

# Teaching Fast and Slow: A Framework and Toolkit for Clinical Reasoning Development on the Wards

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## Part 2



# Introductions

Introduction

- [insert your name, title and qualifications here]

Understand

Diagnose

Treat

Conclusion



# Objectives

Introduction

- Illustrate and implement targeted strategies to help learners with clinical reasoning deficits

Understand

- Practice incorporating strategies for teaching trainees clinical reasoning into everyday work flow through the use of a clinical case and role play

Diagnose

Treat

Conclusion



# Roadmap

Introduction

Understand

Diagnose

Treat

Conclusion

## Part 1

- **Understand** clinical reasoning
  - Dual process theory
  - Clinical reasoning process
- **Diagnose** clinical reasoning deficits
  - General approach to identifying biases and clinical reasoning deficits
  - Discuss how to best identify deficits at each step

## Part 2

- **Treat** clinical reasoning deficits
  - General strategies
  - Targeted approach



## Introduction

Dear Program Director,

I am writing to express my concern about Jim, an intern on my team. It's been 2 weeks and he really seems to be struggling. Yesterday I assigned Jim a case of sepsis in a patient with multiple possible infectious sources. In sum, the patient was a 50-year old male with a history of IVDA and ESRD who presented with subacute onset fevers and was found to have sepsis, a new holosystolic murmur and Osler's nodes on exam.

## Understand

I thought this was a great patient for my intern and I was excited about the possibility of hearing a wonderful, extensive, prioritized, thesis-driven differential. When Jim came back to go over his presentation, his history was disorganized and incomplete. He failed to include pertinent information on his physical exam. In addition, Jim's assessment was completely off the mark since he thought the patient's presentation was consistent with pneumonia. Please advise...

## Diagnose

## Treat

Sincerely,

## Conclusion

--Exasperated attending



**TREAT:**  
General Techniques  
for Reducing  
Diagnostic Error



# Small Group Activity #1

Introduction

Understand

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Conclusion

- What are some specific techniques you have used to incorporate clinical reasoning into your teaching practice or rounds?
- What are the biggest barriers to accomplishing this?
- How have you overcome these barriers?





# Explicitly Describe Heuristics and How They Affect Clinical Reasoning

Introduction

Understand

Diagnose

Treat

Conclusion







# Perform a Diagnostic Time-out

Introduction

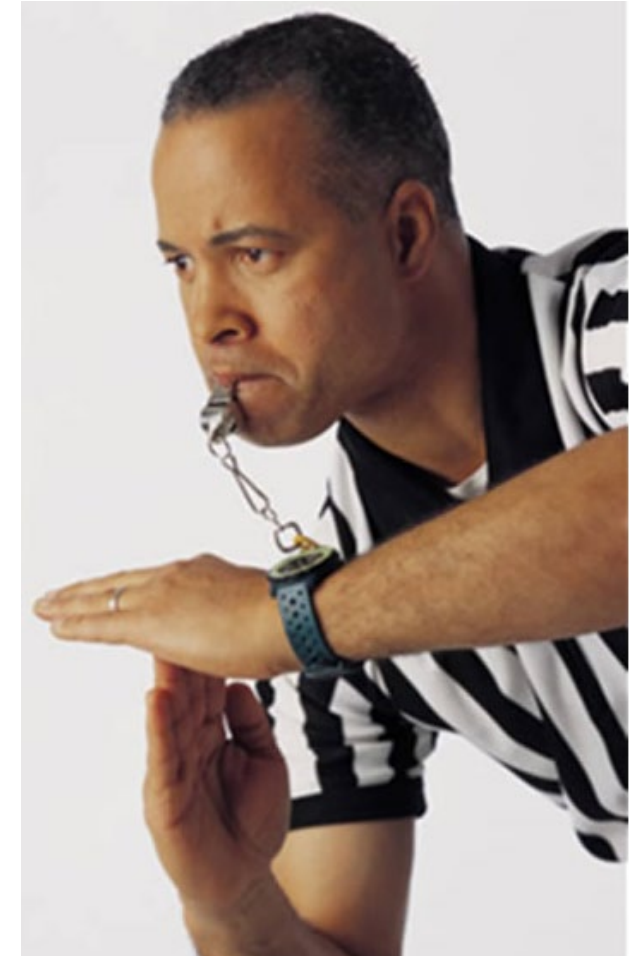
Understand

Diagnose

Treat

Conclusion

- Stop and pause
- Take a “Diagnostic Time Out”
  - Re-examine the data available without framing it with the current diagnosis
  - Re-build the differential from the ground up





# Checklist

**HIGH RISK SITUATIONS FOR DIAGNOSTIC ERROR**  
(A “Yes” response to any of the questions puts you at high risk for error)

Introduction

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- ☐ Is there a “must-not-miss” diagnosis that needs consideration?
- ☐ Did I just accept the first diagnosis that came to mind?
- ☐ Was the diagnosis suggested to me by the patient or another provider?
- ☐ Is there data about this patient I haven’t obtained or reviewed?
- ☐ Are there any pieces that don’t fit?
- ☐ Did I review the information myself?
- ☐ Was the patient seen in the ER/clinic recently for the same problem?
- ☐ Is this a patient I don’t like (or like too much) for some reason?
- ☐ Was this patient handed off to me from a previous shift?
- ☐ Was I interrupted, distracted, cognitively overloaded while evaluating this patient?



# Promote the Practice of 'Worst-Case Medicine'

Introduction

- Particularly useful for learners who tend to experience anchoring bias or overconfidence

Understand

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Conclusion





# Promote Use of a Systematic Approach

Introduction

Understand

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Conclusion



- Especially useful for commonly seen diseases
- Consider creating illness scripts
- Use frameworks to help students generate comprehensive differentials in a systematic, organized manner
  - AKI
    - pre-renal/intrinsic/post-renal
  - Anemia
    - microcytic/normocytic/macrocytic



# Ask 'Why?'

Introduction

Understand

Diagnose

**Treat**

Conclusion





# Use Bayes Theory

Introduction

- Explicit use of pre-test and post-test probabilities
- May prompt the learner to avoid premature closure or overconfidence

Understand

Diagnose

Treat

Conclusion





# Encourage learners to find clinical data that doesn't fit

Introduction

- Ask learners 'what can't we explain?'
- Allows learners to expand their differential and limit anchoring and overconfidence

Understand

Diagnose

Treat

Conclusion







# Role Modeling

Introduction

Understand

Diagnose

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Conclusion

- Take learner through case and explain explicitly how you came up with the diagnosis
- Role model asking thesis-driven questions at the bedside
- Show learners how you critically think about a case
- Acknowledge biases





# Admit your mistakes

Introduction

- One of the most powerful ways to teach clinical reasoning

Understand

- If there was a missed diagnosis, go through the case with the team and discuss in detail where errors were made

Diagnose

Treat

Conclusion





**TREAT:**  
Targeted Techniques  
for Reducing  
Diagnostic Error



# Clinical Reasoning Process

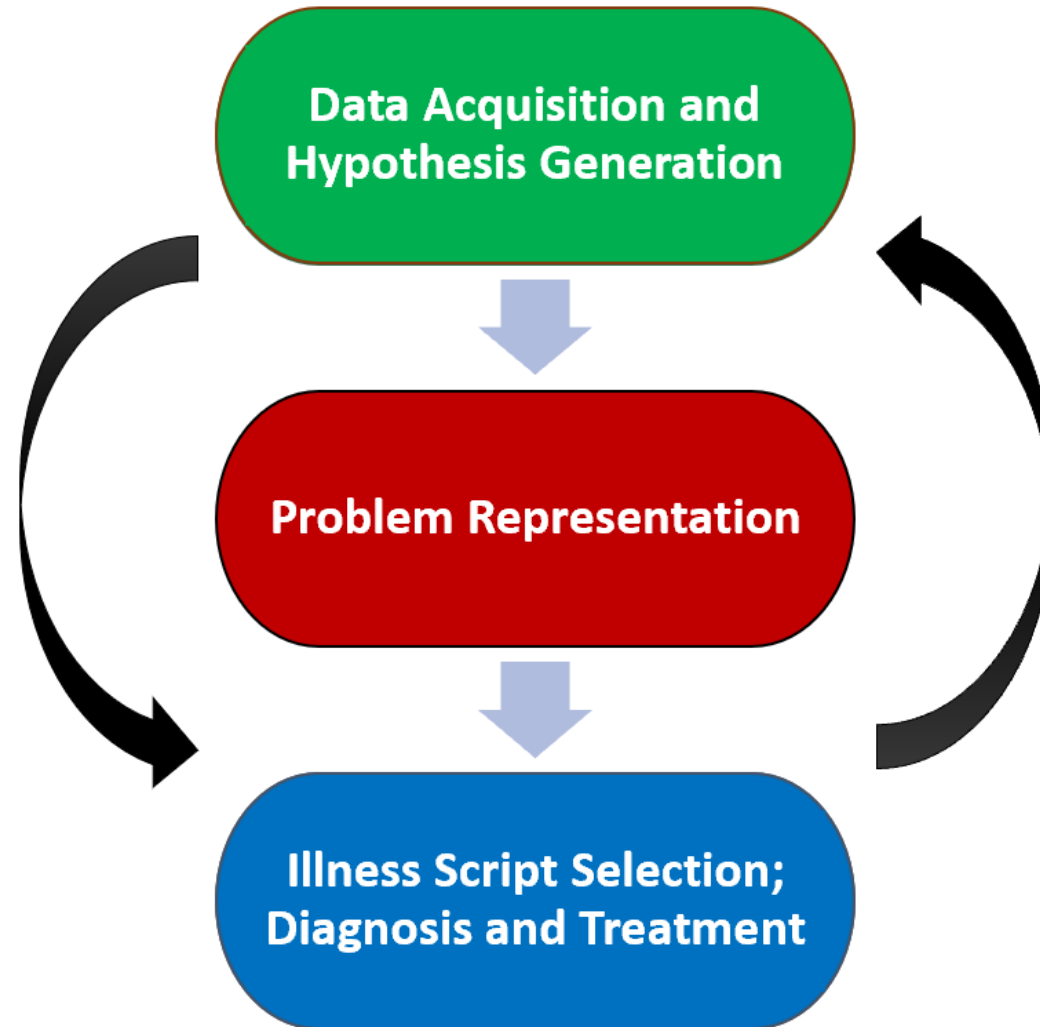
Introduction

Understand

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Treat

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# Data Acquisition/Hypothesis Generation

Introduction

Understand

Diagnose

Treat

Conclusion

Infection

Rheum

Other

**Step 1:** Ask the trainee to come up with a broad differential based on the patient's chief complaint

*Chief Complaint: 50 yo man w/ fevers*



# Data Acquisition/Hypothesis Generation

**Step 2:** Ask the trainee to refine the differential based on receiving additional information about the patient

Chief Complaint: 50 yo man w/ ESRD on HD here with fevers x 5 days, malaise x 8 days and subacute cough

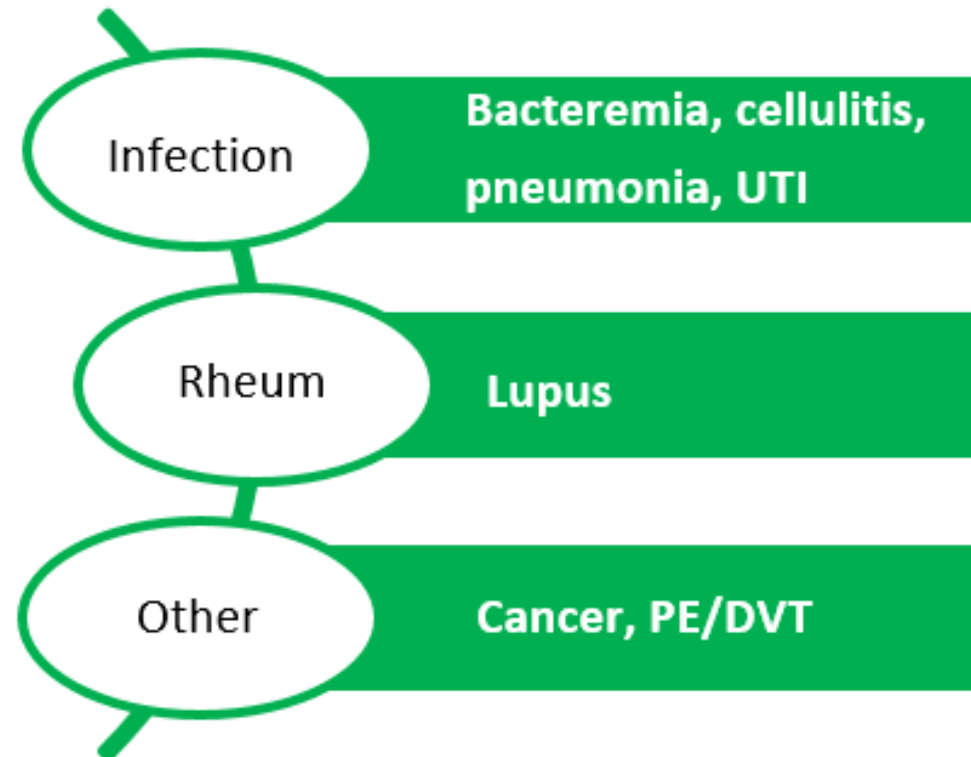
Introduction

Understand

Diagnose

Treat

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# Data Acquisition/Hypothesis Generation

**Step 3:** Ask trainee to come up with questions to ask the patient based on the differential they generated

Introduction

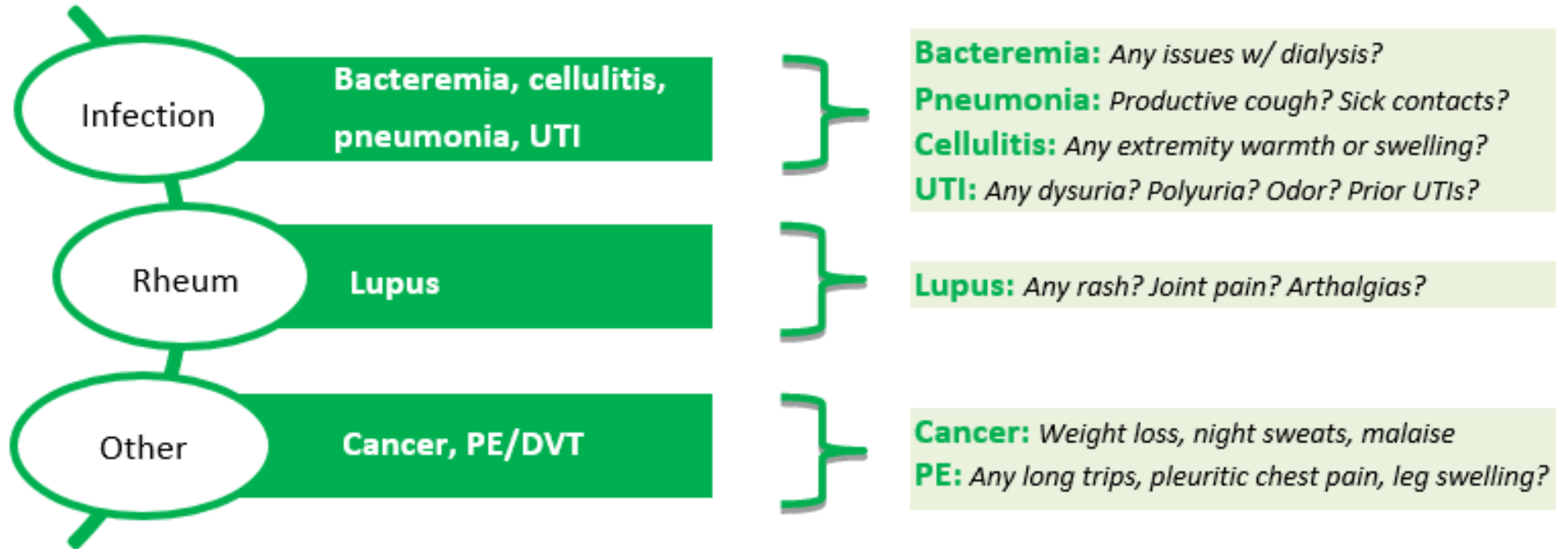
Understand

Diagnose

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Conclusion

*Questions to ask patient based on chief complaint*



**Step 4:** Trainee can now ask the patient targeted questions that are thesis driven and appropriately related to the chief complaint





# Helping learners synthesize data

Introduction

Understand

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Conclusion

PROBLEM	HPI	EXAM	DATA
<b>Fevers?</b> <b>Malaise?</b>  help student refine their problem if needed	<ul style="list-style-type: none"><li>• ESRD</li><li>• Fevers x 5 days</li><li>• Malaise x 8 days</li><li>• Rhinorrhea and nonproductive cough 2 weeks ago</li></ul>	<ul style="list-style-type: none"><li>• T 102; HR 110; RR 22</li><li>• Lungs: Clear</li><li>• CV: Systolic murmur</li><li>• <b><i>Skin: Osler Nodes*</i></b></li></ul>	<ul style="list-style-type: none"><li>• WBC 22,000</li><li>• CXR: infiltrates</li><li>• <del>Creatinine 3.0**</del></li></ul>

**Step 1:** Ask the trainee to circle or list the MOST pertinent items in each major section (HPI, physical exam, data)

- If the trainee misses important information, prompt them or tell them\*
- If a trainee identifies irrelevant information, ask them to defend why they think it's relevant\*\*



# Problem representation

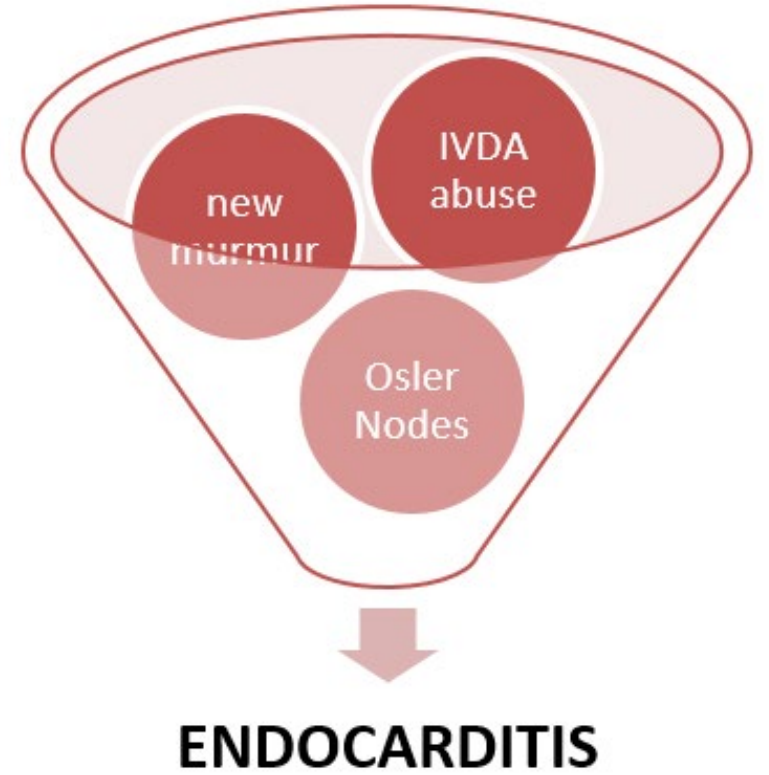
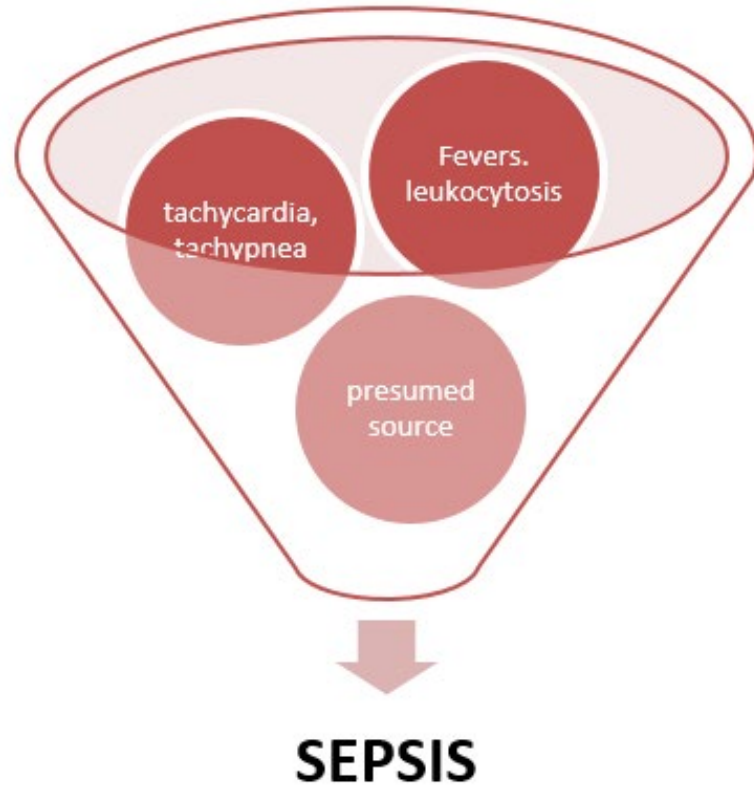
Introduction

Understand

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**Step 2:** Ask trainee to draw connections between the items they highlighted



# Problem representation

Introduction

- 50 yo man w/ h/o ESRD here w/ fevers likely secondary to PNA

Understand

Semantic  
transformation



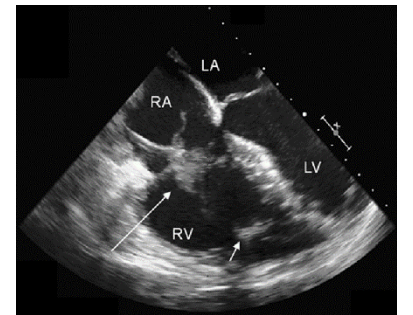
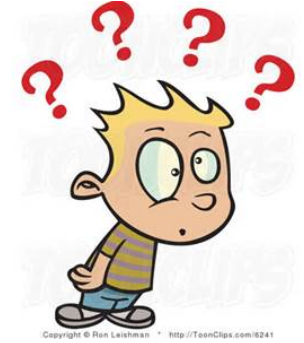
**Step 3:** Ask trainee to revise their summary statement to reflect connections they created

Diagnose

Treat

Conclusion

- 50 yo man w/ **IVDA** and **ESRD** who presented with **subacute onset fevers** and found to have **sepsis**, a **new murmur**, **Osler's nodes** and **pulmonary infiltrates** on exam.





# Helping learners expand their differential

Introduction

Understand

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Conclusion

dDx for Sepsis	Supporting Evidence	Refuting Evidence	Rank	Additional Info?
Pneumonia				
AVF infection				
Endocarditis				

- Step 1:** Ask the trainee to identify the primary problem

**Step 2:** Ask the trainee to list a differential diagnosis for the problem



# Helping learners expand their differential

Introduction

Understand

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dDx for Sepsis	Supporting Evidence	Refuting Evidence	Rank	Additional Info?
Pneumonia	+ Cough + Multiple infiltrates on CXR	Cough is nonproductive No sick contacts Cough occurred 3 weeks ago Lung exam is benign		
AVF infection	+ ESRD w/ an AVF	AVF site not tender or red No issues using AVF; good thrill		
Endocarditis	+ Fevers + Holosystolic murmur + Osler nodes + IVDA			

**Step 3:** Ask trainee to list supporting and refuting factors based on history, exam and data for each item on the differential



# Helping learners expand their differential

Introduction

Understand

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dDx for Sepsis	Supporting Evidence	Refuting Evidence	Rank	Additional Info?
Pneumonia	+ Cough + Multiple infiltrates on CXR	Cough is nonproductive No sick contacts Cough occurred 3 weeks ago Lung exam is benign	2	
AVF infection	+ ESRD w/ an AVF	AVF site not tender or red No issues using AVF; good thrill	3	
Endocarditis	+ Fevers + Holosystolic murmur + Osler nodes + IVDA		1	

**Step 4:** Ask the trainee to rank each item on the differential based on supporting/refuting evidence



# Helping learners expand their differential

Introduction

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dDx for Sepsis	Supporting Evidence	Refuting Evidence	Rank	Additional Info?
Endocarditis	+ Fevers + Holosystolic murmur + Osler nodes + IVDA		1	Blood cultures? TTE? Ask radiology to re-read CXR
Pneumonia	+ Cough + Multiple infiltrates on CXR	Cough is nonproductive No sick contacts; lung exam benign Cough occurred 3 weeks ago	2	Sputum cultures?
AVF infection	+ ESRD w/ an AVF	AVF site not tender or red No issues using AVF; good thrill	3	Blood cultures?

**Step 5:** Ask trainee to list additional information to help them confirm their diagnosis





# Helping learners with Diagnosis

Introduction

## 4 Step Clinical Reasoning Checklist

Understand

1) Summarize the patient in 1 – 2 sentences

Diagnose

2) Pick your pivotal element (main problem)

Treat

3) Gut diagnosis?

**System 1**

**Clinical reasoning error?**

Conclusion

4) 5 W's

**System 2**



# Helping learners with Diagnosis

Introduction

Understand

Diagnose

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Conclusion

## The 5 W's

- Why?
- What else could it be?
- What are my 'can't miss' diagnoses?
- What's my working/revised diagnosis?
- What's the pre-test probability for my diagnosis?
  - If low or moderate:
    - What doesn't fit?
    - What else could it be?
    - What additional info do I need?

- Ask patient additional ?s
- Review physical exam?
- Review labs?
- Order new tests/labs?
- Call a consult?



# Small Group Activity #2: Treatment

Introduction

Understand

Diagnose

**Treat**

Conclusion

- **Pick 3 clinical reasoning treatment strategies** and discuss how you would approach Jim to help him with his clinical reasoning deficits
  - Why did you choose these particular strategies?
  - What specific clinical reasoning deficit(s) are you trying to improve?
- With a partner, **practice utilizing at least one of the strategies**
  - Take turns playing the role of the intern (Jim) and the attending in order to address Jim's clinical reasoning deficit(s)



# Small Group Activity #2: Debrief

Introduction

- What specific clinical reasoning deficit(s) are you trying to improve?

Understand

- Why did you choose these particular strategies?

Diagnose

- How did the role play exercise go?

Treat

- What were some of the challenges associated with utilizing some of these techniques?

Conclusion



# Take Home Points

Introduction

Understand

Diagnose

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Conclusion

## Understand

Dual Process  
Theory



Cognitive Biases



Clinical Reasoning  
Process

## Treat

Ask Scaffolding Questions  
to Prime your learner



Employ General Strategies  
to Augment Clinical  
Reasoning Remediation



Use Targeted Stepwise  
Approach to treat learners  
at each deficit level



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# References

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