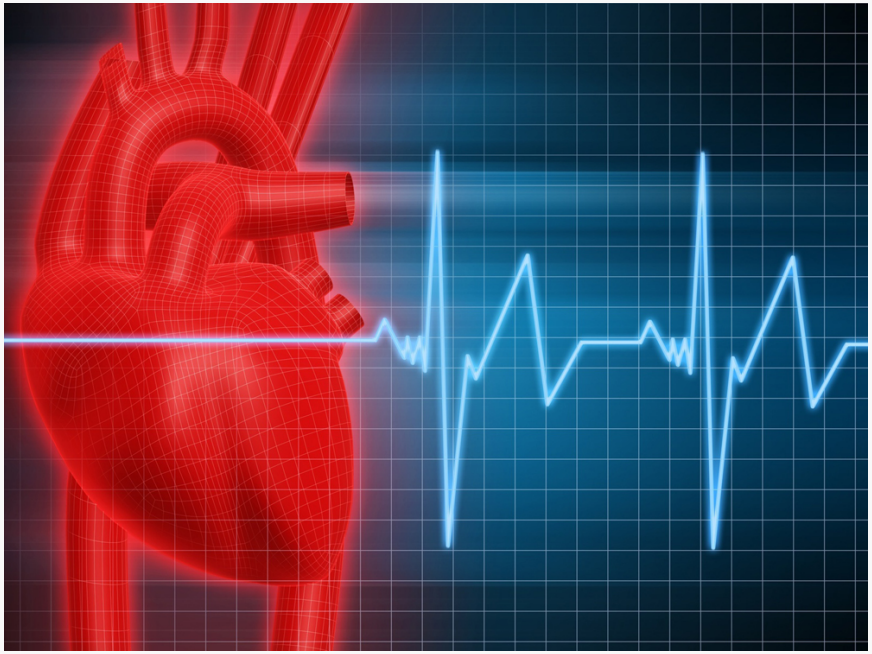
Nursing Management of Patients with Cardiovascular Disease

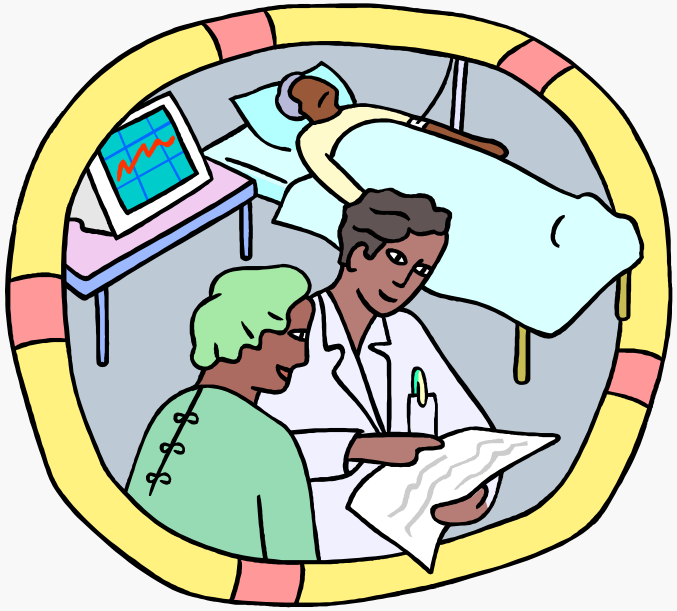
Part II: Acute Myocardial Infarction



Barbara Moloney DNPc, RN, CCRN

Second Patient

- 52-year-old woman came to the hospital complaining of fatigue, nausea, and chest discomfort



Assessment

- BP 156/80
- HR: 100
- Rhythm : regular
- R-28
- T-37°C
- SA_2 96% room air

WHAT ARE YOUR CONCERNS?

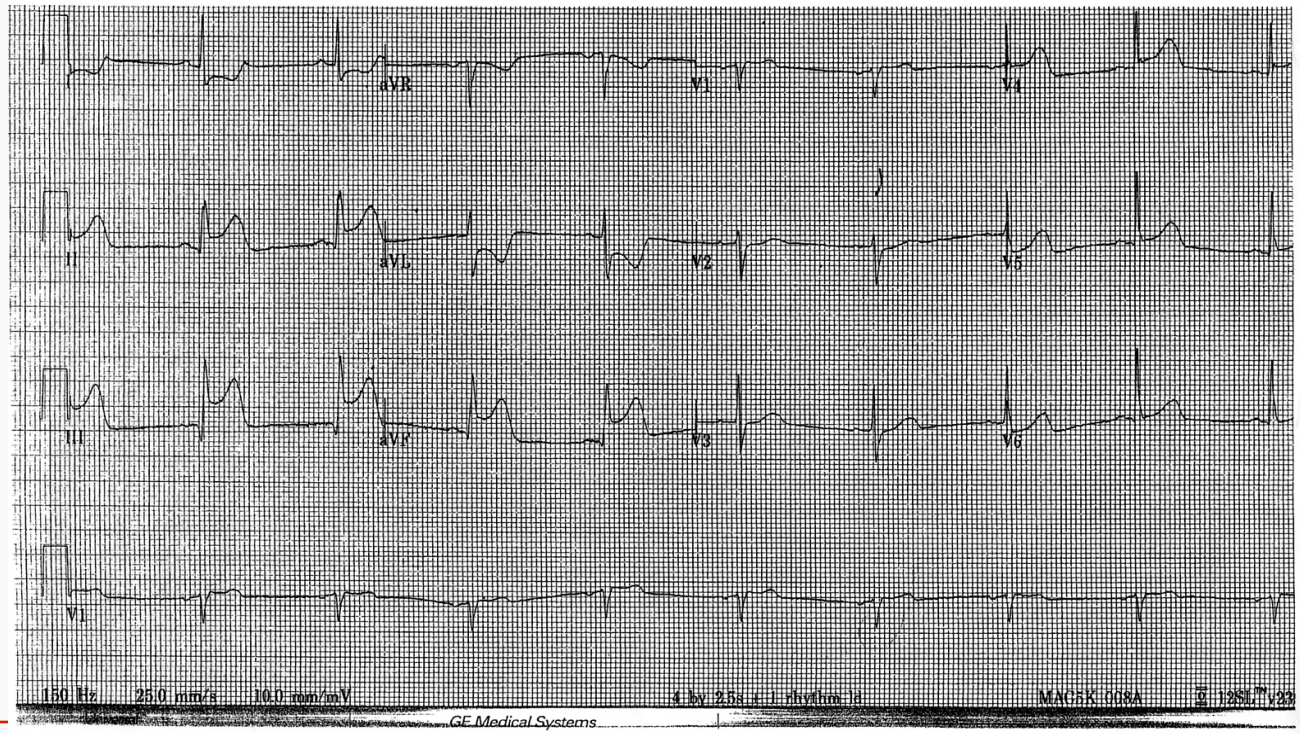
Is there anything that you want to do now?

- Respiratory
  - tachypnea
- Neurological
  - Anxious, restless, oriented
- Skin
  - Diaphoretic
- Complains of
  - Epigastric discomfort 6/10
  - Nausea
  - Short of breath

Focused history

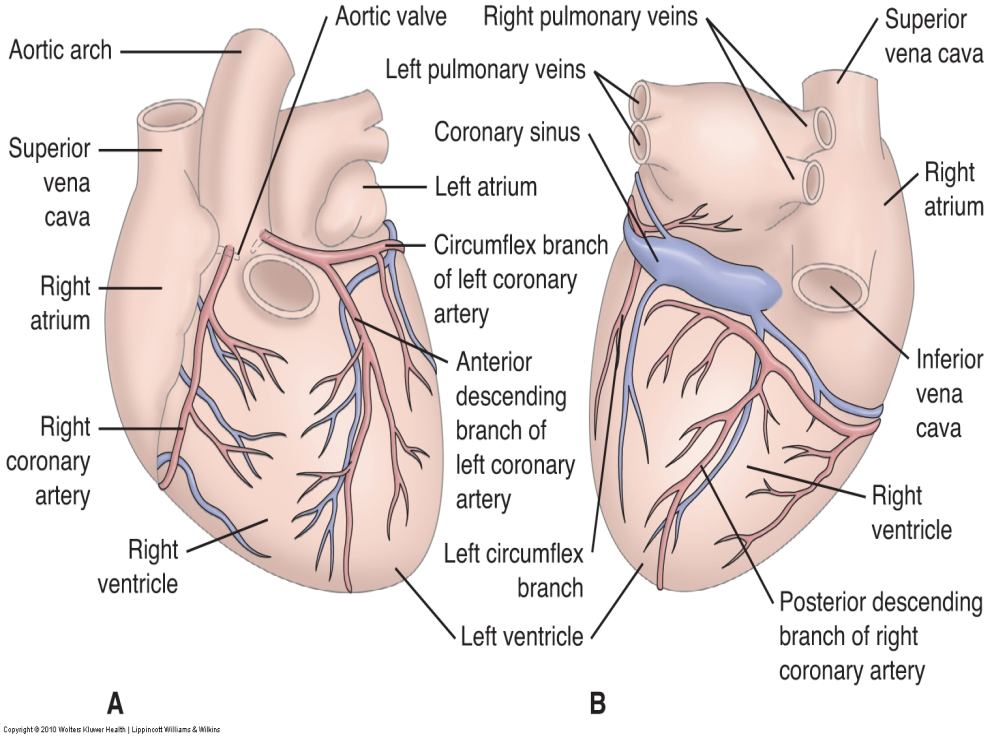
- Precipitation factor: preparing a meal
- Quality of pain: pressure in chest and back
- Radiating – “no”
- Associated symptoms: Nausea, short of breath, diaphoretic
- Onset of pain: 6 hours ago
- Allergies: unknown
- PMHx: hypertension
- Meds at home: hydrochlorothiazide

ECG

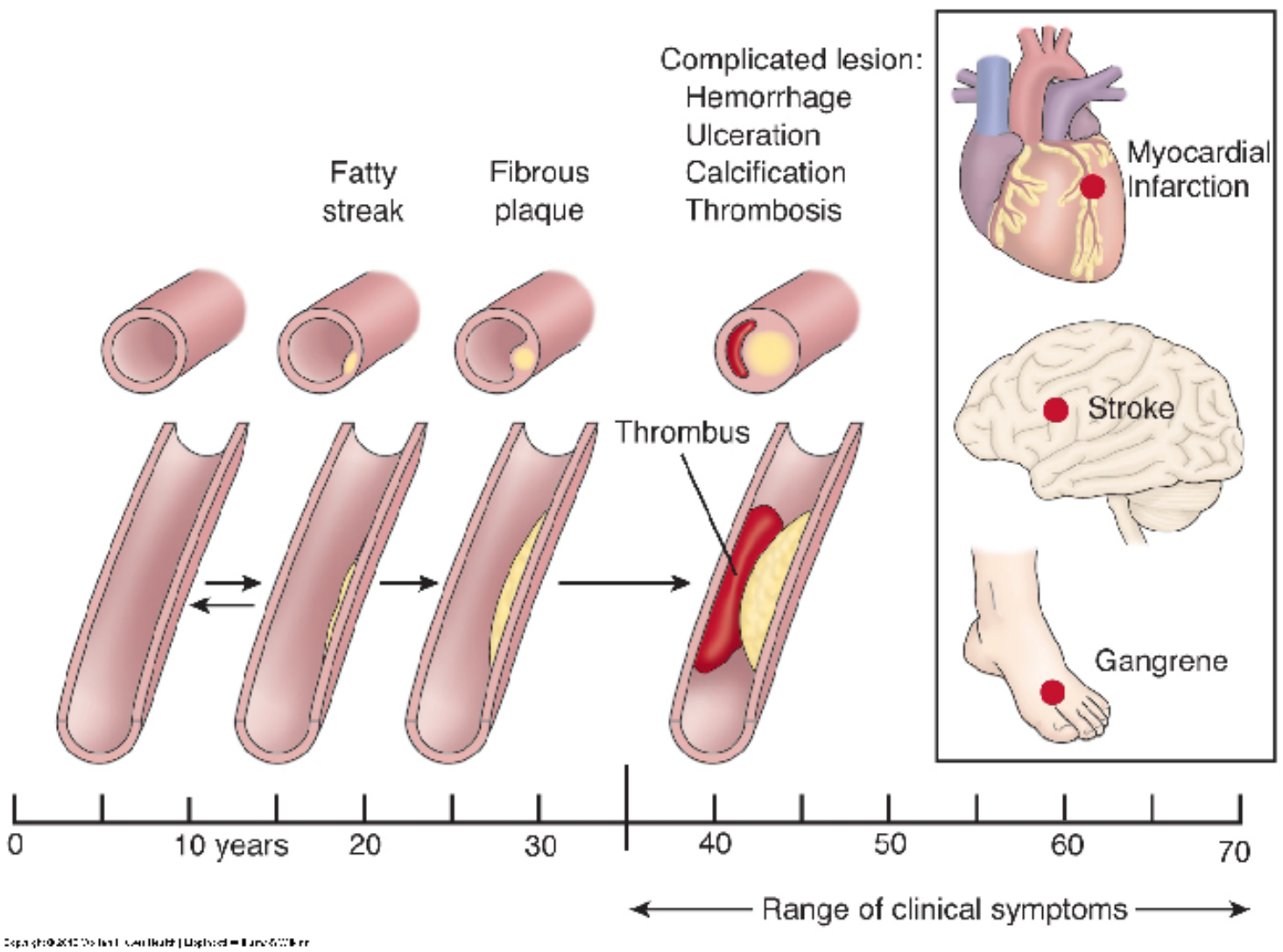

aVR
V1
V4
I
aVL
V2
V5
III
aVF
V3
V6
V1
150 Hz
25.0 mm/s
10.0 mm/mV
4 by 2.5s + 1 rhythm
MAG5K-008A
GE Medical Systems

Review: Coronary Arteries

- Supply oxygen to the myocardium



Formation of Plaque



Development of Atherosclerotic Plaque (Conventional)

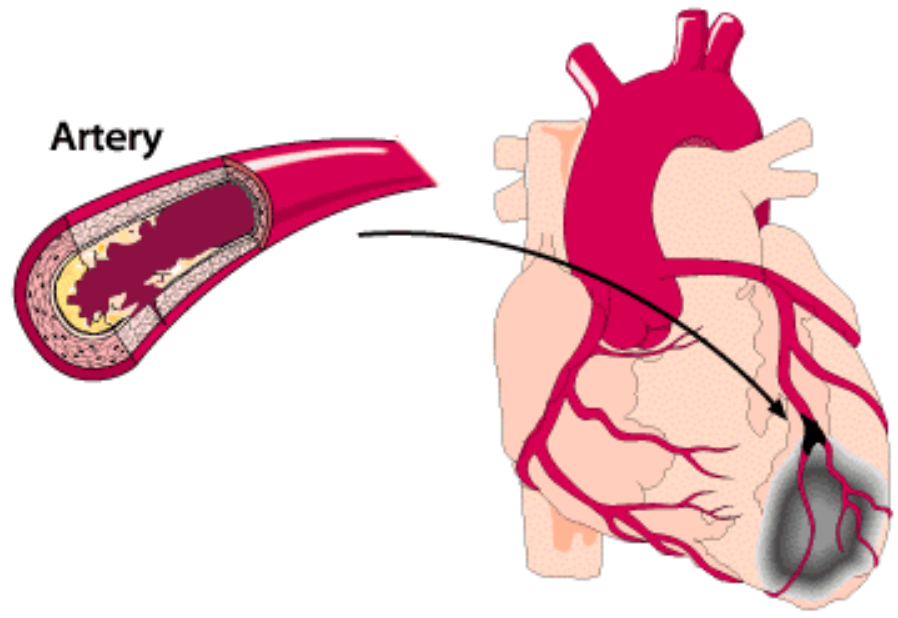

Glagov's Model

Coronary Artery Disease

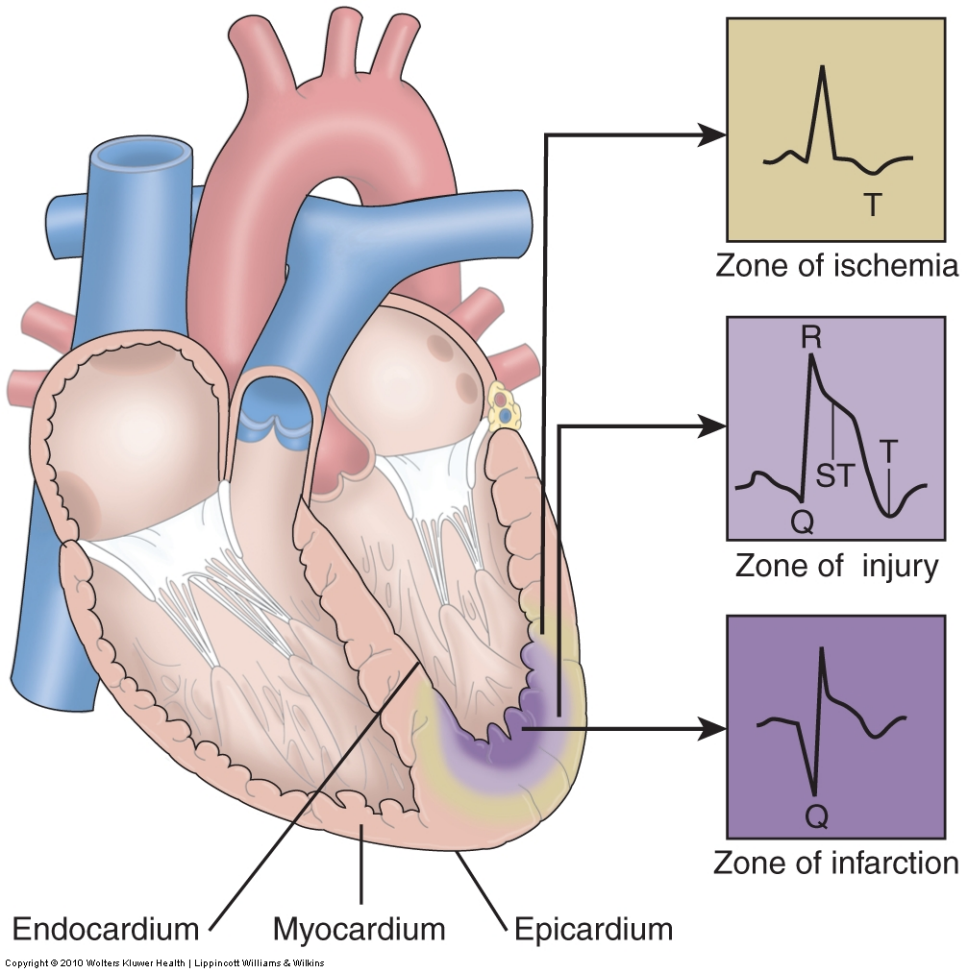
- **Non-modifiable Risk Factors**
  - Age
  - Gender
  - Genetics
- **Contributing factors**
  - Diabetes
  - Stress
- **Modifiable Risk Factors**
  - ***Smoking***
  - ***Hypertension***
  - ***Hyperlipidemia***
  - Physical Inactivity
  - Obesity

Blocked Coronary Artery

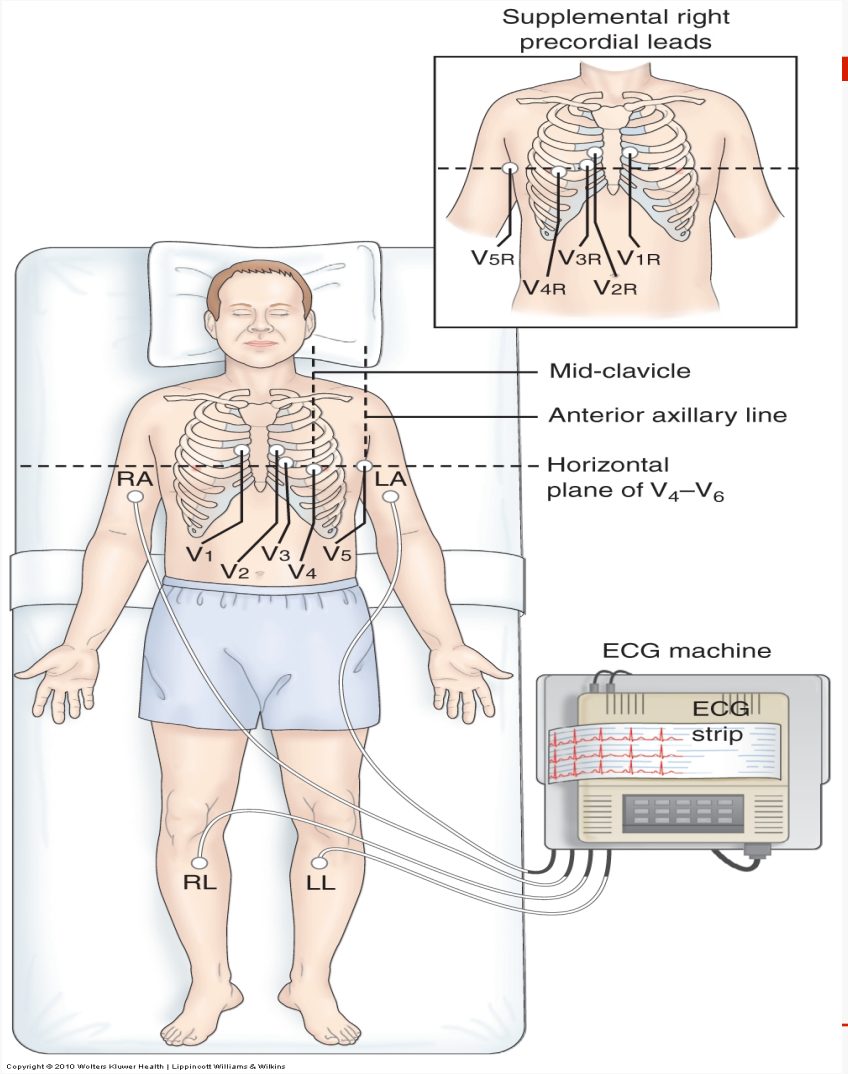
- Myocardial ischemia
- Anaerobic metabolism
  - Lactic acid irritates cardiac nerves
- Angina
- Ischemia>20 min. = acute myocardial infarction

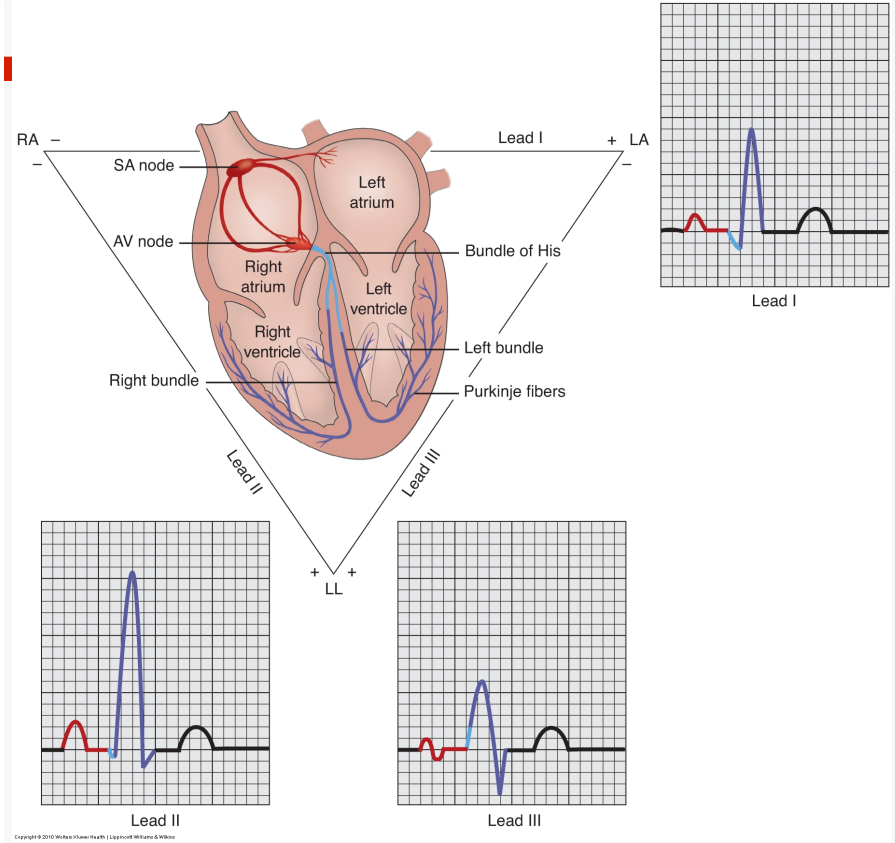


How it looks on ECG

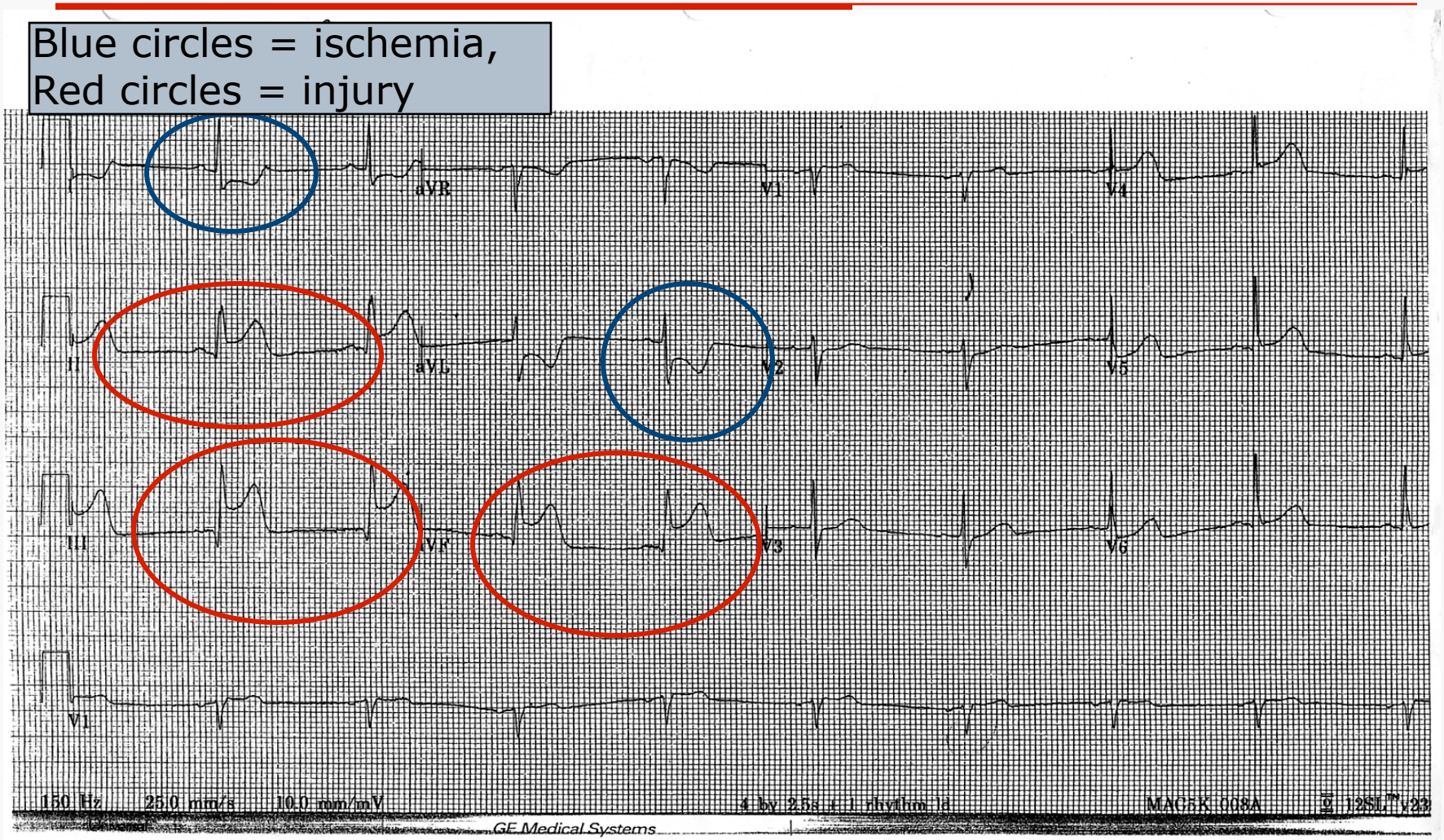


Different leads show different views of the heart

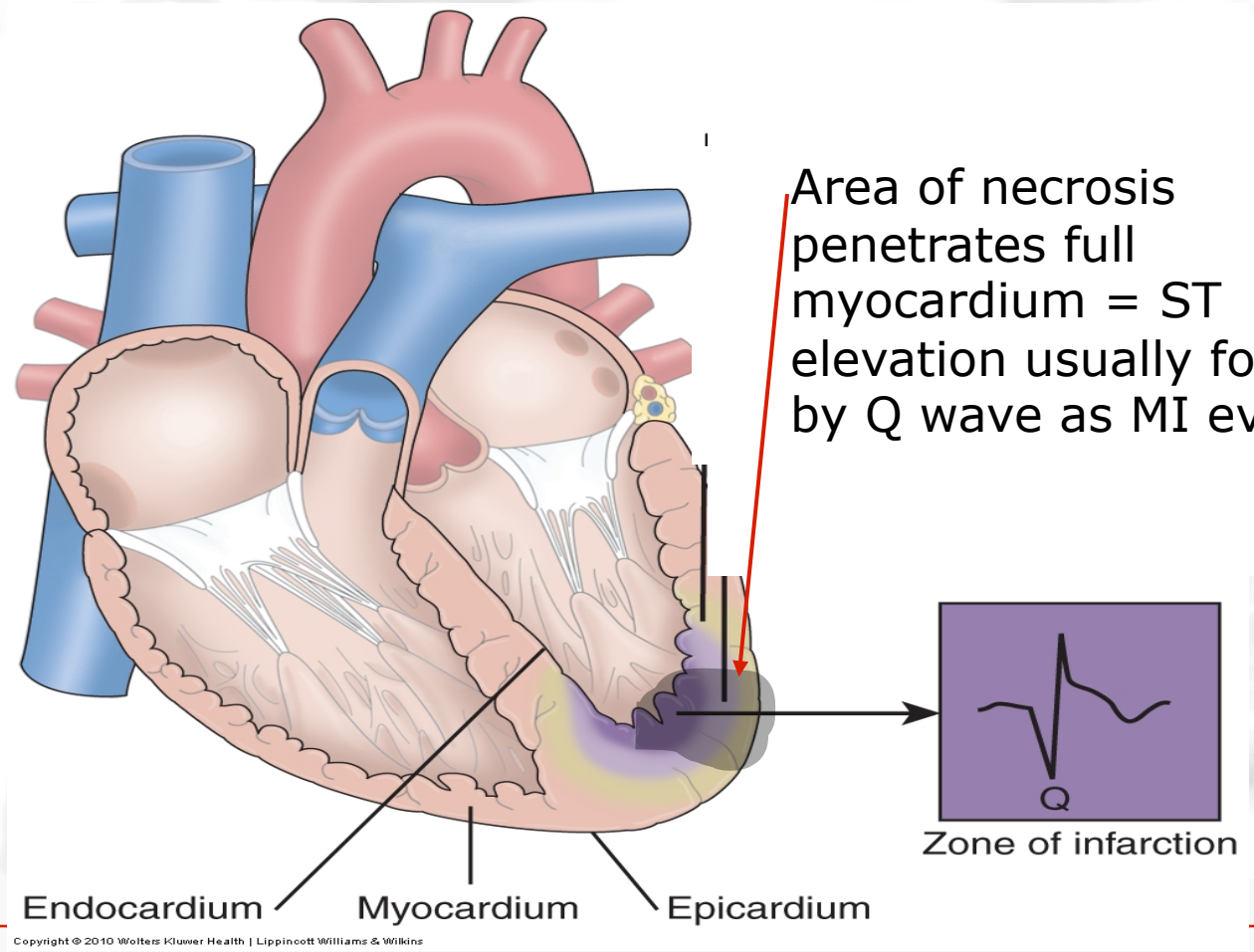




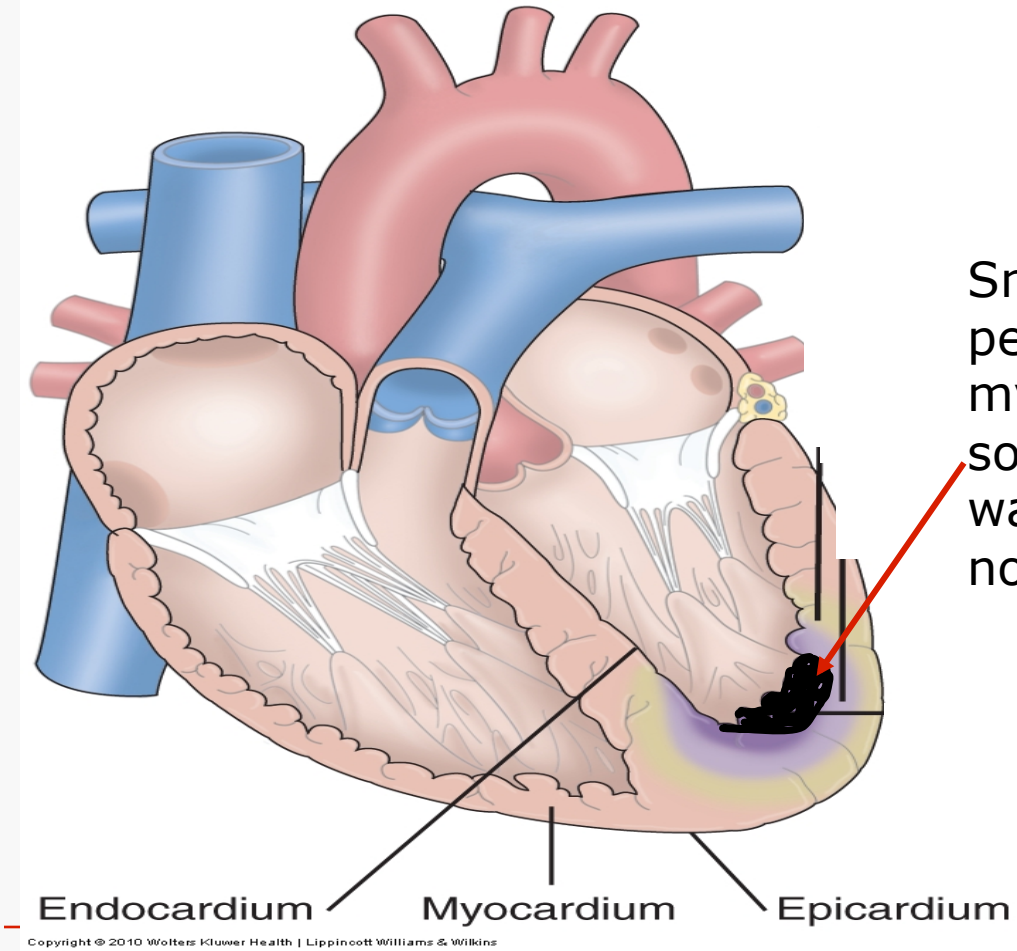
What does this look like on the ECG?



STEMI: ECG changes = injury through the myocardium



NSTEMI: no permanent ECG changes = injury does not go all the way through the myocardium

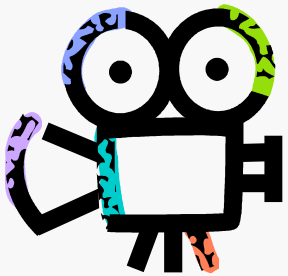


Small area of necrosis not penetrating full myocardium; may have some non-specific ST-T wave changes, but will not have ST elevation

Blood tests

Marker	Normal level	Time for Onset of increase	Peak concentration	Return to normal
CPK (total)	15-105 U/l men 10-80 U/l women	4-6 hours	12-14 hours	2-3 days
CK-MB	0-9 U/L	4-6 hours	12-24 hours	2-3 days
CK index	<2.5%			
Troponins T & I	0.0-0.4 ng/mL (tropI) Check lab	2-4 hours	8-12	5-14 days

What happens to the heart?



- Normal heart beat:

  http://www.youtube.com/watch?v=AOiyjNFB0as

- Heart during a myocardial infarction

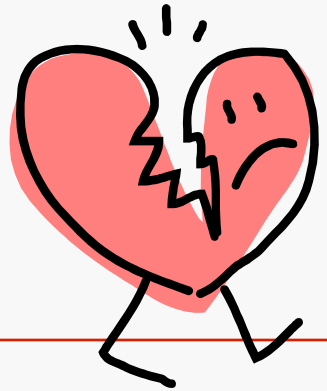
  http://www.youtube.com/watch?v=w8wXdtoW-HQ

Analysis

- Your analysis

Review: Signs and symptoms

- Pale, diaphoretic
- Chest discomfort
  - Epigastric
  - Pressure
  - Pain
  - Arm, shoulder, neck, jaw, back
- Restless, apprehensive
- Dyspnea, orthopnea
- Palpitations
- Syncope
- confusion
- Cyanosis
- Nausea
- Fatigue



- Women, Diabetics, Elderly
  - Symptoms may be more vague
    - Fatigue
    - Short of breath
    - Indigestion, nausea
    - Anxiety
    - Silent ischemia

Vital signs

Temperature elevation

- Up to 38 º C due to tissue damage within first 24 hours
- May last for as long as a week

Pulse

- may be rapid, irregular, or slow

Respirations

- increases with pain and anxiety
- may increase if in heart failure
- decreases with sedation

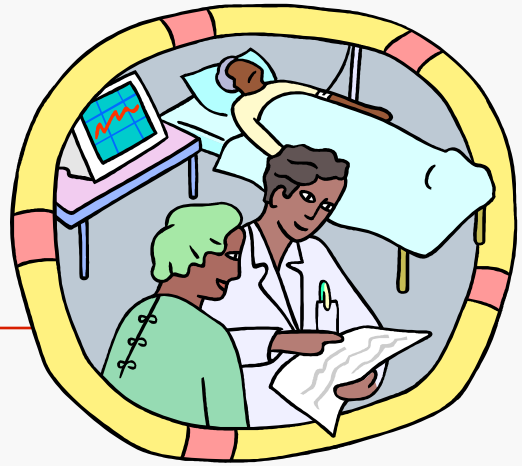
Blood pressure

- may fall below 90 immediately following an MI, returns to pre-infarction 2-4 days

Other tests

- WBC
  - rise in early phase of infarction
- Sed rate
  - rises in early phase
- Electrolytes
- PT/PTT/INR
- Platelets
- CBC
- Chest x-ray
- Echocardiogram

Nursing Diagnoses



- Problem List
  - Myocardial Ischemia/Injury
    - Pain related to myocardial ischemia
    - Nausea
    - Short of Breath
  - Hemodynamic Stability
    - Risk for dysrhythmias
    - Risk for decreased cardiac output
  - Anxiety
  - Knowledge Deficit

Guidelines for management

- Assess: Chest pain, Vital signs
- ***MONITOR***
  - #1 cause of death is dysrhythmias
- ECG
- IV access/blood draw
- Oxygen, medications
- Chest x-ray

American Heart Association Guidelines, 2011

Medications

- Aspirin
- Nitroglycerine
- Oxygen
- Morphine

Aspirin

- Action:
  - Decrease platelet aggregation
- Dose
  - 162-325 mg chewed as soon as ACS is suspected
- Nursing considerations
  - Allergy

Nitroglycerine

- Action:
  - Vasodilates
  - Dilates coronary arteries
  - Increases collateral blood flow
- Dose:
  - ***0.4 mg SL***
  - ***Give every 5 minutes for a total of 3 doses if needed***
- Nursing considerations
  - Assess pain and blood pressure after each dose

Oxygen

- Rationale:
  - Reduces pain
  - Reduces risk for dysrhythmias

Morphine

- Action:
  - Reduces pre-load, afterload
  - Reduces anxiety, pain, dyspnea, and
  - Reduces myocardial oxygen demand
- Dose
  - 1-5 mg IV
- Nursing considerations
  - Monitor for effect, monitor BP, nausea, respiratory depression

Heparin

- Action:
  - Inhibits thrombus
- Dose
  - Monitor PTT
- Nursing considerations:
  - Bleeding precautions
  - Monitor PTT
  - Protamine sulfate

Clopidogrel (Plavix)

- Action
  - Inhibits platelet aggregation
  - May be given in place of ASA or in addition to ASA
- Dose
  - May be given a loading dose (300mg or 600mg) followed by 75mg daily for 3-12 months (maybe longer if client has stents)
- Nursing considerations
  - Allergy
  - Bleeding
  - Discontinue steroids & avoid NSAIDS

Beta Blockers

- Metoprolol
- Administered to acute MI usually within 2 hours - may be given IV
- Action:
  - Slow heart rate
  - Decrease oxygen consumption
  - Decrease pain
- Nursing considerations
  - Monitor blood pressure, pulse

ACE inhibitors *(Lisinopril, Quinapril)*

- Decreases ventricular remodeling – helps the heart heal
- Start slowly - usually within first 24 hours
- Action
  - Reduce afterload
  - Reduce pre-load
  - Decreases ventricular remodeling
- Nursing considerations
  - Orthostatic hypotension, monitor VS
  - Dose – start low

Plan: Nursing Care

- Chest pain: Manage and alleviate
- Monitor
  - Dysrhythmias
  - ST segment
- Vital signs, including oxygen saturation
- Anxiety: assess and reduce
- Monitor labs – esp. potassium and magnesium

- Continuous assessment – lung sounds, heart sounds, head to toe
- Activity
  - Bed rest if unstable (having chest pain)
  - Once hemodynamically stable should not be in bed longer than 12 hours
  - Monitor response of heart rate – remember increased HR = increased oxygen consumption of myocardium
- Prevent constipation
- Monitor effects of medications

Now What????

- Your patient is on the monitor
- Her heart rhythm becomes irregular
- She becomes unresponsive
- Now what do you do?

Nursing management: CAB

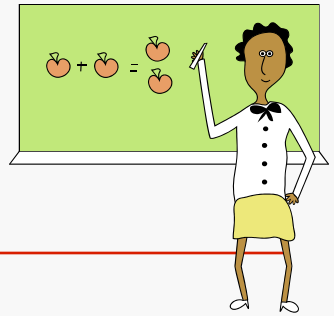
1. Establish unresponsiveness
2. Call for help
   - Defibrillator or DEA
3. Check for pulse
4. Start compressions – give 30
5. Open airway
6. Deliver 2 breaths with ambu bag
7. Continue CPR until defibrillator arrives

American Heart Association (2011)

New Guidelines

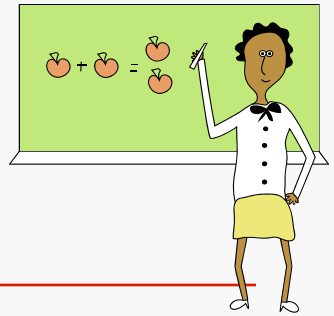
- http://www.youtube.com/americanheartassoc#p/c/7A68846B17049716/9/O9T25SMyz3A
- (3 minutes – in English; change to French version when available)
- Key points:
  - Know what to do if a patient becomes unresponsive
  - Know where the defibrillator or DEA is
  - Code cart needs to be checked regularly, Defibrillator must remain plugged in

Teaching guidelines



- Patient teaching
  - Start as soon as patient is ready
  - Diet and Activity
  - Medications
  - Smoking cessation – client and family
  - How to take nitroglycerine, when to call the MD or come to the ED
  - Risk factors – modifiable
  - Cardiac rehab

Guidelines continued



- Signs and symptoms of acute MI, angina and the reasons they occur
- Healing after MI
- Risk factors
- Rationales for treatments
- Resumption of work, physical activity, sexual activity
- Measures to take to promote recovery ad health
- Importance of gradual, progressive resumption of activity
- When to seek and how to seek help

Teaching guidelines for HT

- Explain what HT means – may include numeric value
- Dietary recommendations
- Life-style recommendations
- Medications