

Competency-based Medical Education and Assessment

TEACH Health Professions Educator Series

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 - The VTCSOM Education Team

Making Connections

TEACH Education Journal Club
Wednesday, January 24, 2024, 12:00 pm - 1:00 pm

TEACH Health Professions Educator Series
Monday, February 26, 2024, 12:00 pm - 1:00 pm

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Evaluating a Competency-Based Blended Health Professions Education Program: A Programmatic Approach

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John Melton, PhD*

“Teaching Professionalism”
Dr. Rebecca Pauly
Vice Dean

Objectives

As a result of this session, participants will be able to:

1. Define “curriculum” and “competency-based medical education” and articulate differences between both.
2. Describe the five-stage model of skill acquisition in the Dreyfus/Dreyfus model.
3. Highlight the essential components to CBME in clinical learning environments (Van Melle Framework)
4. Apply the “educational pyramids” for educational objectives (Bloom’s Taxonomy) and clinical assessments (Miller’s Framework) to medical education examples.
5. Describe the relationship between competency-based medical education and current evolving work in the VTCSOM curriculum.

CBME is huge.

This session is focused on key elements, and does not address so many other critical areas.

A Patient Case

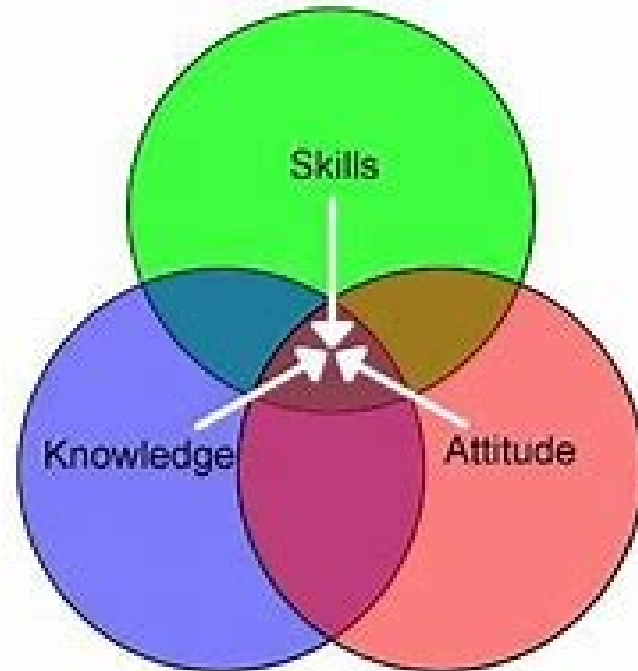
- Larry is a 79-year old currently-working CPA who experiences a large bowel infarction.
- He undergoes two operations and stays in the ICU for a week, with complications of delirium and fever.
- He is transferred to the internal medicine unit and cared for by hospitalists, nurses, therapists.
- Unfortunately, several complications ensue - delayed diagnosis of hospital-acquired pneumonia, Stage 3 sacral decubitus ulcer, subpar coordination between cardiology, ID, IM teams, with several handoff errors.
- Despite these events, Larry is discharged to a “rehab” facility where he:
 - Receives unnecessary salt tablets that result in anasarca
 - Undergoes a trip to the emergency department for a diagnostic error
 - Experiences repeat pneumonia due to aspiration and a feeding error
 - Misses several physical therapy sessions
- Larry is discharged to home with hospice care; he describes his experience at the rehab as “being treated like a thing.”
- He dies eight days following discharge.

Reflection

- Have you ever experienced poor and/or unsafe care with a family member or yourself?
- Have you ever witnessed poor and/or unsafe care as a healthcare professional?
- What is the role of the medical education system in improving care for patients like Larry?

Competency

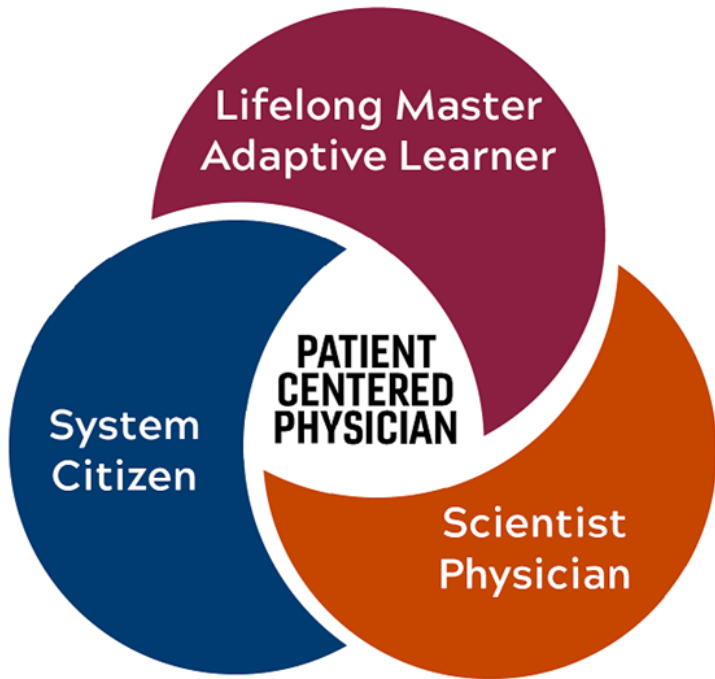
- Competency: An observable ability of a health professional, integrating multiple components such as knowledge, skills, values and attitudes.



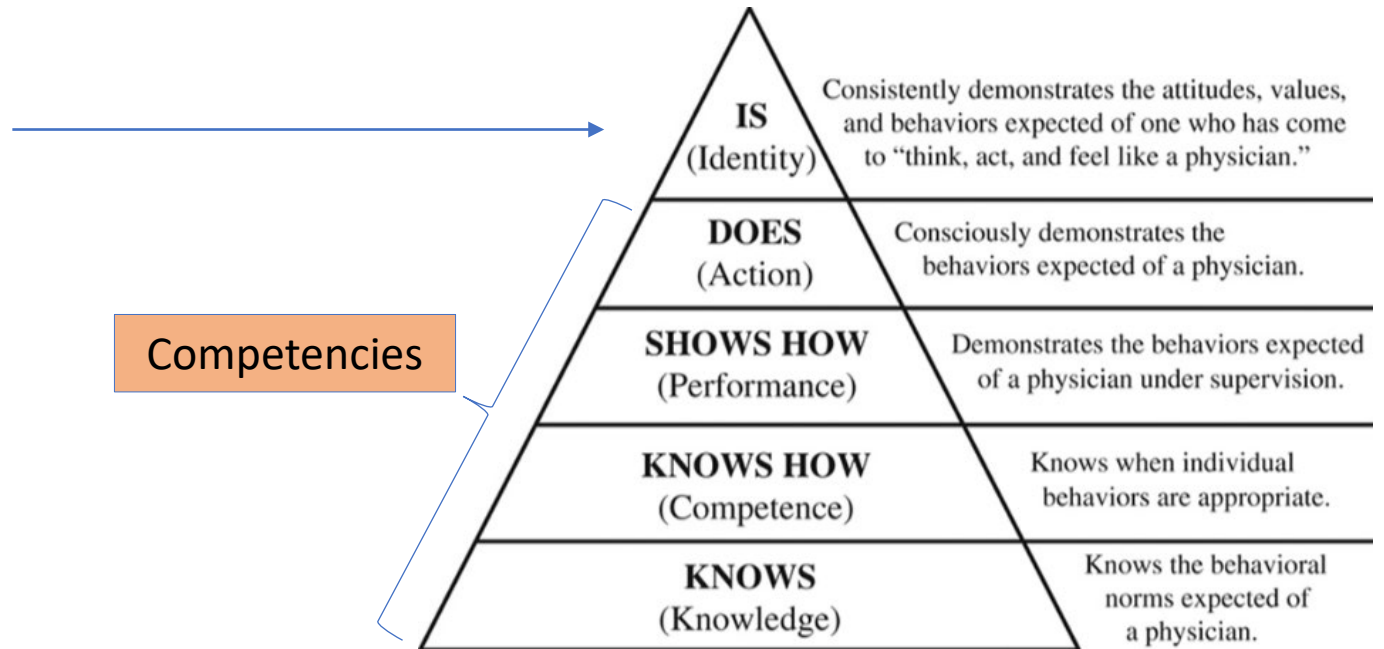
Our North Star in Medical Education: Integrating Professional Identity and Competencies



VTC SOM Professional Identities



Cruess and Cruess Pyramid for Competencies and Professional Identity



Definitions – Competency-Based Medical Education

Definition #1 (Frank et al.): An approach to preparing physicians for practice that is fundamentally oriented to graduate outcome abilities and organized around competencies derived from an analysis of societal and patient needs. It de-emphasizes time-based training and promises accountability, flexibility and learner centeredness.

Definition #2 (Harden et al.): An approach to education in which decisions about the curriculum are driven by outcomes learners should display by the end of the training program. In outcome-based education, product defines the process. The educational outcomes are clearly specified and decisions about the content and how it is organised, educational strategies, teaching methods, assessment procedures and educational environment are made in the context of learning outcomes.

Definition #3 (McGaghie et al.): The intended output of a competency-based programme is a health professional who can practise medicine at a defined level of proficiency, in accord with local conditions, to meet local needs.

**What are some of the key features or elements across these definitions?
Please type in the chat (or comment).**



Unpacking “Competency-Based Medical Education” Definitions

1. CBME and the “competencies” are our outcomes in medical education.
2. CBME starts with an analysis of both society and patient needs.
3. CBME is “An Approach” (not a list).
4. CBME informs all aspect of medical education (curriculum design, assessments, etc.).
5. CBME requires a high-quality “learning environment” for operationalization.
6. CBME is the tailoring of education to learners needs (requires ↑ faculty/learner interaction).

Tea Steeping



Curriculum and Competencies

What are the components of a “curriculum”?

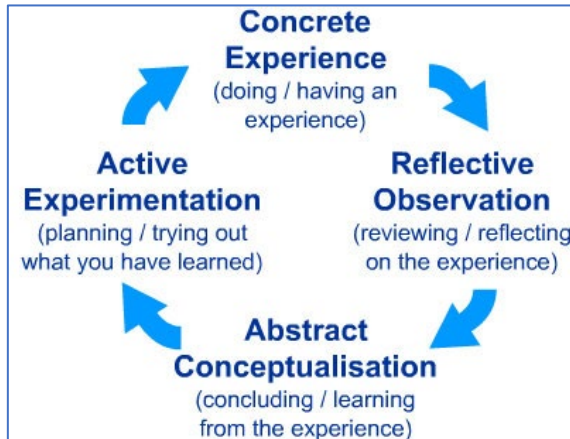
“A Planned Educational Experience”

Must have these 4 components:

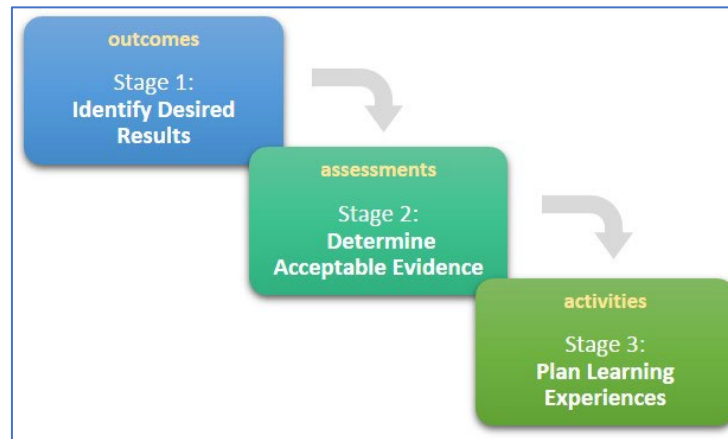
1. Goals: expectations or benchmarks for teaching and learning
2. Methods: specific instructional methods or strategies
3. Materials: media and tools that are used for teaching and learning
4. Assessment: reasons for and methods of measuring learner progress

Types of Curriculum Design Frameworks

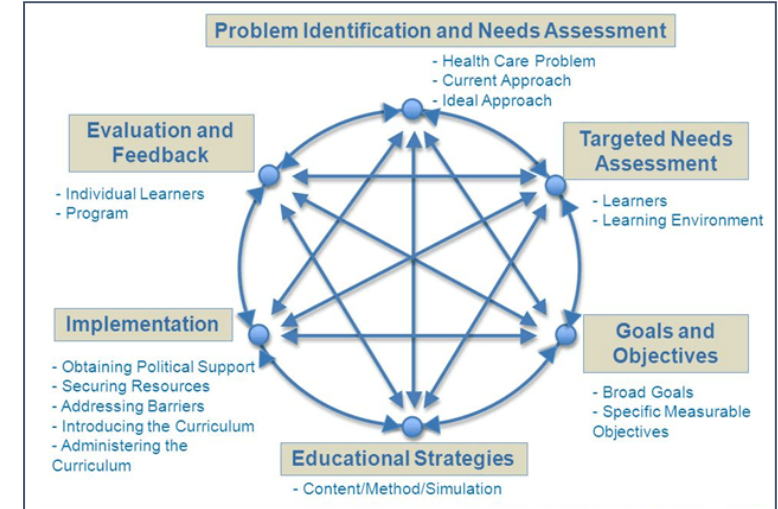
Theory-Based Design (Kolb's Learning Theory)



Understanding By Design (Backwards Design)

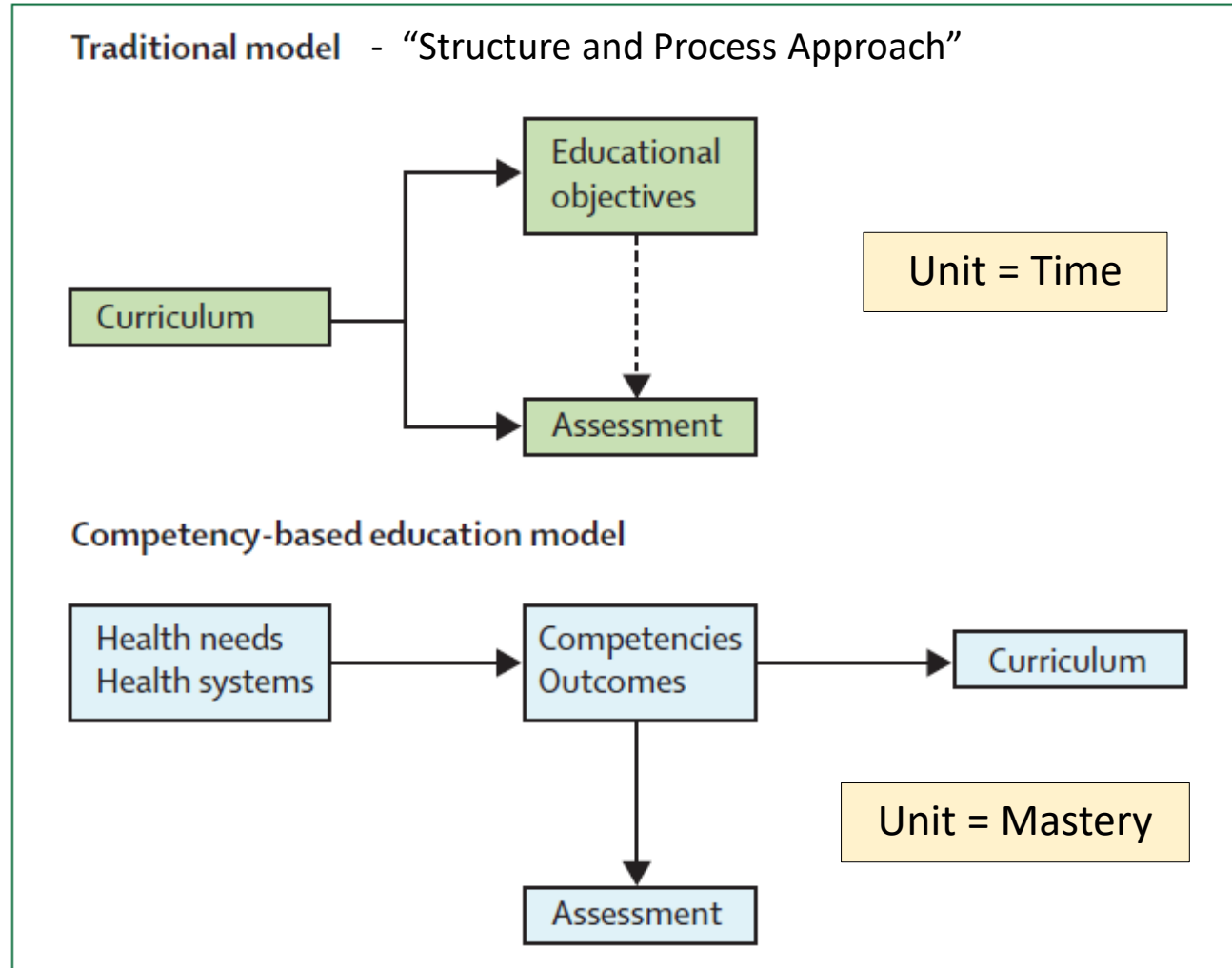


Kern's Curriculum Development Framework



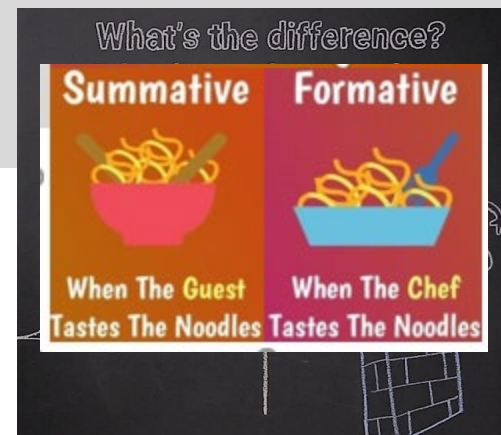
Common thread → learning has occurred with an assessment of that learning

Competencies and Curricular Design



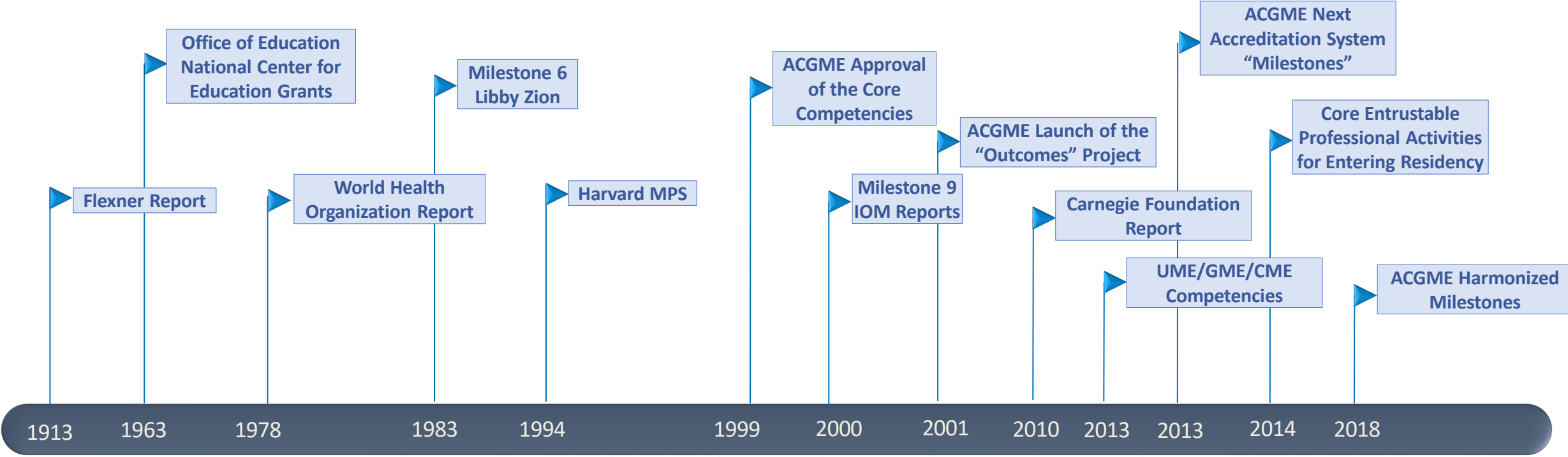
Two Different Approaches: Implications for Curricular Design

Variable	Structure/Process Approach	Competency-based Approach
Driving force for curriculum		
Driving force for process		
Path of learning		
Responsibility for content		
Goal of educational encounter		
Assessment tool		
Setting for evaluation		
Evaluation		
Timing of assessment		
Program completion		



Sense Making with CBME

Salient Mileposts in the History of CBME



"Practice-based knowledge" to "knowledge-based practice"

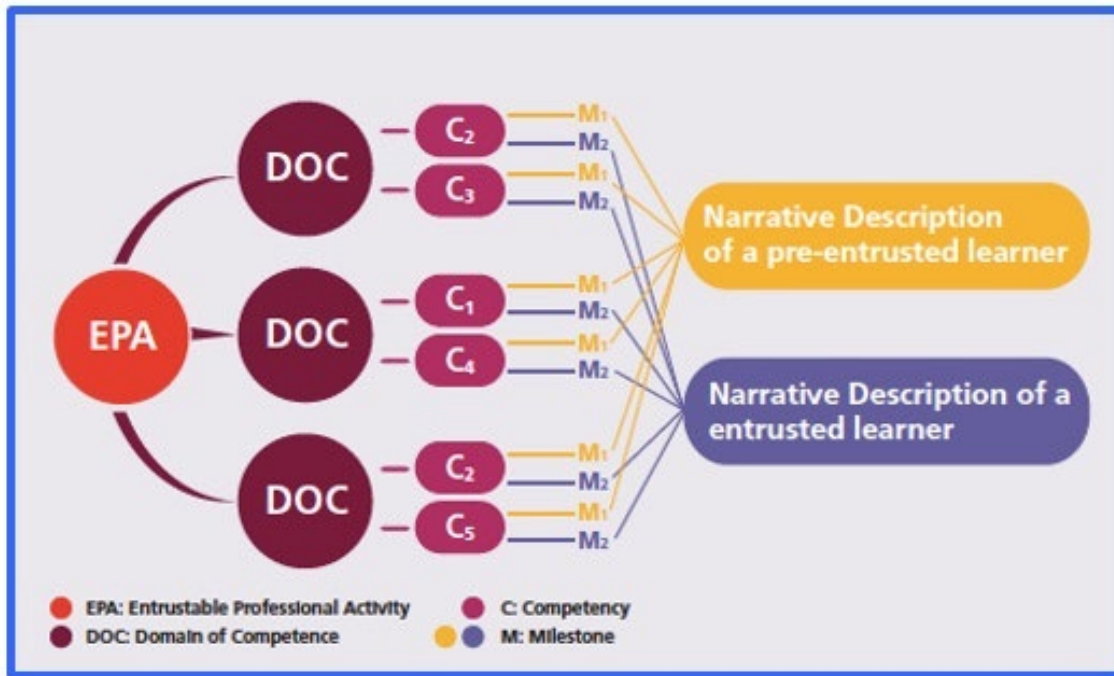
Outcomes-Based Education
Promotion of CBME in Med Ed

Platform for Change Based Upon Patient Needs

CBME Paradigm Shift Initiated

Honing of CBME Ongoing

The Word Soup of CBME



Entrustable Professional Activity (EPA): Unit of professional practice that may be entrusted to a learner to execute unsupervised, once they have demonstrated competence. (work descriptors)

Domain of Competence: A dimension of related competences (e.g., Systems-Based Practice).

Competency: Actions someone performs or demonstrates within the practice environment at a defined stage of professional development (person descriptors).

Milestone: Specific observable and measurable achievements or marker of progress in the development of a learner's competencies.

Core Elements of CBME and Current VTCSOM Curricular Initiatives

Core Elements of CBME – The Van Melle Article

VTCSOM

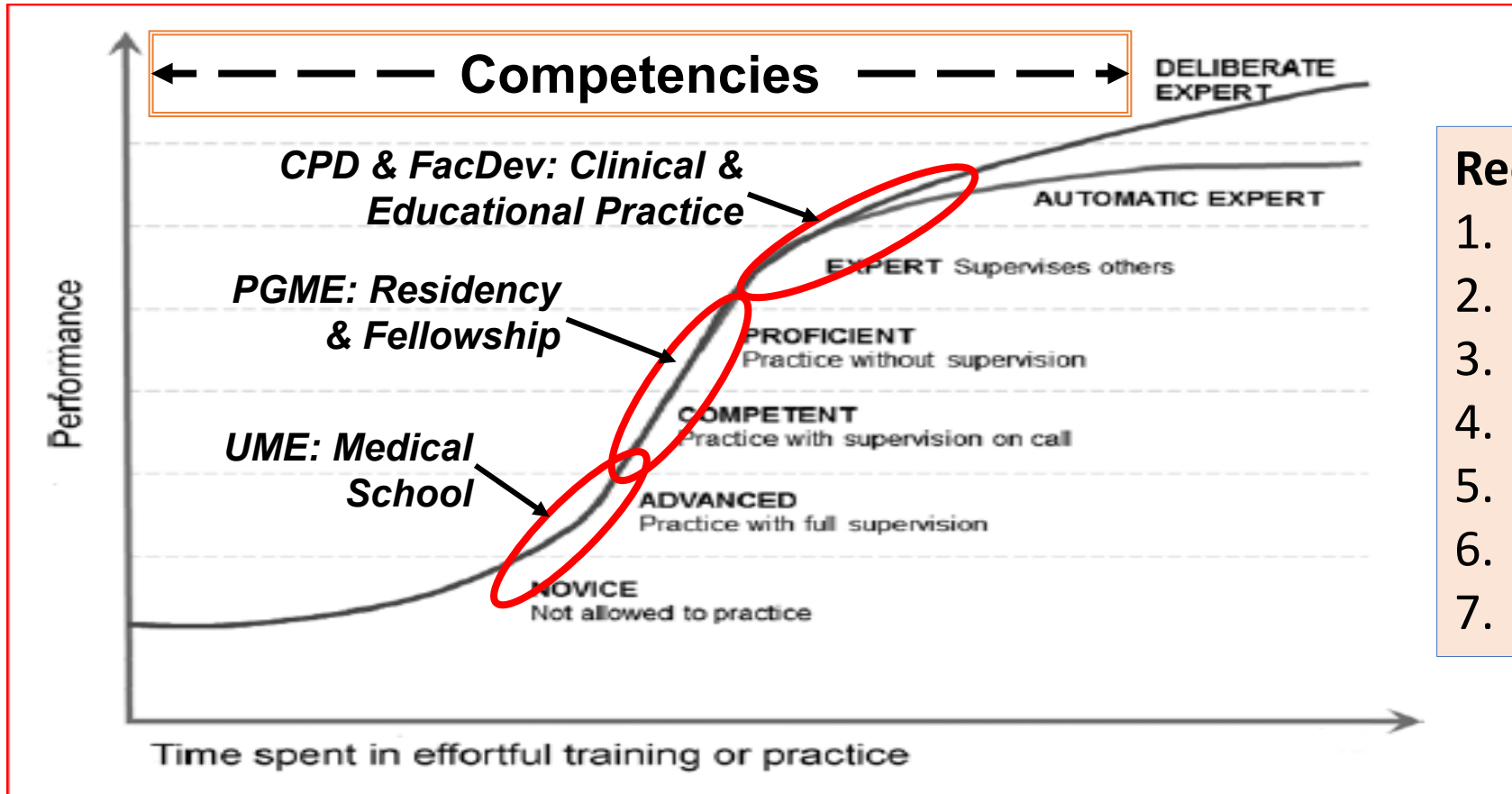
<p>#1 Outcome-based competency framework</p>	<ul style="list-style-type: none">▪ Desired outcomes of training identified based on societal needs▪ Outcomes are paramount for functioning in practice	<p>Scientist Physician</p>
<p>#2 Progressive sequencing of competencies</p>	<ul style="list-style-type: none">▪ Competencies and developmental markers explicitly sequenced▪ Must consider “building blocks” for development of competencies▪ Progression is not always smooth (vertical integration)	<p>Clinical Science, OSCE, SPs</p>
<p>#3 Learning experience tailored to competencies in CBME</p>	<ul style="list-style-type: none">▪ Time is a resource (not criterion)▪ Experiences sequenced in a manner that supports progression▪ Experience should resemble practice environments▪ Experiences should be tied to an essential graduate ability	<p>HSSIP MS4 Elective → Capstone</p>
<p>#4 Teaching tailored to competencies</p>	<ul style="list-style-type: none">▪ Clinical teaching emphasizes application (not knowledge)▪ Teachers use coaching techniques to diagnose a learner/give feedback▪ Learners engage in identifying learning needs▪ Teaching and learners “coproduce” learning	<p>“Integrated Foundational Science” Course</p>
<p>#5 Programmatic assessment</p>	<ul style="list-style-type: none">▪ Multiple data collection points▪ Emphasis is on workplace-based assessment▪ Emphasis on personalized, timely, meaningful feedback▪ Progression based on entrustment▪ Address implicit and explicit bias	<p>Coaching, Dashboard, “Precision Education”</p>

“Learning Curves” in CBME

Caroline's First Basketball Game



Learning Curves and Developmental Models

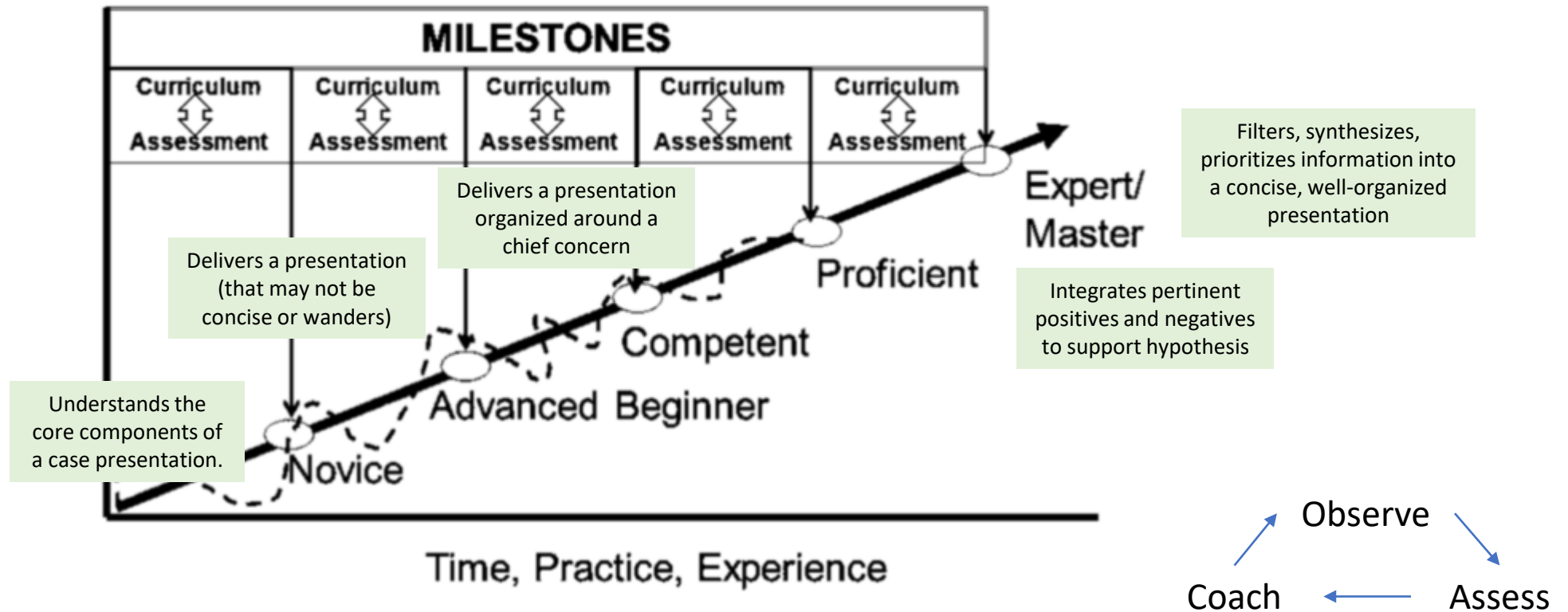


Requires:

1. Legitimate participatory roles
2. Reflective practice
3. Feedback
4. Deliberate practice
5. Coaching
6. Growth mindset
7. Systems thinking

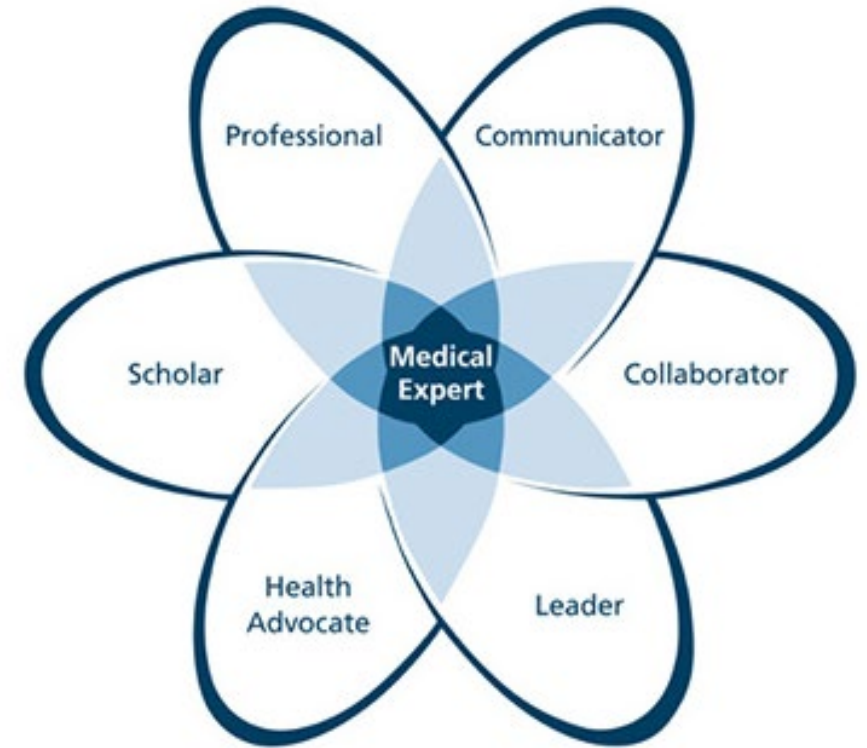
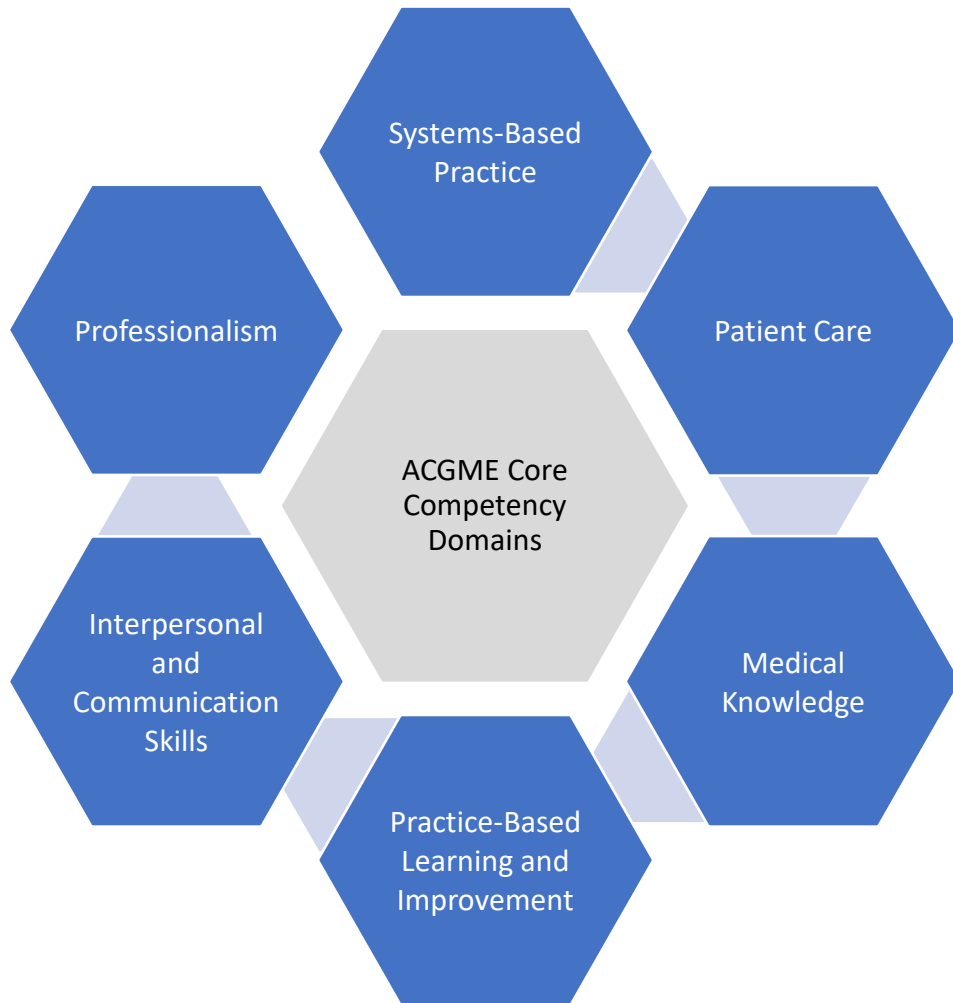
Holistic Assessments and Competencies

Competency/EPA – Provide an Oral Presentation of a Clinical Encounter.
 Key function: Provide accurate, well-organized oral presentation.



Competency Frameworks

ACGME Core Competencies



CANMEDS

The VTCSOM Educational Program Objectives

Educational Program Objectives

- Educational Program Objectives (EPOs) = blueprint of education outcomes for VTCSOM
- The EPOs are used as the “backbone” of all curricular/assessment priority areas.
- The former VTCSOM EPOs were created in 2008 (and edited/approved by MCC in 2013 and 2017)
- Our new EPOs (approved in August 2023) blend the following frameworks:
 - ACGME Harmonized Milestones
 - AAMC EPAs
 - AAMC Physician competencies
 - Several locally-created competencies
- The EPOs are an LCME requirement (Standards 6/6.1 and 8.2)
 - All courses and clerkships need to clearly articulate how the assessments map to the EPOs
 - This requires more than “global faculty assessments” at the end of clerkship

VTCSOM Educational Program Objectives

Education Program Objective

VTC-SBP3_EPO11: System Navigation for Patient Centered Care Collaborates with health system and community partners to innovate and advocate for improvements that optimize patient outcomes.					
Subcompetency	Level 1	Level 2	Level 3	Level 4	Level 5
CD3_S17: Care coordination of a patient's care Contributes to effective and timely coordination of a patient's care between shifts, locations, and time.	Demonstrates knowledge of care coordination	Coordinates care of patients in routine clinical situations effectively utilizing the roles of the interprofessional teams	Coordinates care of patients in complex clinical situations effectively utilizing the roles of their interprofessional teams	Role models effective coordination of patient-centered care among different disciplines and specialties	Analyses the process of care coordination and leads in the design and implementation of improvements
CD3_S18: Transitions of care and handoffs Ability to contribute to and lead effective and safe patient handoffs between units, shifts, and healthcare delivery settings. [EPA 8]	Identifies key elements for safe and effective transitions of care and handoffs	Performs safe and effective transitions of care/handoffs in routine clinical situations	Performs safe and effective transitions of care/handoffs in complex clinical situations	Role models and advocates for safe and effective transitions of care/handoffs within and across healthcare delivery systems including outpatient settings	Improves quality of transitions of care within and across healthcare delivery systems to optimize patient outcomes
CD3_S19: Population and community health needs and inequities Ability to assess and address healthcare inequities of patients in local, regional, and national contexts with the goal of improving outcomes for diverse patient populations.	Demonstrates knowledge of population and community health needs and disparities.	Identifies specific population and community health needs and inequities for their local population	Uses local resources effectively to meet the needs of a patient population and community	Participates in changing and adapting practice to provide for the needs of specific populations	Leads innovations and advocates for populations and communities with health care inequities

Subcompetency

Milestone 1

Milestone 2

Milestone 3

Milestone 4

Milestone 5

Reflections

1. Any reflections on the VTCSOM EPOs? Anything missing?
2. What are your reflections on the core concepts of CBME discussed in this session?

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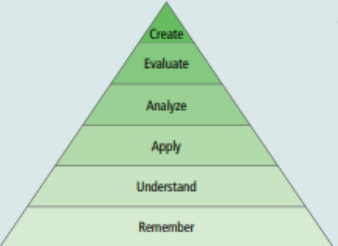
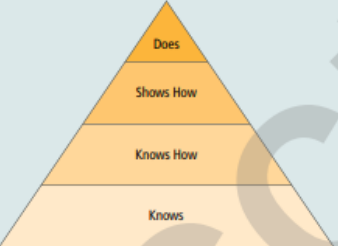

THANK YOU!!!

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Blending “Session Objectives” to “Competencies”

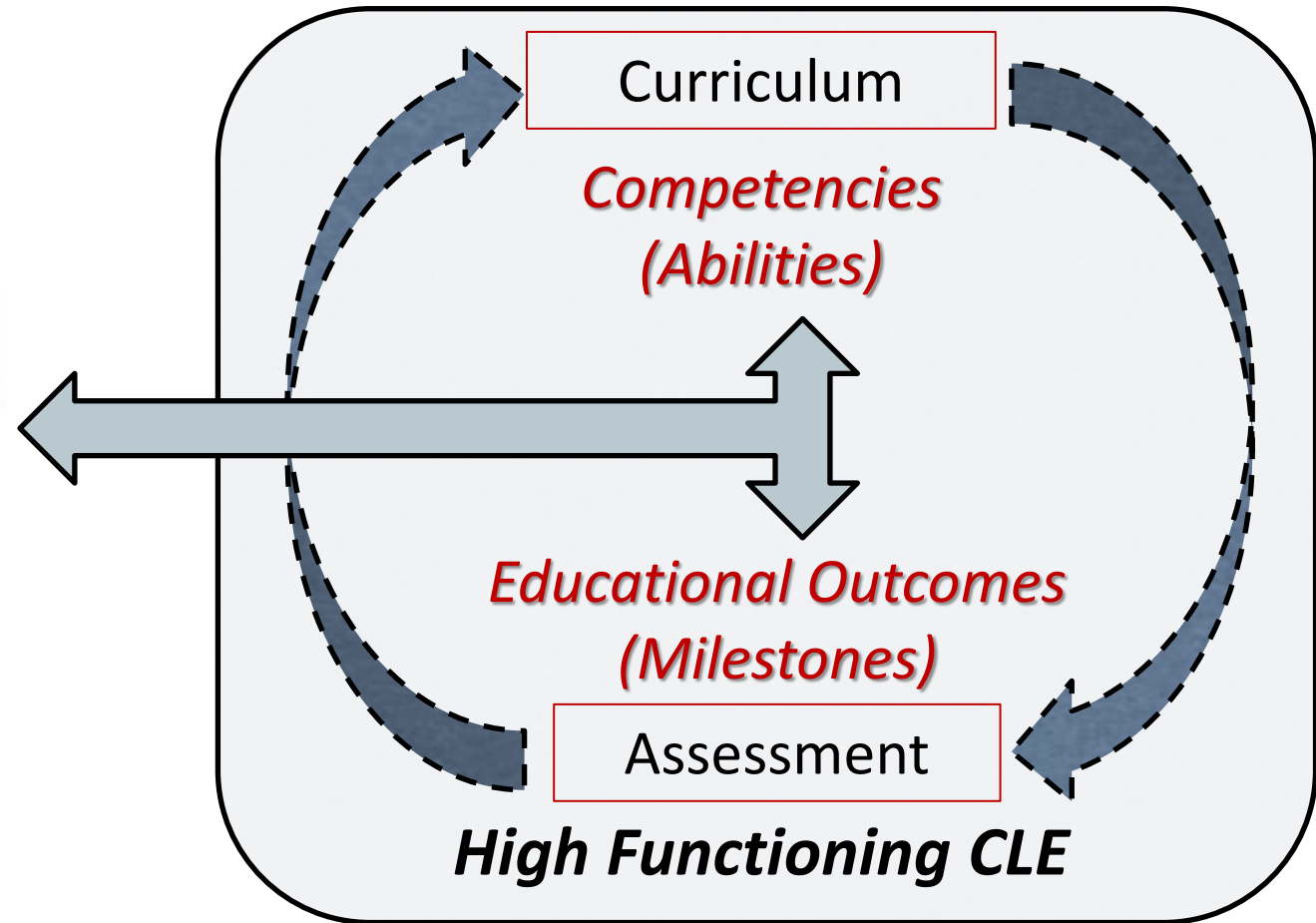
What are some key distinctions between three commonly used educational pyramids in medical education?

BLOOM'S TAXONOMY OF EDUCATIONAL OBJECTIVES ^{1,2}	
	<p>What will be ASSESSED? Cognitive learning</p> <p>What do the LEVELS OF THE PYRAMID indicate? Moving up the pyramid, what can the learner do? Create – Design or develop new or original work? Evaluate – Critique or defend a decision? Analyze – Organize or draw connections among ideas? Apply – Interpret or apply information in new situations? Understand – Describe or explain concepts? Remember – Define or recall facts and basic concepts?</p> <p>WHEN to choose Bloom's Taxonomy? When writing learning objectives, developing a curriculum, or designing a flipped classroom.</p>
MILLER'S FRAMEWORK FOR CLINICAL ASSESSMENT ³	
	<p>What will be ASSESSED? Behavior or performance</p> <p>What do the LEVELS OF THE PYRAMID indicate? Moving up the pyramid, what can the learner demonstrate? Does – Incorporate the clinical skill into their work? Shows How – Demonstrate the application of clinical skills under supervision? Knows How – Collect, interpret, and use data necessary to apply clinical knowledge? Knows – Describe the components of a clinical skill?</p> <p>WHEN to choose Miller's Framework? When assessing learners' clinical reasoning or technical skills.</p>
KIRKPATRICK'S TRAINING EVALUATION MODEL ⁴	
	<p>What will be ASSESSED? Programmatic effects or effectiveness</p> <p>What do the LEVELS OF THE PYRAMID indicate? Moving up the pyramid, what can the learner demonstrate? Results – Influence lasting change in the workplace? Behavior – Lead to behavior change in the program? Learning – Acquire the intended knowledge, skills, or attitudes? Reaction – Enjoy the training and feel it is relevant to their work?</p> <p>WHEN to choose Kirkpatrick's Model? When evaluating the effects of a program on trainees, patients, or populations.</p>

CBME Frameworks

	Milestones	Competency	EPA
Scope	Overarching trajectory	Discreet, observable ability	Professional activity
Timing	Prolonged	Singular	Iterative, Progressive, Varied contexts
How assessed?	Synthesis of other assessment data; Infrequent but routine	Discreet singular assessments; Multiple points of time	Entrustment
Feedback	Formative; Appropriate development?	Formative or summative; Specific	Formative; Contextual
Bottom Line	Road map to ensure progression	The thing they need to do	Assessment strategy to evaluate competencies in context

The Ultimate Goal of CBME



AAMC Core EPA's for Entering Residency (CEPAER)

- EPA 1 - Gather a history and perform a physical examination
- EPA 2 – Prioritize a differential diagnosis following a clinical encounter
- EPA 3 – Recommend and interpret common diagnostic and screening tests
- EPA 4 – Enter and discuss orders and prescriptions
- EPA 5 – Document a clinical encounter in the patient record
- EPA 6 – Provide an oral presentation of a clinical encounter
- EPA 7 – Form clinical questions and retrieve evidence to advance patient care
- EPA 8 – Give or receive a patient handover to transition care responsibly
- EPA 9 – Collaborate as a member of an interprofessional team
- EPA 10 – Recognize a patient requiring urgent or emergent care and initiate evaluation and management
- EPA 11 – Obtain informed consent for tests and/or procedures
- EPA 12 – Perform general procedures of a physician
- EPA 13 – Identify system failures and contribute to a culture of safety and improvement



Internal Medicine Milestones

1. Gathers and synthesizes essential and accurate information to define each patient's clinical problem(s). (PC1)				
Critical Deficiencies			Ready for unsupervised practice	Aspirational
Does not collect accurate historical data	Inconsistently able to acquire accurate historical information in an organized fashion	Consistently acquires accurate and relevant histories from patients	Acquires accurate histories from patients in an efficient, prioritized, and hypothesis-driven fashion	Obtains relevant historical subtleties, including sensitive information that informs the differential diagnosis
Does not use physical exam to confirm history	Does not perform an appropriately thorough physical exam or misses key physical exam findings	Seeks and obtains data from secondary sources when needed	Performs accurate physical exams that are targeted to the patient's complaints	Identifies subtle or unusual physical exam findings
Relies exclusively on documentation of others to generate own database or differential diagnosis	Does not seek or is overly reliant on secondary data	Consistently performs accurate and appropriately thorough physical exams	Synthesizes data to generate a prioritized differential diagnosis and problem list	Efficiently utilizes all sources of secondary data to inform differential diagnosis
Fails to recognize patient's central clinical problems	Inconsistently recognizes patients' central clinical problem or develops limited differential diagnoses	Uses collected data to define a patient's central clinical problem(s)	Effectively uses history and physical examination skills to minimize the need for further diagnostic testing	Role models and teaches the effective use of history and physical examination skills to minimize the need for further diagnostic testing
Fails to recognize potentially life threatening problems				
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:				



Our Professions' Core Competencies

Graduate Medical Education:

1. Patient Care
2. Knowledge for Practice
3. Professionalism
4. Interpersonal Communication Skills
5. Practice-Based Learning/Improvement
6. Systems-Based Practice

Physical Therapy Competencies:

1. Clinical Reasoning
2. Knowledge for Specialty Practice
3. Professionalism
4. Communication
5. Education
6. Systems-Based Practice

Pharmacist Competencies:

1. Direct Patient Care
2. Pharmacotherapy Knowledge
3. Systems-Based Care/Pop. Health
4. Communication
5. Professionalism
6. Professional Development

Unifying Competencies:

1. Systems-Based Practice
2. Population Health
3. Quality and Safety
4. Informatics and Technology
5. Leadership
6. Professionalism

Undergraduate Medical Education:

1. Patient Care
2. Knowledge for Practice
3. Professionalism
4. Interpersonal Communication Skills
5. Practice-Based Learning/Improvement
6. Systems-Based Practice
7. Interprofessional Collaboration
8. Personal/Professional Development

Professional Nursing Education:

1. Knowledge for Nursing Practice
2. Person-Centered Care
3. Population Health
4. Scholarship
5. Quality and Safety
6. Interprofessional Partnerships
7. Systems-Based Practice
8. Informatics/Technologies
9. Professionalism
10. Professional, Leadership

Learning Curves and Inter-Trainee Variation

