Write Your Own Medical Adventure:
Infusing Critical Thinking into Medical Education Curriculum

Amit Shah, MD
Associate Professor
University of Texas Southwestern Medical School

Linh Nguyen, MD
Assistant Professor
University of Texas Houston Health Science Center at Houston Medical School

Jennifer Larson, MSE
Educational Grant Manager
University of Texas Houston Health Science Center at Houston Medical School
Why this topic?
What is a Geriatrician?

“....as a geriatrician, I am by definition an expert in subtlety and complexity”

Hazzard, W. “I Am a Geriatrician” JAGS 52:161, 2004
How we Usually Do It: Teaching with Aphorisms and Pearls.....

• “The older patient often won’t have read the textbook: atypical presentation of illness is typical.”
• “If you’ve seen one 80 year old, you’ve seen one 80 year old.”
• “Occam’s Razor is dangerous”
• “Multifactorial etiologies demand multifactorial solutions”
The Problem

Though memorable, teaching with pearls doesn’t teach our trainees how to think very well
Teaching Trainees to Think

• Last year we discussed teaching clinical reasoning skills and analytic and non-analytic reasoning skills

• This year we want to discuss critical thinking skills and give an example of a curriculum that formally tries to teach students
Outline of Our Discussion Today

• Define Clinical Reasoning and Critical Thinking
• Discuss traits of critical thinkers
• Introduce you to a curriculum developed at UT Houston to teach students critical thinking
• Allow time for questions and lessons learned from developing such a curriculum
What is Clinical Reasoning?

- Problem-solving
- Decision-making
- “Judgment”
- Diagnostic reasoning

- Major domain of clinical competence
- Thinking and decision-making processes that are used in clinical practice
What is Critical Thinking?

- Broader than clinical reasoning
- Many definitions
- Goes beyond the limits of clinical reasoning and clinical decision making
- Includes reasoning both outside and inside of the clinical setting
## Critical Thinking

**Reasoning outside the clinical setting (critical thinking)**

- Problem-solving, decision-making and judgment
- Personal, family, and community safety and welfare
- Teamwork and collaboration
- Teaching-learning (classroom, online, simulated experiences)
- Test-taking
- Using and creating electronic data
- Self improvement, stress management, and health promotion
- Community safety, welfare, and improvement
- Moral and ethical reasoning
- Long-term life planning and management

**Reasoning in the clinical setting (critical thinking and clinical reasoning)**

- Diagnostic reasoning (applying nursing process to determine, prevent, and manage patient problems)
- Problem-solving, decision-making and judgment
- Patient, caregiver, and community safety and welfare
- Patient- and family-centered
- Moral and ethical reasoning
- Applying evidenced-based practice
- Teamwork and collaboration
- Critical teaching and learning
- Using and creating electronic medical data (informatics)
- Self improvement; stress management
- Quality improvement (improving outcomes and care delivery systems)

The Link to Geriatrics

• Think of the “whole person”
• Importance of social situation and social history
• Thinking through moral and ethical issues such as those in end-of-life care
• Who else can help me in the care? Am I the best person? → Interdisciplinary/ Interprofessional Care
• QI: Is the system safe for my patient?
Critical Thinking

- Answering questions
- Questioning answers
- Requires various types of thought
  - Creative
  - Reflective
  - Analytical
- Complex process influenced by emotions and changes
- No one right definition
Critical Thinking

• Synonym: reasoning

• Common descriptions
  o “Know how to learner, reason, think creatively, generate and evaluate ideas, see things in the mind’s eye, make decisions, and solve problems”
  o “Reasonable, reflective thinking that focuses on what to believe or do”
  o “The ability to solve problems by making sense of information using creative, intuitive, logical or analytical process...and the process is continual”
  o “The process of purposeful, self-regulatory judgement...the cognitive engine that drives problem solving.”
  o “Thinking about your thinking, while you’re thinking, to make it better, more clear, accurate, and defensible”
  o “Knowing how to focus your thinking to get the results you need (includes using logic, intuition, and evidence-based practice)”
Critical Thinking, Clinical Reasoning, and Clinical Judgment

The terms are often used interchangeably, but there is a slight difference in the use of these terms.

- **Critical thinking** – a broad term – includes reasoning both outside and inside of the clinical setting. Clinical reasoning and clinical judgment are key pieces of critical thinking in nursing.

- **Clinical reasoning** – a specific term – usually refers to ways of thinking about patient care issues (determining, preventing, and managing patient problems). For reasoning about other clinical issues (e.g., teamwork, collaboration, and streamlining work flow), nurses usually use the term *critical thinking*.

- **Clinical judgment** refers to the result (outcome) of critical thinking or clinical reasoning – the conclusion, decision, or opinion you make.
<table>
<thead>
<tr>
<th>Critical Thinking</th>
<th>Not Critical Thinking</th>
<th>Example of Critical Thinking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organized and explained well by using words, examples, pictures, and graphics</td>
<td>Disorganized and vague</td>
<td>Persisting until you find a way to make your ideas easy to understand; using examples and illustrations to facilitate understanding</td>
</tr>
<tr>
<td>Critical for the sake of improvement, new ideas, and doing things in the best interest of the key players involved</td>
<td>Critical for the sake of attacking without being able to suggest new ideas or alternatives; critical for the sake of having it your way</td>
<td>Determining key players affected, and then looking for flaws in the way something is done and figuring out ways to achieve the same outcomes more easily or better</td>
</tr>
<tr>
<td>Inquisitive about intent, facts, and reasons behind an idea or action; thought- and knowledge- oriented</td>
<td>Unconcerned about motives, facts, and reasons behind an idea or action; task-oriented, rather than thought-oriented</td>
<td>Raising questions to deeply understand what happened, why it happened, and what was being attempted when it happened</td>
</tr>
<tr>
<td>Sensitive to the powerful influence of emotions, but focused on making decisions based on what’s morally and ethically the right thing to do</td>
<td>Emotion-driven</td>
<td>Finding out how someone feels about something, then moving on to discuss what’s morally and ethically right</td>
</tr>
<tr>
<td>Communicative and collaborative with others when dealing with complex issues</td>
<td>Isolated, competitive, or unable to communicate with others when dealing with complex issues</td>
<td>Seeking multidisciplinary approaches to planning care as indicated by client needs</td>
</tr>
</tbody>
</table>
Scheffer and Rubenfeld’s Habits of the Mind¹

- CONFIDENCE: Assurance of one’s reasoning abilities
- CONTEXTUAL PERSPECTIVE: Consideration of the whole situation, including relationships, background, and environment relevant to some happening
- CREATIVITY: Intellectual inventiveness used to generate, discover, or restructure ideas. Imagining alternatives.
- FLEXIBILITY: Capacity to adapt, accommodate, modify, or change thoughts, ideas and behaviors.
- INQUISITIVENESS: An eagerness to know, demonstrated by seeking knowledge and understanding through observation, and thoughtful questioning to explore possibilities and alternatives
- INTELLECTUAL INTEGRITY: Seeking the truth through sincere, honest processes, even if the results are contrary to one’s assumptions and beliefs
- INTUITION: Insightful sense of knowing without conscious use of reason
- OPEN-MINDEDNESS: A viewpoint characterized by being receptive to divergent views and sensitive to one’s biases
- PERSEVERANCE: Pursuit of a course with determination to overcome obstacles
- REFLECTION: Contemplation upon a subject, especially on one’s assumptions and thinking for the purposes of deeper understanding and self-evaluation

How Other Authors Describe Critical Thinking Traits

Facione’s Critical Thinking Dispositions

• TRUTHSEEKING: A courageous desire for the best knowledge, even if such knowledge fails to support or undermines one’s preconceptions, beliefs, or self-interest
• OPEN-MINDEDNESS: Tolerance of divergent views; self-monitoring for possible bias
• ANALYTICITY: Demanding the application of reason and evidence; alert to problematic situations; inclined to anticipate consequences
• SYSTEMATICITY: Valuing organization; focusing; being diligent about problems of all levels of complexity
• CRITICAL THINKING SELF-CONFIDENCE: Trusting one’s own reasoning skills; seeing oneself as a good thinker
• INQUISITIVENESS: Curious and eager to acquire knowledge and learn explanations even when the applications of the knowledge are not immediately apparent
• MATURITY: Prudence in making, suspending, or revising judgment; awareness that multiple solutions can be acceptable; appreciation of the need to reach closure even in the absence of complete knowledge

How Other Authors Describe Critical Thinking Traits

Paul and Elder’s Intellectual Traits

- INTELLECTUAL HUMILITY: Consciousness of limits of your knowledge; willingness to admit what you don’t know
- INTELLECTUAL COURAGE: Awareness of the need to face and fairly address ideas, beliefs, or viewpoints to which you haven’t given serious hearing
- INTELLECTUAL EMPATHY: Consciousness of the need to imaginatively put yourself in the place of others to genuinely understand them
- INTELLECTUAL AUTONOMY: Having control over your beliefs, values, and inferences; being an independent thinker
- INTELLECTUAL INTEGRITY: Being true to your own thinking; applying intellectual standards to thinking; holding yourself to the same standards you hold others; willingness to admit when your thinking may be flawed
- CONFIDENCE IN REASON: Confidence that, in the long run, using your own thinking and encouraging others to do the same gets the best results
- FAIR-MINDEDNESS: Awareness of the need to treat all viewpoints alike, with awareness of vested interest

---

Benefits Of Adding Critical Thinking

• Traditional case based learning is linear with only one outcome
• current cases can be further improved by adding alternate pathways and/or endings which is more true to real life patient care
Rate Critical Thinking Skills (0 to 10)

Examples of Personal Critical Thinking Indicators (CTIs)

• **Self-Aware**: identifies own learning, personality, and communication style preferences; clarifies biases, strengths, and limitations; acknowledges when thinking may be influenced by emotions or self-interest

• **Open and fair-minded**: shows tolerance for different viewpoints; questions how own viewpoints are influencing thinking

• **Reflective and self-corrective**: carefully considers meaning of data and interpersonal interactions; asks for feedback; corrects own thinking; alert to potential errors by self and others; finds ways to avoid future mistakes
How to Teach Critical Thinking

Think, Pair, Share

- Complete the following sentences, and then compare your responses with others
  
  • If I were to explain to someone else what critical thinking is, I would say that...
  • I do my best thinking when...
  • I do my worst thinking when...

- Discuss times when you’ve experienced some of the descriptions listed under “Not Critical Thinking.” How did it affect your thinking?

- Consider the CTIs listed. Identify five indicators that are especially challenging for beginning medical students caring for the elderly.
Example Case
Natural Language Question Structure

- Question
- Response
- Evaluation
- Critical Thinking
A comprehensive geriatric assessment (CGA) exam goes beyond the standard adult history and physical examination. It is a more extensive evaluation that includes elements of special significance in older adults. A CGA ensures that you are providing the highest quality healthcare for this population. The comprehensive geriatric assessment differs from a standard medical evaluation in four important ways.

It focuses on elderly individuals with complex conditions. As older adults age, it is often the case that older patients will develop groups of related medical problems. These conditions are referred to as “Geriatric Syndromes.” Common geriatric syndromes include falls, cognitive impairments, polypharmacy (conducting regular medication review for all over-the-counter, as well as prescribed, drugs or supplements), delirium, depression, incontinence, impaired homeostasis and iatrogenic disorders. The CGA assists clinicians in uncovering such problems.

Obtaining an in-depth social history helps to fully understand overall health. Often, the concerns or problems of an older adult will not present themselves as purely physical ailments. A thorough social history includes questions about living environment, social support, social activities, and advanced directives. These questions can reveal problems such as caregiver stress, elder abuse and mistreatment and financial concerns that would not be evident from a routine physical exam.

It emphasizes functional status. A comprehensive geriatric assessment addresses the most prevalent issues that affect functionality faced by an older adult patient. It involves a thorough evaluation of:

- Cognition: dementia and delirium;
- Mobility: fall risk, gait and balance, instrumental and basic activities of daily living (IADL and ADLs);
- Affect: depression and other mood disorders;
- Pain;
- Vision;
- Hearing; and,
- Nutrition.

It frequently takes advantage of an interprofessional team of providers. The interprofessional team can help with the comprehensive geriatric assessment, allowing for more expert assessment of and advice for the patient, and allowing the geriatrician more time for other patients. The interprofessional team provides the patient with more resources from other professionals (social workers, case managers, physical and occupation therapists, registered dieticians, and nurses). Using a team offers a holistic approach to healthcare.

The CGA is a critical tool that geriatricians and geriatric interprofessional teams rely on to formulate an individualized plan of care for older patients. It is important because it is comprehensive and the approach is holistic. It utilizes an array of assessments that address issues faced by older adults with complex comorbidities. The CGA provides an integrated picture of older adult health, taking into account all the multifaceted domains that impact an older adult’s health, well-being, independence, and quality of life.
## Natural Language Keyword Grid

<table>
<thead>
<tr>
<th>Keywords</th>
<th>Synonyms</th>
</tr>
</thead>
<tbody>
<tr>
<td>complex</td>
<td>comorbidities, complex problems, interrelated, syndromes, complexity, many problems, varied problems, multiple problems</td>
</tr>
<tr>
<td>social history</td>
<td>social activities, social support, social environment</td>
</tr>
<tr>
<td>functional</td>
<td>functioning, functional, ability, capacity, able to do</td>
</tr>
<tr>
<td>interprofessional</td>
<td>interdisciplinary, expert, specialist, team</td>
</tr>
<tr>
<td>individualized</td>
<td>customized, tailored, personalized, specified, specific, particular, self-care, self</td>
</tr>
<tr>
<td>plan of care</td>
<td>care plan, assessment and plan, therapeutic plan, therapeutic alliance</td>
</tr>
<tr>
<td>quality of life</td>
<td>life of older adult, quality, value, worth, good life</td>
</tr>
<tr>
<td>independence</td>
<td>individuality, individualism</td>
</tr>
<tr>
<td>Trait</td>
<td>Novice=1</td>
</tr>
<tr>
<td>------------------------------</td>
<td>---------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>KNOWLEDGE</strong> (geriatric terminology)</td>
<td>Incorrect Response Demonstrates limited knowledge of geriatric terminology and/or strategies</td>
</tr>
<tr>
<td><strong>COMPREHENSION</strong> (grasp of geriatric essentials)</td>
<td>Response is stated without clarification or description.</td>
</tr>
<tr>
<td><strong>APPLICATION AND ANALYSIS</strong> (Evidence, perspective and influence of geriatric concepts and context)</td>
<td>Response is minimally developed, simplistic and obvious with limited degree of clarity and with little confidence Response without any interpretation/evaluation. Shows an emerging awareness of geriatric concepts and geriatric context</td>
</tr>
<tr>
<td><strong>SYNTHESIZING AND EVALUATING</strong> (Discover meaning or significance, draw conclusions, and make an assessment)</td>
<td>Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.</td>
</tr>
</tbody>
</table>