**EM Basic- Chest Pain**

(This document doesn’t reflect the views or opinions of the Department of Defense, the US Army or the SAUSHEC EM residency, copyright 2011 EM Basic, Steve Carroll DO)

Look at the chart, vitals, EKG

Rapid EKG interpretation

Is this a STEMI? (1mm elevation in 2 contigous leads)

Look in anatomical locations

I and AVL (lateral)

II, III, AVF (inferior)

V1-V3 (anterior/septal)

V4-V6 (lateral)

AVR (isolation)

Rate- look at machine or divide 300 by number of boxes between two R waves or 300, 150, 100, 75, 60, 50, etc…

Rhythm- P before every QRS (sinus) or not?

Axis- if upright in I and AVF, normal

Ischemia

Flipped T waves- can be ischemia

Elevations= infarction

Depression= infarction opposite of that lead

Look at computer interpretation and reconcile with your own reading

**Chest pain history**

**OPQRST**

**Onset**- When did the symptoms start AND what were you doing?

**Provocation/Provoking**- What makes you pain better or worse?

**Quality**- What does your pain feel like (sharp, dull, pressure, burning?

**Radiation**- Where does your pain radiate to (neck, jaw, arm, back?)

**Severity**- 1 to 10 scale

**Time**- When did your pain start?

**PEARL-** Make sure this isn’t syncope (much different workup)

**Associated signs and symtpoms**- nausea, vomiting, diaphoresis, abdominal pain or back pain, syncope

**Similarity to previous pain or MI?**

**Past history-** HTN, hyperlipidemia, MI, CHF, echo with EF in chart?

**History of stress tests or caths**- confirm if possible

**PEARL**: a “negative cath” can still have 30% occlusions- that is heart disease!

**Medications-** BP meds, statins, aspirin, plavix, coumadin, pradaxa

**Physical exam key points**

**Volume status**- volume up, down, or euvolemic (wet or dry?)

**Heart and lung sounds**- Murmurs? Wet lungs or wheezing?

**Abdominal and back exam-** palpable AAA?

**Legs**- edema or swelling?

**Pulses**- asymmetric deficits suggest a dissection

**Differential**

Take your **PET MAC** for a walk**-** the 6 deadly causes of chest pain

**P**E **E**sophageal rupture **T**ension pnuemothorax

**M**I **A**ortic Dissection **C**ardiac Tamponade

**Workup**

**Every patient- Chest x-ray and EKG**

Chest pain + EKG with 1mm elevation in 2 contiguous leads or new left bundle branch block = CATH LAB

**Chest x-ray**- Pneumothorax, screen for dissection (widened mediastinum is 60-70% sensitive), esophageal rupture

**PEARL:** Be liberal with your EKGs and stingy with your enzymes

**If you are suspecting cardiac chest pain:**

**Labs-** Cardiac set- (major reasons for labs in parentheses)

CBC (anemia) Chem 10 (electrolyte abnormalities)

Coags (baseline) Cardiac Enzymes (Troponin, CK, CK-MB)

**PEARL: One set of enzymes USUALLY means admission for rule out ACS**

**Treatments**- Aspirin 325mg PO, Nitroglycerin (0.4mg sublingual q5 minutes x3 total doses, hold systolic BP <100 or pain free, contraindicated with Viagra, Cialis, etc.

**PEARL**: have an IV in place before giving nitro, if hypotensive usually fluid responsive to 500cc NS bolus, avoid nitro in posterior MIs

**If not pain free after aspirin and nitro**- can give morphine, zofran

**PEARL:** Get a pain free EKG and make sure there are no changes!

**If patient has persistent pain despite interventions**- consider unstable angina and admission to CCU instead of tele floor

**If you are suspecting Pulmonary Embolism**

**Symptoms**- pleuritic chest pain, SOB, tachycardia, tachypnea, hypoxia

**Risk factors**- OCPs, pregnancy, trauma, recent surgery, malignancy

**PEARL**- Therapeutic INR (2-3) is NOT 100% protective against PE

**Workup**- EKG and CXR

CBC (low yield but consultants want it)

Chem 10 (creatinine for a CT)

Coags (baseline)

**PEARL-** DON’T indiscriminately order D-dimers

**Decision making in PE**

First step- Gestalt (“gut feeling”)

Low probability- no workup or proceed to PERC criteria below

Moderate or high probability- CT pulmonary angiogram (CTPA)

**PERC criteria-** low risk gestalt PLUS all of the following- **BREATHS**

**B**lood in sputum (hemoptysis)

**R**oom air sat <95%

**E**strogen or OCP use

**A**ge >50 years old

**T**hrombosis (in past or current suspicion of DVT)

**H**eart rate >100 documented at ANY time

**S**urgery in last 4 weeks

**If negative-** no testing (risk of PE 1.8%, risk of anti-coagulation 2%)

**If positive**- if negative D-dimer- no further testing, if positive- CTPA

**Treatment**

If you diagnose a PE- get cardiac enzymes and BNP for risk stratification

**Regular PE** (vitals stable, no elevation in cardiac enzymes or BNP)- lovenox 1mg/kg SQ, admit

**Submassive PE** (vitals stable with elevation in CEs or BNP, right heart strain on echo)- lovenox 1 mg/kg SQ, strongly consider ICU admit

**Massive PE** (unstable vitals, systolic BP less than 90 at any time)**-** thombolytics and ICU admit, ?interventional radiology intervention

**Other diagnoses**

**Esophageal rupture** **(Boorhave’s syndrome)**

**History**- recent forceful vomiting, recent endoscopy, alcoholic, sick and toxic looking patient

**Chest x-ray**- Free air under diaphragm, rigid abdomen on exam

**Treatment**- resuscitation, surgical intervention

**Aortic Dissection**

**History**- ripping or tearing chest that goes into the back or shoulder area

**PEARL-** Chest pain + motor or neuro deficit **OR** chest pain but a seemingly unrelated complaint elsewhere in the body- think about dissection- aorta connects them both

**Risk factors**- HTN (#1), pregnancy, connective tissue diseases (Marfan’s and Ehler-Danlos)

**Exam**- unequal BPs (more than 20 mmHg, 60-70% sensitive), pulse deficits (20% sensitive)

**Chest x-ray**- widened mediastinum (60-70% sensitive)

**Testing-** CT Aorta with contrast, TEE if dye allergy or creatinine elevated, cardiac MRI

Miscellaneous:

**Sample conversation with cardiologist regarding a low risk chest pain admission in the “cardiology format”:**

Hi, this is Dr. Turn and Burn in the ED, I have a 40 year old male with a history of HTN with no known coronary artery disease who comes in with 3 hours of chest pain at home. It started at rest and persisted for 3 hours. It wasn’t exertional or positional. He described a sharp in his chest, 5 out of 10 severity. No other associated signs or symptoms. Exam is normal, EKG is normal and non-ischemic, Chest x-ray normal, and cardiac enzymes are normal as well. He got a 325mg ASA and one sublingual nitro with total relief of his pain. Repeat EKG has no changes. I would like to admit him for a low-risk rule out.

(**Contact for suggestions or comments-** steve@embasic.org)