AED
• AEDs have a high specificity for recognizing shockable rhythms (V-Fib, pulseless V-Tach)
  o Means that they are highly reliable, it'd be extremely rare for the AED to recommend a shock when one is not indicated or fail to recommend a shock when ones indicated
• Most common error: battery failure secondary to operator error
  o To avoid, AEDs are equipped with an alarm that warns the operator if the battery is not fully charged (old ones do not)
• If AED advises “no shock” immediately resume CPR starting with chest compressions
  o Unless the patient starts to move or has other signs of life (coughing) stopping CPR to assess for a pulse should be avoided because it just causes an unnecessary delay in performing chest compressions
• If the AED gives a no shock advised message, it has determined that the patient is not in a shockable rhythm (e.g., V-Fib, pulseless V-Tach).
• The energy setting for a biphasic AED is manufacturer specific

CPR
• Adequate chest compressions “push hard push fast”
• One-rescuer CPR
  o Adult
    ▪ At least 100 compression/min to a depth of at least 2 inches. Ventilations 8 to 10 breaths/min (one breath every 6 to 8 seconds)
    ▪ 30:2 ratio, compression to ventilation
  o Infant or child:
    ▪ At least 1/3 the depth of the chest (about 1.1/2 inches for infants, 2 inches for children)
    ▪ 30:2 compression to ventilation
• Two-rescuer CPR
  o 15:2 compression to ventilation (for infant and child)
  o 30:2 compression to ventilation (for adults)
  o If the airway is not secured with an advanced device (e.g., ET tube, multilumen airway, supraglottic airway)
    ▪ Ventilation and chest compressions must be coordinated (synchronous)
  o After your partner delivers 30 compressions, he or she should pause as you deliver two breaths.
  o Switching compressors during two-rescuer CPR should occur every 2 minutes throughout the arrest
  o Minimize interruptions in CPR to 10 seconds or less, every effort should be made to switch compressors in less than 5 seconds.
• Allow chest to fully recoil after each compression and allow equal time for compression and relaxation
  o Incomplete chest recoil causes increased intrathoracos pressure which may impair blood return to the heart
• Ventilation should be delivered over a period of 1 second each, just enough to produce visible chest rise
• Chest compressions must be paused when using the AED to analyze the patient’s cardiac rhythm or defibrillate and when assessing for a pulse
• Upon arriving at a scene where by bystander CPR is in progress, must confirm that the patient is indeed apneic and pulseless and need CPR (stop CPR so you can assess berating and pulse)
  o Bystanders who are not properly trained often perform CPR on patients who do not need it. After confirming cardiac arrest, you should resume CPR and attach the AED as soon as possible
• Analyzed a cardiac arrest patient’s rhythm three times with the AED, separated by 2-minute cycles of CPR, and have received no shock messages each time
  o Continue CPR and transport at once

Return of spontaneous circulation (ROSC)
• Palpable pulse is restored
• 1st action should be to reassess the patient’s airway and ventilator status
• If patient remains apneic, continue rescue breathing
• If patient is breathing adequately, administer high flow oxygen.
• After reassessing the airway and breathing and treating patient, prepare for immediate transport
• Because of the high risk that cardiac arrest will recur following resuscitation, you should not remove the AED pads; simply turn the AED off instead

Questioning about type of pain
• Avoid asking leading questions that can simply be answered yes or non. To obtain the most reliable assessment, open-ended questions should be asked to allow the patient to describe the quality of the pain in his or her own words
• First ensure that you and the patient are in a safe place
• A lighting strike typically induces asystole (cardiac standstill); however, this spontaneously resolves in some people or can be reversed with early, high-quality CPR.
• The energy associated with lightning is composed of direct current (DC) of up to 200,000 amperes and a potential of 100 million volts or more; however the duration of a lightning strike is short.
  o Skin burns are usually superficial; full thickness (3rd degree) burns are rare.
• Lighting cause massive contraction of all the body’s muscles, potentially resulting in long bone and spinal fractures (although this can clearly increase morbidity, not he most common cause of lightning related deaths)
• The process of triaging multiple victims of a lightning strike is different than the conventional triage methods used during a mass-casualty incident. When lightning, respiratory or cardiac arrest strikes a person, if it occurs, usually occurs immediately. Those who are conscious following a lightning strike are much less likely to develop delayed respiratory or cardiac arrest; they usually survive. Therefore, you should focus your efforts on those who are in respiratory or cardiac arrest. This process, called reverse triage, differs from conventional triage, where such patients would ordinarily be classified as deceased.

Behavior emergency
• Primary responsibility is to keep yourself safe; safely transporting the patient to the hospital is your ultimate goal. If possible, you should attempt to obtain a medical history and should take any of the patient's prescribed medications to the hospital.
• Ex: psychiatric crisis. History of depression and schizophrenia and takes Zoloft and Zyprexa
  o If scared not violent—prepare to spend extra time with the patient
    ▪ Just because he is experiencing an acute crisis does not mean that he has not been taking his medications;
  o Silent and unwilling to speak to you, do not fear the silence. The patient simply does not wish to speak. You should not press the issue, because doing so may upset the patient. You should remain calm until the patient speaks to you, and then respond accordingly
  o Violent-if a violent patient needs to be restrained, you must ensure the presence of at least four people (one per extremity). One of the EMTs should continuously talk to the patient to explain what is happening, even if the patient is not listening. Restraint is a last resort used to protect the EMT as well as the patient. Consent is not needed from a family member prior to restraining the patient
• You must be honest, reassuring, and patient. Let the patient tell you how he or she is feeling in his or her own words, and acknowledge any auditory or visual hallucinations
• Do not, however, play along with the hallucinations; this is cruel and simply reinforces that what the patient is hearing or seeing is real
• An adult with decision-making capacity (i.e., a mentally competent adult) has the legal right to refuse medical treatment, even if that treatment involves lifesaving care. In psychiatric cases, however, a court of law would likely consider your actions in providing lifesaving care to be appropriate, particularly if you have a reasonable belief that the patient will harm himself or herself or others without your intervention. In addition, a patient who is in any way impaired, whether by mental illness, medical condition, or intoxication, may not be considered competent to refuse treatment and transport. If you are unsure of a patient’s decision-making capacity, err on the side of treatment and transport.
• Immediate threat to your own and your partner’s safety! The patient is verbally abusive and has a firearm within arm’s reach. In this situation, you and your partner should slowly back away from the patient, exit the residence, and notify law enforcement. Do NOT take your eyes off the patient; if you turn your back, you may take a bullet in the back! Backing away gives you the opportunity to take cover if you see the patient reach for his gun. Remember, your safety comes before all else.

Drowning victims
• Drowning and near-drowning are referred to as submersion injuries.
• In a drowning, death is either immediate or occurs within 24 hours following submersion.
• Near-drowning is defined as survival, at least temporarily (24 hours), after submersion.
• It should be noted, however, that complications such as pneumonia and pulmonary edema could cause death more than 24 hours following submersion. For this reason, all patients with a submersion injury should be transported to the hospital, even if they appear fine at the scene.
• After safely reaching a drowning victim,
  o Should 1st turn him to a supine position by rotating the entire upper half of the body as a single unit; protect the cervical spine as you do this because a spinal injury cannot be ruled out
  o Open patient airway, without manipulating the neck, and begin rescue breathing while still in the water.
  o Float a buoyant backboard under the patient, secure him to it, and remove him from the water.
• After removing the victim from the water
  o Assess for a pulse. If the victim is pulseless, begin CPR, dry him off, and apply the AED as soon as possible.
o In cases where a patient is not breathing and is regurgitating (passively vomiting) secretions at the same time, you must address both issues. This is accomplished most effectively by suctioning for 15 seconds and then ventilating for 2 minutes.
  ▪ You should turn the patient onto his side to facilitate drainage of liquid, but do not apply pressure to his abdomen.
  ▪ Manual gastric decomposition, which involves applying pressure to the patient's abdomen, is a dangerous maneuver because it will force more water from the stomach, which the patient could potentially aspirate.
    ▪ Be performed ONLY if gastric distention is so severe that it is impossible to ventilate a patient
      AND a paramedic is not present to insert a gastric tube into the stomach.

Hear-related emergency
• Your first action is to move the patient to a cooler environment.
• Once you have moved the patient to a cooler place, you should begin your assessment and treat the patient accordingly.
• Remember, you must FIRST prevent further harm to the patient.
• Heat exhaustion
  ▪ Should be transported to the hospital for evaluation, especially since he experienced a syncopal episode (fainting)
  ▪ Nauseated, he should not be given anything to drink and should be placed on his side during transport to prevent aspiration if he vomits.
• Heatstroke
  ▪ Occurs when the body is exposed to more heat than it can eliminate and normal mechanisms for eliminating heat, such as sweating, are overwhelmed.
  ▪ Many patients with heatstroke have hot, dry, flushed skin; however, early in the course of heatstroke, the skin may be moist due to residual perspiration, as with exertion heatstroke. As the core body temperature rises, the patient's level of consciousness decreases

Hypothermia
• Mild hypothermia --- a core body temperature (CBT) between 93.2°F and 95.8°F (34°C and 35°C).
  ▪ Patients are usually alert and shivering in an attempt to generate heat through muscular activity. Their skin is typically pale due to the body's constriction of blood vessels, the skin to retain heat.
• In moderate hypothermia (CBT between 86°F and 95.8°F [30°C and 34°C]).
  ▪ Shivering stops and muscular activity decreases. As the CBT falls further, all muscle activity stops.
• In severe hypothermia (CBT < 93.2°F [34°C]),
  ▪ Vital functions decrease (e.g., level of consciousness, BP, pulse, respirations) and the patient is at risk for life-threatening cardiac dysrhythmias. The muscles become rigid and the patient appears stiff. The patient may appear dead; although a pulse is present, it may not be palpable.
    ▪ Should be managed with basic life support (chest compressions and ventilations), passive external rewarming (i.e., removal of wet clothing, applying warm blankets), and rapid transport to the hospital
    ▪ Because cold muscle is a poor conductor of electricity, defibrillation, if indicated, should be limited to one attempt until the patient's body temperature has been increased. Cardiac arrest patients with severe hypothermia generally do not respond to defibrillation.
    ▪ Hyperventilation should be avoided, as this may increase intrathoracic pressure and impair blood flow back to the heart.
• Goal is to prevent further heat loss; this involves removing wet clothing, applying warm blankets, and allowing the patient's body temperature to rise gradually and naturally (passive rewarming)
• If the patient is moderately or severely hypothermic, you should NOT try to rewarm him or her actively (placing heat on or into the body).
• Rewarming too quickly may cause a fatal cardiac dysrhythmia, such as ventricular fibrillation (V-Fib). Active rewarming may also cause rewarming shock, a condition in which the blood vessels dilate when heat is applied to the body, resulting in significant hypotension.
• Active rewarming should be performed only in the controlled setting of a hospital

Frostbitten body parts
• Should not rewarmed if there is a chance that they could freeze after you have rewarmed them
• If an extremity thaws and then refreezes, the amount of tissue and cellular damage may be worse than the damage caused by the initial freezing.
• If rewarmed, the extremity should be immersed in water that is 105°F to 112°F. Analgesia would certainly be a comfort to the patient, although its absence does not negate rewarming a frostbitten body part in the field.

Ingested poison
• Once an ingested poison gets into the body, it can affect multiple organ systems. Signs that this is occurring include tachycardia or bradycardia, hypotension or hypertension, weakness, restlessness, and an altered level of consciousness, among others. (Systemic reaction)
The systolic BP for a child between 6 and 12 years of age
• Typically ranges between 80 and 110 mm Hg.

The respiratory rate in a child between 1 and 3 years of age
• Typically ranges between 20 and 30 breaths/min.

There are three stages of labor: dilation of the cervix, delivery of the baby, and delivery of the placenta.
• The first stage begins with the onset of contractions and ends when the cervix is fully dilated.
  ○ Since assessing for cervical dilation is not performed in the prehospital setting, the first stage of labor is said to have ended when crowning occurs.
    ▪ Crowning occurs when the baby’s head is visible at the vaginal opening; it is an obvious sign of delivery in progress.
  ○ Because the cervix has to be stretched thin by uterine contractions until the opening is large enough for the fetus to pass through into the vagina, the first stage is usually the longest, lasting an average of 16 hours for a first delivery.
  ○ With subsequent pregnancies, the first stage of labor typically progresses more quickly. You will usually have enough time to transport the mother during the first stage of labor, especially if this is her first pregnancy.
  ○ It should be noted, however, than some primigravida (pregnant for the first time) women progress through the first stage of labor very quickly.

Baby delivery
• As the baby’s head begins to deliver, it is usually in a posterior, face-down position. After the head delivers completely, however, it usually tilts to the side in preparation for delivery of the shoulders. Remember to check for the presence of a nuchal cord (umbilical cord wrapped around the neck), and to suction the baby’s mouth and nose as soon as its head delivers.
• You should assist with the delivery of the baby’s head by:
  ○ Placing your fingers on the bony part of the skull and applying gentle pressure.

Following delivery of a newborn and placenta, you note that the mother has moderate vaginal bleeding. The mother is conscious and alert, and her vital signs are stable
• Administering oxygen and massaging the uterus.
  ○ Uterine massage stimulates the pituitary gland to secrete a hormone called oxytocin, which constricts the blood vessels in the uterus and helps stop the bleeding.

Braxton-Hicks contractions:
• During pregnancy, women may experience false labor, or Braxton-Hicks contractions, in which there are contractions but they do not represent true labor. Unlike true labor contractions, Braxton-Hicks contractions do not increase in intensity, are not regular, and are typically alleviated by activity or a change in position.

Seizures in children MOST often are the result of: fever (febrile seizures)
• An abrupt rise in body temperature

During transport of a woman in labor, the patient tells you that she feels the urge to push. You assess her and see the top of the baby’s head bulging from the vagina. You should:
• Advise your partner to stop the ambulance and assist with the delivery.
• Apply gentle pressure to the top of the baby’s head (be careful of the fontanelles) to prevent an explosive delivery. After the head is delivered, you should quickly run your fingers around its neck to determine if the cord is wrapped around its neck (nuchal cord). If a nuchal cord is not present, suction the baby's mouth and nose and continue with the delivery.

Pediatric assessment triangle purpose
• Form a general impression of the child without touching him or her.

MOST common cause of shock in infants and children
• Dehydration (even from a few episodes of vomiting and/or diarrhea), and blood loss from trauma.

MOST detrimental effect of gastric distention in infants and children is:
• Decreased ventilatory volume.

MOST indicative of inadequate breathing in an infant
• Expiratory grunting

High fever and an alerted mental status indicate sepsis (severe infection). A generalized rash should alert you to the possibility of meningitis, a condition caused by infection and inflamation of the meninges that protect the brain and spinal cord
• Children with meningitis are at risk for seizures (convulsions), usually due to increased intracranial pressure (ICP) and/or high fever; therefore, you must continually monitor the child’s condition en route to the hospital and be prepared to treat seizures if they occur.

Because infants and small children rely heavily on their diaphragm for breathing (as evidenced by belly breathing),
• Elevating their lower extremities can cause the diaphragm to shift into the thoracic cavity and decrease the effectiveness of breathing.