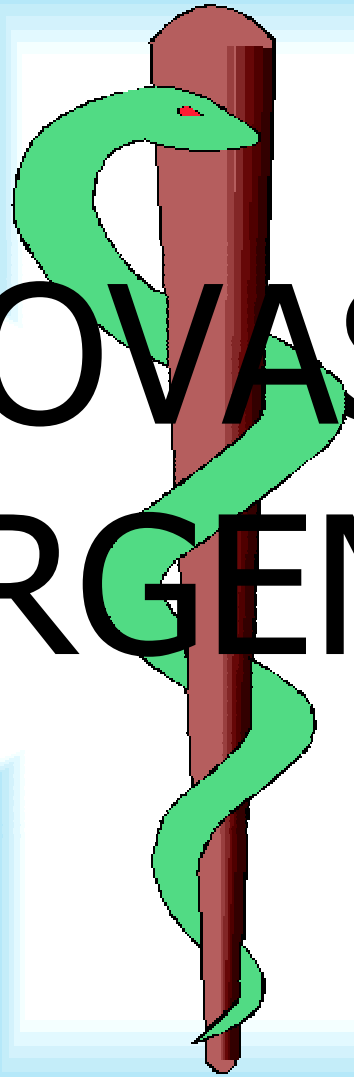
CARDIOVASCULAR EMERGENCIES



OBJECTIVES

5-2.1 Identify why and when procedures regarding cardiovascular emergencies must be done with at least 80% accuracy.

OBJECTIVES

- Cardiac Compromise
- Emergency Medical Care
- Nitroglycerin
- Cardiac Dysrhythmias
- Automated External Defibrillation

CARDIAC COMPROMISE

General term that refers to any kind of problem with the heart

CARDIAC COMPROMISE

Signs and symptoms

- Squeezing, dull pressure, chest pain
- Sudden onset of sweating
- Dyspnea
- Anxiety

CARDIAC COMPROMISE

- Feeling of impending doom
- Abnormal pulse rate
- Abnormal BP
- Epigastric pain
- Nausea/Vomiting

Emergency Care

Circulation absent

- Medical patient >8 years old
  - »CPR with AED
- Medical patient <8 years old or <55 pounds
  - »CPR only

Emergency Care

- Responsive patient with know cardiac history
  - Perform initial assessment
  - Perform focused history and physical exam
  - Position of comfort

Responsive Patient

- Cardiac
  - Apply oxygen if not already done
  - Assess baseline vital signs
- Ask HPI questions
  - OPQRST

Responsive Patient

- Has been prescribed nitroglycerin
  - Blood pressure >100 systolic
    - »One dose, repeat 3-5 minutes i no relief, authorized by medical direction up to maximum 3 doses

Responsive Patient

- Has been prescribed nitroglycerin
  - Blood pressure <100 systolic
    - »Do not give medication
    - »Continue with assessment
    - »Transport immediately

Responsive Patient

- Does not have prescribed nitroglycerin
  - Continue with assessment
  - Transport immediately

NITROGLYCERIN

- Generic
  - Nitroglycerin
- Trade
  - Nitro-stat

NITROGLYCERIN

- Indications
  - Signs and symptoms of chest pain
  - Has prescribed medication
  - Medical Authorization

NITROGLYCERIN

Contraindications

- Blood pressure less than 100 systolic
- Head injury
- Infant or child
- Taken maximum dose

NITROGLYCERIN

- Medication form
  - –Tablet
  - –Sublingual spray

NITROGLYCERIN

- Dosage
  - –One dose, every 3-5 minutes up to a maximum of three doses
    - »BP remains above 100
    - »Medical direction

Administration

- Perform focused assessment for cardiac patient
- Take blood pressure – above 100 systolic
- Contact medical direction

Administration

- Assure four rights/patient is alert
- Check expiration date
- Question patient on last dose
- Place dose under tongue

Administration

- Have patient keep mouth closed until tablet is dissolved and absorbed
- Transport
- Recheck blood pressure within 2 minutes

Administration

- Record activity and time
- Perform reassessment

NITROGLYCERIN

- Actions
  - –Relaxes blood vessels
  - –Decreases workload of heart

NITROGLYCERIN

- Side effects
  - –Hypotension
  - –Headache
  - –Pulse rate changes

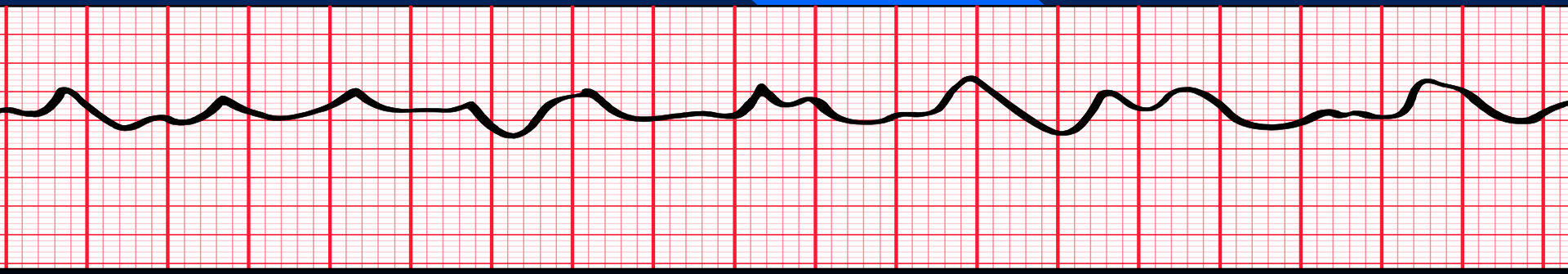
NITROGLYCERIN

- Reassessment strategies
  - Monitor blood pressure
  - Ask patient about effect on pain relief

Cardiac Dysrhythmias

Ventricular Fibrillation

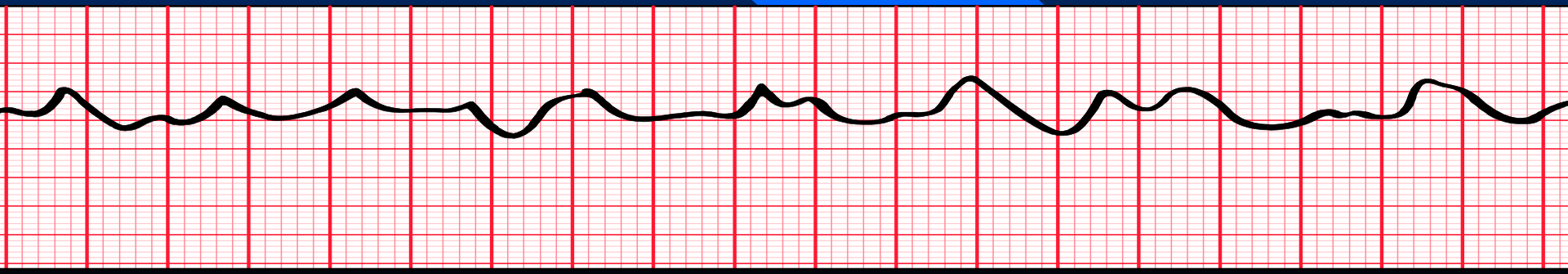
- Most common cardiac arrest rhythm
- Primary electrical disturbance resulting in cardiac arrest



Cardiac Dysrhythmias

Ventricular Fibrillation

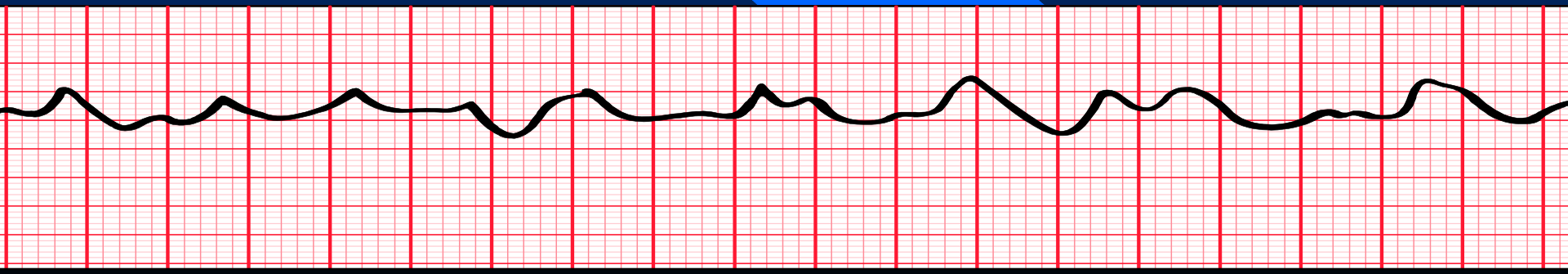
- Plenty of electrical activity but disorganized
- Ventricles do not contract as a unit



Cardiac Dysrhythmias

Ventricular Fibrillation

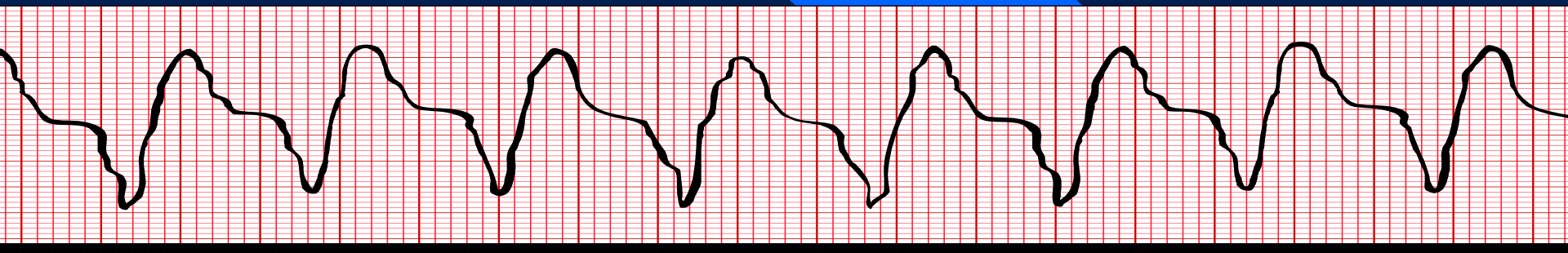
- Patient will be pulseless
- This is a shockable rhythm



Cardiac Dysrhythmias

Ventricular Tachycardia

- Less than 10% of all out of hospital cases
- Heart rhythm is organized but very rapid



Cardiac Dysrhythmias

Ventricular Tachycardia

- Ventricles may not have time to fill
- Patient may or may not have a pulse

Automated External Defibrillation

Fundamentals of early defibrillation

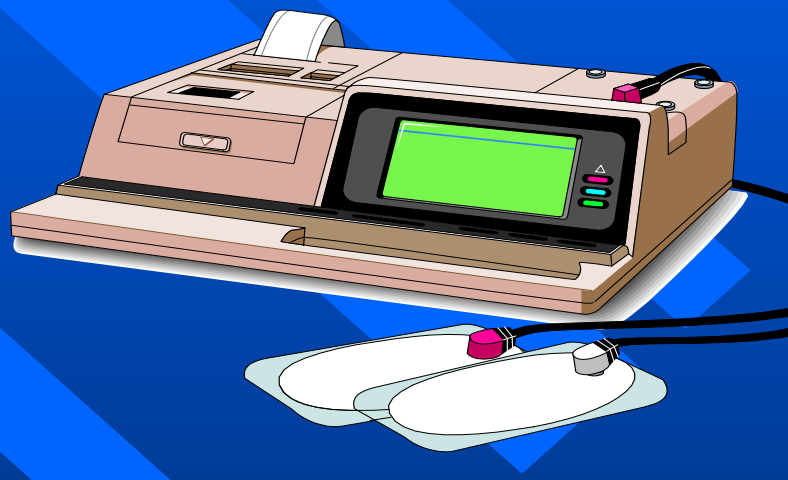
–Chain of survival

Rational

- EMS systems have demonstrated increased survival outcomes
- Increased survival was after defibrillation programs were implemented and all links in the chain of survival were present

Overview of AED's

- Types
  - Fully automated
  - Semi automated



Overview of AED

- Analysis of cardiac rhythms
  - Computer microprocessor evaluates the patient's rhythm and confirms shockable rhythm
  - Accuracy in rhythm analysis has bee high
  - Must have properly charged batterie

Overview of AED's

- Inappropriate delivery of shocks is attributed to
  - –Human error
  - –Mechanical error

Overview of AED's

- Only attach to pulseless, unresponsive and apneic patients

Interruption of CPR

- No CPR performed at time shocks are delivered
- No person should be touching
- No chest compressions/ artificial ventilations when rhythm is analyzed

Interruption of CPR

- Defibrillation is more effective than CPR
- CPR can be stopped up to 90 seconds to deliver shocks

Interruption of CPR

- Resume CPR only after up to the first three shocks are delivered

Advantages of AED

- Initial training
  - Easier to learn than CPR
  - Continuing education every three months
- Speed of operation
  - First shock within 90 seconds

Advantages of AED

- Remote defibrillation through pads
  - Defibrillation is hands off
  - Safer method
  - Better electrode placement
  - Less anxiety in EMT-B

Operating Procedures

- Transport the patient when any of the following occur
  - Patient regains pulse or signs of circulation
  - Six shocks are delivered
  - Three consecutive "no shock is advised" messages

Operating Procedures

- One EMT-B can operate AED
- Defibrillation comes first
  - Before oxygen
  - Before anything that delays analysis of rhythm

Operating Procedures

- EMT-B must be familiar with AED
- All contact with patient must be avoided
- Clear the patient before shocks

Operating Procedures

- No defibrillator can work without properly functioning batteries
  - Check every shift
  - Carry extra batteries

Age and Weight Guideline

- Airway and artificial ventilation
- Patient less than 8 years old
- Patient weighing less than 55 pounds

Persistent Ventricular Fibrillation

- After 6 shocks, prepare for transport
- Additional shocks may be delivered enroute per local protocol
  - »Must completely stop vehicle

Recurrent Ventricular Fibrillation

- If enroute with unconscious patient
  - Check pulse frequently
  - Stop vehicle
  - Start CPR if AED is not ready

Recurrent Ventricular Fibrillation

- Analyze rhythm
- Deliver shock if indicated
- Continue resuscitation per protocol

If enroute with conscious patient complaining of chest pain who goes unconscious, pulseless and apneic

- Stop vehicle
- Start CPR if AED is not ready
- Analyze rhythm

If enroute with conscious patient complaining of chest pain who goes unconscious, pulseless and apneic

- Deliver 3 shocks, if indicated
- Continue resuscitation per protocol

If “no shock” message is elivered and no pulse is preser

- Start or resume CPR
- Analyze rhythm until three consecutive “no shock” messages given or six shocks delivered or patient regains pulse
- Continue transport

Coordination with ALS

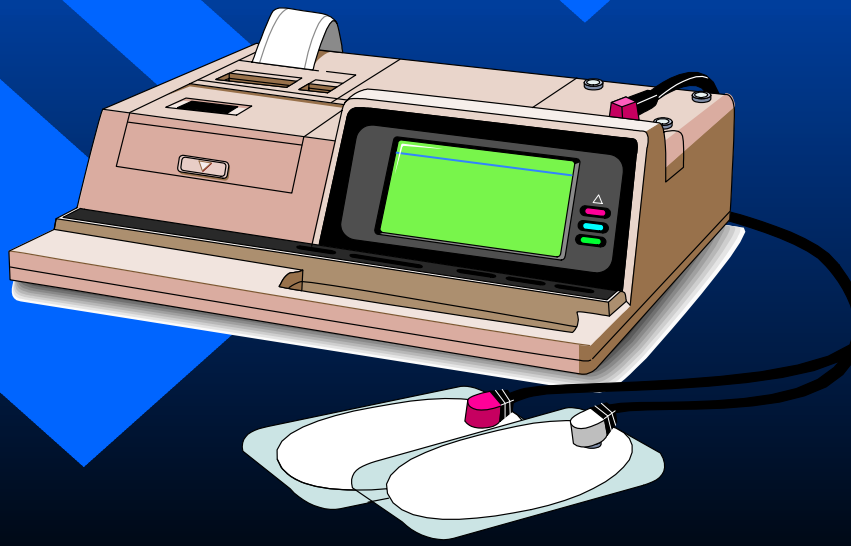
- EMS systems design protocols
- AED usage does not require ALS on scene
- ALS should be notified as soon as possible

Coordination with ALS

- Considerations for EMT-Basic transporting the patient or waiting for ALS should be in local protocols established by medical direction

Safety Considerations

- Water - rain
- Metal



Defibrillator Maintenance

- Regular maintenance is necessary
- AED should be checked daily
- EMT-Basics must assure properly charged batteries

Review

5-2.1 Identify why and when procedures regarding cardiovascular emergencies must be done with at least an 80% accuracy.

Review

- Cardiac Compromise
- Emergency Medical Care
- Nitroglycerin
- Cardiac Dysrhythmias
- Automated External Defibrillation