From Problem Lists to Illness Scripts

Learning and Teaching Expert Clinical Problem Solving

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Learning Objectives

- Compare and contrast problem solving strategies used by novices and experts.

- Define and understand the tools of processing and illness scripts as they apply to clinical problem solving

- Use these concepts to help learn and teach clinical diagnosis and medical decision making

Case-Based, Small Group Discussions

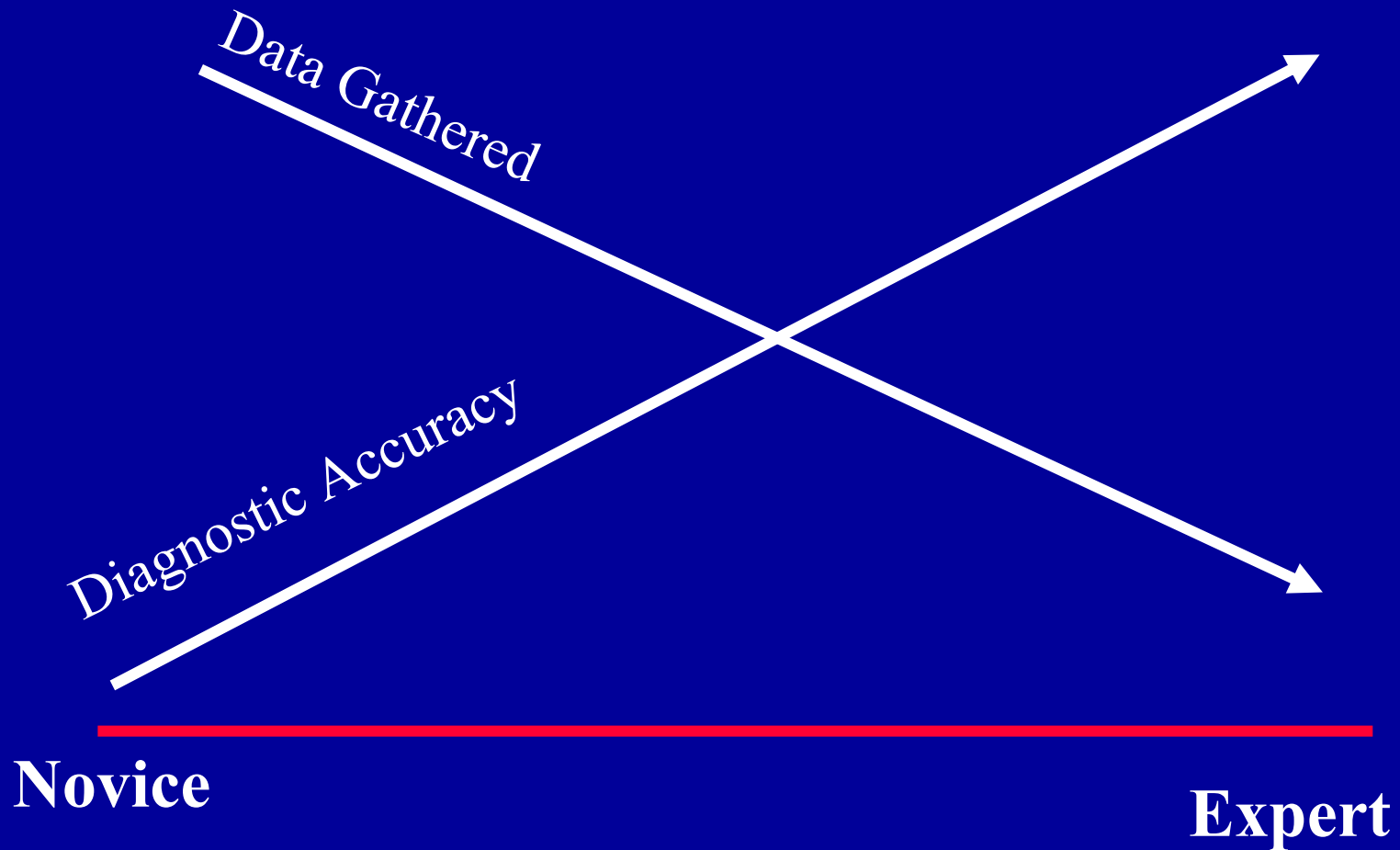Case Presentation → ? → Differential Diagnosis

Analyze

Lessons from the Experts:

Learn in the style that you will use the knowledge
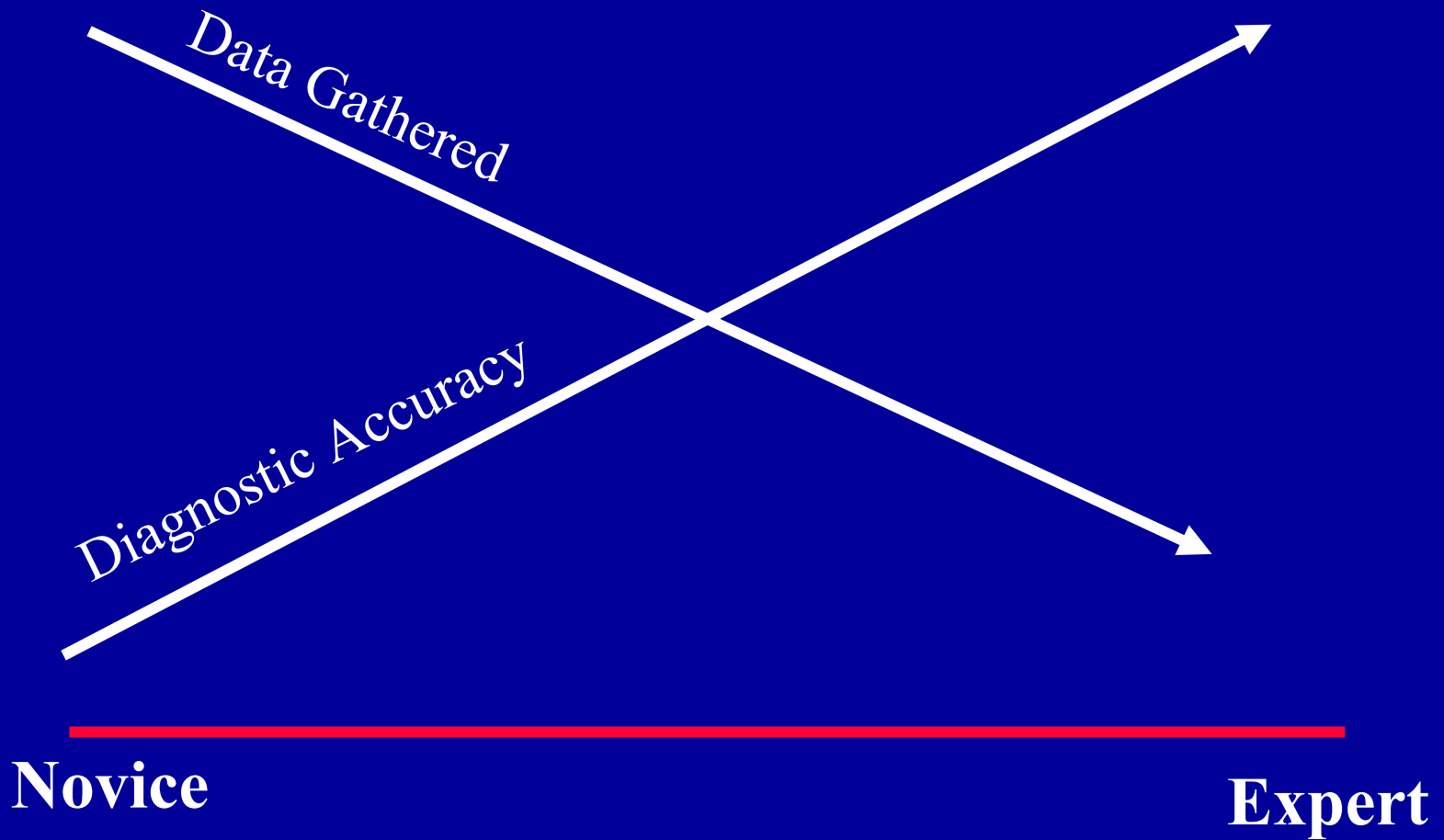
Cognitive Psychology

Georges Bordage, MD PhD

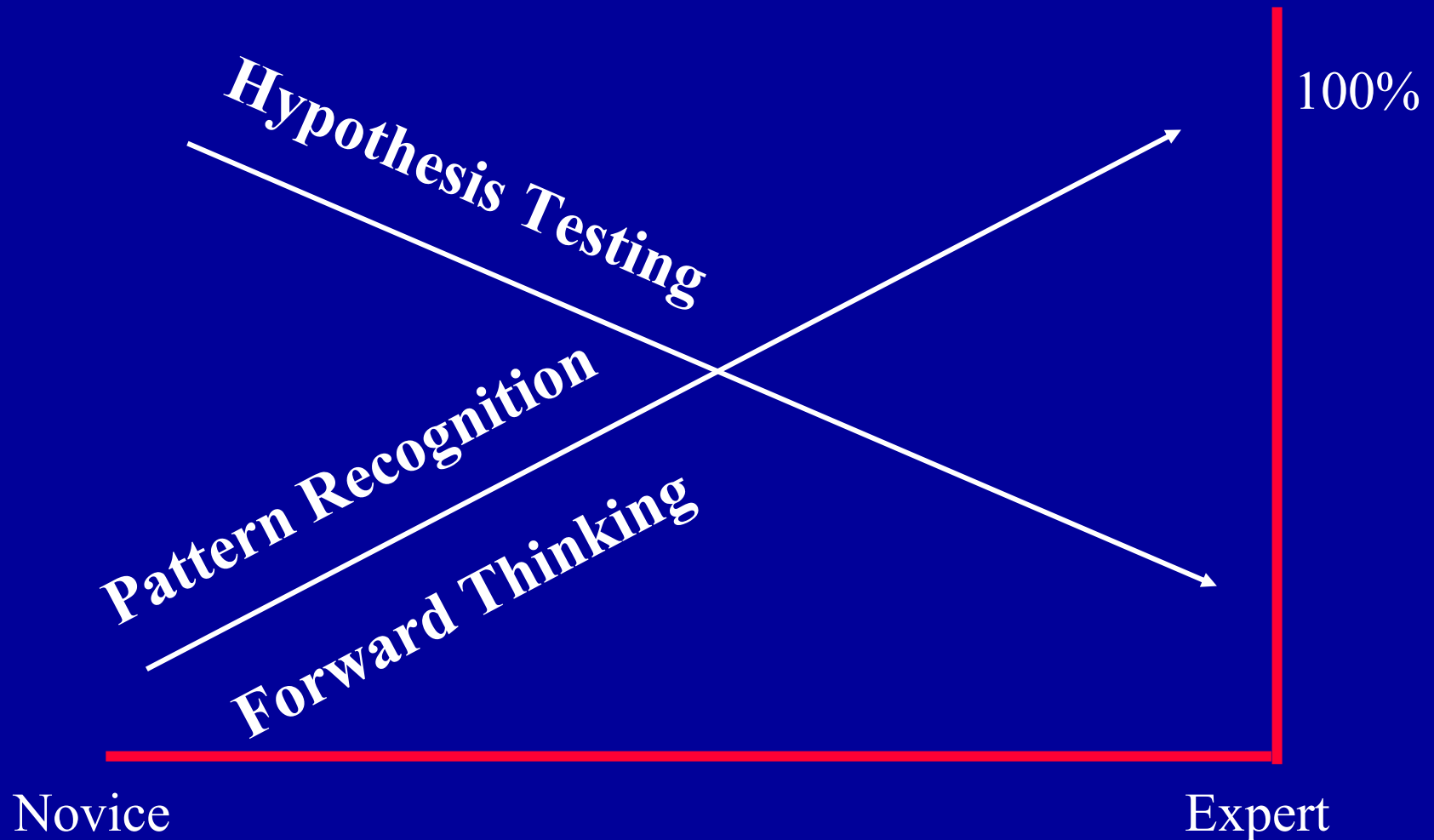# Building Blocks of Problem Solving

Hypothesis Testing

Forward Thinking
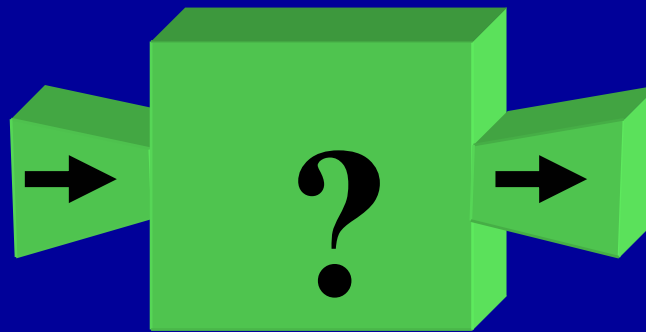
Pattern Recognition

Learner Maturation

Typical Small Group Exercise

Case:
35 year old AA female with one day hx of sharp, left-sided chest pain, occurring at rest and worse with inspiration and coughing. + SOB (-) fevers Meds: OCPs Normal exam except tachycardic.

Diff Dx:
CAD
Pneumonia
Pericarditis
PE
Musculoskeletal
Pleuritis
GERD

?

Traditional Morning Report

Case:
35 year old AA female with one day hx of sharp, left-sided **chest pain**, occurring at rest and worse with inspiration and coughing. No fevers, no SOB. Meds: OCPs Normal exam except tachycardic.

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- Pneumonia
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- PE
- Musculoskeletal
- Pleuritis
- GERD

Hypothesis Testing

What is Emphasized by this Process?

- **Cast the net widely**
  - **Pauci-clue differential Diagnosis**
- **The law of clinical plausibility**
  - "Could Be…" problem solving, undercuts value of the clinical evaluation

Morning Report

<u>Case:</u>
35 year old AA female with one day hx of sharp, left-sided chest pain, occurring at rest and worse with inspiration and coughing. No fevers, no SOB. Meds: OCPs
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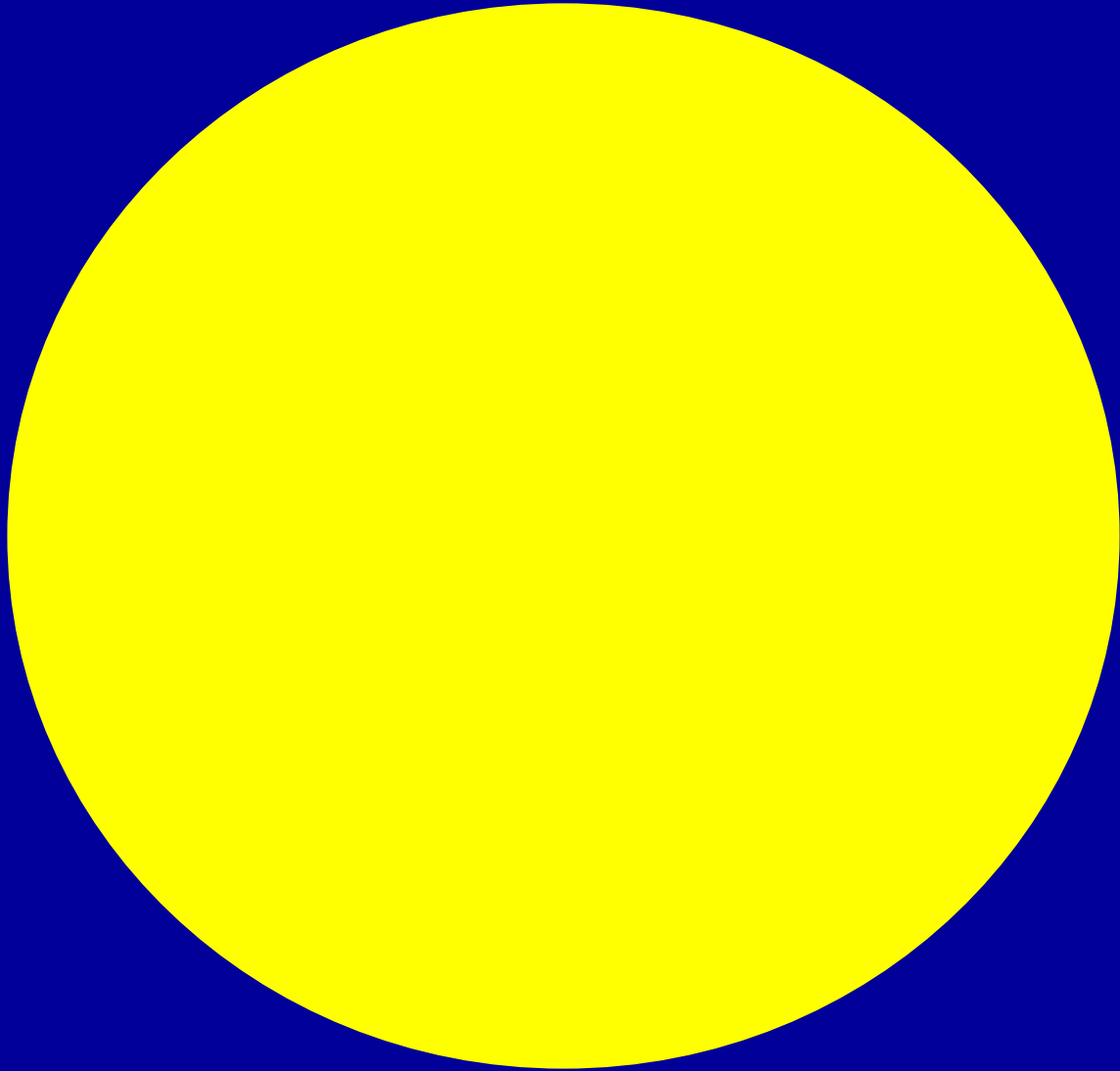
Defining the Syndrome

Case:
35 year old AA female
with one day hx of sharp,
left-sided chest pain,
occurring at rest and
worse with inspiration
and coughing. No fevers,
no SOB. Meds: OCPs
Normal exam except
tachycardic.

Acute
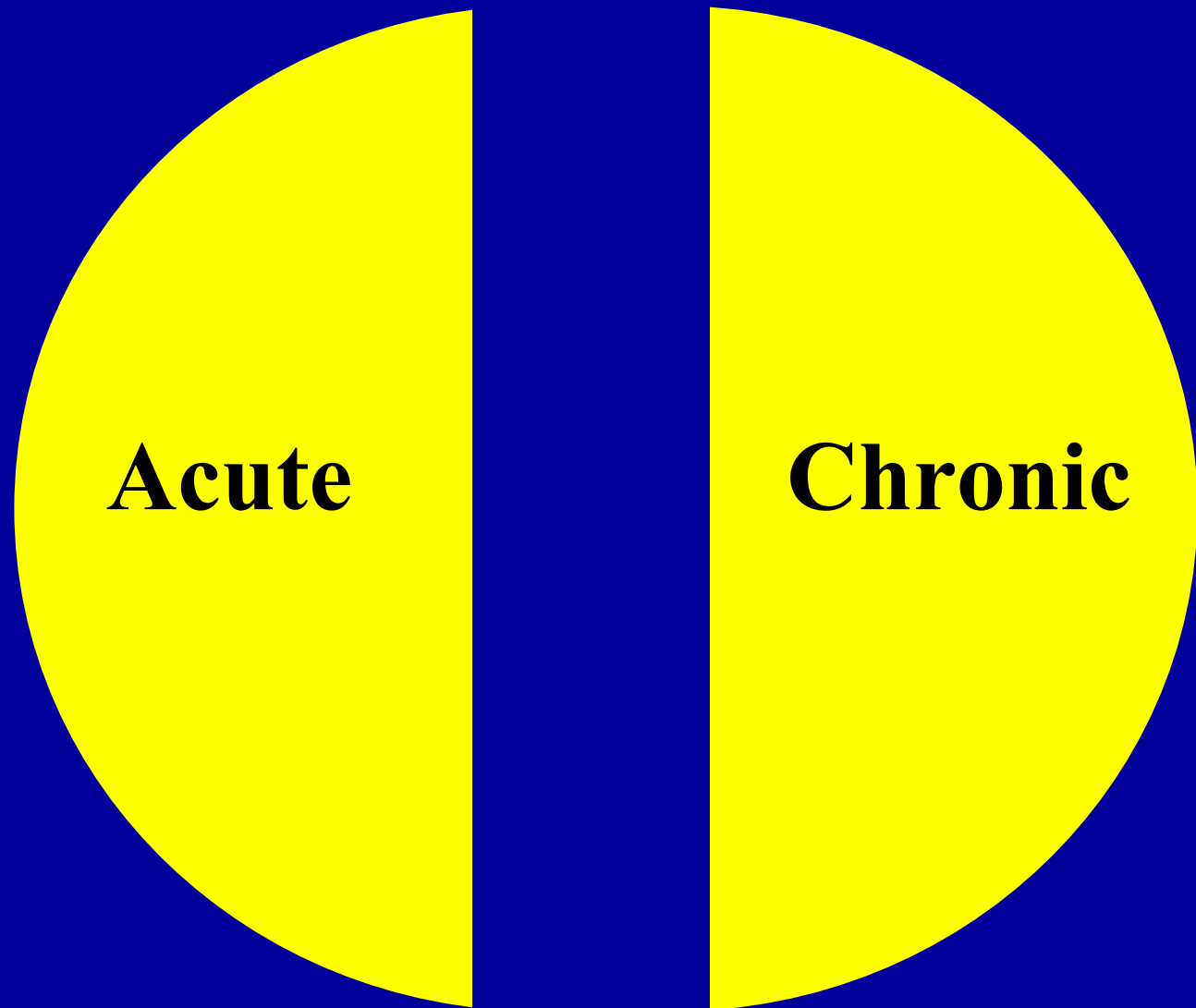
Pleuritic

Chest Pain

Forward Thinking

Chest pain

Acute

Chronic

Chest pain
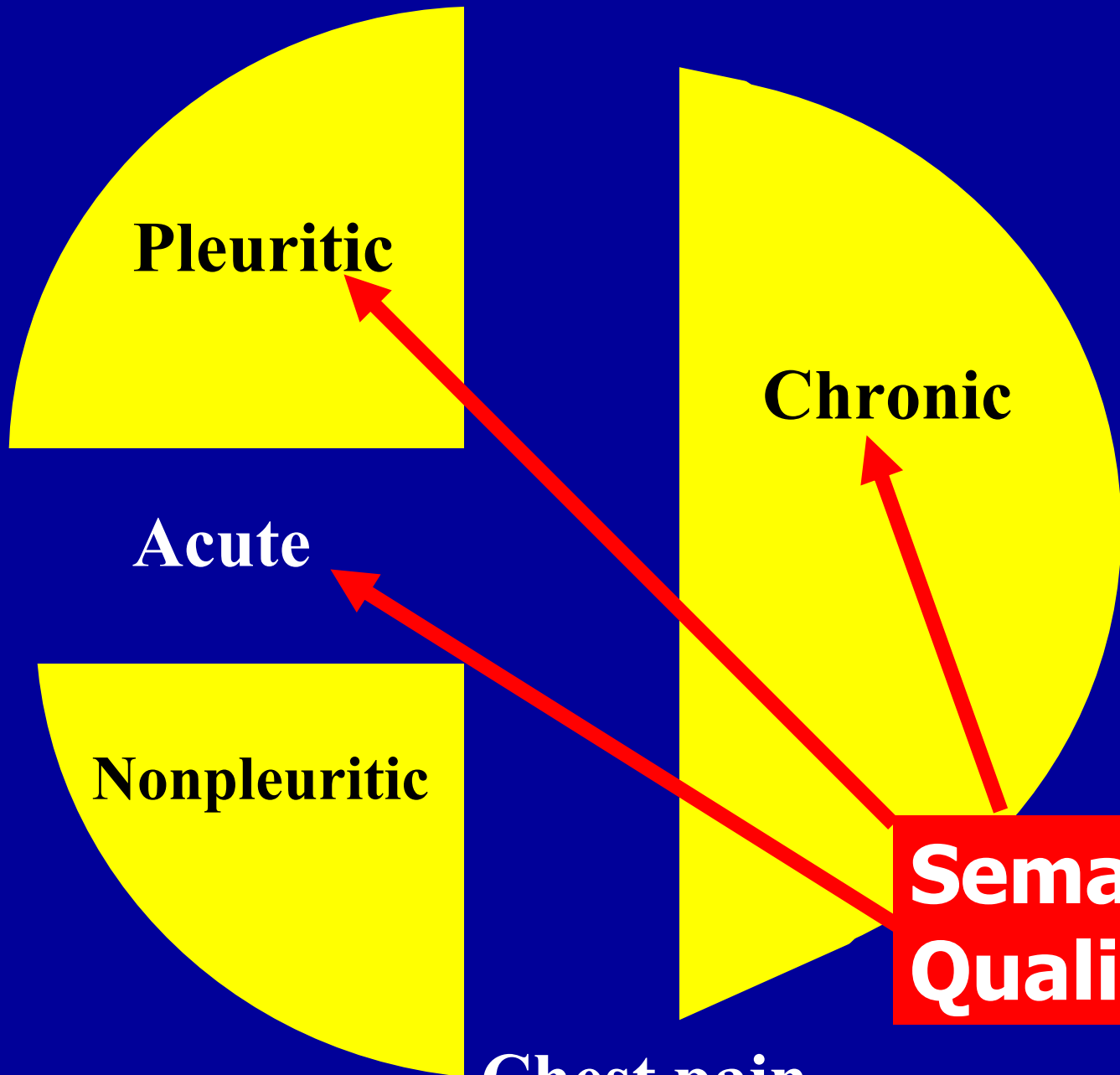
Pleuritic

Chronic

Acute

Nonpleuritic

Chest pain

Semantic Qualifiers

PROCESSING:
the key to forward thinking

- Use of Semantic Qualifiers to Refine Symptoms
  - 'Medical-ese' facilitates recall
  - Binary and oppositional (either…..or)
  - Facilitates algorithmic thinking
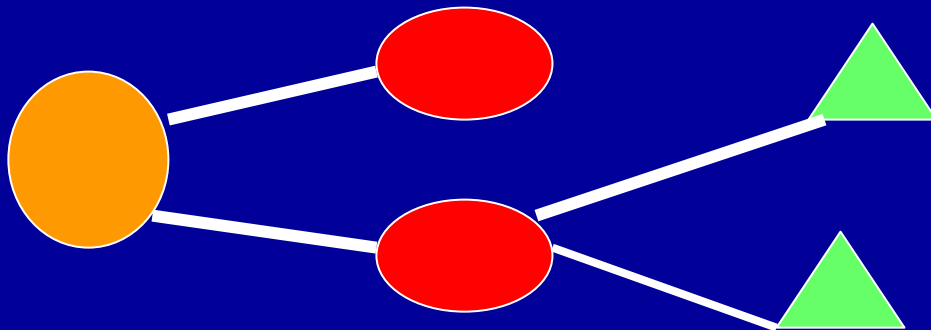
Examples: Descriptive Processing

Temporal → Acute vs Chronic

→ Progressive vs Stable

Qualitative → Colicky vs Visceral Abdominal Pain

Epidemiology → Immunocompromised
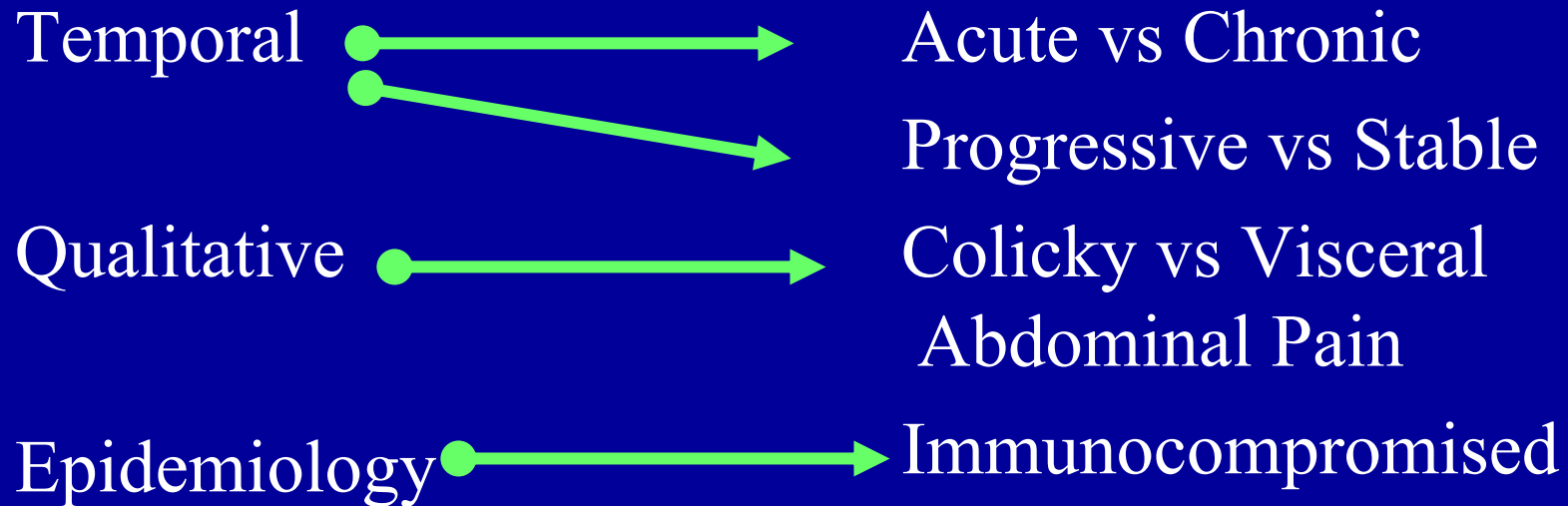
Summative Processing

- Combining the processed descriptive terms to generate the syndrome

- Decreases the number of isolated symptoms that we must keep track of

- Prevents inappropriate focus on one aspect of the syndrome complex

Summative Processing Examples

- Classic Syndromes:
    - CHF, Shock, Meningitis

- Thematic Summaries
    - Pulmonary Dyspnea with a nonfocal exam
    - Destructive Thrombocytopenia

Exercise: Processing

- Key Concepts: Page 3
- Exercise: Page 4

- Using the information provided, practice processing the items listed on the table.
- Discuss whether the processing is descriptive or summative (or both!)

Dry, brittle hair
Slowed mentation
Loss of lateral eyebrow
Periorbital edema
Macroglossia
Coarse, puffy facies
Deep voice
Dry, coarse, yellowish skin
Pleural effusion
Cardiomegaly, pericardial effusion, angina
Elevated blood pressure
Ascites
Swollen hands, cool and dry
Metromenorrhagia
Muscle weakness
Decreased reflexes with prolonged recovery
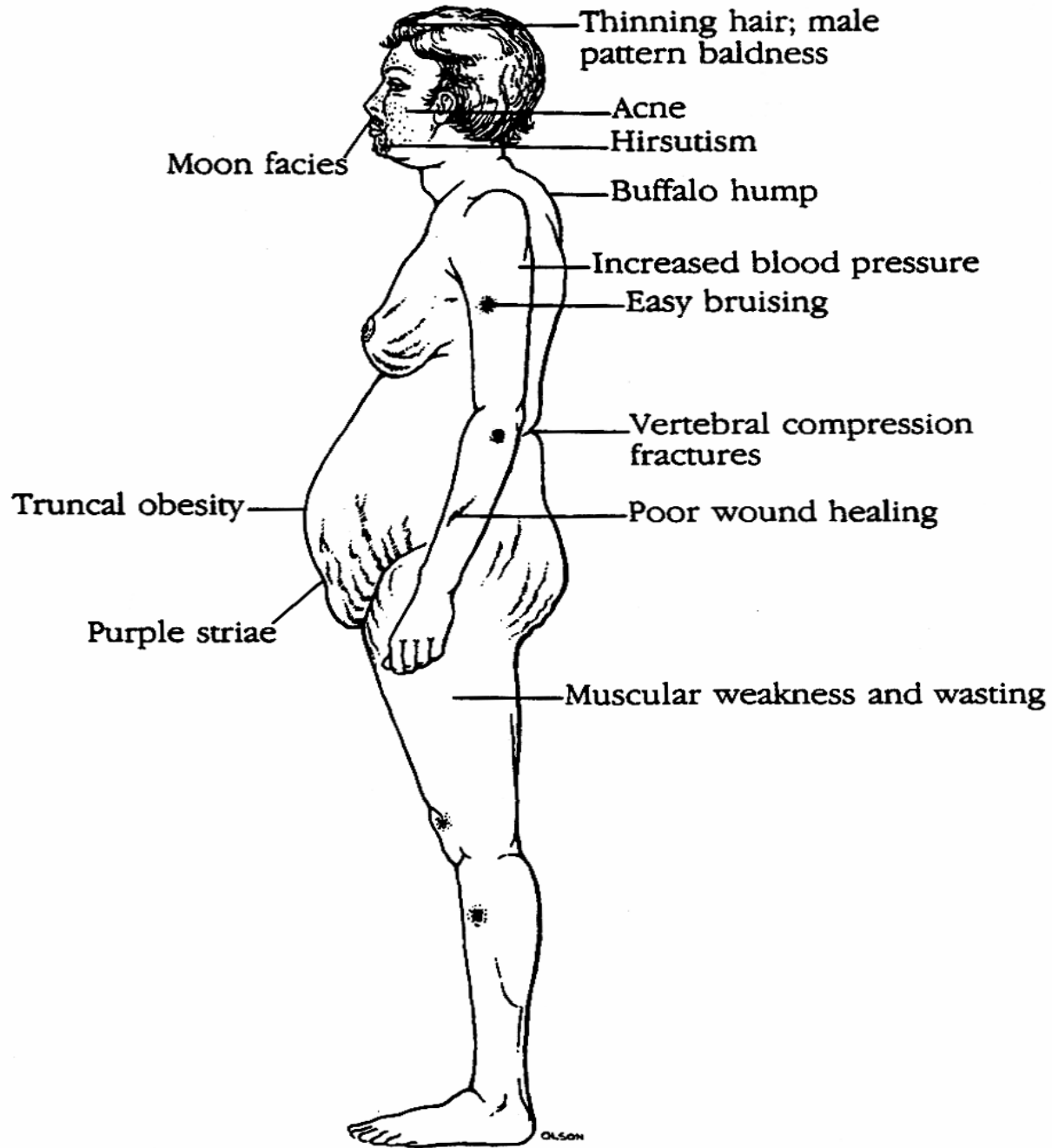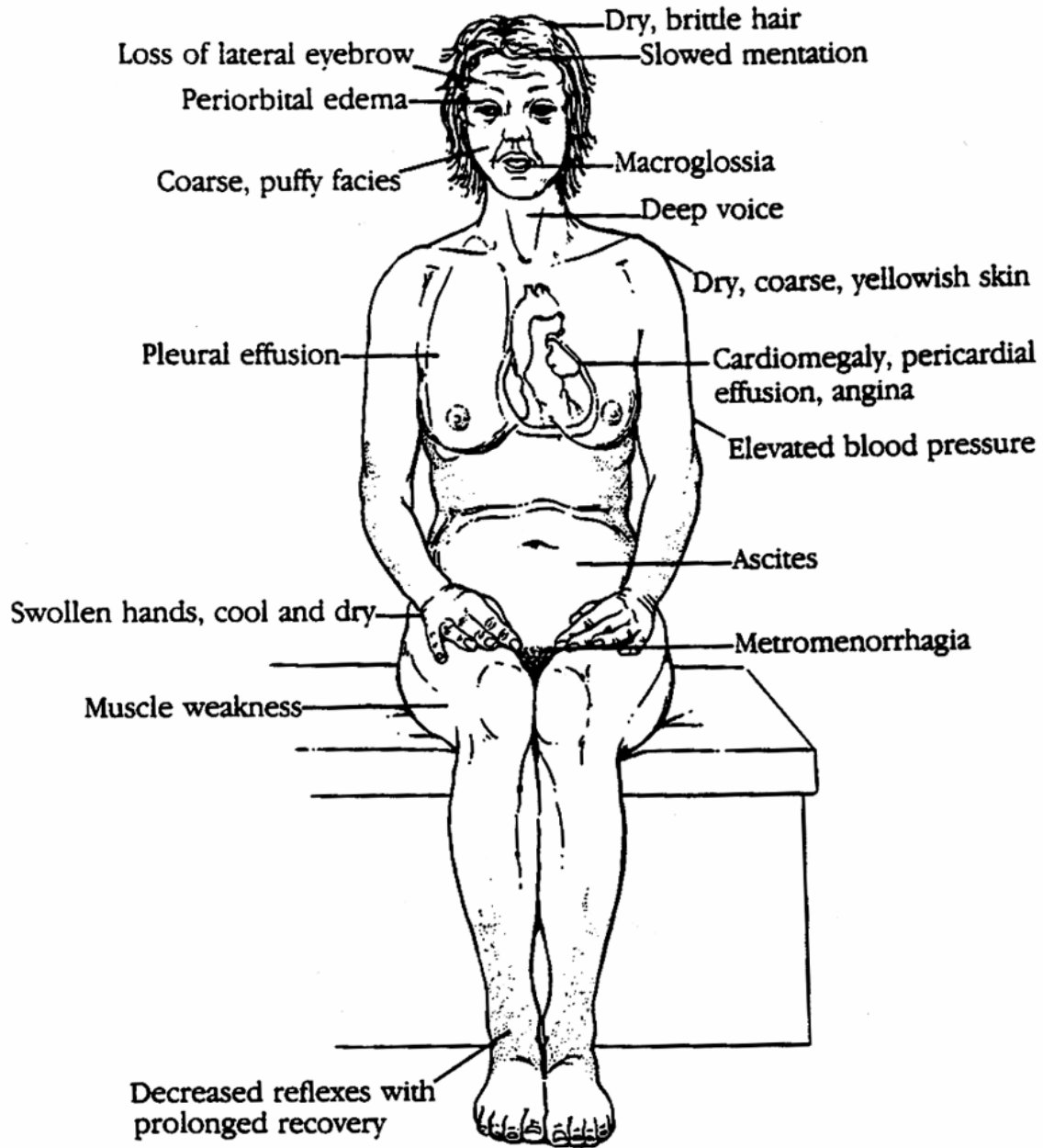
Pattern Recognition

- The near instantaneous recognition that all (or almost all) components of a known disease are present
    - Rapid fire processing
    - Further questioning searches for the missing elements of the disease
- Accurate and Efficient

Illness Scripts:
Key to Pattern Recognition

- Disease Specific Packets of Information
  - Generated by reading and by experience
- Storage Strategy of Experts
- Structure: fairly regimented
  - Epidemiology, temporal pattern, syndrome statement
- Content: those elements which distinguish among like diseases

Acute Pleuritic Chest Pain with Dyspnea in a young OCP user

Case:
35 year old AA fem...
one day hx of sha...
sided chest pain...
at rest and wor...
inspiration and coughing.
(-) fevers, (+) SOB. Meds:
OCPs Normal exam except
tachycardic.

TRAVEL??
HEMOPTYSIS??
INCREASED A-a Grad?

Group Exercise: Illness Scripts

- Key Concepts, page 6
- Exercise: pp 7-11

- Each Group should work on defining illness scripts for each set of diseases
- Use processed terms and summative statements (brief is better)
- Identify distinguishing features

Small Group Teaching Goals

Case Presentation

Chief com_____t

HPI

PE

Labs

Promote Advanced Problem-Solving Strategies

...iagnosis
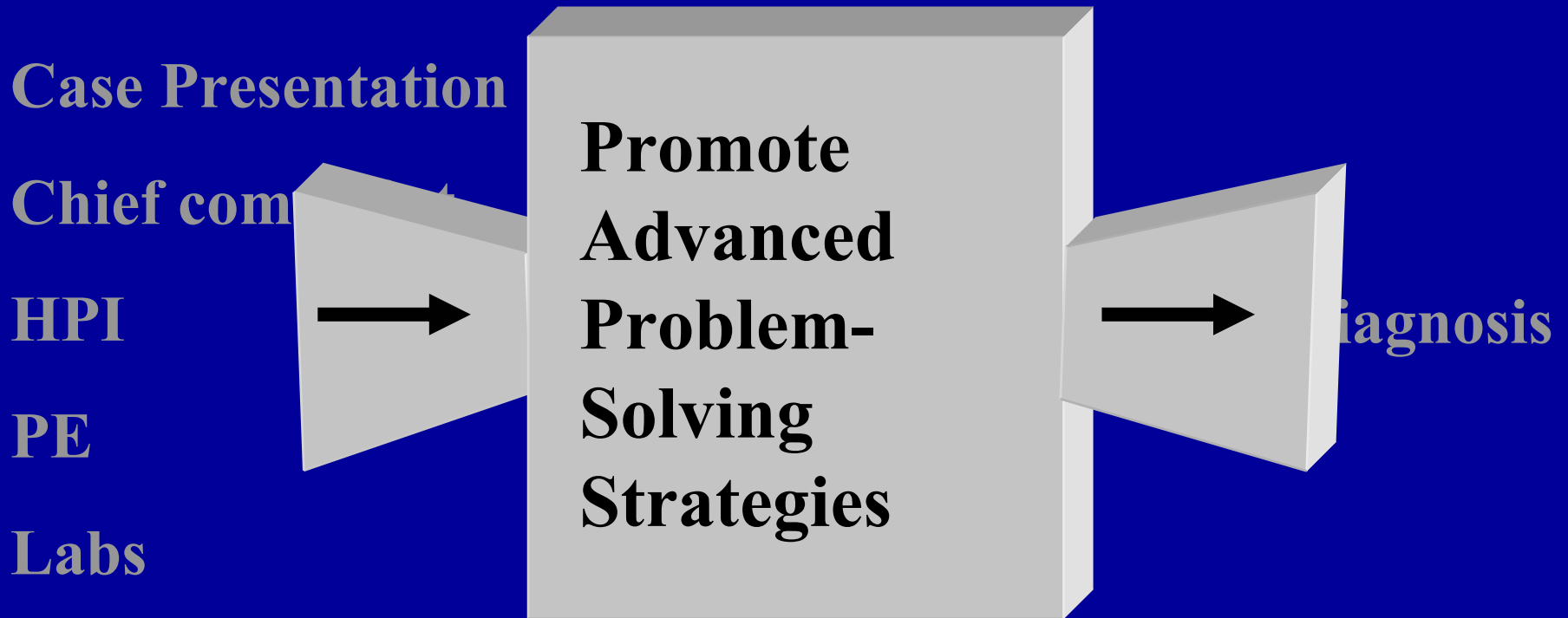
Pattern Recognition>Forward Thinking>Hypothesis Testing

TEACH/LEARN

- PROCESSING
- ILLNESS SCRIPTS
- PRIORITIZING

CC: Headache and Confusion

- **32 yo African American woman with AIDS, CD4 = 22 presents with 4 weeks of worsening headache and fever. The headache is over her entire head, throbbing and unremitting and is associated with photophobia and a stiff neck. Over the past two weeks she has become progressively confused, and over the past two days she has stopped eating. She also complains of blurry vision and general aches and pains.**

CC: Headache and Confusion

- PMHX: AIDS on no meds (ran out), PCP Pneumonia x 2
- SHX: prior IDU, 2 kids, both healthy, no cigs, no ETOH, no drugs for one year
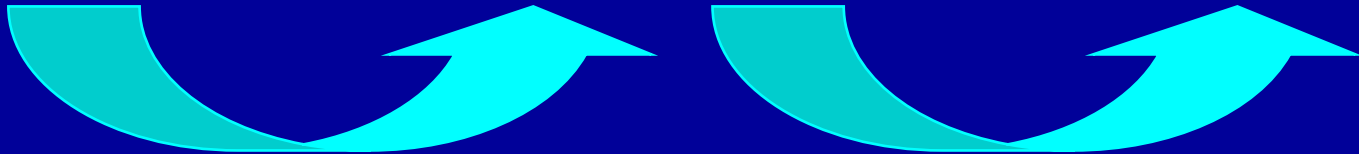- MEDS: none   ALL: NKDA

Physical Exam

- **VS: 103.5° ; 139/72; 100; 22;**
- **Lethargic obese patient, O x 1**
- **Dry MM, orthostatic pulse change**
- **Rigid Neck, + Kernigs**

- **Papilledema, photophobic, PERRLA**
- **Neuro: no focal motor deficits, unable to test sensory or cerebellar fxn**
- **All else normal**

Step I: Simple Problem List

Headache for 4 weeks	T = 103.5
Fever	Tachycardia
Stiff neck	Intermittent lethargy
Confusion	Disorientation
Trouble Walking	Dry mucous membranes
Blurry Vision	Stiff neck and Kernig's
Poor PO intake	Papilledema
Incontinence	AIDS

Step II: Process the List

- **Processing into 'medical'ized terms facilitates recall**

- **Develop a precise and descriptive statement that describes this PATIENT'S illness script**

  – narrows the diagnostic playing field

- **Fewer items on the list allows for better attention**

Processed Problem List

- Epidemiology

- Temporal Course of the Problem

- Syndrome description

Epidemiology

- Choose those aspects of the patient's demographics, exposure or PMHx that set the stage for the illness

- Process the risk factors to emphasize their importance

If the CC	And the PMHX	Epidemiology
Chest Pain	Htn, DM, Stroke, PVD, Hypothyroidism	Vasculopathy
Cough	AIDS, CD4 = 12, Ghanaian Native,	Profound CMI Deficit in recent immigrant
Rash	Intracranial Hemorrhage, DM, COPD	Recent initiation of anti seizure medication
Fever	ESRD, Htn, s/p appendectomy	Immunocompromised host with indwelling vascular device

Temporal Processing

- Acute, Subacute, Chronic
  - Definition is linked to the chief complaint
- Patterns:
  - intermittent, waxing and waning, biphasic illness, episodic
- Stability:
  - progressive, indolent, constant

Creating a Syndrome Statement

- Descriptively process all items on the list
- Eliminate nonspecific/redundant symptoms
  - malaise, fatigue, transient diarrhea
  - tachypnea and Shortness of Breath
- Identify the most important symptom and combine it with those s/s that explain the most important symptom
- Check for completeness

Headache
Fever
Stiff Neck
Photophobia
Kernig's

→ Meningitis

Waxing and Waning
Mental Status,
Disorientation

→ Delirium

Headache
Papilledema
Lethargy

→ Increased Intracranial Pressure

Poor PO Intake
Dry Mucous Memb

→ Volume Depletion

Original Problem List	Processed Problem list	Prioritized Diff Dx
Headache	**Epi:**	Tier 1
Fever	**35 yo woman**	
Stiff neck	**withT cell**	
Confusion	**immunodef**	
Trouble Walking	**Time course:**	1b
Blurry Vision	**Chronic**	
Poor PO intake	**Syndrome:**	Tier 2
Incontinence	**Meningitis**	
T = 103.5	**Delirium**	
Tachycardia	**ICH**	Tier 3
Intermittent leth	**Secondary Vol**	
Disorientation	**Depletion**	
Dry MM		
Stiff neck and		
Papilledema		
AIDS		

Step III: Prioritized DDX

- The processed problem list describes the patient's **ILLNESS SCRIPT**

- Goal: Search for a disease which has an **ILLNESS SCRIPT** that matches the patient's

- Tools: Pattern Recognition > Forward Thinking > Hypothetico-deductive

Prioritization of Differential

- **Learner Must describe classic pattern of any diagnosis offered**
- **The extent of match between patient's presentation and classic determines priority**

Rationale

- Emphasizes that diagnostic power of the carefully done and analyzed clinical exam
- Stresses compare and contrast thinking
- Prioritizes management
- Closes the loop
  - illustrates the value of pertinent positive and negatives from the HPI.

Prioritizing Differential Diagnosis

- **Tier I Diagnosis:**
  - Disease illness script matches the patient's illness script almost perfectly

- **Tier II Diagnosis:**
  - Patient is missing **key features** of the disease
  - Disease does not explain prominent features of patient's presentation

- **Tier III Diagnosis:**
  - single or pauci clue match

IB: A critical addition

Demystifying Pre test Probability

- **Tier I Diagnosis: 75% pretest probability**
  - Disease illness script matches the patient's illness script almost perfectly

- **Tier II Diagnosis: 30-50 % pretest probability**
  - Patient is missing **key features** of the disease
  - Disease does not explain prominent features of patient's presentation

- **Tier III Diagnosis: < 30% pretest probability**
  - single or pauci clue match

Original Problem List	Processed Problem list	Prioritized Diff Dx
Headache for Fever **Stiff neck** **Confusion** **Trouble Walk** **Blurry Vision** **Poor PO intake** **Incontinence** **T = 103.5** **Tachycardia** **Intermittent** **Disorientation** **Dry MM** **Stiff neck and Papilledema** **AIDS**	**Epi:** *35 yo woman with T cell immunodef* **Time course:** *Chronic* **Syndrome:** *Meningitis* *Delirium* *ICH* *Secondary Vol Depletion*	**I.** **Cryptococcal Mening** **Tuberculous Mening** **Histoplasm. Mening** **1b** **Bact. Mening.** **II** **Toxoplasmosis** **CNS Lymphoma** **III.** **CNS SLE** **Pseudotumor Cerebri**

Group Exercise: Case Dissection

- Key Concepts: page 12

- Exercise: pp 13-15

- Create a **processed problem list** for the case described on page 13.

- Identify **illness scripts** and then prioritize the ddx for this case using the diagnoses listed on page 15.

Step IV. Teaching and Learning Issues

Wrong Answers?--Coach

- Encourage Autocorrection
- What does that disease typically look like?
  - Use structured processed problem list format
- How does that compare with **this** patient?
- Stress Key and Rejecting Features
  - What would have to be present to make this a Tier I diagnosis?

No Patterns?
Recommend Alternate Strategies

- Goal:Generate diagnostic ideas and then
- Evaluate: using illness scripts
- Forward Thinking
  - Categories of thrombocytopenia
- Pathophysiology/Anatomy
  - How is edema formed?
- Category Chase

Evaluative Benefits

Process allows window into the black box of thinking

Wrong Answer?

- Step I: inattentiveness
- Step II: processing problem; syndrome recognition
- Step III:
  - Factual knowledge (incorrect illness scripts)
  - Lack of understanding of Key features (correct illness scripts, can't match)
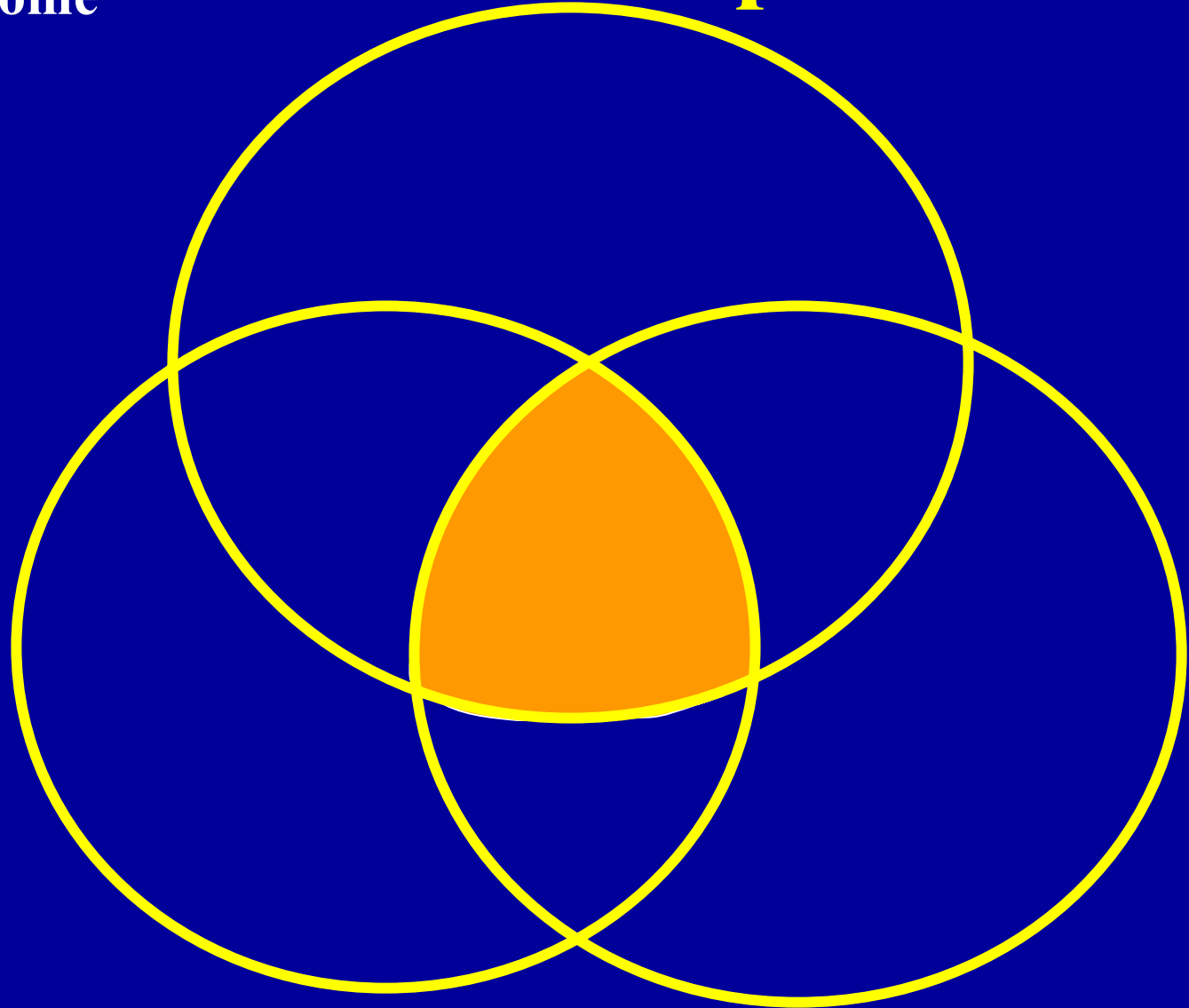
Compare and Contrast Illness Scripts
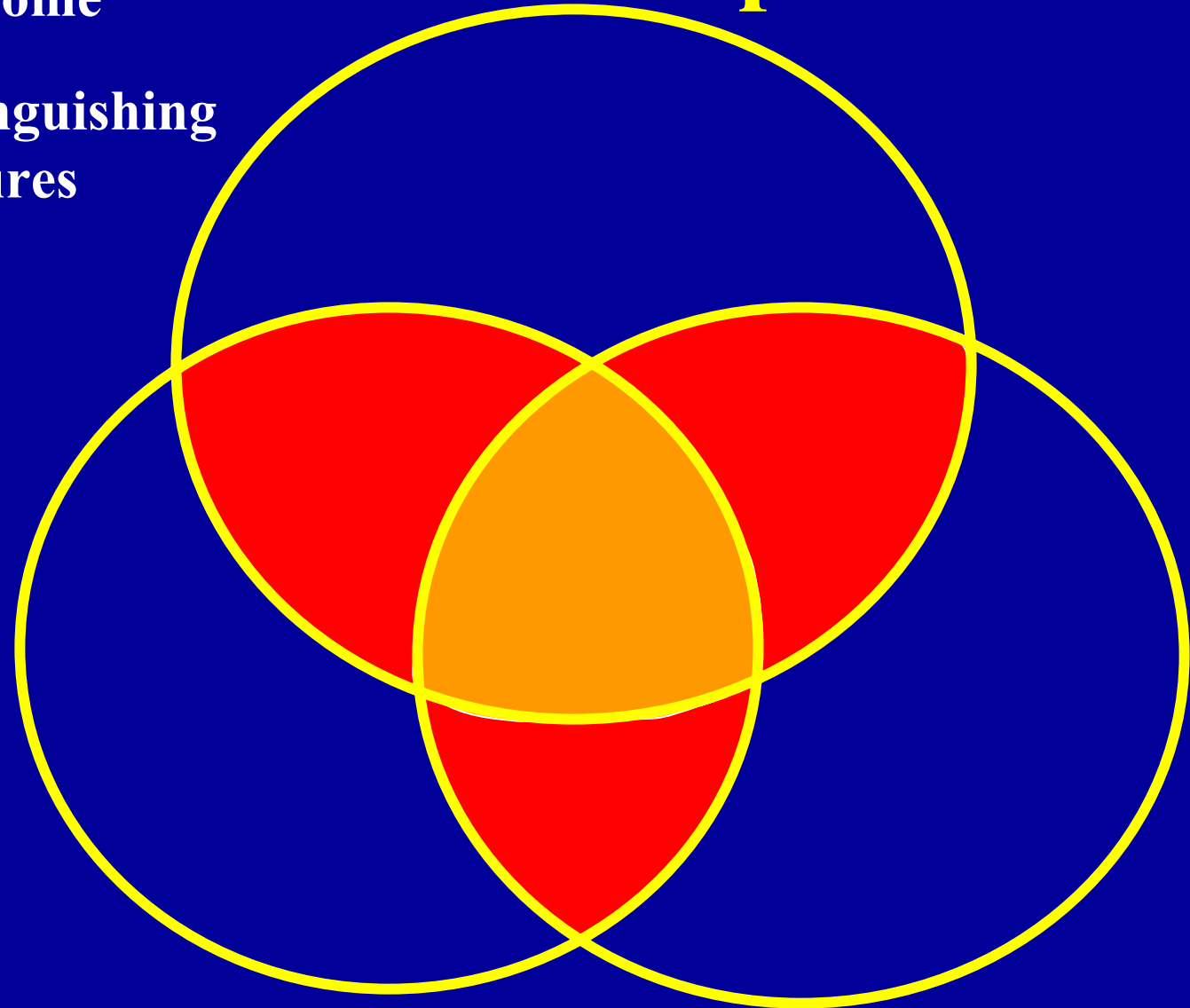
Syndrome

Compare and Contrast Illness Scripts

- ■ Syndrome
- ■ Distinguishing Features