

Preparing For Step 1: Developing A Step 1 Brain

John W. Pelley, PhD
Texas Tech University
School Of Medicine
Lubbock, TX

www.ttuhschool.edu/SOM/success
john.pelley@ttuhschool.edu

Achieving Program Goals

Good Course Grades

- *Carry-over* of team study thinking to individual study
- Better efficiency from *long term* memory

Strengthen Analytic Thinking

- Analyzing *course-relevant* Step 1 questions
- Reframing thinking process to *explain patient data*

Weekly Question Analysis Sessions

- 10-12 per team
 - Some teams may prefer fewer (5-7)
 - Can also be used individually, or up to 15 per team
- Correlated with current course content
- Utilizes side-to-side concept map on whiteboard
- Develops “ruling-out” thinking

What Is “Ruling-Out” Thinking?

- Rationale for ruling out wrong answers
 - Saying “why” develops analytic skills
- Requires full learning cycle processing
 - Learning cycle explained later
- Not guessing, but processing

Five Steps to Step 1

(illustrated on separate slides)

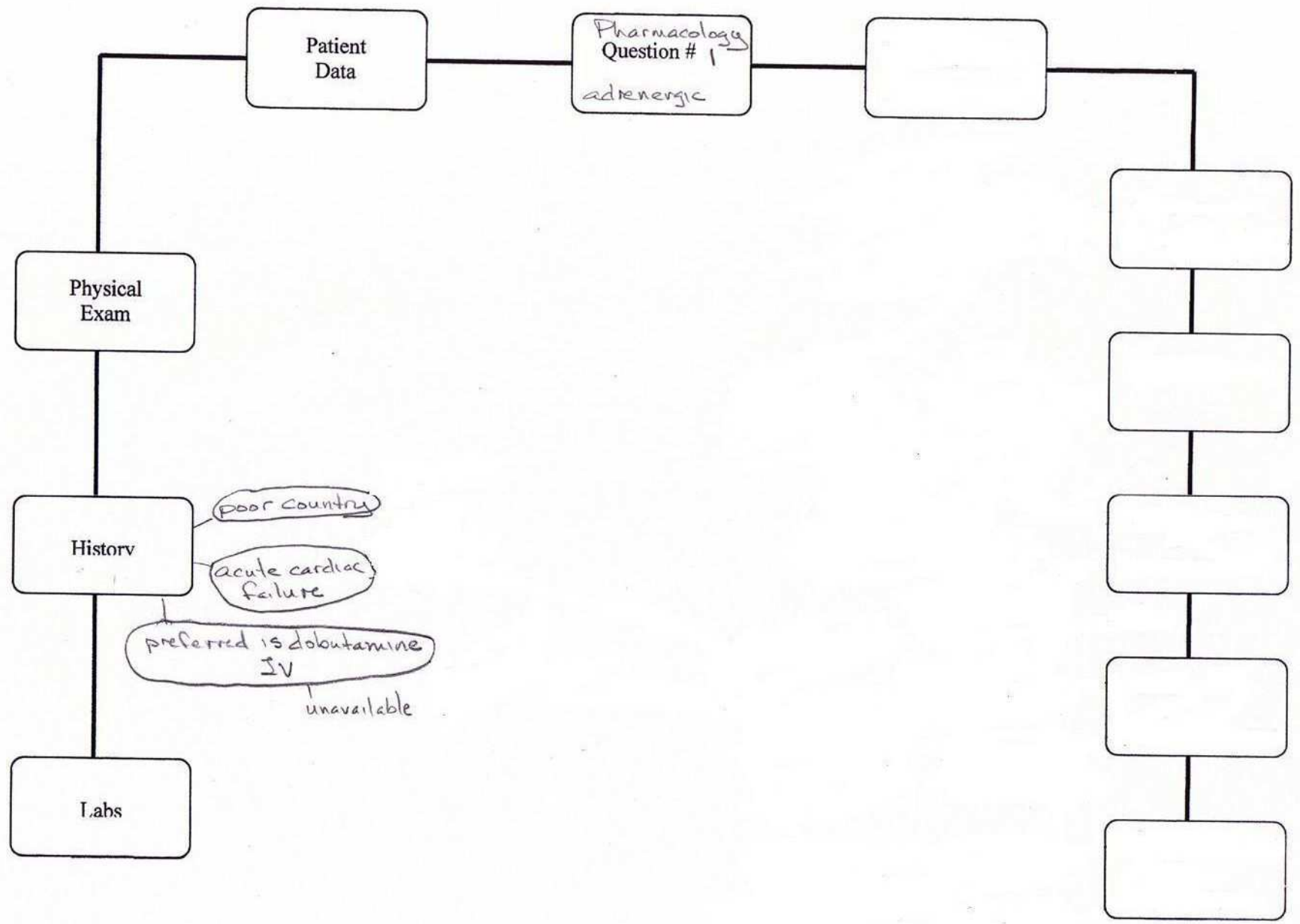
1. Session leader calls on first student to read stem from first question and to propose patient data to add to concept map.
2. Session leader adds data to concept map by calling on additional students; other significant information is added to patient data
3. Session leader fills in lead-in and answer choice information in concept map template
4. Session leader calls on group members to identify relevant information for each answer that contributes to ruling it out.
 - Relevance is frequently debated for clarity
5. Group proposes pathophysiology crosslinks between answer choices and patient data in question.

1. Patient Data – Log it in

1. Session leader calls on first student:
 - reads stem from first question
 - proposes patient data for concept map.
- Sample question – next slide

Can You Identify The Appropriate Patient Data?

- A 54-year-old female who lives in an economically underdeveloped country is brought to a village clinic in acute cardiac failure. The preferred therapy is intravenous dobutamine, but this drug is too expensive and is therefore unavailable.



Patient Data

Pharmacology Question # 1
adrenergic

Physical Exam

History

Labs

poor country

acute cardiac failure

preferred is dobutamine IV

unavailable

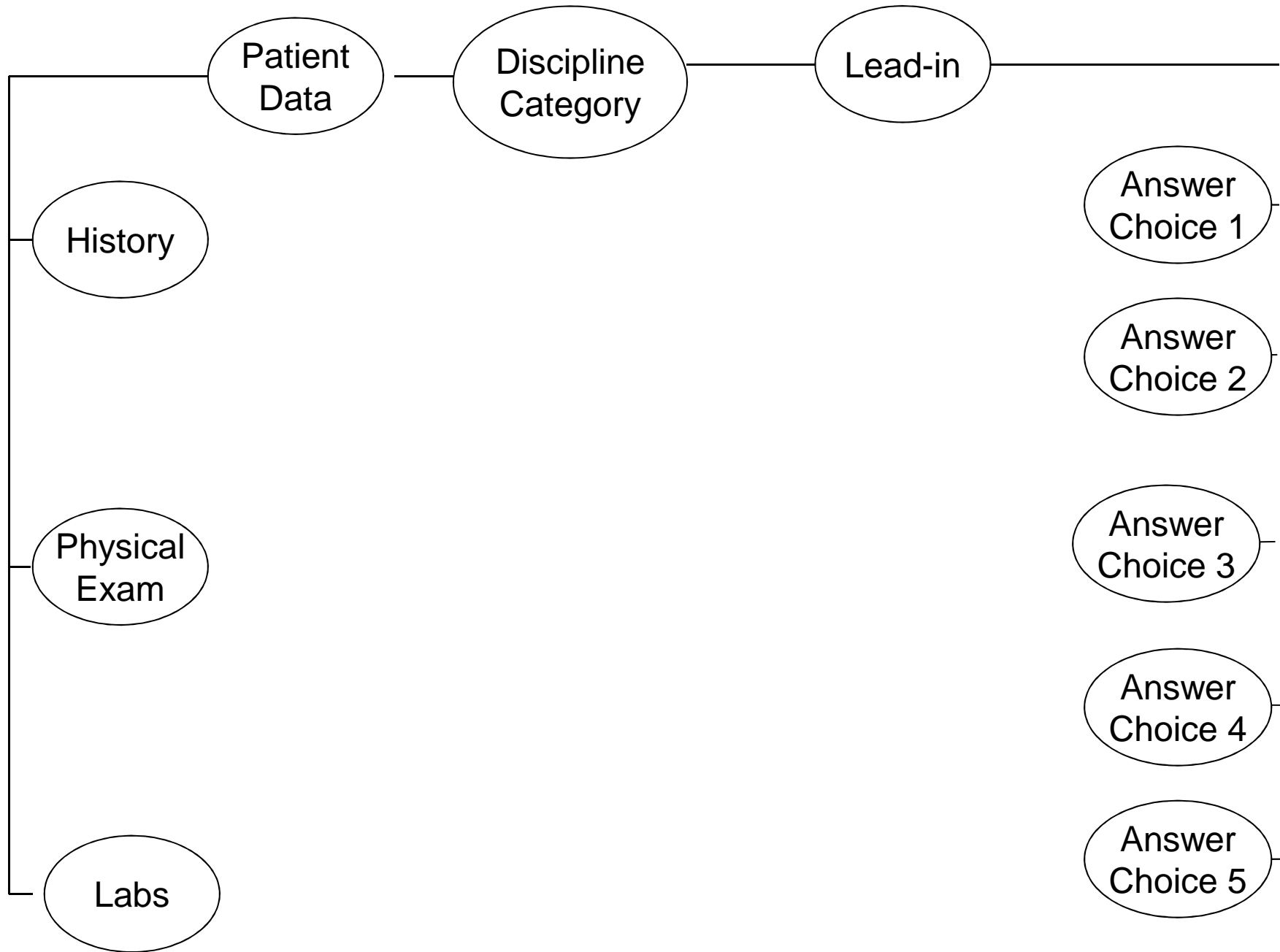
[Empty box]

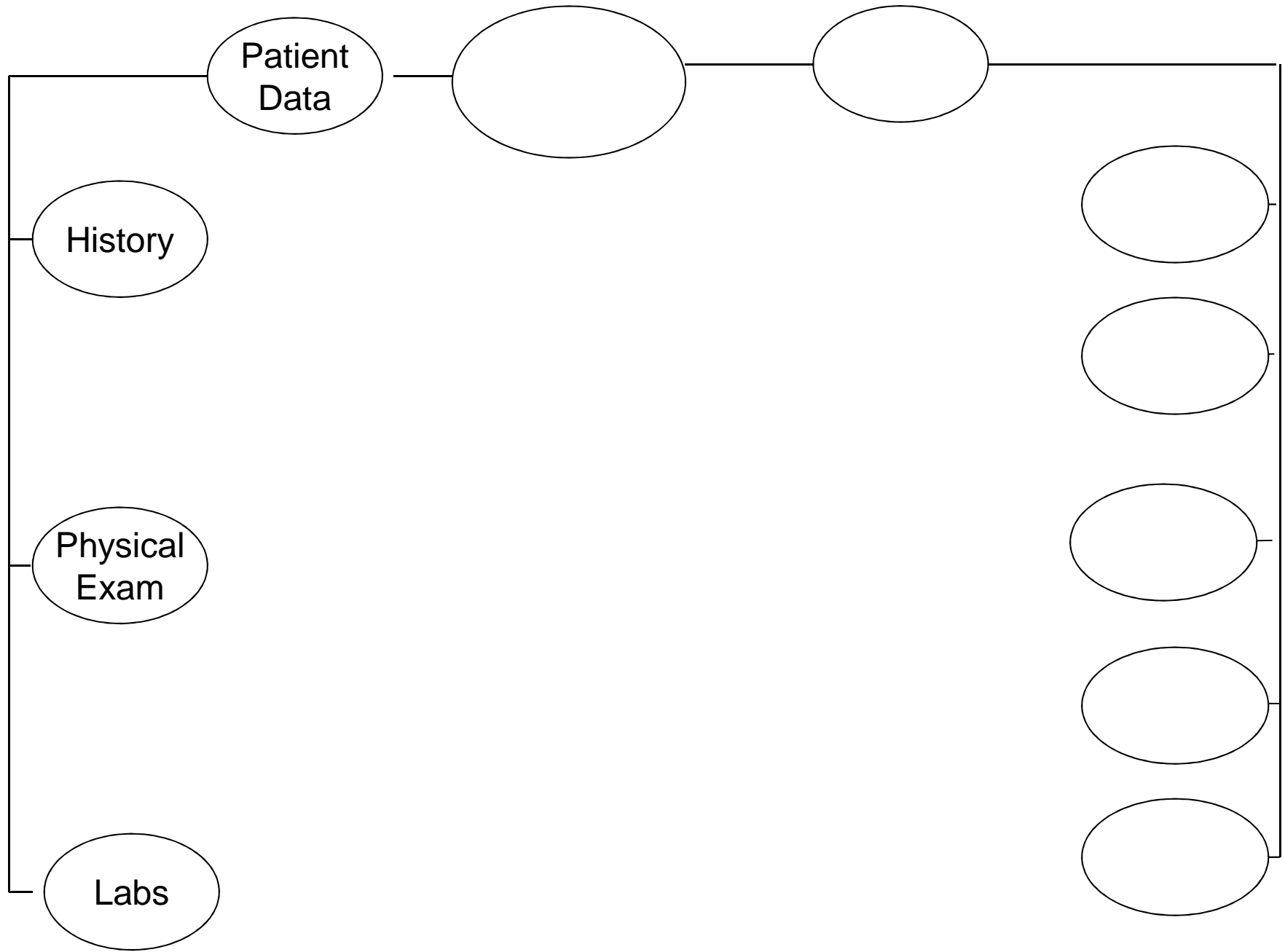
[Empty box]

[Empty box]

[Empty box]

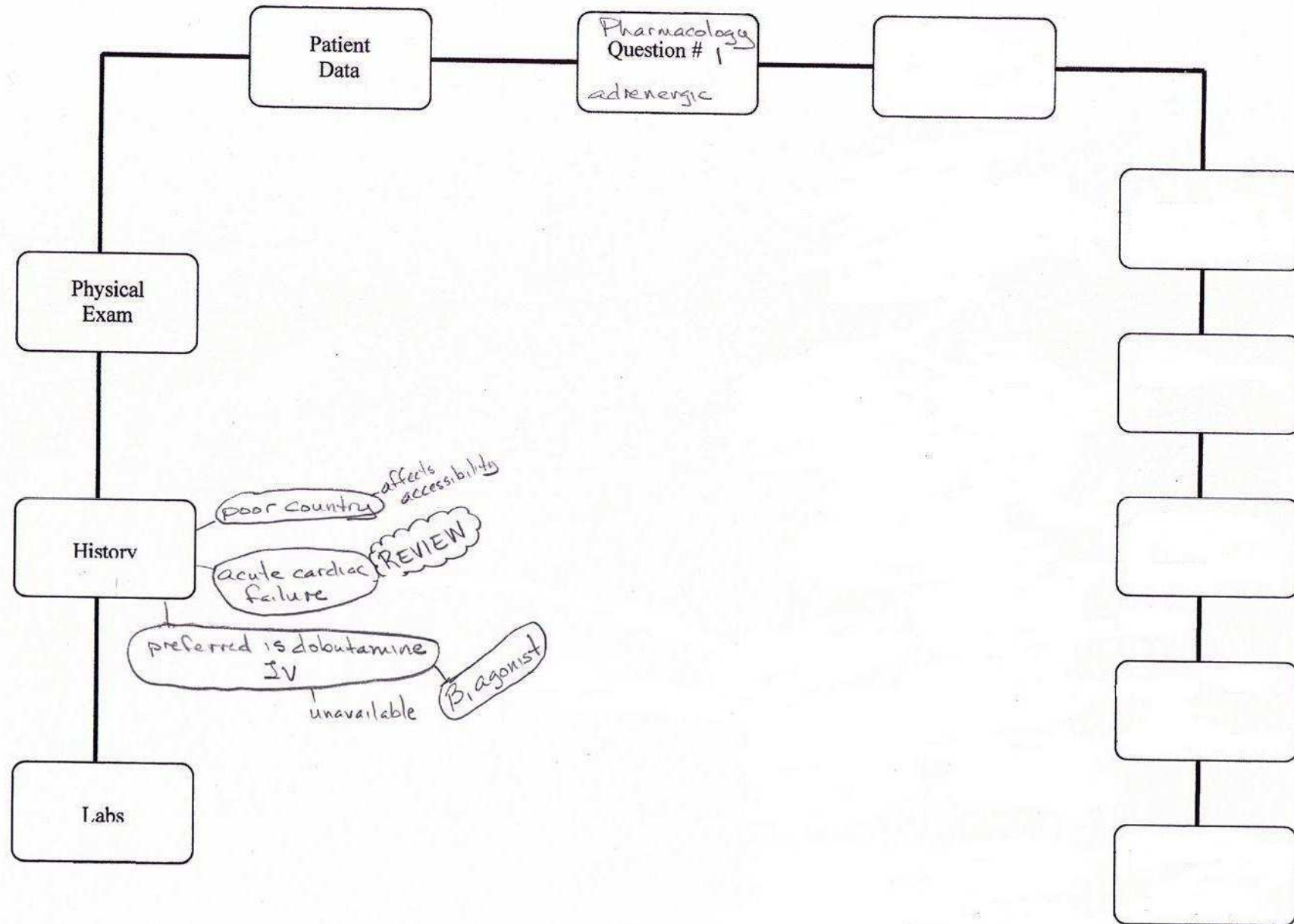
[Empty box]





2. Patient Data – add significant information

2. Session leader adds data to concept map by calling on additional students; other significant information is added to patient data



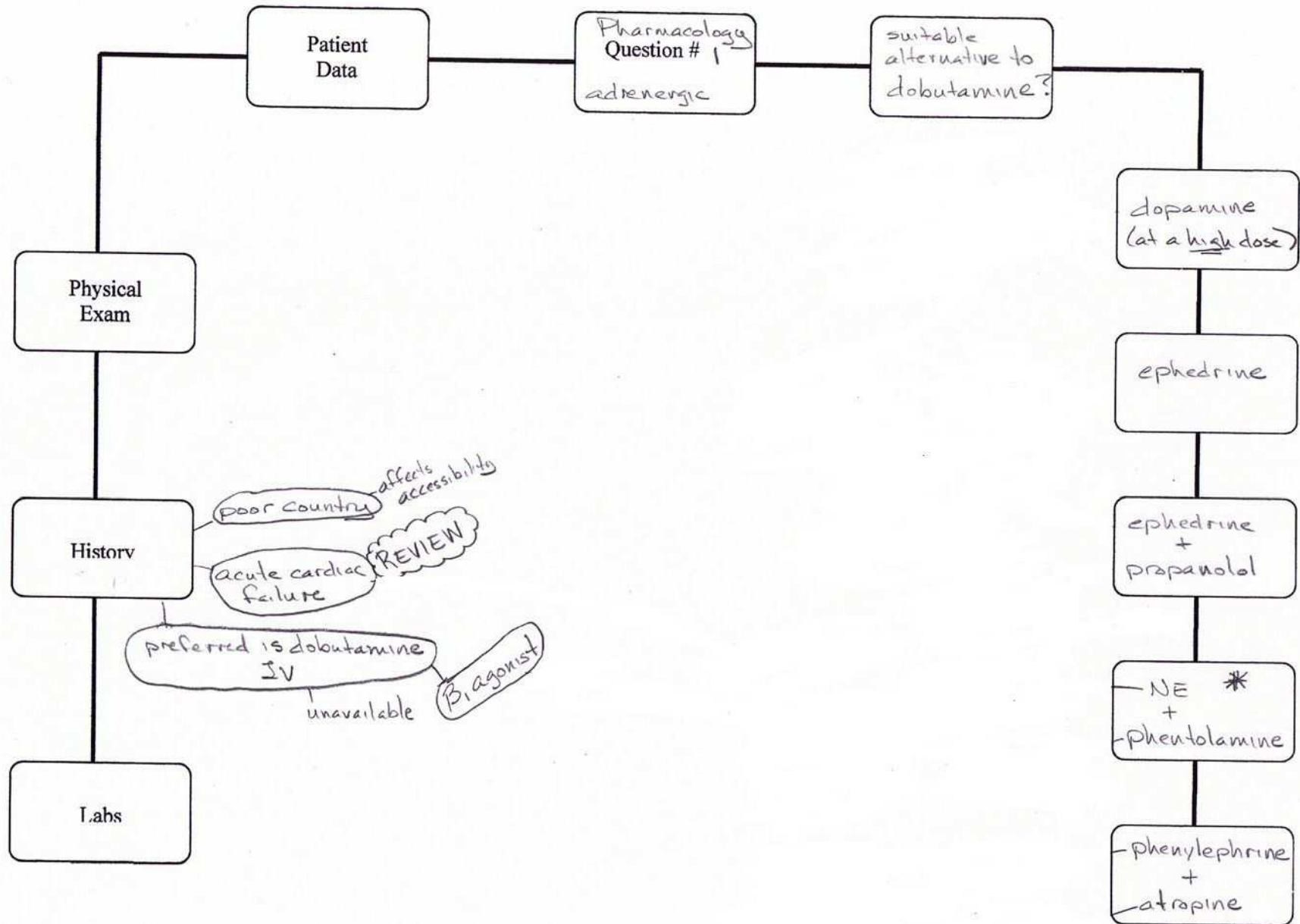
3. Log in “lead-in” and answer choices

3. Session leader fills in lead-in and answer choice information in concept map template

- Note: The time taken to enter information into map gives “processing” time.

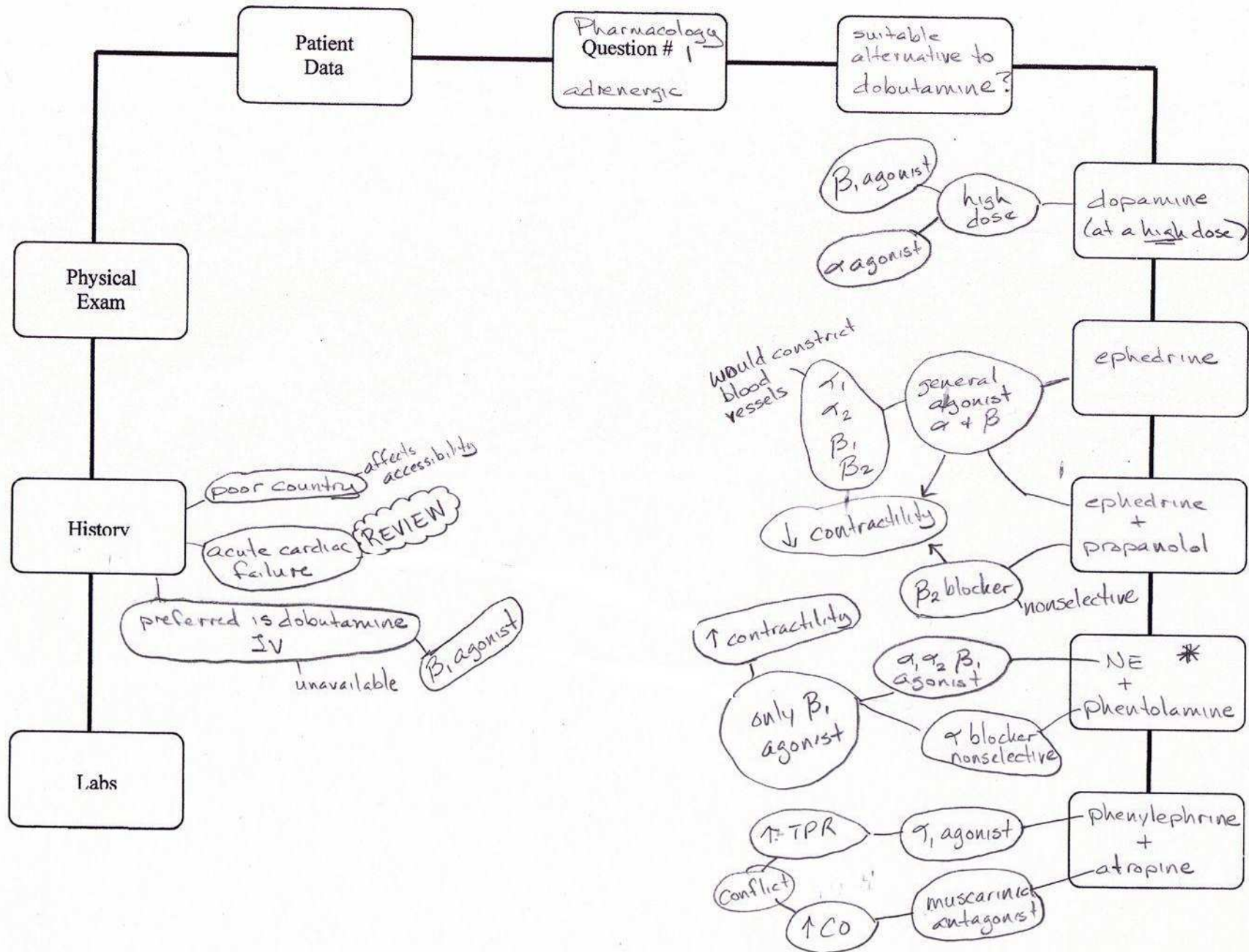
Lead-In and Answer Choices

- A 54-year-old female who lives in an economically underdeveloped country is brought to a village clinic in acute cardiac failure. The preferred therapy is intravenous dobutamine, but this drug is too expensive and is unavailable. Which of the following is the most suitable alternative to dobutamine in treating this patient?
 - A. high dose dopamine
 - B. ephedrine
 - C. ephedrine plus propranolol
 - D. norepinephrine plus phentolamine
 - E. phenylephrine plus atropine



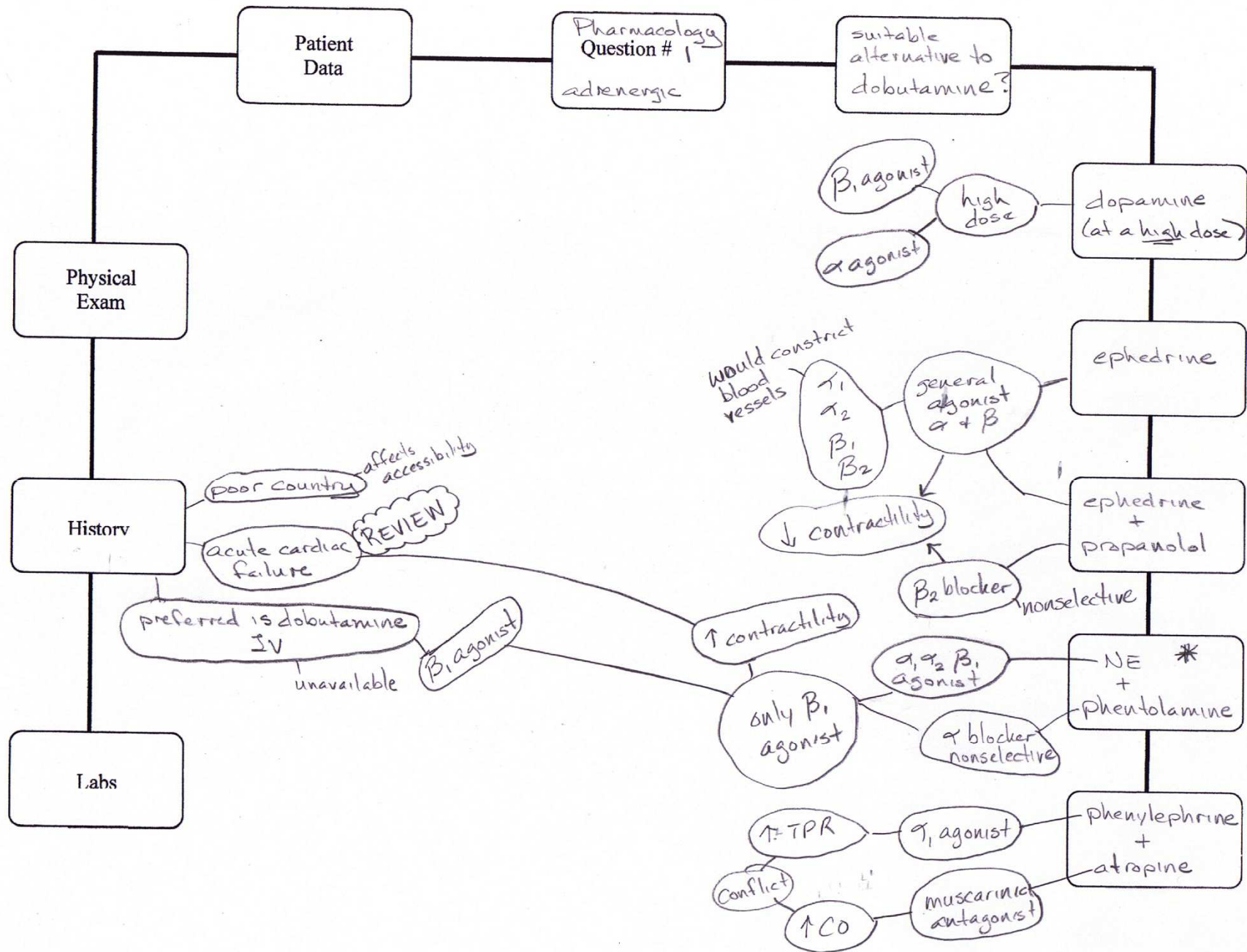
4. Decide on ruling-out facts

4. Session leader calls on group members to identify relevant information for each answer that contributes to ruling it out.



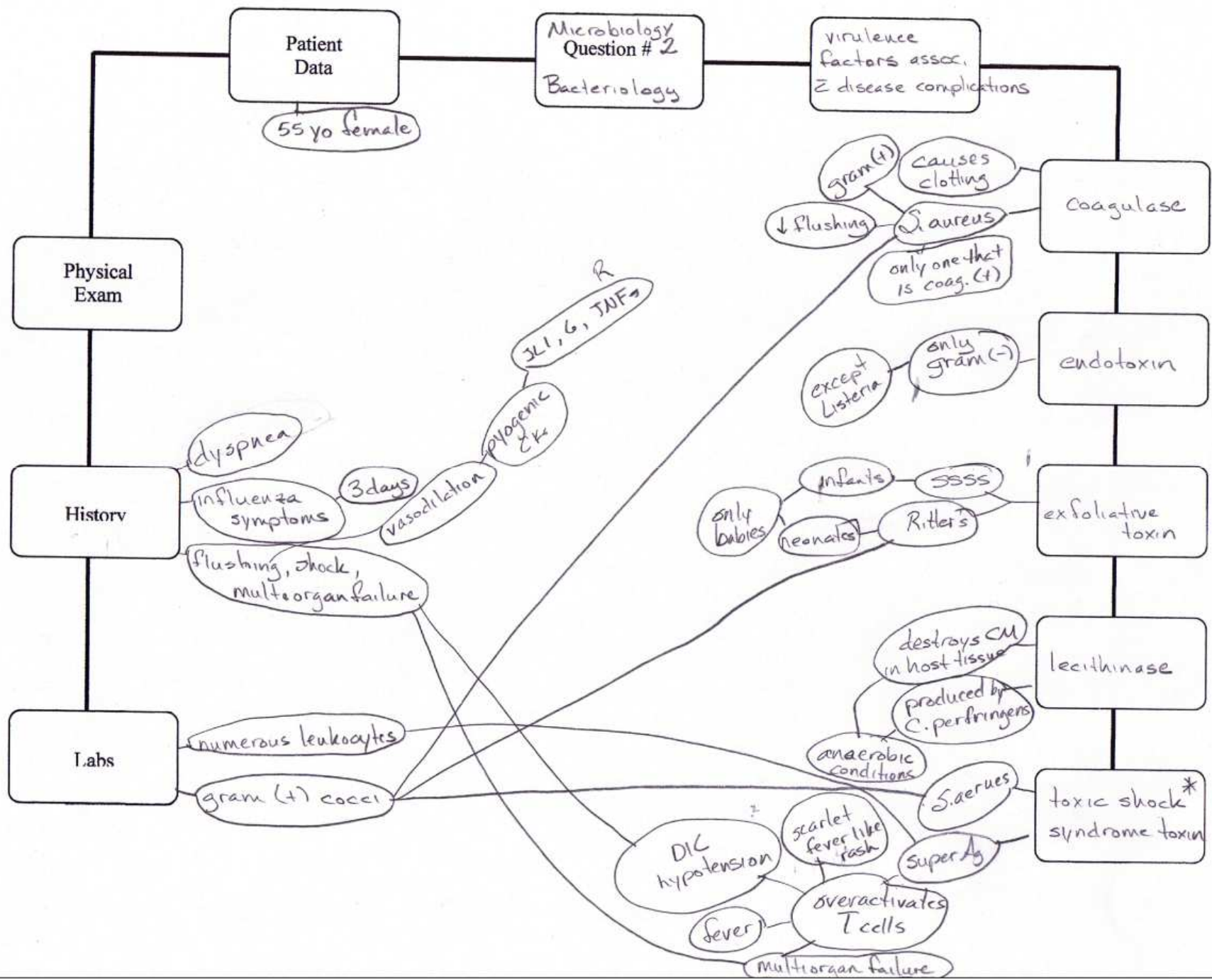
5. Determine pathophysiology cross-links

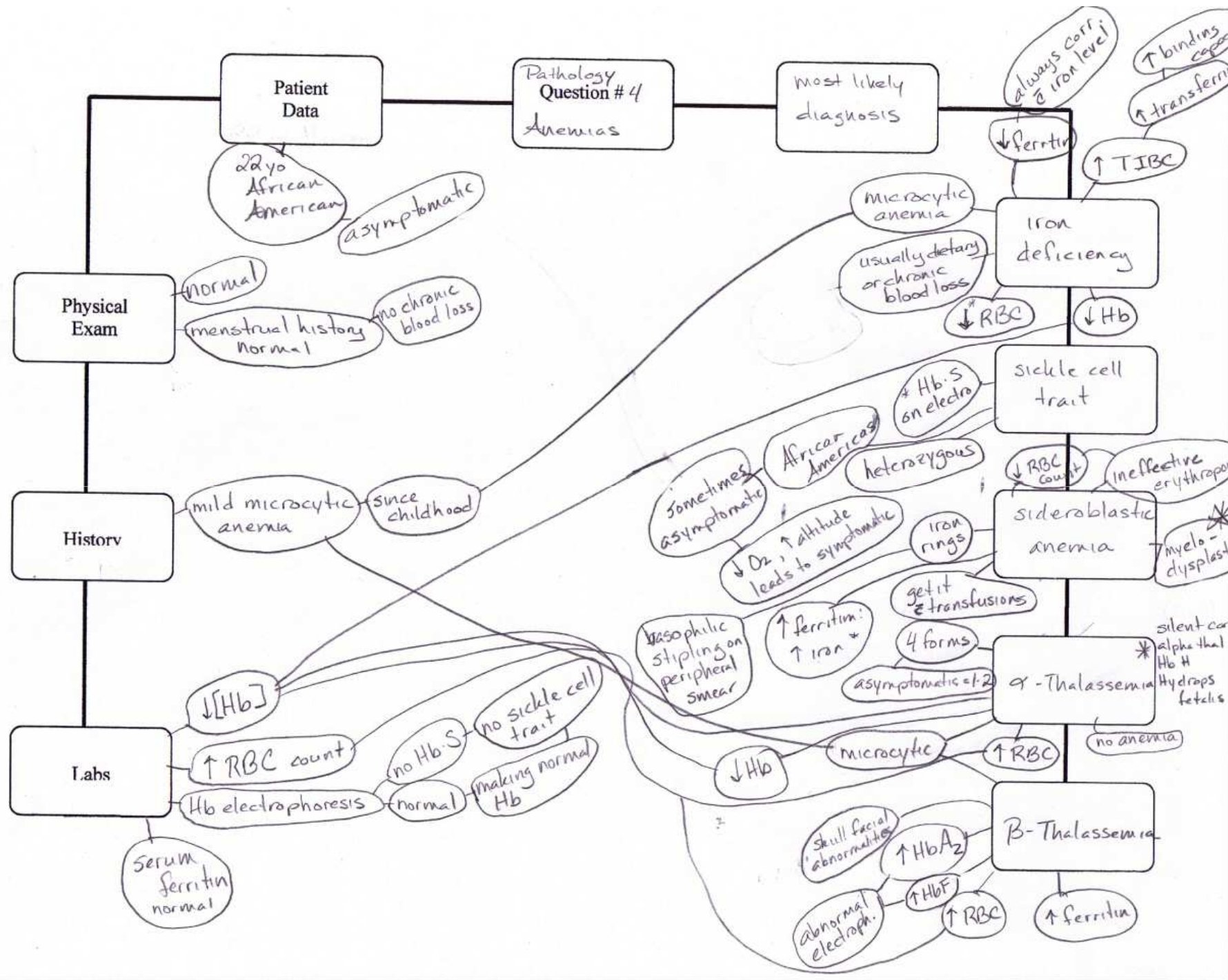
5. Group proposes pathophysiology crosslinks between answer choices and patient data in question.



Two more examples

- Microbiology – Bacteriology
 - Lead-in “Virulence factors associated with disease complications”
- Pathology – Anemias
 - Lead-in “Most likely diagnosis”





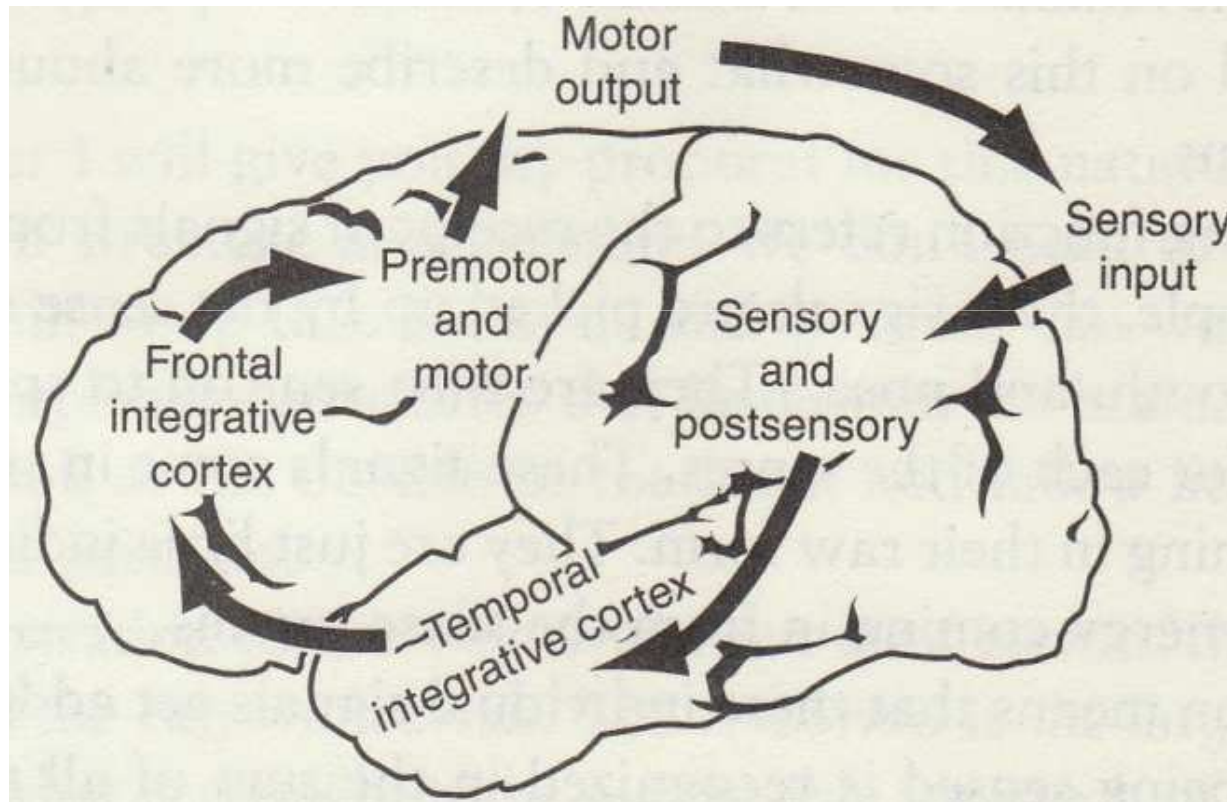
Summary Of Case Vignette Analysis

- *Identify topics* needed to rule out wrong answers
- *Debate relevance of facts* – people remember arguments and agreements
- *Fill in gaps* in learning – different people remember different things; no one remembers everything
- Aggressively seeking relevant information
 - “Always be thinking ahead!”

How Do We Prepare For The Sessions?

- Study the way you always do.
- Session leader retrieves 4-8 case vignette questions (fewer at first)
 - Webpath site
 - Klatt Path book
 - Rapid Review
 - Other
- Session leader emails to group prior to session. Previewing not critical.
 - Can just email questions from Klatt

Flow Of Information During Learning



Experiential Learning Model

(Kolb, 1984, p.21)

Try out what you have learned

Concrete experience

Have an experience

Testing implications of concepts in new situations

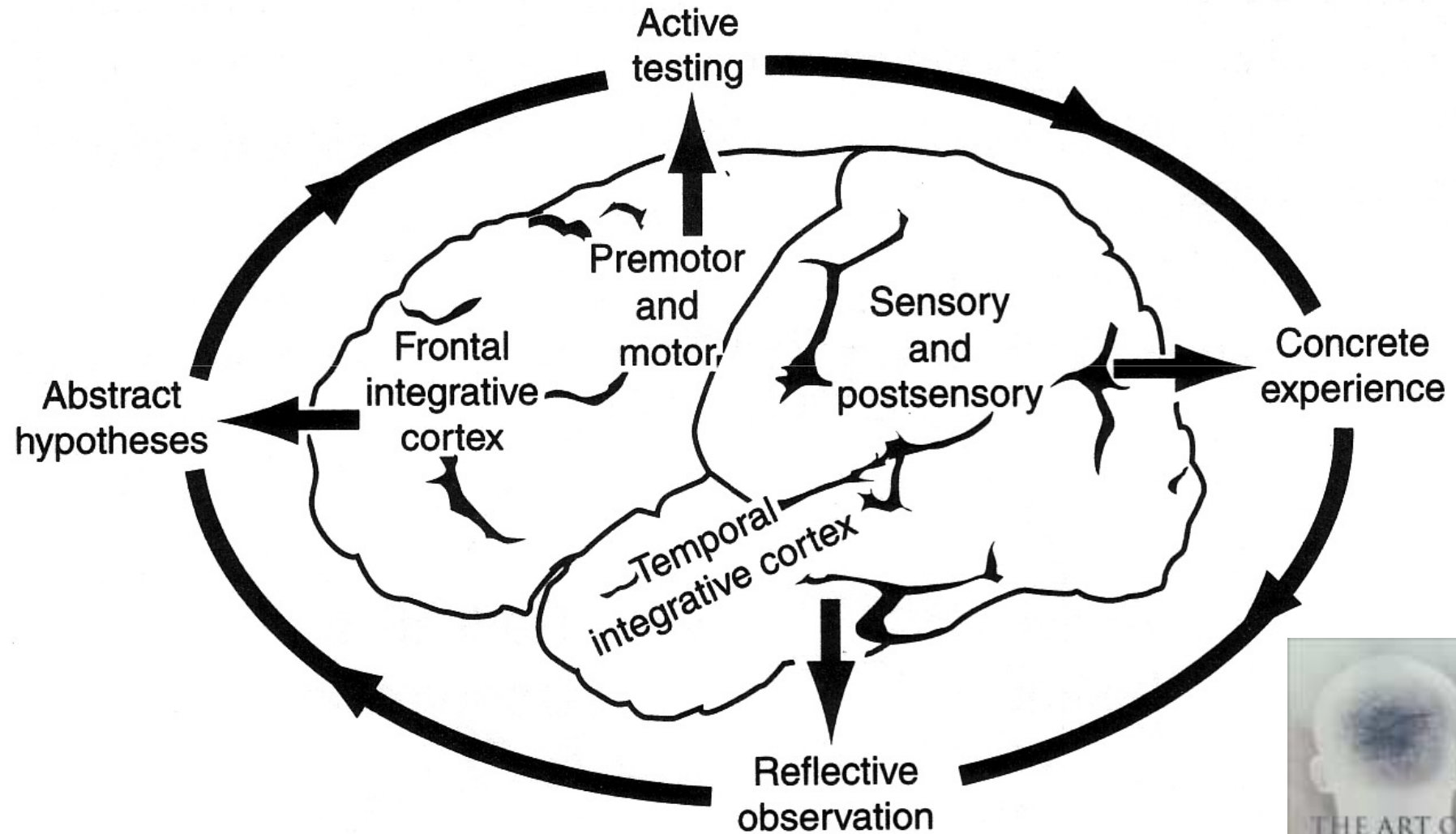
Observations and reflections

Learn from the experience

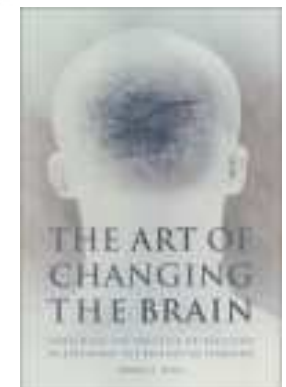
Reflect on the experience

Formation of abstract concepts and generalizations

The Learning Cycle



Zull, 2002, The Art of Changing the Brain



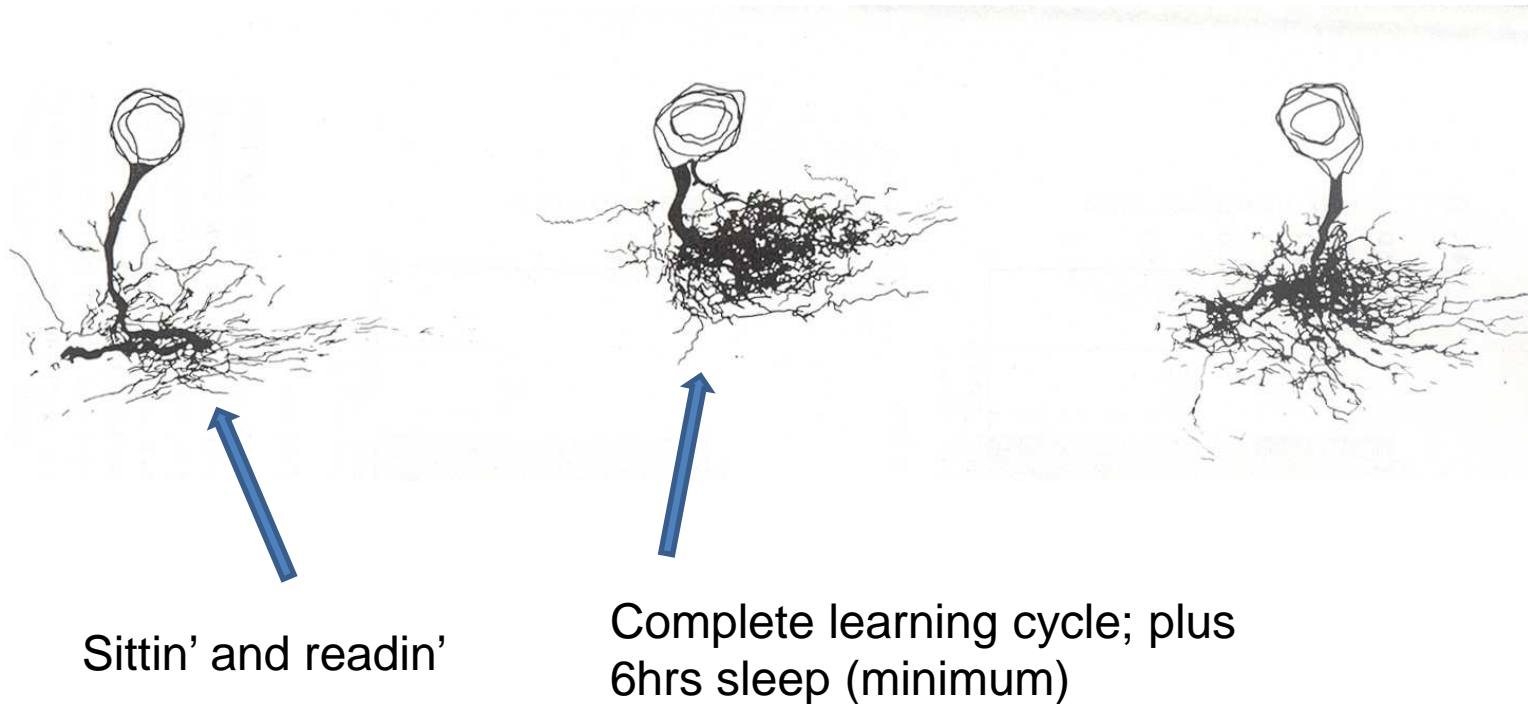
Back To The Future

- Temporal (back) processing looks at
 - Facts, grouping, memorized patterns
 - From lectures, books, other resources
- Frontal (future) processing looks at
 - “Discovered” patterns, inferences, evaluation of options
 - From dialog (usually missing in meded)

**If you build the front,
the back will follow.**

- Back = fact memory
- Front = skill memory
- If you develop analytical skills, long-term memory will follow.

Can You Find The Sittin' And Readin' Dendritic Tree?



- Control left, sensitized right
- The arbor of long-term potentiated cells is markedly increased.

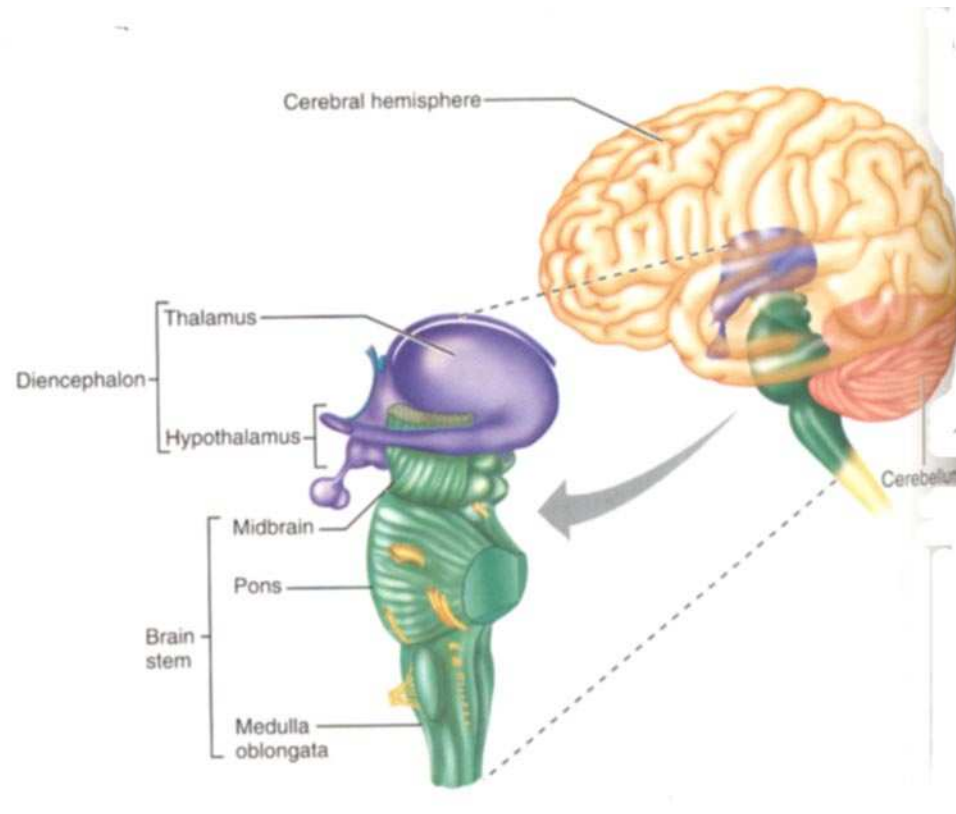
How Does A Step 1 Brain Learn?

- Knows how to relate past learning to present learning
- Knows how to determine areas of deficiency and find the missing information
- Prioritizes what is learned by actively organizing new information
- Builds long-term memory through motor activity that creates associations

Insights Into Personality

- Talk it out – “low gain” thalamic activity
 - ▶ Seeking more input
 - ▶ Extraversion preference
- Think it through – “high gain” thalamic activity
 - ▶ Reducing input
 - ▶ Introversion preference

Your Thalamus Distributes My Biochemistry Lectures To Your Cerebral Hemispheres



What's Your Favorite Lobe?

- What information do you give the *most* attention to?
- Sensing types (MBTI)
 - Specifics, details, routine procedure
 - Temporal lobes emphasized
- Intuitive types (MBTI)
 - The big picture, relationships, predictions
 - Pre-frontal lobes emphasized

Test Taking Style

- Linear style
 - Seek answer that matches memorized knowledge
 - Re-read question to stimulate recall
 - Memorization learning requires recognition
- Integrative style
 - Rule out answer choices
 - Don't fit learned patterns/relationships
 - Big picture learning establishes patterns

How Does A Step 1 Brain Take Tests?

- Can explain significance of each finding in the history, physical exam, or labs
- Can explain why wrong answers are wrong (and what would make them right)
 - “why” = understanding
- Can explain why right answer is right

What Can We Do To Make This Work Best?

1. Set a time limit – 90 min.
2. Seek group consensus
3. Keep multiple references open
 - Be aggressive in finding information!
4. Maximize integration (additional material, comparisons, contrasts, and cause-and-effect)
5. Always be solving a problem

What Is A Step 1 Brain?

- Maximum memory access, analytical skills, dendritic growth, use of time
 - ❑ Memory access – temporal region
 - ❑ Analytical skills – pre-frontal region
 - ❑ Dendritic growth – bodybuilding for the brain
 - ❑ Time – work smart and play hard
- Step 1 brain = pre-frontal decision making skills

Summary – What and Why?

- What...
 - Is a Step 1 brain?
 - Is side-to-side concept mapping?
 - Is my role in the group?
- Why...
 - Does this work?
 - Is it different from other systems?
 - Should I take the risk? (...and can I afford not to?)