Step Three Making a Diagnosis

Diagnostic Thinking

- weight gain + edema
- exertional dyspnea but clear lungs
- pallor
- high BP + Hx HTN
- tachycardia
- S4 gallop
- RFs for CAD
- ex smoker

- Edema – entire DDx
  - Heart- HTN, but lungs clear
  - Liver – no stigmata
  - Kidneys – not anasarca
  - Nutrition – rare in US
- Dyspnea
  - Heart (HTN? Pericardium?)
  - Lungs (smoker)
  - Anemia (pallor)
  - Restriction (abdomen)
  - Deconditioning
- Tachycardia

Some Techniques for Diagnosis

- Systematic
  - e.g. VINDICATE, organ system
- Anatomic
  - e.g. chest anatomy
- Pathophysiologic
  - e.g. bilirubin metabolism
- Pattern recognition
  - e.g. NDM
- Mnemonic
  - PT Barnum Loves Kids

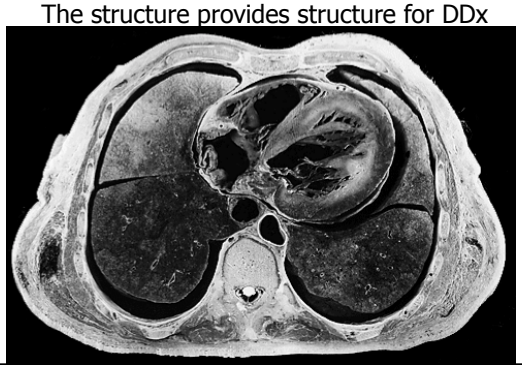
- Heuristics
  - when you hear hoofbeats, look for horses, not zebras
- Mathematics
  - Baye's Theorem
  - SpIN, SnOUT
- Temporal patterns
  - acute, subacute, etc

Systematic Approach
Brainstorming To Expand Differential

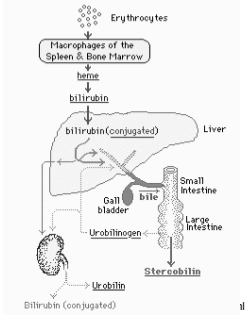
VINDICATE (processes)
- vascular
- infectious
- neoplastic
- drugs
- inflammatory/ idiopathic,
- congenital
- autoimmune
- trauma
- endocrine/metabolic)

Organ (systems)
- Neuro
- CV
- Pulmonary
- Renal
- Heme
- GI
- Bones
- Joints
- Skin

Anatomic Approach
The structure provides structure for DDx



Pathophysiologic Approach
All the causes of jaundice



- Erythrocyte
  - erythropoiesis
  - hemolysis
- Liver
  - uptake- Gilbert's
  - conjugate- Crigler-Najer
  - secretion: Dubin-Johnson
- Biliary obstruction
  - intrahepatic cholestasis
  - bile duct - clonorchis
  - pancreas - cancer

Patterns of Data in Diagnosis Especially Neurologic Diagnosis

- Topographic pattern
  - locate lesion in nervous system
  - peripheral nerves, plexus, spine, brain
- Temporal pattern
  - pace of appearance and resolution of symptoms
  - pathophysiologic process
- Clinical context - the company it keeps
  - other symptoms (e.g. fever)
  - comorbidities (e.g. valvular heart disease)
  - past Hx (e.g. smoking)

Topography and Neurologic Diagnosis

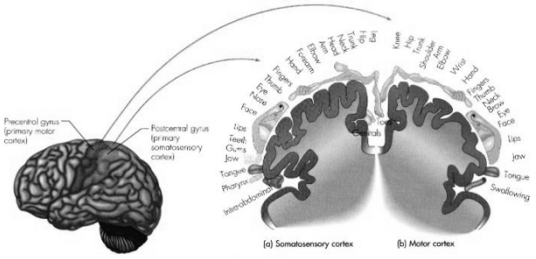
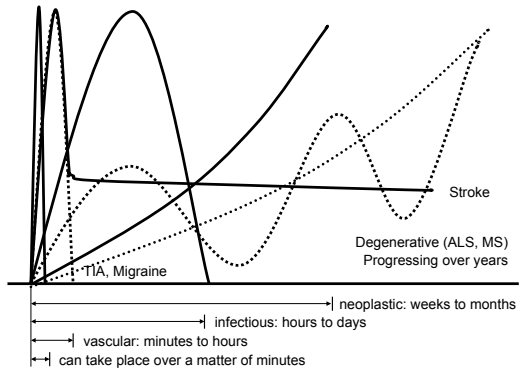


Figure 4.21 Approximate representation of sensory and motor information in the cortex
(a) Each location in the somatosensory cortex represents sensation from a different body part. (b) Each location in the motor cortex regulates movement of a different body part. *(Source: After Penfield & Rasmussen, 1950)*

http://mywebpages.comcast.net/epollak/PSY255_pix/homunculus.jpg

Temporal Pattern and Neurologic Dx



Heuristics: Rules of Thumb

- Err on the side of life
- When you hear hoofbeats, think of horses, not zebras (unless you're at the zoo…)
- You are more likely to see an uncommon case of a common disease than an uncommon disease
- Weaknesses
  - cognitive errors
  - heuristics and biases
- Strength:
  - "fast and frugal heuristics"

Mathematical Approaches

- Bayes' theorem
  - SpIN & SnOUT
  - PPV and LR+
  - ROC curves
- Decision Rules
  - Well's criteria for PE
  - strep throat, sinusitis
- Decision Analysis
  - Utility of Dx/Tx

$$P(H|d) = \frac{P(d|H)\,P(H)}{P(d)}$$