**EM Basic- Chest Pain**

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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)