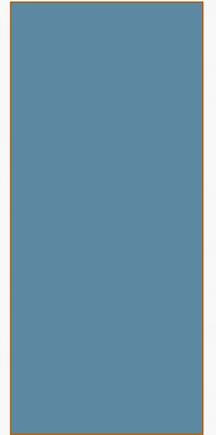


HOW TO TEACH HOW WE THINK

THE FIVE STEP "MICROSKILLS" MODEL



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HOW DO WE THINK?

- “**Critical thinking** is the ability to identify a problem, select and evaluate pertinent information, recognize assumptions, formulate appropriate hypotheses, and draw valid conclusions and critical inferences”
– Ross, et al (2013), p 724
- “**Critical thinking**, particularly clinical reasoning, is felt to be an instrumental clinical skill. It has been proposed that critical thinking may improve diagnostic skills and reduce errors in management”
-- Ross, et al (2013), p 724

HOW DO WE THINK?

- “The acquisition of **clinical reasoning** skills—the ability to organize and use medical knowledge and reasoning ability to diagnose medical problems—is essential for medical students, yet is poorly understood”
- “Even less is known about the development of **clinical reasoning** over the medical curriculum as a whole”

– Williams (2011), p 1148

HOW TO TEACH HOW WE THINK

- “Our problem is not what to do; it is how to talk about it”
- ...despite several decades of scholarship and research, it is still poorly understood. This is because it is poorly articulated. *We still do not know how to talk about **clinical reasoning***”

-- Loftus (2012), p 1175

HOW DO WE THINK?

- **A multi-step multifactorial process:**
 - Careful observation
 - Appropriate elicitation of historical information
 - Accurate performance of physical maneuvers
 - Generation of hypotheses
 - Appreciation of the relationship between each piece of data and each hypothesis
 - Attempting to confirm / disconfirm hypotheses through the appropriate ordering of diagnostic tests
- **Our ability to do so is related to, but distinct from, expertise within the content area to be taught**

HOW DO WE THINK?

- **Analytic**

- Traditional focus of medical educators
- Presumes a careful analysis of the relation between signs/symptoms
- Diagnoses are the hallmark of expertise
- Incorporates relative probability

- **Non-Analytic**

- Pattern recognition
- Need not reason at all
- Ability increases with expertise
- Even among novices: *not* inferior to more analytic forms of reasoning
- Optimal form of **clinical reasoning** should be an additive model which includes both modes

HOW DO WE THINK?

- These processes appear nearly invisible from the outside
- Experienced clinicians and educators often take this process for granted in their own work
- Learners remain confused
- **Medical training represents “not only new information, but a new way of thinking”**

– Neher (1992), p 419

HOW DO WE THINK?

- The steps of clinical reasoning are often not made explicit
- They were never made explicit to us when we were trained
- **“Clinical skills are not innate”**

– Neher (1992), p419

HOW DO WE TEACH HOW WE THINK?

- The importance of teaching around examples
- The traditional basic-medical-sciences-before-consideration-of-clinical-problems model may be misguided
- **Practice with cases should proceed in a way that mimics the eventual use of the resulting knowledge**

HOW DO WE TEACH HOW WE THINK?

- Make the process of **clinical reasoning** as overt as possible
- Convey it effectively
- **“In the typical traditional model, learning encounters range from three to six minutes in length and typically contain little teaching and virtually no feedback”**

– Aagaard (2004), p 43

- Enter Neher!

THE FIVE-STEP “MICROSKILLS” MODEL

- Developed by Jon O. **Neher**, MD for training of family practice residents affiliated with the University of Washington in Seattle
 - First published in *Clinical Teaching* in 1992
- Has also become known as “The One-Minute Preceptor”
- Attempts to provide a practical method for teaching **clinical reasoning** to students / evaluating their progress
 - **“a student-oriented, patient-centered method that helps make a student’s learning needs visible for teaching purposes”**

THE FIVE-STEP “MICROSKILLS” MODEL

- Sequential teaching behaviors that are traditionally employed in the clinical setting but can work equally well in the didactic phase with virtual or standardized patients
- Developed for medical students and residents; equally applicable to physician assistant student clinicians
 - **“Developed to simultaneously diagnose the patient and the learner’s thinking process in a time-efficient manner to target teaching without compromising patient needs.”**

THE FIVE-STEP “MICROSKILLS” MODEL

- “Untrained clinical teachers tend to give mini-lectures rather than conduct discussions, provide inadequate feedback to learners, and allow residents to present haphazardly or bluff their way through presentations.”
–Neher (1992), p 419

- **Been there, done that?**

THE FIVE-STEP “MICROSKILLS” MODEL

1. Get a commitment
2. Probe for supporting evidence
3. Teach general rules
4. Reinforce what was done right
5. Correct mistakes

STEP 1: GET A COMMITMENT

- **Explanation:** Listen patiently as the learner presents the patient case, then cut to the chase and ask for a commitment on the part of the learner
- **Example:** What do you think is going on with this patient?
- “I am particularly interested in what you are thinking because it makes me a better teacher”

– Neher (2003), p 392

- **Benefit:**
 - Involves the student in patient care by helping them feel responsible
 - Encourages the learner to process information within their own “database” of knowledge and experience
 - The student is invested in the outcome
 - This sets the tone for more active/engaged learning

STEP 2: PROBE FOR SUPPORTING EVIDENCE

- **Explanation:** Once you get the commitment, ask the learner to reflect back on the process used to arrive at that decision
- **Example:** What were the findings in this case that lead you to that conclusion? What factors did you take into account when deciding to use that drug? Importantly: What else did you consider? What kept you from making that choice?
- **Benefit:** “elicits the learner’s understanding of the case by asking open-ended questions that...force the learner to reveal his or her thinking process along with patient care information”

–Aagaard (2004), p 47

STEP 3: TEACH GENERAL RULES

- **Explanation:** Following the first two steps, it will often be possible to identify any gaps in knowledge or flaws in reasoning exhibited by the learner; use these as teaching points about the *general* rules, as applied in the case of this individual patient
- **Example:** “A patient with cystitis usually experiences pain with urination, increased frequency and urgency of urination, but not all patients will. You may need to obtain a sample for urinalysis even if the patient is not exhibiting classic signs and symptoms” ...
- **Benefit:** “Instruction is more memorable and transferable to other cases when it is offered as a general rule...avoid anecdotes and idiosyncratic preferences”

STEP 4: REINFORCE WHAT WAS DONE *RIGHT*

- **Explanation:** This microskill is not to be general praise; be as specific as possible in the way of positive feedback
- **Example:** “I noticed you kept an open mind until the patient revealed her true agenda for coming in today...you saved yourself and the patient a lot of time and unnecessary expense by getting to the heart of her concerns first” ...
- **Benefit:** For appropriate decisions to become firmly established, competencies must be repeatedly rewarded in some fashion. This process helps to guide teaching as well as build the learner’s self-esteem

STEP 5: CORRECT MISTAKES

- **Explanation:** Placed last for a reason; many start their feedback with what didn't go well. Requires tact to be effective. Ask the learner to critique their own performance first. Major focus should be on *how* to correct the mistake and do better for the patient
- **Example:** “You could be right that this child’s symptoms are due to a viral upper respiratory tract infection, but without checking the ears, you could easily miss an otitis media. Missing this diagnosis could result in...”
- **Benefit:** “The one-minute preceptor model helped to overcome one of the most pervasive and difficult problems in clinical education – the lack of feedback”

THE “MICROSKILLS” MODEL IN ACTION



THE NEXT STEP

- Assessing a learner's **clinical reasoning** ability via the Five-Step “Microskills” Model can then be taken to the next level:
 - A learner's **clinical reasoning** can be categorized as “strong or weak” based on the framework of developed by **Bordage**
 - Professor of medical education and director of graduate studies, University of Illinois College of Medicine at Chicago
 - Outlined in an article in *Academic Medicine* in 1994

BORDAGE'S FRAMEWORK

- **Clinical reasoning** is strong or weak based on which of the following categories best describes the learner's knowledge:
 - a. Reduced
 - b. Dispersed
 - c. Elaborated
 - d. Compiled

BORDAGE'S FRAMEWORK

STRONG

a. Reduced

b. Dispersed

WEAK

c. Elaborated

d. Compiled

WEAK CLINICAL KNOWLEDGE

- **Reduced**

- Learner either doesn't have the appropriate knowledge or can't access it; response is characterized mostly by inertia
- In a case involving neuromuscular symptoms in a 63 year-old male with a history of manual labor:
 - "I don't know. I can't seem to remember what brisk reflexes and clonus mean. I'll just move on..."

- **Dispersed**

- Learner lists diagnoses in a static fashion as if creating an abstract differential diagnosis; does not synthesize this patient's particulars into general knowledge
- In the same case above:
 - "Yes, upper and lower limbs, yes. Looks like the extremities are involved. Could be alcoholism, B12 deficiency, or polyneuritis..."

STRONG CLINICAL KNOWLEDGE

- **Elaborated**

- Learner begins by clearly defining the patient's findings; uses abstract binary qualifying terms (gradual vs. sudden, bilateral vs. unilateral) to describe the findings; then compares and contrasts diagnoses
- In same case of the 63 year-old with neuromuscular symptoms:
 - “What we have here is an older man with a gradual onset of motor and sensory symptoms in a problem that is bilateral yet asymptomatic...there is peripheral motor involvement in the upper extremity...cervical arthrosis causing a myelopathy at C7-T1 is likely...”

- **Compiled**

- Learner recognizes a pattern and is able to arrive at a potential likely diagnosis quite quickly and easily
- Same case:
 - “Here's why I think that this is cervical myelopathy...”

RECAP: THE FIVE STEPS PLUS ONE

- A student's **clinical reasoning** ability can be assessed in an interactive process, first developed by **Neher**, known as the Five-Step “Microskills” Model
- A student's **clinical reasoning** ability can be diagnosed within a broader framework developed by **Bordage**
- *Continued interaction with the student and repetition of the above assessments can create a solid formative evaluation pathway for a process that has often remained obscure and difficult to measure*

HOW TO TEACH HOW WE THINK

- What do you think?
- What have you tried?
- Can you see this working for your students?



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