

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 contiguous 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 your 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 symptoms- 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 cath- confirm if possible

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

Medications- BP meds, statins, aspirin, Plavix (clopidogrel), coumadin (warfarin), pradaxa(dabigatran)

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

PE Esophageal rupture **Tension** pneumothorax

MI Aortic Dissection **Cardiac** 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**

Blood in sputum (hemoptysis)

Room air sat <95%

Estrogen or OCP use

Age >50 years old

Thrombosis (in past or current suspicion of DVT)

Heart rate >100 documented at ANY time

Surgery 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 (enoxaparin) 1mg/kg SQ, admit

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

Massive PE (unstable vitals, systolic BP less than 90 at any time)- thrombolytics 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 - 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)