Problem Representation

And other core clinical reasoning concepts

URMC DOM Educator Development Forum
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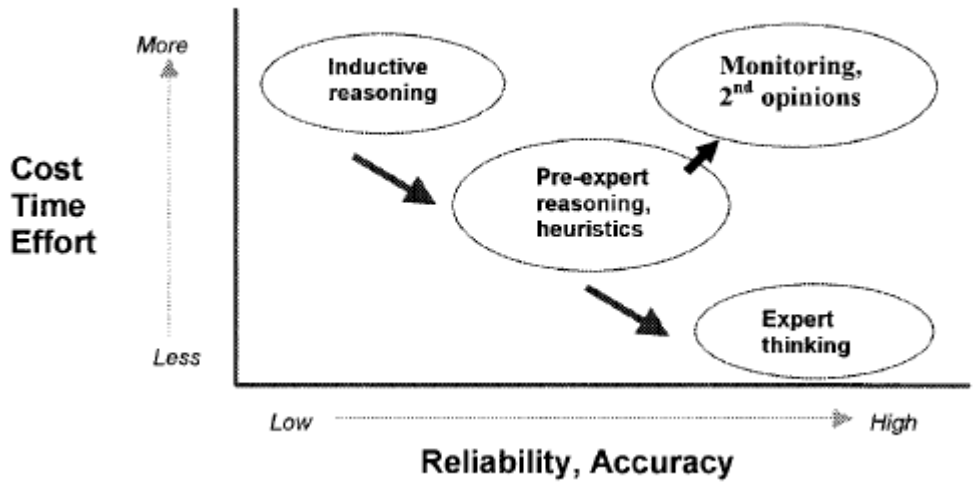
Teaching Clinical Reasoning

- Isn’t that what we do all the time?
- Encouraging the learner to reason out loud
- Prompting the learner to think in a structured fashion &
- Sharing your own thinking
- Improving care for this patient AND the next one

Suspected benefits of sound clinical reasoning

- Better diagnostic accuracy and efficiency
- Better communication with colleagues and patients
- Reduced physician anxiety (did I miss anything?)
- More professional bonding in the team
  - Sharing your craft, not simply correcting/evaluating the learner
  - Talking like a doctor
- Multiple levels of learners can participate together
- Its so much fun

Clinician Thinking



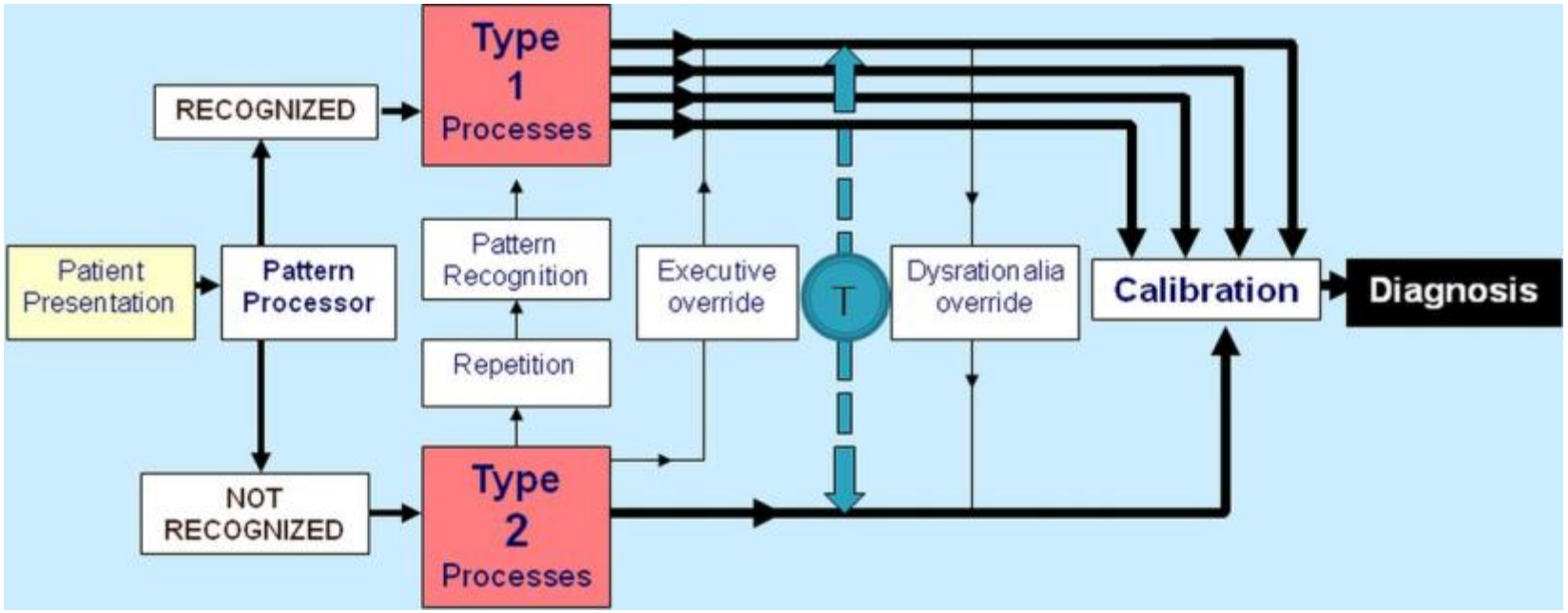
How your mind works- Dual Process Theory

System 1	System 2
Fast	Slow
Unconscious	Conscious
Automatic	Effortful
Everyday Decisions	Complex Decisions
Error prone	Reliable

Dual Process Theory

	Definition	Example	Diagnosis
System 1	Reflexive	Acute diarrhea & recent antibiotics	*C. difficile* colitis
System 2	Analytical	Chronic diarrhea	Broad ddx

Decision making



Pat Croskerry et al. BMJ Qual Saf 2013;22:ii58-ii64 $

BMJ Quality & Safety

Lots of patterns

- Weight gain, orthopnea and bilateral edema
- Anemia, thrombocytopenia and schistocytes
- Weight loss, dysphagia and guaiac positive stool &
- Dyspnea, hypoxia and clear CXR

The brain finds patterns everywhere

- **Occam's razor** (diagnostic parsimony)- simplest unifying diagnosis is preferred
- **Hickum's dictum** (counterargument)- the patient can have as many diseases as they please
- **Crabtree's bludgeon-** "No set of mutually inconsistent observations can exist for which some human intellect cannot conceive a coherent explanation, however complicated"

Clinical Reasoning

Moving beyond pattern recognition

What makes good clinical reasoning

Step 1: Name the problem	Problem Representation
Step 2: Work the problem	Clinical schema
Step 3: Make the diagnosis (es)	Illness script

Core Clinical Reasoning Vocab

- **Problem Representation-** the “core” of the case. The problem (s).
  - A short summary of the most essential/diagnostically helpful features of a case. " (e.g. A middle aged woman with acute hypoxic respiratory failure without evidence of volume overload)

- **Clinical Schema-** a structured diagnostic approach to a problem.
  - 'User specific, organized mental approach, typically patient-agnostic
    - (e.g. approach to hypoxia, approach to petechial rash, approach to syncope, approach to abnormal liver enzymes)

- **Illness script**: A structured mental summary of a specific disease.
  - 'User specific, grows and becomes more nuanced with experience.
    - (e.g. Bacterial pneumonia in the older adult; ACS atypical presentations)

Name the problem

Problem representation

Problem Representation

- Key components
  - Patient
  - Time course/tempo
  - Clinical syndrome (Key signs, symptoms and descriptors)

A 60-year-old woman with rheumatoid arthritis on prednisone presents with one day of ankle pain and swelling in the setting of malaise, with exam significant for tachycardia, fever, left ankle pain and swelling, and leukocytosis.

A 60 year-old immunocompromised woman with acute monoarticular arthritis and systemic inflammatory response syndrome (SIRS).

Jennifer Olenik, Jeff Kohlwes, Reza Sedighi Manesh, Denise M. Connor, JGIM ECR Team

Words Matter- clinical synthesis

DESCRIPTION	SYNTHETIC CLINICAL TERM
• Right sided abdominal pain after eating	• Biliary colic
• Waxing and waning mental status	• Delirium
• Shortness of breath and hypoxia	• Hypoxic respiratory failure
• Cough, runny nose and fever	• URI symptoms
• Weight loss, falls, increasing dependency	• Failure to thrive

Words Matter- use medical adjectives

(Semantic qualifiers)

- Clinically significant descriptors
- Often paired opposites

• 'Acute	• Chronic
• Localized	• Diffuse "
• 'Static	• Progressive
• 'Single Episode	• Recurrent
• 'Painful	• Painless
• 'Bilious	• Nonbilious
• 'Constant	• Intermittent (eg. Colicky)
• 'Abrupt	• Gradual
• 'Single	• Multiple

A more muscular summary

TRADITIONAL SUMMARY

- Comprehensive of all potentially relevant details
- Purely objective
- Purely descriptive
- Static
- Avoids being wrong

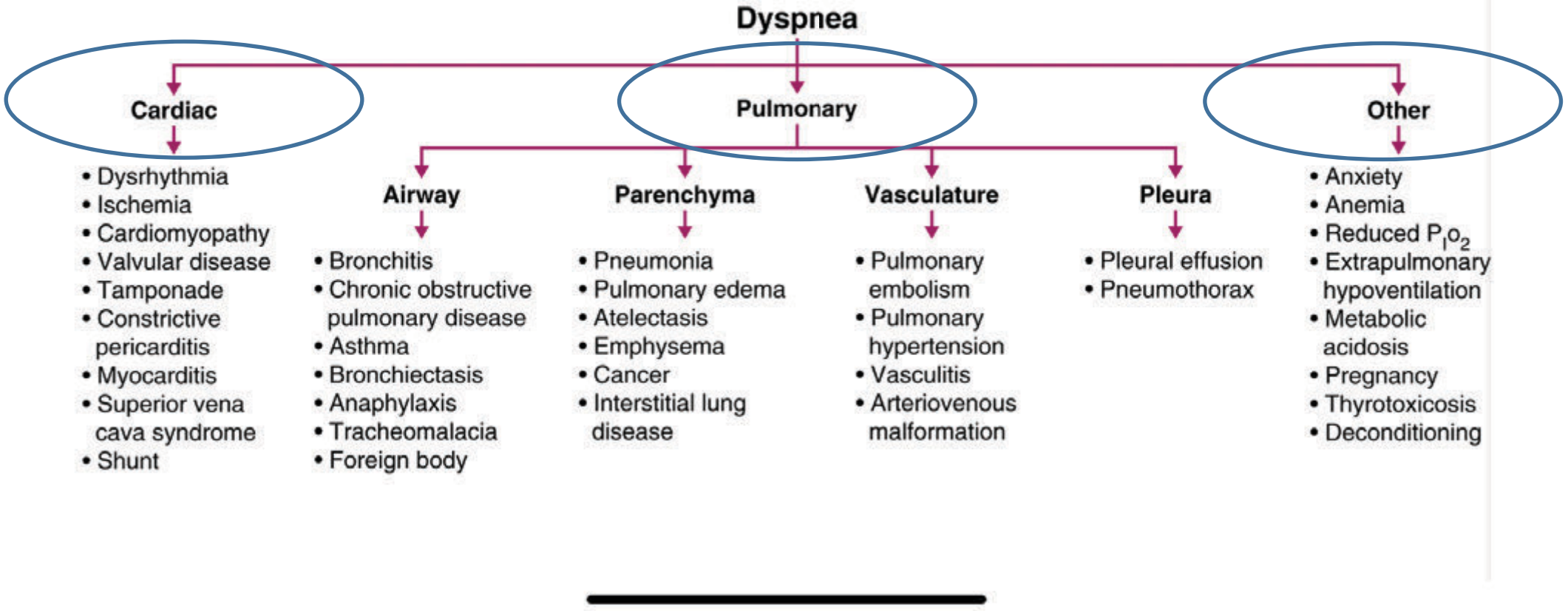
PROBLEM REPRESENTATION

- Selective about most helpful or high priority details
- Intentionally selective/biased
- Partially prescriptive
- Iterative
- Hopes to be correct, but expects to be reformulated if needed

Work the problem

Diagnostic schema

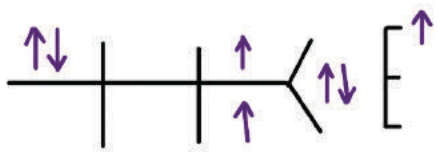
Dyspnea schema



Mansoor AM, Frameworks for Internal Medicine, 2019

AMS 1.0 = MIST

Metabolic



↑ $PaCO_2$/↓ PaO_2

Liver Function ↓

Infection

Extra-CNS

- PNA
- UTI

Intra-CNS

- Encephalitis

Structural

- Subdural Hemorrhage

Toxin

- Opiate Overdose
- EtOH withdrawal

Dx
The Clinical Problem Solvers

Features of diagnostic schema

- Typically organize diagnoses into a small number of conceptual “buckets” that are easy for the clinician to recall.
- Clinician-specific- The schema needs to make sense to the user &
- Help reminding us to consider less easily recalled etiologies
- Help clinician feel confident they are not “missing something” &

How can I foster this thinking)

Less helpful

- What do you think is going on?
- So what's your DDx for this patient? $
- What else could it be?
- Go read about your patients

More helpful

- Lets do a problem representation! $
- What is your approach to jaundice? $
- What features are inconsistent or atypical for this diagnosis? What doesn't quite fit?
- How does this case add to your understanding of heart failure? $

Venues

- Pretty much anywhere
    - Morning report
    - Ambulatory office
    - Ward rounds
    - Noon conference/didactics
    - Student preceptor rounds

Problem Representation Exercise

- For each clinical summary
- Each person should take 2 minutes and write their own Problem Representation with the standard format
  - Key Patient Factors (important demographics, history)
  - Tempo/Time Course of the problem
  - Clinical Syndrome (key signs/symptoms/labs)
- Goal is to create a short, high yield problem statement
- Share with your group and compare and refine

Resources

- SGIM website
- Clinical Problem Solvers podcasts
- Human Dx project
- Frameworks for Internal Medicine, Andre Mansoor – text book &