Seattle/King County EMT-B Class

Topics

1. Trauma: Chapter 21
2. Bleeding: Chapter 22
3. Shock: Chapter 23
4. Soft Tissue Injuries: Chapter 24
5. Intro to AED

Trauma
**Kinematics of Trauma**

- Injuries are the leading cause of death among children and young adults.

**Traumatic Injuries**

- **Blunt trauma**
  - Caused by a force to the body
  - Injuries do not penetrate soft tissue or organs

- **Penetrating trauma**
  - Caused by objects such as knives and bullets
  - Injuries pierce the surface of the body

**Mechanism of Injury (MOI)**

- MOI is the way in which traumatic injuries occur.
- Different MOIs produce many types of injuries.
  - Isolated to one body system
  - Injuries to many body systems
**Vehicular Crashes and MOI**

- By assessing the crash, the MOI may be determined.
- By determining the MOI, you may be able to predict the types of injuries that may have happened at the time of impact.

**Vehicular Collisions**

Three types of crashes
- Collision of car against another car or object
- Collision of passenger(s) against interior of car
- Collision of passenger’s internal organs against the solid structures of the body

**Significant MOI**

- Severe deformities to the frontal part of the vehicle
- Moderate intrusion from a T-bone accident
- Severe damage from the rear
- Collisions in which rotation is involved
Types of Motor Vehicle Collisions

• Frontal
• Lateral
• Rear-end
• Rollovers
• Spins

Frontal Collisions

• Evaluate seat belts and airbags.
• Remember that supplemental restraint systems cannot prevent all injuries.
• You should still suspect that serious injuries have occurred.

Frontal Collisions, continued

• Check for contact points.
• Steering wheels can also cause chest injuries, especially if no airbag is present.
Rear-End Collisions

- Commonly cause whiplash-type injuries
- Unrestrained passengers will be thrust forward into the dashboard.

Rear-End Collisions, continued

- Back seat passengers wearing only lap belts might have a higher incidence of lumbar and thoracic spine injury.

Quiz Question Alert...!

Lateral Collisions

- Responsible for the highest incidence of deaths.
- Lateral whiplash injury is the result.
- There may be intrusion into the passenger compartment.
Rollover Crashes

- Injury patterns differ if patients are unrestrained.
- The most unpredictable injuries are to unrestrained passengers.
- Ejection is the most common life-threatening injury.

Spins

- Vehicle is put into rotational motion.
- Vehicle often strikes a fixed object, combining forces of rotation with lateral impact.

Car-Versus-Pedestrian Collisions

- Often cause serious injuries to body systems.
- Evaluate MOI to determine:
  1. Whether patient was thrown and how far, OR
  2. Whether patient was struck and pulled under car.
- Presume injury to the spinal cord and maintain immobilization.
Falls

- Injury potential is related to the height of the fall.
- A fall either 10' or 2 times the person’s height is considered significant.
- Suspect internal injuries from a significant fall.

Considerations for Falls

- The height of the fall
- The surface struck
- The part of the body that hit first, followed by the path of energy displacement
- Always consider syncope or other medical conditions as an underlying cause.

“Can you tell me what happened before you fell?”

Penetrating Trauma

- 2nd largest cause of death in the United States after blunt trauma.
- Penetration can be low-energy, or medium- or high-velocity.
- The greater the speed of penetration, the greater the injuries.
Penetrating Trauma

Low-Energy
- Caused accidentally by an object or intentionally with a weapon
- Injury caused by the sharp edges of the object moving through the body

Penetrating Trauma, continued

Medium- and High-Velocity
- Usually caused by bullets.
- Bullets can change shape and ricochet within the body.
- If possible, identify weapon caliber and shooting distance.

Injuries to the Head
- Bruising or tearing of the brain
- Bleeding or swelling inside the skull is often life threatening.
- Some patients may not have signs and symptoms.
Injuries to the Neck

- Tearing or swelling of trachea can cause life-threatening airway problems.
- Injury to large blood vessels in the neck may produce swelling that prevents blood flow to the brain.
- Open wounds to neck vein bleed heavily or allow air to enter the circulatory system.

Injuries to the Chest

- Broken ribs may interfere with chest's ability to expand normally.
- Large vessels may tear, causing massive bleeding.

Pneumothorax

- Air collecting between lung tissue and chest wall
- Compression of lung tissue interferes with oxygen exchange.
- May also interfere with the functioning of the heart (tension pneumothorax)
Abdominal Injuries

- Solid organs can tear, lacerate, or fracture, causing serious bleeding and death.
- Hollow organs can leak digestive fluids.
- Trauma patients who complain of abdominal pain may have abdominal bleeding.

Mutisystem Trauma Patient

- A patient whose injuries involve more than one body system
Cardiovascular System

The cardiovascular system is responsible for supplying and maintaining adequate blood flow.

Consists of 3 parts:
- Heart (the pump)
- Blood vessels (the pipes)
- Blood and body fluids (fluids)

Significance of Bleeding

- The body will not tolerate an acute blood loss of greater than 20% of blood volume.
- In the typical adult, 20% is 1 liter or 2 pints.
- A 1-year-old infant typically has 800 mL. A loss of 200 mL is significant.

Characteristics of Bleeding

Arterial

Blood is bright red and spurts:
Characteristics of Bleeding

- **Arterial**
  - Blood is dark red and does not spurt:

- **Venous**
  - Blood oozes out and is controlled easily:

Characteristics of Bleeding

- **Arterial**
  - Blood is dark red and does not spurt:

- **Venous**
  - Blood oozes out and is controlled easily:

- **Capillary**

Blood Clotting

- Bleeding normally stops within 10 minutes.
- Some medications interfere with clotting.
- Some injuries will be unable to clot.
- Patients with hemophilia lack clotting factors.
Perfusion

Circulation in adequate amounts to meet the cells’ needs for oxygen, nutrients, and waste removal.

- The heart demands a constant supply of blood.
- The brain and spinal cord can survive for 4 to 6 minutes.
- The kidneys may survive 45 minutes.
- The skeletal muscles may last 2 hours.

External Bleeding

1. Follow BSI precautions.
2. Ensure patient has an open airway and adequate breathing.
3. Provide oxygen if necessary.

There are several methods to control bleeding:
- Direct pressure
- Elevation
- Pressure points

Direct pressure
- Most common and effective.
- Apply pressure with gloved finger or hand.
External Bleeding

- Elevating a bleeding extremity often stops venous bleeding.
- Use both direct pressure and elevation whenever possible.

Direct pressure
Elevation

If bleeding continues, apply pressure on pressure point.
Pressure points are located where a blood vessel lies near a bone.

External Bleeding

Direct pressure
Elevation
Pressure points

Splints

- Splints can help control bleeding associated with a fracture.
- Air splints can be used to control bleeding of soft-tissue injuries.
Bleeding from the Nose, Ears, and Mouth

Causes:
- Skull fractures
- Facial injuries
- Sinusitis
- High blood pressure
- Coagulation disorders
- Digital trauma

Controlling a Nosebleed

- Help the patient sit and lean forward.
- Apply direct pressure by pinching the patient's nostrils.
- Or place a piece of gauze bandage under the patient's upper lip and gum.
- Apply ice over the nose.

Bleeding from Skull Fractures

- Do not attempt to stop the blood flow.
- Do not attempt to push contents back in.
- Loosely cover bleeding site with sterile gauze.
- Note presence of cerebrospinal fluid coming from the ears or nose.
Internal Bleeding

Internal bleeding may not be readily apparent.

Assess patient’s:

- Mechanism of injury
- Nature of illness

Signs/Symptoms of Internal Bleeding

- Ecchymosis: bruising
- Hematoma: bleeding beneath the skin
- Hematemesis: blood in vomit
- Melena: black, tarry stool
- Hemoptysis: coughing up blood
- Pain, tenderness, bruising, guarding, or swelling
- Broken ribs, bruises over the lower chest, or rigid, distended abdomen

Signs of Hypoperfusion (Shock)

- Change in mental status
- Tachycardia
- Weakness
- Thirst
- Nausea or vomiting
- Cold, moist skin
- Shallow, rapid breathing
**Signs of Hypoperfusion (Shock)**

- Dull eyes
- Dilated pupils
- Weak, rapid pulse
- Decreased blood pressure
- Altered level of consciousness

**Emergency Medical Care**

1. Take BSI precautions.
2. Decide SICK/NOT SICK.
3. Maintain airway and administer oxygen.
4. Control external bleeding.
5. Quickly assess pulse rate and quality.
6. Determine skin condition, color, and temperature.
7. Elevate legs and keep patient warm.
8. Transport immediately.

**Shock**
**What is Shock?**

- State of collapse and failure of the cardiovascular system.
- Leads to inadequate circulation.
- Without adequate blood flow, cells cannot get rid of metabolic wastes.
- The result of shock causes the organ, then organ systems, to fail.

**Perfusion Triangle**

- **Heart** (Pump Function)
  - Damage to the heart by disease or injury.
  - It cannot move blood adequately to support perfusion.

- **Blood Vessels** (Pipe Function)
  - If all the vessels dilate at once, the normal amount of blood volume is not enough to fill the system and provide adequate perfusion to the body.

- **Blood** (Content Function)
  - If blood or plasma is lost, the volume in the container is not enough to support the perfusion needs of the body.

**Characteristics of Shock (cardiac)**

- Cardiogenic Shock (pump failure)
  - Inadequate function of the heart
  - Causes a backup of blood into the lungs
  - Results in pulmonary edema
  - Pulmonary edema leads to impaired ventilation
Characteristics of Shock (cardiac)

Neurogenic Shock (pipe failure)
- Damage to the cervical spine may affect control of the size and muscular tone of blood vessels.
- The vascular system increases.
- Blood in the body cannot fill the enlarged system.

Characteristics of Shock (cardiac)

Hypovolemic Shock (content failure)
- Results from fluid or blood loss.
- Blood is lost through external or internal bleeding.
- Severe thermal burns cause plasma loss.
- Dehydration aggravates shock.

Characteristics of Shock (cardiac)

Combined Pipe and Content Failure
- Some patients with severe bacterial infections, toxins, or infected tissues contract septic shock.
- Toxins damage vessel walls, causing leaking and impairing ability to contract.
- Leads to dilation of vessels and loss of plasma, causing shock.
Non-cardiac Causes of Shock

Respiratory Insufficiency
- Patient with a severe chest injury or airway obstruction may be unable to breathe adequate amounts of oxygen.
- Insufficient oxygen in the blood will produce shock.

Non-cardiac Causes of Shock

Anaphylactic Shock
- Occurs when a person reacts violently to a substance.
- Four categories of common causes:
  - Injections
  - Stings
  - Ingestion
  - Inhalation

Non-cardiac Causes of Shock

Psychogenic shock
- Caused by sudden reaction of the nervous system that produces a temporary, generalized vascular dilation.
- Commonly referred to as fainting or syncope.
- Can be brought on by serious causes: irregular heartbeat, brain aneurysm.
- Can be brought on by fear, bad news, unpleasant sights.
Progression of Shock

Compensated Shock
When the body compensates for blood loss.

Compensated Shock
The late stage of shock when blood pressure is falling.

Decompensated Shock
Irreversible Shock
The terminal stage.
Compensated Shock
- Sustained tachycardia (heart rate of 100-120 or higher)
- Anxiety
- Restlessness
- Feeling of impending doom
- Weak pulse

- Altered mental status
- Clammy skin
- Pallor
- Shallow, rapid breathing
- Shortness of breath
- Nausea or vomiting
- Delayed capillary refill
- Marked thirst

Decompensated Shock
- Falling blood pressure (<90 mm Hg in an adult)
- Labored, irregular breathing
- Ashen, mottled, cyanotic skin
- Thready or absent pulse
- Dull eyes, dilated pupils
- Poor urinary output

When to Expect Shock
- Multiple severe fractures
- Abdominal or chest injuries
- Spine injuries
- Severe infection
- Major heart attack
- Anaphylaxis
Emergency Medical Care

- Decide SICK/NOT SICK.
- Ensure patent airway.
- Keep patient supine.
- Control external bleeding.

Emergency Medical Care, cont’d

- Splint any broken bones or joint injuries.
- Always provide oxygen.
- Place blankets under and over patient.

Emergency Medical Care, cont’d

- If not contraindicated, elevate feet 6” to 12”.
- Do not give the patient anything by mouth.
Pneumatic Antishock Garment

- Some localities allow EMTs to apply a pneumatic antishock garment (PASG) for some patients in decompensated shock.
- Know your local protocol regarding their usage.

Treating Shock

Cardiogenic Shock (pump failure)
- Patient may breathe better in a sitting or semi-sitting position.
- Administer high-flow oxygen.
- Assist ventilations as necessary.
- Have suction nearby in case the patient vomits.
- Transport promptly.

Neurogenic Shock (pipe failure)
- Maintain airway.
- Assist breathing as needed.
- Keep patient warm.
- Transport promptly.
Treating Shock

Hypovolemic Shock (content failure)
• Control obvious bleeding.
• Splint any bone or joint injuries. If no contra-indication, raise legs 6" to 12".
• Secure and maintain airway.
• Give oxygen as soon as you suspect shock.
• Transport rapidly.

Treating Shock

Septic Shock
• Transport as promptly as possible while giving all general support available.
• Give high-flow oxygen during transport.
• Use blankets to conserve body heat.

Treating Shock

Anaphylactic Shock
• Administer epinephrine.
• Provide prompt transport.
• Provide all possible support:
  – Oxygen
  – Ventilatory assistance
Treating Shock

Psychogenic Shock

- It is usually self-resolving.
- Assess patient for injuries from fall.
- If patient has difficulties after regaining consciousness, suspect another problem.

Soft Tissue Injuries

Anatomy of the Skin
Function of the Skin
- Protection
- Sensation
- Temperature control

Soft-Tissue Injuries
- Closed injuries
  - Soft-tissue damage beneath the skin
- Open injuries
  - Break in the surface of the skin
- Burns
  - Soft tissue receives more energy than it can absorb

Contusion
- Results from blunt force striking the body
Hematoma
- Pool of blood that has collected in the body

Crushing Injury
- Occurs when a great amount of force is applied to the body

Scene Size-up
1. Scene Size-up
   - Observe for hazards.
   - Take BSI precautions.
   - You may be able to identify bleeding before even reaching patient.
   - Look for MOI indicators.
1. Scene Size-up

2. Initial Assessment

- Decide SICK/NOT SICK.
- Does patient have any apparent life threats?
- Look for hidden injuries.
- Ensure patent airway.
- Protect patient from further spinal injury.
- Quickly assess breathing.
- Palpate chest wall for DCAP-BTLS.

1. Scene Size-up, continued

2. Initial Assessment

- If soft-tissue injury is discovered on chest or abdomen:
  - Check for clear and symmetrical breath sounds.
- Quickly assess pulse rate and quality.
  - Pulse will indicate how aggressively you need to treat for shock.
  - Closed soft-tissue injuries do not have visible signs of bleeding.

Focused History/Physical Exam

1. Scene Size-up
2. Initial Assessment
3. Focused History/Physical Exam

Focused physical exam
- Focus assessment on the isolated closed injury, complaint, and affected body region.

Rapid physical exam
- Perform if significant trauma has likely affected multiple systems.
- Make sure cervical collar is applied.
Detailed Physical Exam

1. Scene Size-up
2. Initial Assessment
3. Focused History/Physical Exam
4. Detailed Physical Exam

- Any time there is a significant MOI, perform detailed physical exam if time permits.

Ongoing Assessment

1. Scene Size-up
2. Initial Assessment
3. Focused History/Physical Exam
4. Detailed Physical Exam
5. Ongoing Assessment

- Repeat the initial assessment.
- Reassess vital signs frequently.
- Communication and documentation
  - Provide accurate account of how you treated injuries.

Baseline Vital Signs

- Closed-injury patients may rapidly become unstable.
- Look for tachycardia; tachypnea; low blood pressure; weak pulse; and cool, moist skin.
- Soft-tissue injuries, even without a significant MOI, can cause shock.
SAMPLE History

- Obtain from responsive patient or bystanders/family.
- Look for medical ID jewelry or cards.

Interventions

- Provide complete spinal immobilization early if spinal injuries are suspected.
- Provide high-flow oxygen.
- Treat aggressively for shock.
- Request ALS if necessary.
- Do not delay transport.

RICES

- Rest—keep patient quiet and comfortable as possible.
- Ice slows bleeding.
- Compression over an injury slows bleeding.
- Elevation above the level of the heart reduces swelling.
- Splinting decreases bleeding and reduces pain.
Common Injuries

Abrasions
- Caused by friction

Common Injuries, continued

Abrasions
Lacerations
- Jagged cut

Common Injuries, continued

Abrasions
Lacerations
Avulsion
- Separation of various layers of the skin
Common Injuries, continued

- Abrasion
- Laceration
- Avulsion
- Penetrating wound

• Results from a sharp pointed object

Common Injuries, continued

- Abrasion
- Laceration
- Avulsion
- Penetrating wound
- Gunshot wound

• Gunshot wounds have unique characteristics

Common Injuries, continued

- Abrasion
- Laceration
- Avulsion
- Penetrating wound
- Gunshot wound
- Crushing open wound

• May involve damaged internal organs or broken bones
Scene Size-up

1. Scene Size-up
   - Wear BSI.
   - Do not touch equipment with bloody gloves; wear several pairs.
   - Beware of contaminating one patient with another patient’s blood.
   - Wear eye protection.
   - Consider MOI.

Initial Assessment

1. Scene Size-up
2. Initial Assessment
   - Decide SICK/NOT SICK.
   - There may be internal underlying injuries.
   - Injuries can affect airway and breathing.
   - Provide spinal immobilization.
   - If the patient has an open chest wound, evaluate for bubbling or sucking sounds.

Initial Assessment, continued

1. Scene Size-up
2. Initial Assessment
   - Quickly place an occlusive dressing over wound.
   - Provide high-flow oxygen.
   - Assess pulse and skin for shock.
   - Control significant bleeding.
Focused History/Physical Exam
1. Scene Size-up
2. Initial Assessment
3. Focused History/Physical Exam
   • Focus on isolated injury, complaint, and affected body region.
   • Perform if there is significant trauma affecting multiple systems.
   • Look for DCAP-BTLS.
   • Be sure that spine is stabilized.

Detailed Physical Exam
1. Scene Size-up
2. Initial Assessment
3. Focused History/Physical Exam
4. Detailed Physical Exam
   • Perform if patient is stable and time allows.

Ongoing Assessment
1. Scene Size-up
2. Initial Assessment
3. Focused History/Physical Exam
4. Detailed Physical Exam
5. Ongoing Assessment
   • Reassess all bandaging.
   • Reassess ABCs.
   • Communication and documentation
   • Include description of MOI and patient’s position.
   • Describe location, size, depth of injury.
   • Provide accurate account of how you treated injuries.
Baseline Vital Signs/SAMPLE History

Baseline vital signs
- Will help determine if patient is going into shock
SAMPLE history
- Anemia and hemophilia
- Medications that thin the blood (aspirin, prescribed blood thinners)

Interventions
- Control bleeding.
- If bleeding is not significant, control later in assessment.
- Stabilize spine and assist breathing.
- Splint painful, swollen, deformed extremities.

Emergency Medical Care
- Use proper BSI precautions.
- Decide SICK/NOT SICK.
- Administer oxygen.
- Treatment priority is ABCs—including controlling bleeding.
Emergency Medical Care, cont’d

• Apply dry, sterile dressing over entire wound.
• Maintain pressure and secure dressing with a roller bandage.

4

Emergency Medical Care, cont’d

• Leave original dressing in place if bleeding continues.
• Apply a second dressing on top of first and secure.
• Splint the extremity.

4

Abdominal Wounds

• Open wound in abdomen may expose organs.
• Organ protruding through abdomen is called an evisceration.
Abdominal Wound Management

- Do not touch exposed organs.
- Cover organs with a moist sterile dressing.
- Transport immediately.

Impaled Objects

- Do not attempt to move or remove object.
- Control bleeding and stabilize object.

Impaled Objects, continued

- Tape a rigid item over object to prevent movement.
- Transport to hospital carefully.
Amputations

- Immobilize partial amputation with bulky dressings and splint.
- Wrap amputated part in dry sterile dressing and place in plastic bag (then place that in another plastic bag).
- Put bag(s) in container filled with ice. **Do not let object freeze!**
- Transport severed part with patient.

Neck Injuries

- An open neck injury can be life threatening.
- Air can get into the veins and cause an air embolism.

Neck Injuries, continued

- Cover the wound with an occlusive dressing.
- Apply manual pressure.
- Secure a pressure dressing loosely over the neck and firmly through the opposite axilla.
Burns

• Burns account for over 10,000 deaths/year.
• Burns are the most serious and painful injuries.
• Remember to perform a complete assessment on burn patients for other injuries.

Determining Burn Severity

• What is the depth of the burn?
• What is the extent of the burn?
• Are any critical areas involved?
• Are there any preexisting medical conditions or other injuries?
• Is the patient younger than 5 years or older than 55 years of age?

Depth of Burns

- Superficial: 1st degree
  - Involve only top skin layer.
Depth of Burns, continued

Superficial: 1st degree
- Involve epidermis and some portion of dermis.

Partial-thickness: 2nd degree
- Extend through all layers of skin.

Full-thickness: 3rd degree

Extent of Burns
Critical Burns

- Full-thickness burns involving hands, feet, face, upper airway, genitalia, or circumferential burns of other areas
- Full-thickness burns covering more than 10% of total body surface area
- Partial-thickness burns covering more than 30% of total body surface area
- Burns associated with respiratory injury

Critical Burns, continued

- Burns complicated by fractures
- Burns on patients younger than 5 years old or older than 55 years old that would be classified as moderate on young adults

Moderate Burns

- Full-thickness burns involving 2% to 10% of total body surface area excluding hands, feet, face, upper airway, or genitalia
- Partial-thickness burns covering 15% to 30% of total body surface area
- Superficial burns covering more than 50% of total body surface area
**Minor Burns**

- Full-thickness burns involving less than 2% of the total body surface area
- Partial-thickness burns covering less than 15% of the total body surface area
- Superficial burns covering less than 50% of the total body surface area

**Pediatric Needs**

- Burns to children are considered more serious than burns to adults.
- Children have more surface area relative to body mass than adults.
- Many burns result from abuse.
- Report all suspect cases of abuse to the authorities.

**Critical Burns in Infants and Children**

- Full-thickness burns covering more than 20% of total body surface area
- Burns involving hands, feet, face, upper airway, genitalia
Moderate Burns in Infants and Children

- Partial-thickness burns covering 10% to 20% of total body surface area

Minor Burns in Infants and Children

- Partial-thickness burns covering less than 10% of total body surface area

Emergency Care for Burns

- Follow proper BSI precautions.
- Move patient away from burning area.
- Immerse affected area in cool sterile water or saline solution and cover with cool, wet dressing.
Emergency Care for Burns, cont'd

- Provide high-flow oxygen.
- Prevent body heat loss.
- Rapidly estimate the burn's severity.
- Check for traumatic injuries.

Emergency Care for Burns

- Treat the patient for shock.
- Provide prompt transport.

Chemical Burns

- Occur whenever a toxic substance contacts the body.
- Eyes are particularly vulnerable.
- Fumes can cause burns.
- To prevent exposure, wear appropriate gloves and eye protection.
Care for Chemical Burns

• Remove the chemical from the patient.
• If it is a powder chemical, brush off first.
• Remove all contaminated clothing.

Care for Chemical Burns, cont'd

• Flush burned area with large amounts of water for about 15 to 20 minutes.
• Transport quickly.

Chemical Burn to the Eye

• Hold open eyelid while flooding eye with a gentle stream of water.
• Continue flushing en route to hospital.
**Electrical Burns**

- Make sure power is off before touching patient.
- There will be two wounds (an entrance and an exit wound) to bandage.
- Transport patient and be prepared to administer CPR.

**Small Animal Bites**

- All small animal bites should be considered potentially infected.
- Occasionally bites require surgical repair.
- Apply a dry, sterile dressing and transport.

**Rabies**

- Potentially fatal viral infection
- May be transmitted through biting or licking an infected wound
- Some common carriers are bats, squirrels, skunks, foxes, raccoons, and stray dogs.
- Refer to local resources for identification and capture.
- All patients with bites need medical attention.
Human Bites

- Very serious injury
- Promptly immobilize with a splint or bandage.
- Apply a dry, sterile dressing.
- Provide transport.

Dressing and Bandaging

- Control bleeding.
- Protect wound.
- Prevent contamination.

Dressings and Bandages

- Sterile dressings
  - Used to cover wounds
- Bandaging
  - Used to keep dressing in place
AED

Automated External Defibrillator
- Various models.
- A specialized computer recognizes heart rhythms that require defibrillation.
- Some operator interaction required.

Cardiac Arrest

The complete cessation of cardiac activity, either electrical, mechanical, or both.

Ventricular fibrillation
Potential AED Problems

- Battery is dead.
- Patient is moving.
- Patient is responsive and has a rapid pulse.

AED Advantages

- ALS providers do not need to be on scene.
- Remote, adhesive defibrillator pads are used.
- Efficient transmission of electricity.

Non-Shockable Rhythms

- Asystole
- Pulseless electrical activity
Rationale for Defibrillation

- Early defibrillation is the third link in the chain of survival.
- A patient in ventricular fibrillation needs to be defibrillated within 2 minutes.

Preparation

- Make sure the electricity injures no one.
- Do not defibrillate a patient lying in pooled water.
- Dry a soaking wet patient’s chest first.
- Do not defibrillate a patient who is touching metal.
- Remove nitroglycerin patches.
- Shave a hairy patient’s chest if needed.

Using an AED

- Assess responsiveness.
- Stop CPR if in progress.
- Check breathing and pulse.
- If patient is unresponsive and not breathing adequately, give two ventilations no more than 1 second in duration.
Transport Considerations

Transport:
• Keep AED attached.
• Check pulse frequently.
• Stop ambulance to use an AED.

Cardiac Arrest During Transport

Check unconscious patient’s pulse every 30 seconds. If pulse is not present:
• Stop the vehicle.
• Perform CPR until AED is available.
• Analyze rhythm.
• Deliver shock.
• Continue resuscitation according to local protocol.

Defibrillator Protocol
AED / CPR Standing Orders

- Research continues to indicate a need for more uninterrupted CPR.
- Longer periods of CPR help keep VF coarse!
- Longer periods of CPR provide greater coronary / cerebral perfusion.
- Pump Cavitations
- Cases of VF on decline.
- Conversion with 1st shock 95%.

Standing Orders

- ALL periods of CPR now are 2 minutes in duration.
- Pulse checks eliminated except when a “no shock” is indicated.
- Patient should be removed from PAD device ASAP.

Keys To Improved Resuscitation

- Early Access
- Early CPR
- Early Defib
- Early ALS
What Do We Say On a Call?

CRITICAL:
- Name of firefighter
- Agency and unit
- Approximate age/gender of patient
- Estimated downtime
- By-stander CPR (yes/no/unknown)

"Steve Perry...King County Medic One with a 54 y/o male...approximate downtime of 6-12 minutes...no bystander CPR."
- By-stander CPR (yes/no/unknown)

What Do We Say On a Call, cont’d

IMPORTANT:
- Applying patches
- Clear before analyze / shocking
- Witnessed / un-witnessed?
- Pulse checks
- Arrival of medics (most commonly omitted information)

When Do We Send a Case?

ANYTIME we do CPR. This includes cases when the defibrillator was not attached.
• What questions do you have?

To review this presentation, go to: http://www.emsonline.net/emtb