



Emergency Medical Training Services

Emergency Medical Technician – Basic Program Outlines

Outline Topic: **CARDIAC EMERGENCIES**

Revised: 11/2013

DEFINITIONS:

- Chain of survival (adult) - early activation, early CPR, early Defib, Early ALS.
- Chain of survival (pedi) - prevention, CPR, activation, ALS.
- Stroke Volume - amount ejected from the heart each contraction.
- Cardiac Output - amount ejected from the heart in one minute.
- Systolic - contraction of left ventricle pressure.
- Diastolic - relaxation of left ventricle pressure.
- Frank Starling said the more you stretch the ventricle the larger the ejection.
- Syncope - fainting due to a temporary lack of O₂ to the brain.
- Atherosclerosis - plaque build up.
- Arteriosclerosis - narrowing of blood vessels cause by caffeine and nicotine.
- Ischemia - O₂ is being withheld. The tissue is holding its breathe.
- Necrosis - Tissue has died.
- Hemoglobin is an iron in RBC's that bond the oxygen.

SIGN OF CARDIAC EMERGENCIES

- Chest pain is #1 symptom of MI. 75% complain of pain.

- Dyspnea is a secondary problem caused by the cardiac problem.
- Syncope - due to lack of perfusion to the brain.
- Radiation - left side most common. Can go right, posterior, or absent.
- Skin changes. Pale, moist, wet.
- Look for JVD, Pulmonary Edema. Heart failure
- Denial is a major sign also. Most deny for 1 to 2 hours before getting help.

Hooking Up ECG

- Clouds over Grass (white over green) White is Right. Smoke over Fire, (black over red). Brown in the middle.
- Hook electrodes to leads before placing on patient.
- For a 12 lead you only connect 10 cables and electrodes.
- Do not place on boney areas.

Sign/Symptoms of Angina or MI

- Chest pain.
- SOB.
- Epi release.
- Radiating pain.

- DENIAL.
- Palpitations.
- History of MI or cholesterol/high BP.
- CHF.
- NOTE: diabetics have vague S/S - bad nerves.

ANGINA PECTORIS

- "Mini-heart attack". It is really a supply and demand problem. The vessel lumen is narrow and not enough blood flows.
- Look like a MI but comes on with activity, stress and goes away with rest. Pain relived within 15 minutes.
- Still treat as MI.

Myocardial Infarction (MI)

- "the big one".
- Blocked coronary vessel.
- Left coronary vessel supplies 80% of myocardial blood supply.
- Comes on at rest 59% of the time.
- Need "clot buster" in less than 1 hour of symptoms.

- Need cardiac cath lab to open vessel.

CARE for MI or Angina

- Rest, stop activity and calm.
- Give O2.
- Call for ALS or transport in POC.
- Get order for Nitro - .4mg 3X every 5 minutes if BP over 100mmHg.
- Have AED ready.

Congestive Heart Failure

- Can have left, right or complete.
- If left CHF - S/S are pulmonary edema, SOB.
- If right CHF - pedal edema, JVD at 45 degree angle.
- Think this way - "L"eft side backs up into the "l"ungs.
- The most common cause of left CHF is MI.
- The most common cause of right CHF is left sided failure.
- Ask yourself - who has puffy ankles?
- Ask yourself - who has to sleep sitting up?
- When diagnosed with complete CHF most die within 2 years.

A&P

- Artery, arteriole, cap, veinules, veins.
- Pulmonary artery and Pulmonary vein swap oxygenation status.
- Artery away from heart.
- Vein to the heart.
- Three central pulses are 1) femoral, 2) carotid, 3) apical.
- Pulse is when Left Ventricle contracts.
- Heart layers - epicardium, myocardium, endocardium and the pericardial sac.

Lethal Rhythms

- Asystole - no electrical activity. We do not shock this.
- V-tach pulseless.
- V-fib - cannot produce a pulse. 94% of Cardiac Arrest go into this rhythm.
- To shock someone is to slow a heart. You do not shock a dead heart. You shock to reorganize a living heart.
- Joules is the energy used to shock. It will hurt you.

AED USE

- In this country they are officially SAED units. "S" stands for SemiAutomated

- For patients over the age of 8 adult pads must be used. For patients under the age of 8 pediatric pads are preferred, but you can use adult pads if that is all that's available.
- Must be dead.
- Safety - no water, metal, medication patch, hairy, 2 inches away from implants
- 2000 Guidelines: Shocks in unit of 3 stacked shocks. Then a pulse check then 1 minute of CPR if needed.
Then starts over.
- 2006 Guidelines: Shocks one time at highest setting then immediate CPR for 2 minutes. Then starts over.
- Keep on if the patient get a pulse back.
- Cannot move patient when analyzing the heart and shocking.
- Most two common errors are - 1) dead battery and 2) no pads/electrodes
- Monophasic and Biphasic energy. Mono hits it once at a higher setting and bi hits it twice at a lower setting.
- EMS goal is to have it on the patient within one minute of EMS arrival. The overall goal is to have an AED on within 5 minutes of the arrest start time.