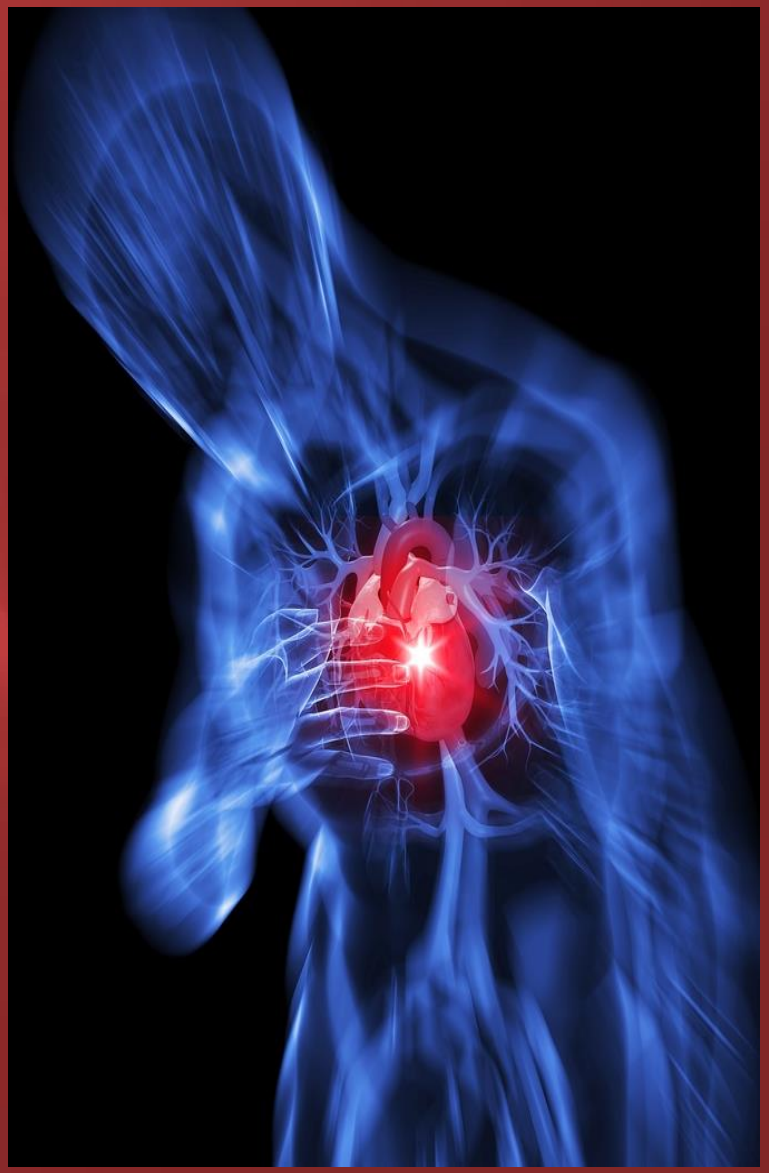
NavicentHealth

Everything about us, is all about you.

CHEST PAIN CENTER

Acute Coronary Syndrome

Education for RNs



Objectives

- Understand the goals and purpose of our Chest Pain Center (CPC)
- Develop understanding of:
  - Risk factors for MI (heart attack)
  - Pathophysiology of Acute Coronary Syndrome (ACS)
  - Signs & Symptoms, Early recognition & interventions
  - Atypical presentations, including differences in age & gender
  - Typical dysrhythmias in MI
  - Cardiac biomarkers (lab work)
  - Guidelines for stress testing
  - Process for initiating code STEMI
  - Treatment of ACS

Purpose & Goals of CPC Program

- Adherence to current evidence-based guidelines in the care of the ACS patient
- Focus on ACS patients across the continuum
- Assess the processes related to diagnosing and treating the ACS patient
- Advocate for and allocate resources for the ACS patient
- Evaluate clinical care management, analyze performance/process metrics, analyze key outcomes metrics and oversee process improvement initiatives for the ACS patient

Risk Factors for Heart Disease

Risk factors

Major independent risk factors	Predisposing risk factors	Possible risk factors
Cigarette smoking	Physical inactivity[a]	Fibrinogen
Hypertension	Obesity[a]	C-reactive protein
Elevated total and LDL cholesterol	Family history of premature coronary disease	Homocysteine
Low HDL cholesterol	Ethnicity	Elevated Lp(a)
Diabetes mellitus	Psychosocial factors	
Older age		

- American Heart Association guide to risk factors for coronary artery disease.
- Resource: "Cardiology explained"

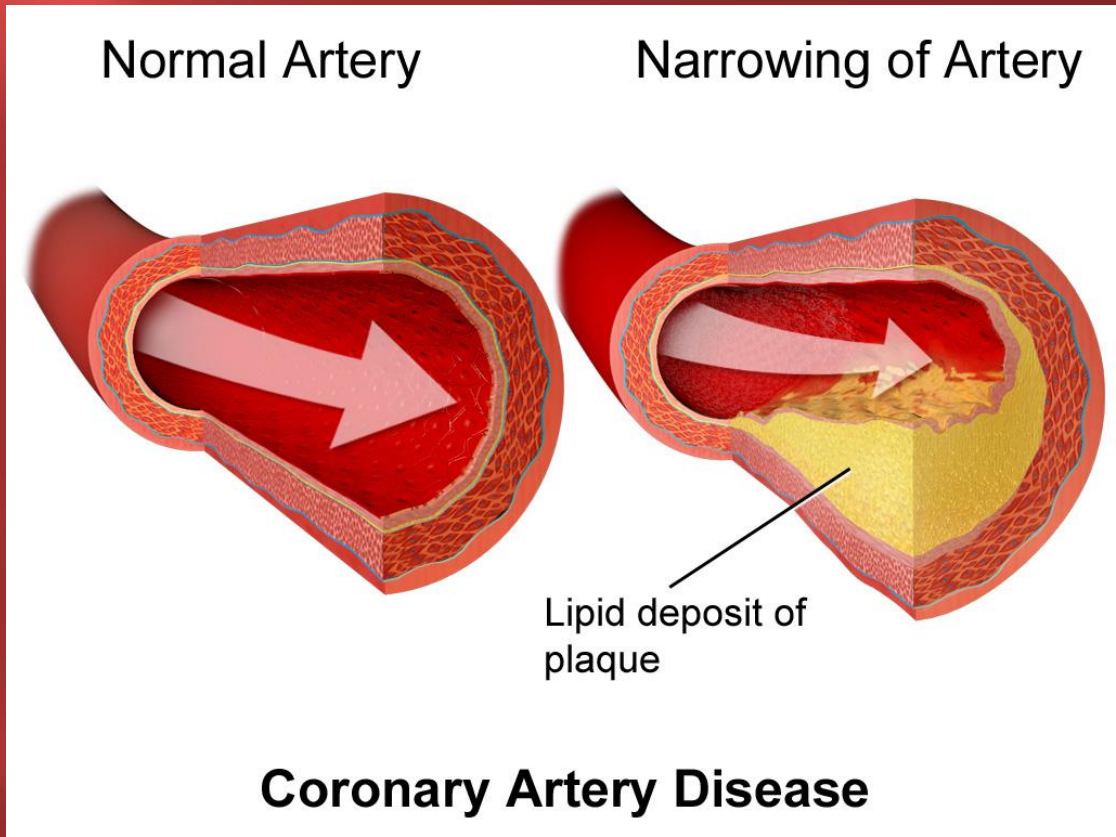
Acute Coronary Syndrome

- **ACS is a term used to describe the spectrum of acute coronary artery disease such as:**
  - Unstable Angina
  - Non ST-elevation MI (NSTEMI)
  - ST segment elevation MI (STEMI)

Pathophysiology of ACS

- Coronary Artery Disease (CAD):
  - atherosclerotic plaques, called atheromas or "lesions"
  - block coronary artery blood flow.
    - ↓ Heart's Supply of

- Oxygen
- Nutrients



Myocardial O_2 Supply and Demand

Concepts of Myocardial O_2 Supply and Demand

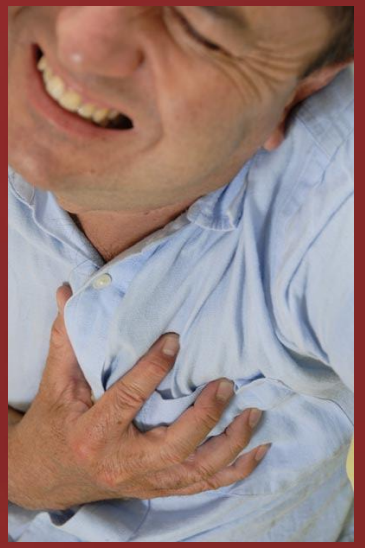
- ↑ demands (WORK)exceed supply (Blood Flow or O^2)
- Imbalance leads to myocardial ischemia.

Effects of Ischemia

- Heart failure
- Arrhythmias

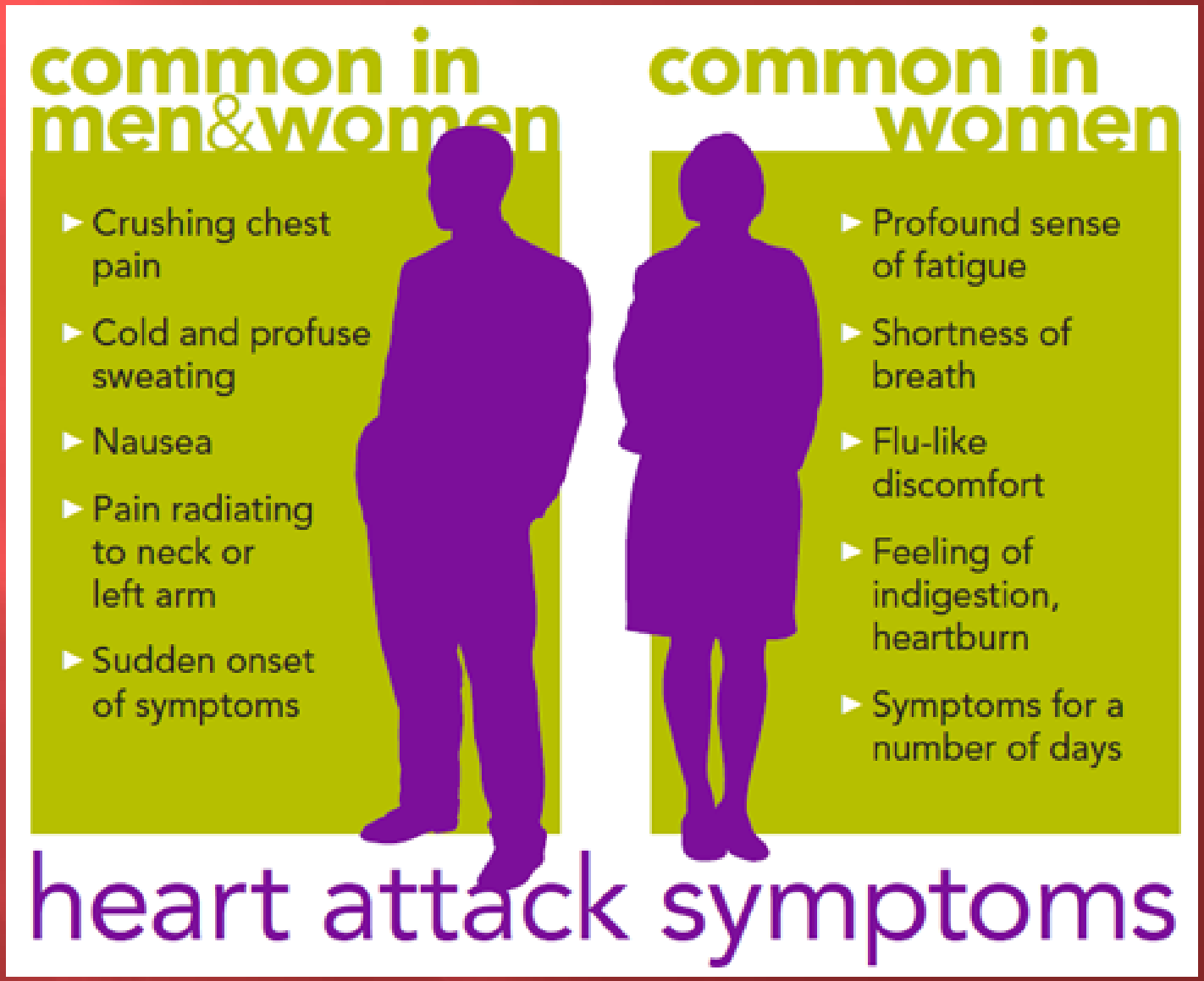
Early Signs and Symptoms of ACS (MI or Heart Attack)

- Pressure
  - fullness, squeezing, or pain in the center of the chest lasting several minutes (usually more than 15 minutes)
- Pain
  - spreading to the shoulders, neck, arms, or jaw, or pain in the back or between the shoulder blades
- Other symptoms:
  - weakness, dizziness, sweating, N/V, uneasiness, dyspnea
- distress, anxiety, or impending doom



ACS signs/symptoms

- WOMEN
- Don't always show typical heart attack symptoms.
  - Shortness of Breath
  - abdominal discomfort
  - **unusual fatigue, sometimes extreme w/o exercise.**


common in men&women
Crushing chest pain
Cold and profuse sweating
Nausea
Pain radiating to neck or left arm
Sudden onset of symptoms
common in women
Profound sense of fatigue
Shortness of breath
Flu-like discomfort
Feeling of indigestion, heartburn
Symptoms for a number of days
heart attack symptoms

Age related symptoms of ACS

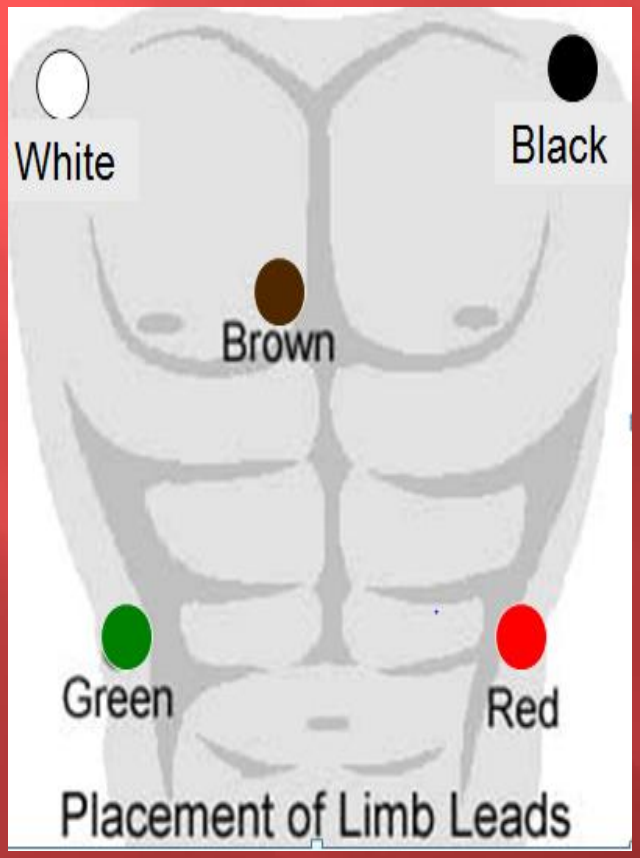
- Age is the number 1 risk factor for heart disease.
- Heart disease is a leading cause of death in people over the age of 65.
- Aging causes:
  - Heart walls, particularly the left ventricle, get thicker.
  - Heart rate changes
  - Heart muscle cells deteriorate.
  - Abnormal heart rhythms (atrial fib)
  - Heart valves may thicken or leak .

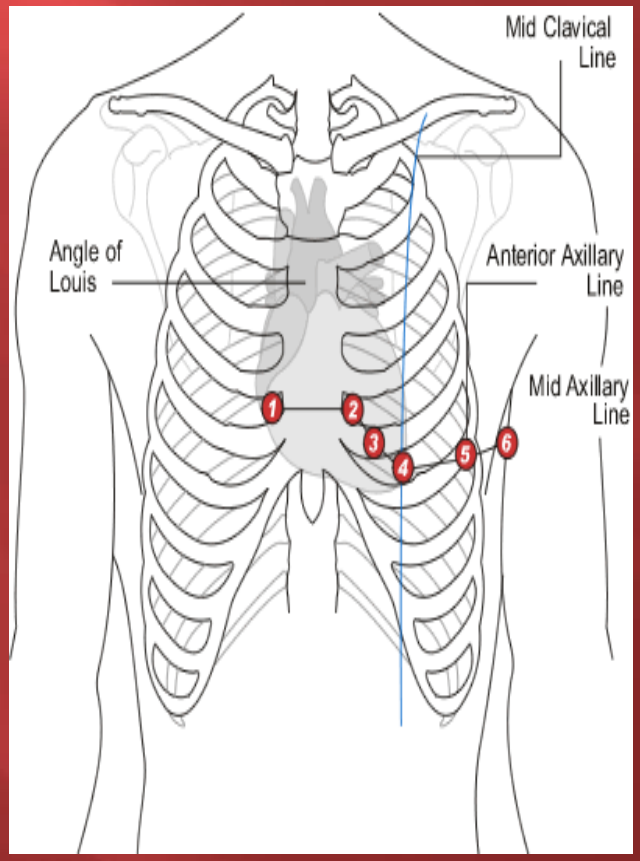
Age related symptoms of ACS

- In elderly symptoms are:
  - less frequent and may be non-existent.
- ECG - shows fewer clues

Diagnostics: 12-lead EKG

- Diagnostic for location of MI
- Place leads PROPERLY.

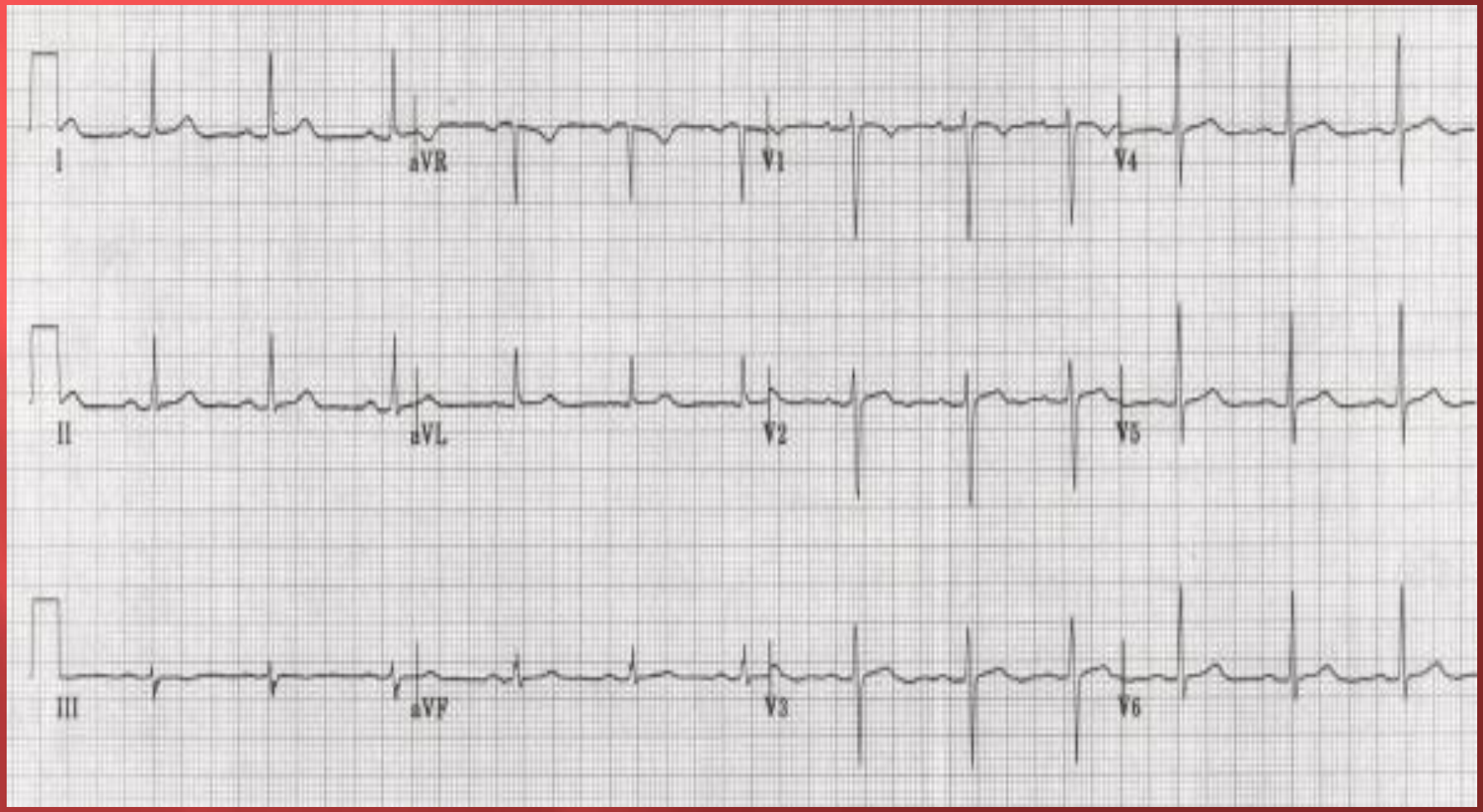




Position of the V leads (chest leads)

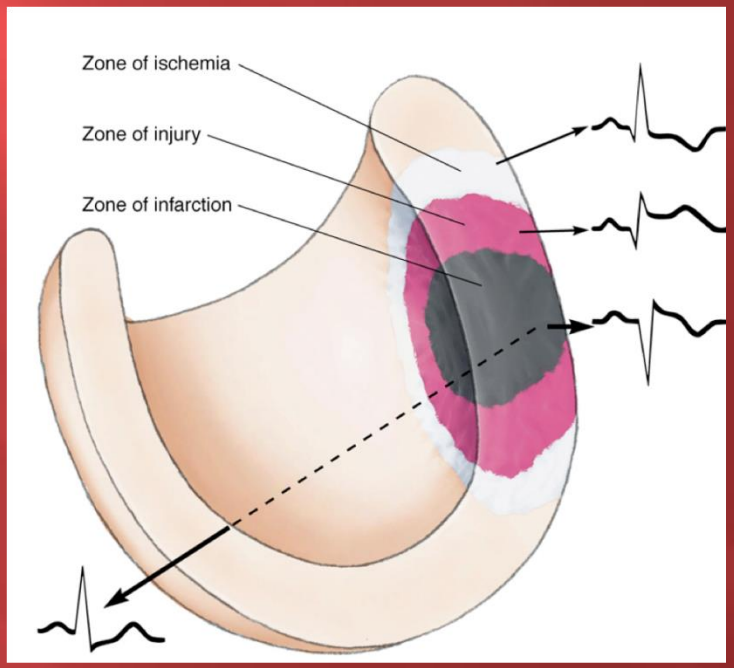
- V1 - 4th ICS, RSB
- V2 - 4th ICS, LSB
- V3 - between V2 and 4
- V4 - 5th ICS, L MCL
- V5 - 5th ICS, L Ax Line
- V6 - 5th ICS, L Mid Ax Line

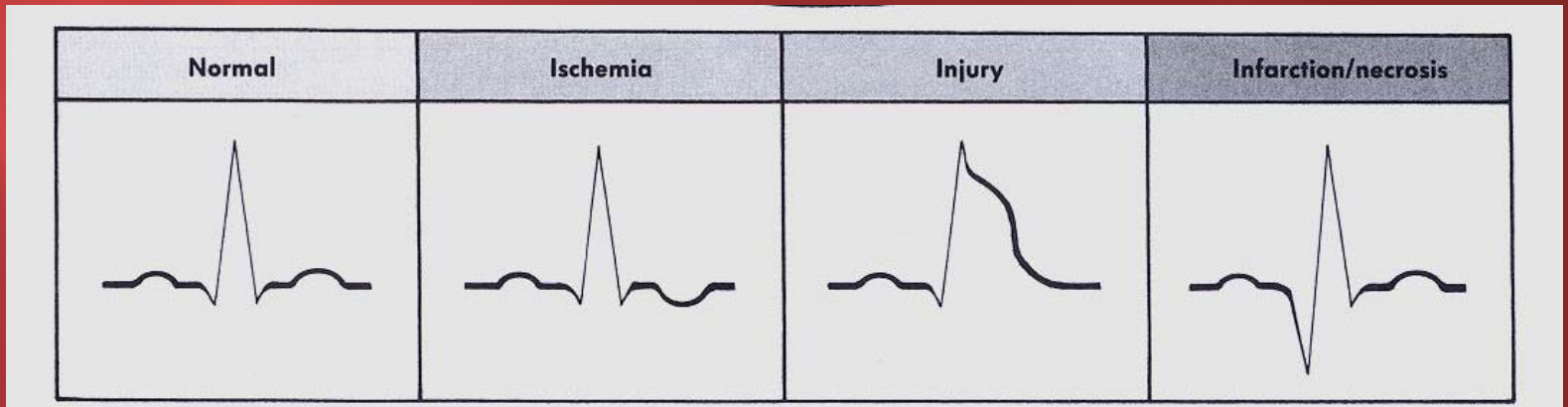
The normal 12 lead EKG



Purpose of the 12-lead EKG

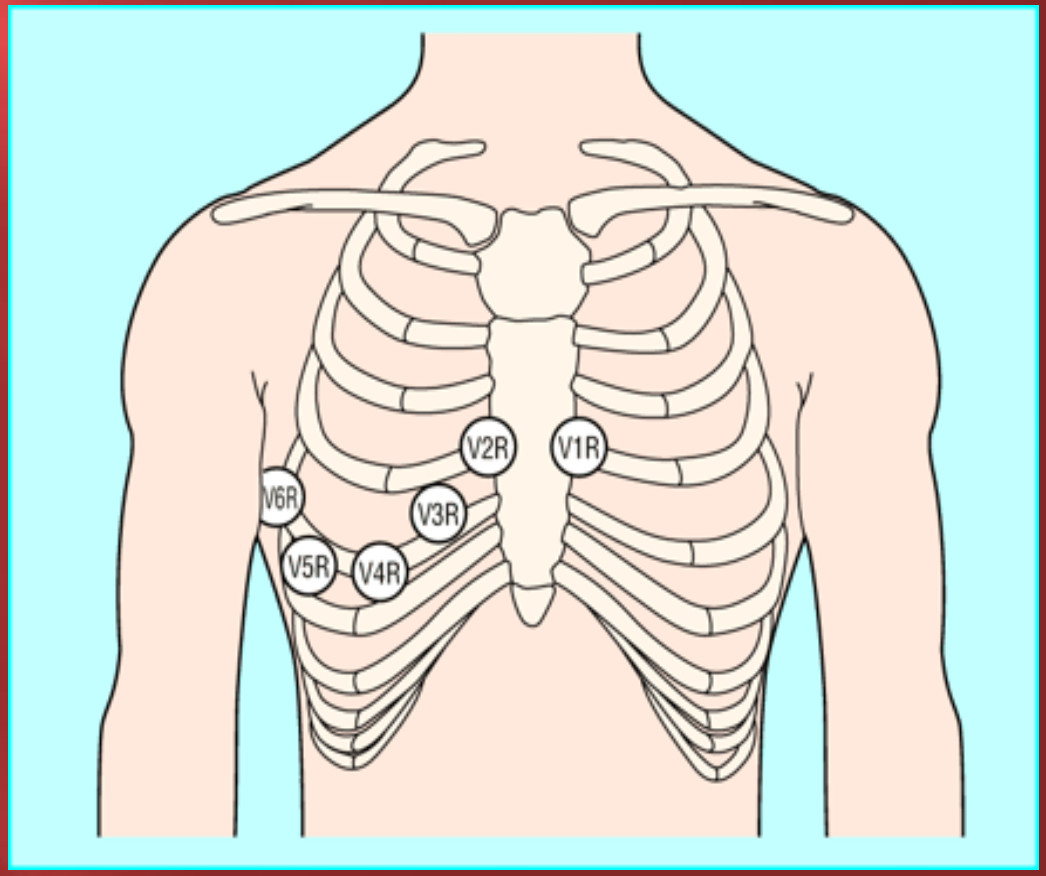
- To detect ischemia or acute coronary injury.





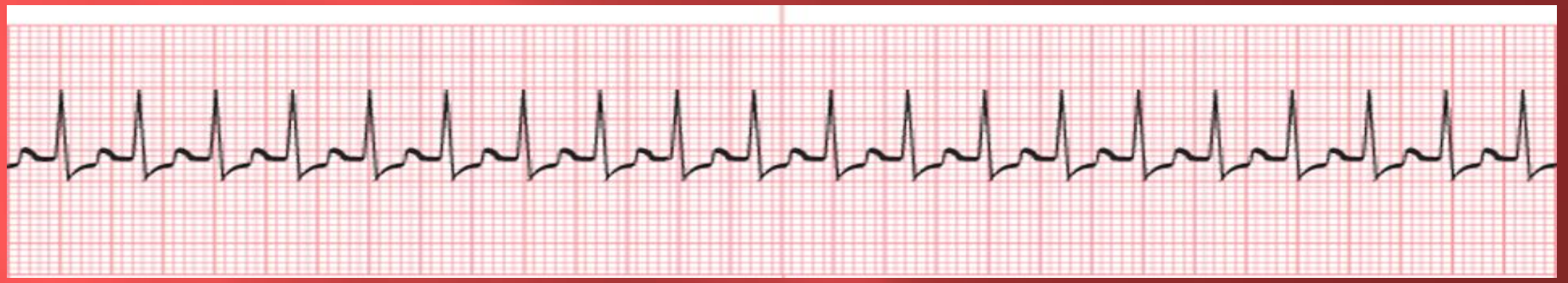
Right Sided EKG

- Why do we need one?
  - To rule out Right Ventricular infarct
  - MD may order
  - Used infrequently



Major Dysrhythmias in MI

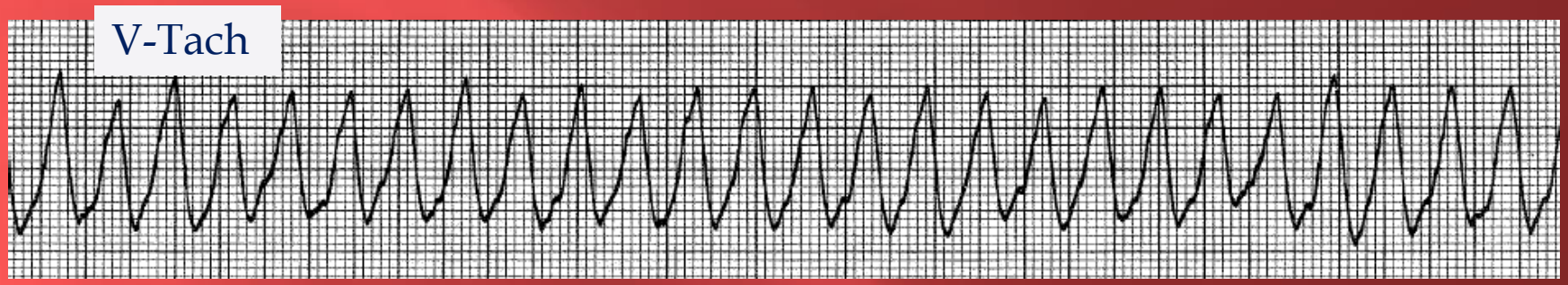
SVT: Supraventricular Tachycardia (rate too fast)

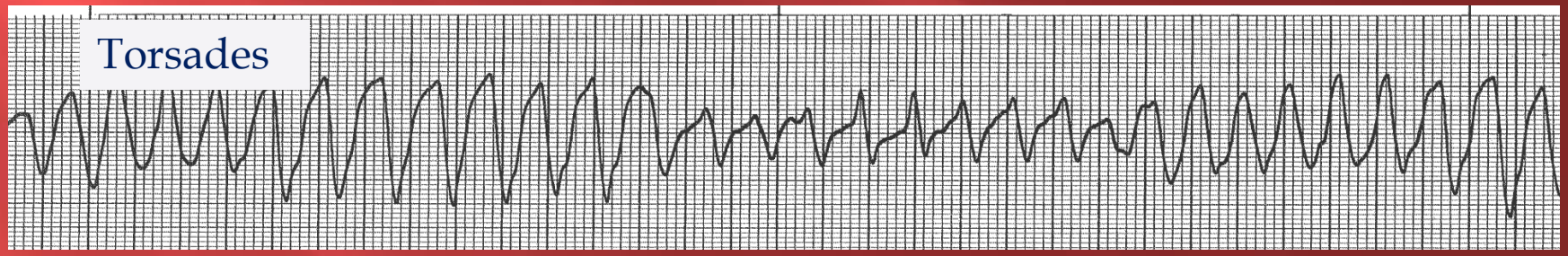


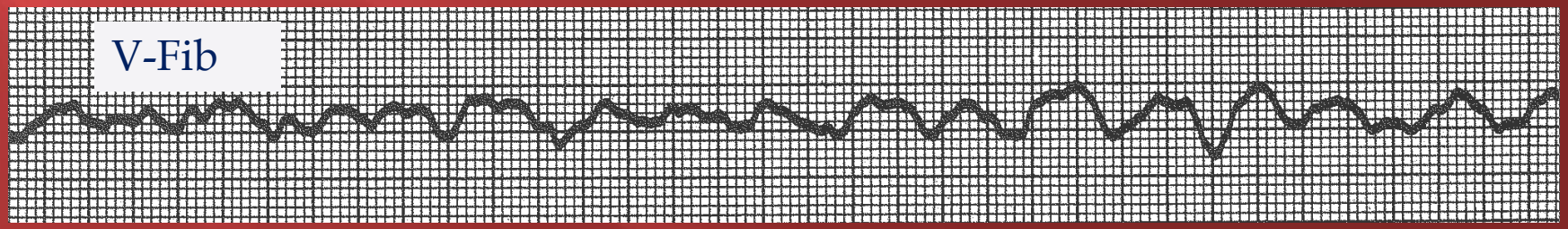
Heart Blocks (rate too slow)

Major Dysrythmias

Ventricular Arrhythmias are Common and can result in Sudden Death. These are LETHAL rhythms!!



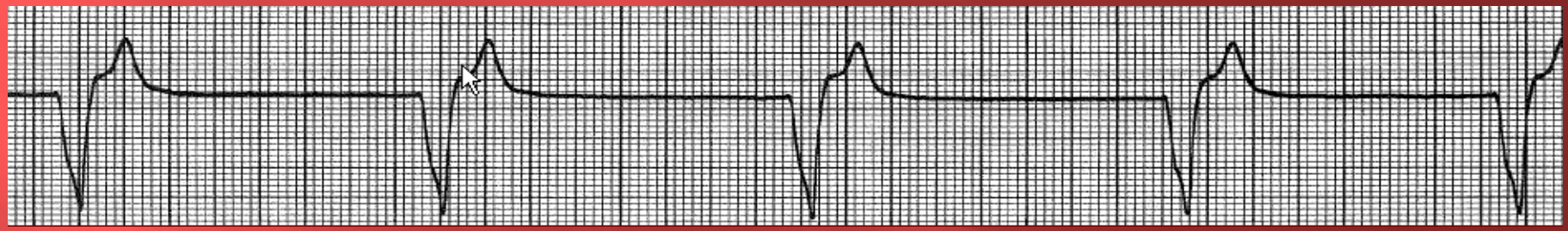




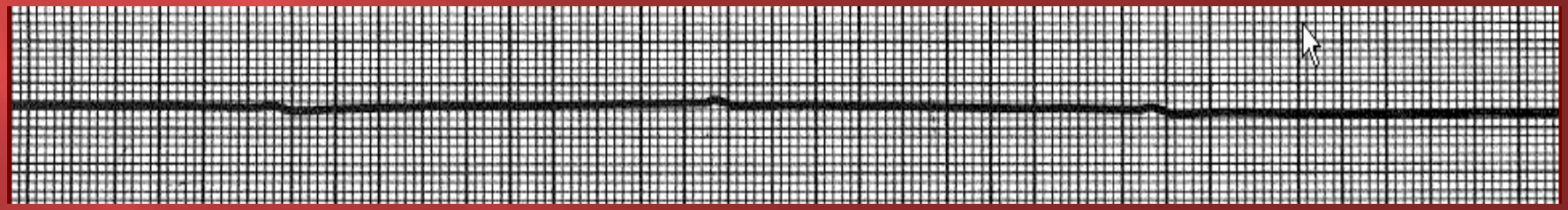
Major Dysrhythmias

- Other Lethal Rhythms

Idioventricular Rhythm (may or may NOT have pulse)



Asystole (NO PULSE)

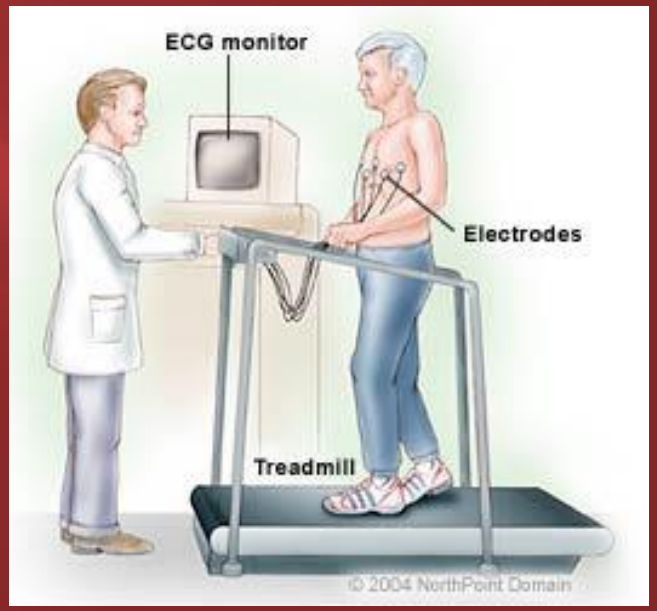


Common Labs in Diagnosis MI

- **Cardiac Biomarkers**
  (Lab results indicating a patient is having a MI)
  - **Cardiac Proteins**
    - **Troponin is specific to myocardial injury and rise quickly after injury**
  - **Cardiac Enzymes**
    - **Enzymes specific to cardiac muscle that are released into the blood stream when tissue dies.**
      - **CPK - MB Rises in 2-4 hours, peaks in 12-20 hours and returns to normal 48 - 72 hours later.**
      - **LDH Rises in 24 hours, Peaks in 48-72 hours and returns to normal in 7-10 days..**

ACC/AHA ACS Guidelines for Stress Testing

- Exercise Stress test
  - Easiest
  - Must be able to exercise
  - Must be able to evaluate ST baseline on EKG
- Pharmacologic imaging study
  - Pts unable to exercise
- Exercise imaging for:
  - baseline ST abnormalities
  - BBB
  - LV hypertrophy
  - intra-ventricular conduction defect
  - paced rhythm
  - digoxin

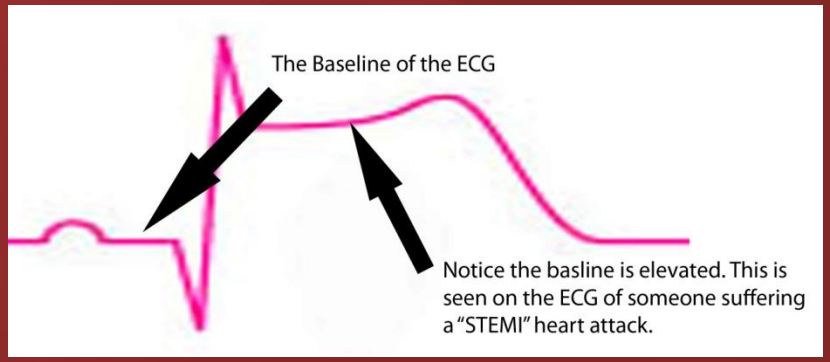


In-house STEMI Process

- IF you suspect your patient is having a MI….
- Think H.E.A.R.T.
  - H –Help (call Quick team, MD, House Coordinator)
  - E – EKG STAT
  - A – Activate Inpatient STEMI order set
  - R – Reperfusion
  - T – Transport to the Cath Lab

Is MY PATIENT having an MI???

- Do they have:
  - New Arrhythmias?
  - c/o chest pain?
  - ST elevation on tele?
  - Change in cardiac rhythm?
- CONSIDER MI!!



What if I'm not SURE?

- Some patients (elderly, diabetics, women, etc.) will not complain of chest pain.
- They may have less "classic" symptoms.
- Don't IGNORE IT. GET HELP!!!

- Consult Clinical Lead
- Call Quick Team
- Call MD

Resource: Call the QUICK team

- The Quick Team will help assess the situation and initiate the Code STEMI process.
- Order and obtain a STAT 12 lead EKG
- If it is felt the patient may be having a STEMI, call 3-6511 to activate the STEMI team.

Script for calling the MD

- If a cardiologist is on the case, call them.
- If no cardiologist, call the attending:
  - I am calling about ____ in room ___.
  - He/she is having the following symptoms: (describe)
  - We are obtaining a 12 lead EKG.
  - Would you like me to fax it to you to read or would you like for me to get the in house physician to read? (10 minutes to read the EKG)
  - If there is no Cardiologist on the case ask:
    - If the patient is having a STEMI, do you want me to call the Cardiologist on call for STEMI or do you have a preference in which Cardiologist is called?

Implementing Code STEMI

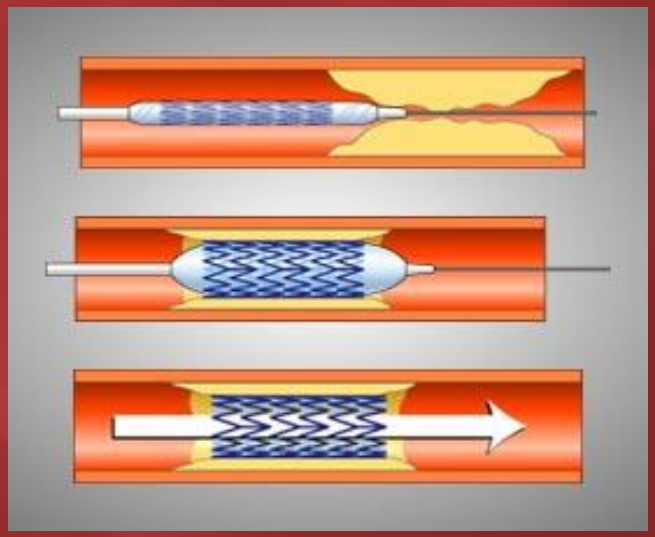
- Notify the House Coordinator
  - assess & facilitate implementation of Code STEMI
- Activate Inpatient STEMI Order Set as ordered
  - Implement orders (labs, meds, prep etc)
- Assist with transport to Cath Lab
  - Remember to transport on EKG monitor!
- GOAL: Get patient to Cath Lab in under 90 minutes!!

Treatment of ACS

- Medications for Acute MI
  - Morphine
    - for pain and decreases myocardial oxygen needs.
  - Oxygen
    - to provide adequate oxygen to tissues.
  - Nitroglycerine
    - to dilate coronary arteries and promote blood flow.
  - Aspirin
    - decreases blood clotting and improves flow

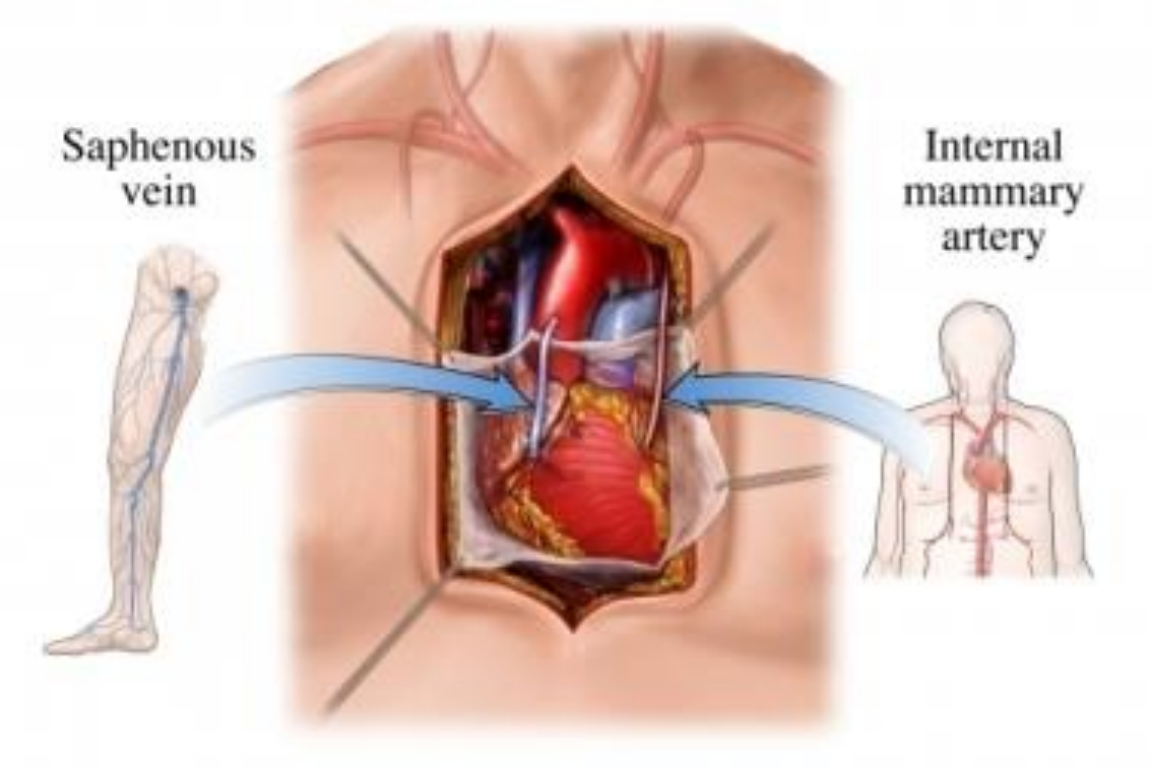
Treatment of ACS

- Surgery / Procedures
  - Stent and Angioplasty –
    - A catheter is passed to the narrowed / closed cardiac blood vessel
    - A balloon is inflated, compressing the plaques against the artery walls.
    - A stent (or prop) is left in the artery to keep the artery open.



Treatment of ACS

- CABG – Coronary Artery Bypass Graft
  - Surgical Procedure: grafts are sewn onto the coronary arteries to bypass the narrowed area.



Time is MUSCLE!

- The sooner you act, the more cardiac muscle you save!
- The more cardiac muscle lost results in increased disability and possibly death for the patient!
- Remember, ACT FAST!
- TRUST YOUR INSTINCTS !!
- It is always best to ask for help and not need it than to need it and never ask for it!!

CLICK THE LINK BELOW FOR THE ASSESSMENT TEST

Chest Pain Center Annual Education Test

When the test is successfully completed (score 100%),

you'll be prompted to supply your name, API# and the last four digits of your social security number.