERATIONS
CREW RESOURCE MANAGEMENT
ADULT & PEDIATRIC PATIENTS: EXPECTED DURATION 1 HOUR

INSTRUCTOR PREPARATIONS

- [40] *IAFC Crew Resource Management Manual*

LESSON OBJECTIVE

- Define Crew Resource Management (CRM)
- Explain the benefits of CRM to EMS
- State the guiding principles of CRM and briefly explain each
- Explain the concept of communication in the team environment using advocacy/inquiry or appreciative inquiry
- State characteristics of effective team leaders
- State characteristics of effective team members
- Explain how the use of CRM can reduce errors in patient care

LESSON CONTENT

I. Define Crew Resource Management
   a. Reference: [40] *IAFC Crew Resource Management Manual*
   b. Effectively using all resources in an effort to minimize errors, improve safety, and improve performance.
   c. Based on crew resource management training created by the aviation industry
      i. Their mission is "preventing accident by improving crew performance through better crew coordination." U.S.D.O.T., F.A.A., 2004
   d. Addresses various human factors that contribute to errors
   e. Created to optimize human performance by reducing the effect of human error through the use of all resources, including:
      i. People
      ii. Hardware
      iii. Information

II. Benefits of Crew Resource Management to EMS
   a. Overarching aim is to minimize errors
   b. Improved safety for patients and care providers
   c. Improved team performance
      i. Conflict resolution
      ii. Improved communication
      iii. Increased feedback
      iv. Better workload management; task assignments
      v. Improved clinical decision making
   d. Improved situational awareness
   e. All team members have equal value and input
   f. All members of the organization participate in CRM and CRM training

III. Five guiding principles of Crew Resource Management
   a. Situational Awareness
      i. Awareness of surroundings
      ii. Evaluation of options
      iii. Communicating options with team members
   b. Decision making
      i. Life threatening vs. non-life-threatening
      ii. Entire team should be aware of all necessary information
      iii. Collective team knowledge and experience should be utilized to make a

decision
    iv. Team leader is ultimate authority on final decision but relies on input from all members with equal weight, incorporating experience and knowledge of team
c. Workload/Task management
    i. Tasks should be divided among all team members to optimize functioning of team as a whole
    ii. Team leaders and members must recognize and communicate limitations
d. Teamwork
    i. Teams are comprised of leaders and followers
    ii. There are competencies for each role: leadership and followership
    iii. Development of leadership and followership allows teams to resolve conflicts during stressful situations and stay on task with the mission of the team
    iv. Team leaders and team members must develop accurate self-assessment skills (meta-cognition) to be effective in their roles
e. Communication
    i. Involves transmitting and receiving messages
    ii. Possibility of transmitting erroneous information
    iii. Possibility of interpreting information incorrectly
    iv. Clarification is necessary in both transmission and reception of information
    v. Clarify and agree on the message between individuals and gain agreement prior to any proposed action (closed-loop communication) in order to reduce errors

IV. Advocacy and Inquiry Communication; appreciative inquiry
a. Four steps to using inquiry/advocacy or appreciative inquiry to improve communication among teams
    i. Alert the other members of the team to a situation or action of concern
    ii. State the problem as it is seen
    iii. State a solution or alternative
    iv. Obtain agreement among the team to alter plan or action

V. Characteristics of effective team leaders
a. Creates, implements and revises an action plan
b. Communicates accurately and concisely while listening and encouraging feedback
c. Receives, processes, verifies, and prioritizes information
d. Reconciles incongruent information
e. Demonstrates confidence, compassion, maturity, and command presence
f. Demonstrates a role of authority for the group and scene
g. Maintains accountability for team's actions/outcomes
h. Assesses situation and resources and modifies accordingly
i. Maintains situational awareness
j. Utilizes appreciative inquiry/ inquiry/advocacy when miscommunication or potential errors occur
k. Uses closed-loop communication
l. Reports progress on tasks
m. Performs tasks accurately and in a timely manner
n. Addresses safety concerns and is safety conscious at all times
o. Treats all team members as equals and with equal level of respect, regardless of rank or experience level

VI. Characteristics of effective team members
a. Communicates accurately and concisely while listening and accepting feedback
b. Demonstrates followership–is receptive to leadership
c. Demonstrates confidence, compassion, maturity

d. Maintains situational awareness
e. Utilizes appreciative inquiry, advocacy/inquiry when miscommunications or potential errors occur
f. Uses closed-loop communication
g. Reports progress on tasks
h. Performs tasks accurately and in a timely manner
i. Advocates safety concerns and is safety conscious at all times
j. Treats all team members as equals and with equal level of respect, regardless of rank or experience level
k. Immediately suggests corrective action if a harmful intervention is ordered/performed by others

VII. Effects of using Crew Resource Management to reduce errors in patient care
a. Increased communication among crew (team leader and team members) can reduce potential safety concerns for the crew
b. Increasing patient safety, mitigation or elimination of errors, and increasing the overall effectiveness of a team are benefits of increased communication and effective communication techniques, such as:
i. The process of identifying a potential or actual error,
ii. Supplying information,
iii. Suggesting alternative actions,
iv. Agreeing on a new plan,
c. Team members experience a safe environment in which to identify human errors and suggest ways to mitigate or eliminate errors.
d. Routine training and practice of CRM can increase self-awareness and self-efficacy for all personnel.

AEMT CREW RESOURCE SKILLS	none

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ADVANCED EMTS
OPERATIONS
EMS RESEARCH
ADULT & PEDIATRIC PATIENTS: EXPECTED DURATION ½ HOUR

INSTRUCTOR PREPARATIONS

- [41]*National EMS Research Agenda 2001*
- [42]*Safety in Numbers: EMS Data IS Important* (course handout)
- [43]*CARES in Action*

LESSON OBJECTIVES

- Identify national initiatives and resources that promote and enable EMS Research
- Explain the practical use of research in EMS care
- Explain the scientific method
- Differentiate among the different research methods
- Explain the process of conducting a literature review

LESSON CONTENT

I. National initiatives and resources that promote and enable EMS Research
   a. Federal Interagency Committee on EMS (FICEMS) included "data-driven and evidence-based EMS systems that promote improved patient care quality" as a strategic goal, published in 2014.
   b. National Highway Traffic Safety Administration (NHTSA) supports the development of evidence based guidelines through the use of standardization and improvement of EMS data collection using NEMSIS
   c. The National Institute of General Medical Sciences coordinates EMS research efforts, promotes ideas for research funding and collaboration

II. Practical use of research in EMS
   a. Ensures that care provided will glean the best, safest possible results and patient outcomes
      i. Reference: [43]*CARES in Action*
      ii. Supported by evidence and expert experience
   b. Demonstrates value of EMS care with reportable outcomes
   c. Improves working conditions-safety research can be focused on EMS providers
   d. Encourages accurate and complete documentation

III. Describe the scientific method
   a. Ask a question
   b. Conduct literature review to seek answers
   c. Determine a hypothesis based on literature review
   d. Test the hypothesis
   e. Analyze the data to prove or disprove hypothesis, consider limitations
   f. Report findings, discuss limitations
   g. Repeat with adjustments or refine hypothesis and begin again

AEMT RESEARCH SKILLS	none

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OPERATIONS
EVIDENCE BASED GUIDELINES
ADULT & PEDIATRIC PATIENTS: EXPECTED DURATION ½ HOUR

INSTRUCTOR PREPARATIONS

- [44]NASEMSO—*Statewide Implementation of an Evidence-Based Guideline*
- [45]NASEMSO—Statewide Implementation of an EBG: References
- [46]National Prehospital Evidence-based Guideline Model Process

LESSON OBJECTIVES

- Define evidenced based medicine and practice
- Identify resources available through NASEMSO to aid states and agencies in developing evidence based guidelines
- Explain the benefits of EBG to patients

LESSON CONTENT

I. Define evidenced based medicine and practice
   a. Statements developed through rigorous scientific inquiry that inform EMS systems, medical directors and EMS personnel on standards of care that have been vetted by research
   b. The National Prehospital Evidence-base Guideline Model Process has been approved by the Federal Interagency Committee on EMS and the National EMS Advisory Council
   c. The Process is cyclical in nature:
      i. System Inputs
      ii. EMS Evidence Accumulation & Evaluation
      iii. Establish Priorities for Guideline Development
      iv. EMS Protocol Development
      v. Dissemination of Guidelines/Protocols
      vi. Implementation
      vii. Evaluation of Effectiveness/Outcomes
      viii. EMS Evidence Accumulation
      ix. Repeat

II. Resources available to aide states and agencies in developing EBGs
   a. Resource: [44]NASEMSO—*Statewide Implementation of an Evidence-Based Guideline*
   b. NASEMSO was awarded a grant
      i. Focus on pediatric patients
         1. To implement an evidence-based guideline on pre-hospital pain management

III. Patients benefit from EBGs
   a. Ensures high quality patient management
      i. Standardized, consistent approach
      ii. Proven successful through expert practice and clinical evidence.

AEMT EVIDENCE BASED GUIDELINES ACTIVITY	Successful	Unsuccessful
1. Create an outline or a synopsis of one or more of the following EMS Evidence Based Guidelines		
a. [47]An Evidence-based Guideline for Pediatric Prehospital Seizure Management Using Grade Methodology		
b. [48]An Evidence-based Guideline for Prehospital Analgesia in Trauma		
c. [49]An Evidence-based Guideline for the Air Medical Transportation of Prehospital Trauma Patients		

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