Emergency Department:
Rapid Fire Diagnosis

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Objectives

- Why emergency medicine is unique
- Approach to the emergent patient
- Discuss forming a differential diagnosis
- Rapid diagnosis cases
Emergency Medicine: Why is it unique?

- Purest form of rapid diagnosis
- Medical decision making process separates emergency medicine from other specialties

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Emergency Medicine: Why is it unique?

- Fast paced
- Team oriented approach
- Specialized knowledge
- Know what to do and do it fast
- Limited time for form rapport with patient
- Tune out distraction and noise
Emergency Medicine: Why is it unique?

- Make the **right** decision, you may save a life
- Make the **wrong** decision, the patient may get sicker
- Sometimes you only have a few minutes to make your decision, or nature will make it for you

### Approach

#### Traditional approach
- Comprehensive H & P
- Complete problem list
- Formulate long term diagnostic and treatment plan

#### Emergency approach
- Focused H & P
- Immediately recognize emergency
- Immediately initiate work up and treatment
- Disposition when all life threats are identified, stabilized or ruled out
- Ensure a safe follow up plan
Identifying the chief complaint

What brought you to the ED now?
What have you worried about?
What have others worried about you?

Wait for the patient to answer.
What is the key question to ask about a chronic problem?

- Is this different from your previous pain?
- If so, how?

How do I identify a life threatening situation?

- Focused history
  - Based on chief complaint
- Focused examination
- Critical interpretation of results
- Vital signs
How do I formulate my differential diagnosis?

- What is the most serious possible cause of this patient’s presenting signs and symptoms?

- Assume the worst case scenario and proceed to rule it out.

Rapid Fire Diagnosis
Case 1

- A 45-year-old female presents with sharp right sided chest pain and shortness of breath after carrying her groceries into her home. She appears uncomfortable.

- Vital signs:
  - BP 130/70
  - P 104
  - RR 22
  - O2 98% RA
  - T 37
Case 1

What is the diagnosis?
Case 1

- A 45-year-old female presents with **sharp** right sided chest pain and **shortness of breath** after carrying her groceries into her home. She appears uncomfortable.

- **Vital signs:**
  - BP 130/70
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Pulmonary Emboli

**WELLS CRITERIA / SCORING FOR PE**

- Clinical Signs and Symptoms of DVT? +3
- PE is No. 1 Dx or Equally likely Dx +3
- Heart Rate > 100 +1.5
- Immobilization at least 3 days, or Surgery in the Previous 4 weeks +1.5
- 5 Previous, objectively diagnosed PE or DVT? +1.5
- Haemoptysis? +1
- Malignancy with treatment within 6 months, or palliative? +1

- Pre-test clinical probability of a PE:
- Wells Score > 4 - PE likely. Consider diagnostic imaging.
- Wells Score 4 or less - PE unlikely. Consider D-dimer to rule out PE.
Wells Criteria

- Two Tier Model

- “PE Unlikely” (0-4 points):
  - Consider high sensitivity d-dimer testing
  - If the dimer is negative consider stopping workup
  - If the dimer is positive consider CTA

- “PE Likely” (>4 points):
  - Consider CTA testing

Pulmonary Emboli
Case 2

- A 54-year-old male presenting for dizziness and near syncope after lifting weights this morning. He just completed the night shift and was feeling well. Non-radiating central chest pain. Dizziness. Difficulty using his right lower extremity upon triage arrival.

- Vital signs:
  - BP 180/90
  - P 70
  - RR 20
  - O2 97% RA
  - T 37
What is the diagnosis?

Case 2

- A 54-year-old male presenting for **dizziness** and **near syncope** after lifting weights this morning. He just completed the night shift and was feeling well. Non-radiating central **chest pain**, Dizziness. **Difficulty using his right lower extremity** upon triage arrival.

- Vital signs:
  - **BP 180/90**
  - **P 70**
  - **RR 20**
  - **O2 97% RA**
  - **T 37**
Aortic dissection

- Management of Aortic Dissection
  - Type A dissection – ascending - surgical
  - Type B dissection – any other part - medical

- Mainstay of medical therapy
  - Pain control
  - HR and BP control
    - Goal HR = 60 beats/min
    - Goal SBP = 100-120 mmHg
  - Use IV beta-blockers (i.e. Labetalol, Esmolol)
  - Nitroprusside

Case 3

- A 68-year-old female with recurrent right sided pleural effusion presenting for right sided chest pain two hours after a thoracentesis.

- Vital signs:
  - BP 130/90
  - P 90
  - RR 20
  - O2 96% RA
  - T 37
What is the diagnosis?

Pneumothorax
Pneumothorax management

- < 3 cm
  - Supplemental oxygen and observation

- > 3 cm
  - Chest tube

- Unstable
  - Chest tube

Case 4

- A 52-year-old male presents with severe pain and redness of his left leg and foot that started a few hours ago. No injury or trauma.
What is the diagnosis?

Necrotizing fasciitis

- Early
  - Tenderness to palpation beyond redness
  - Pain out of proportion
  - Swelling
  - Warmth

- Intermediate
  - Blisters
  - Skin fluctuance

- Late
  - Hemorrhagic bullae
  - Skin anesthesia
  - Crepitus
  - Skin necrosis
A 82-year-old female presents for severe epigastric pain that radiates around to her back like a “band”. For the previous two days - vague heartburn, bloating and waking up with epigastric pain.

Vital signs:
- BP 110/60
- P 90
- RR 20
- O2 98% RA
- T 37
What is the diagnosis?

Perforated duodenal ulcer

- Aspirin 325 mg at bedtime
- Stopped taking omeprazole
Case 6

- A 45-year-old male presents to the ED from the urgent care for sore throat, fever and neck pain for the past two days. Pain with swallowing.
- Oral exam - unremarkable
- Neck exam - nuchal rigidity, cervical LAD
- Vital signs:
  - BP 150/60
  - P 90
  - RR 24
  - O2 98% RA
  - T 38.1

What is the diagnosis?
Case 6

- A 45-year-old male presents to the ED from the urgent care for sore throat, fever and neck pain for the past two days. Pain with swallowing.
- Oral exam - unremarkable
- Neck exam - nuchal rigidity, cervical LAD
- Vital signs:
  - BP 150/60
  - P 90
  - RR 24
  - O2 98% RA
  - T 38.1

Retropharyngeal Abscess

- Soft tissue neck xray
- C2: > 7 mm soft tissue swelling
- C6: > 22 mm soft tissue swelling
Case 7

- A 42-year-old female presents for sudden onset occipital headache that started one hour ago at home. Dizziness. Vomiting. Headache nearly resolved at this time.

- Vital signs:
  - BP 160/80
  - P 90
  - RR 20
  - O2 98% RA
  - T 37.1

CT head
What is the diagnosis?

Subarachnoid hemorrhage

- **Etiology**
  - Ruptured cerebral aneurysm
  - Head injury

- **Diagnosis**
  - CT if performed within 6 hours of onset
  - Lumbar puncture considered if CT negative and > 6 hours
Case 8

- A 52-year-old female with history of chronic low back pain presents for acute on chronic low back pain. Urinary retention. No incontinence.

- Vital signs:
  - BP 140/80
  - P 90
  - RR 20
  - O2 98% RA
  - T 37

Case 8

- Physical exam
  - Severe low back pain
  - Diminished ankle and knee jerk reflexes
  - Decreased sensation of the perirectal area
What is the diagnosis?

Cauda Equina Syndrome

- Spinal cord tapers and ends at L1 and L2
- Distal to this end of the spinal cord are nerve roots which are horsetail-like in appearance and hence called the cauda equina
- Resulting from the simultaneous compression of multiple lumbosacral nerve roots below the level of the conus medullaris
  - Tumors/lesions
  - Trauma
  - Spinal stenosis
  - Inflammation
Treatment

- Immediate surgical decompression is necessary to minimize the chances of permanent neurologic injury
  - Typically within 24 hours

Rapid Fire Diagnosis Errors

- Do not undermanage a difficult patient
- Make safe dispositions
- Not listening to the patient and their family
- Sensory overload and distractions
- Do not label patients
  - Once a patient is labeled, all thinking stops
Golden Rule

- Assume the worst case scenario and proceed to rule it out

Questions?

"That's correct, Doctor. He claims that the instructions said to squeeze toothpaste from bottom."