Competency-Based Education: the What, Why, and How

H. Carrie Chen, MD, PhD
Senior Associate Dean for Assessment
and Educational Scholarship
Professor of Pediatrics

GEORGETOWN UNIVERSITY

Conflicts of Interest

- No financial conflicts of interest
- Faculty in International Course on Ins & Outs of Entrustable Professional Activities

Objectives

- Explain the concept of competency-based education (CBE)
- Describe the five core components of CBE
- Compare the two main approaches or frameworks for defining outcomes in CBE

Competency-Based Education: Definitions

"An outcomes-based approach to the design, implementation, assessment, and evaluation of [health professions] education programs, using an organizing framework of competencies"

"An approach to preparing [health professionals] 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 greater accountability, flexibility, and learner-centeredness"

Frank et al., *Medical Teacher* 2010

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What Do We Mean by Outcomes-Based?

Learning (outcome) versus Teaching (process)

Unacceptable Variability in Graduates

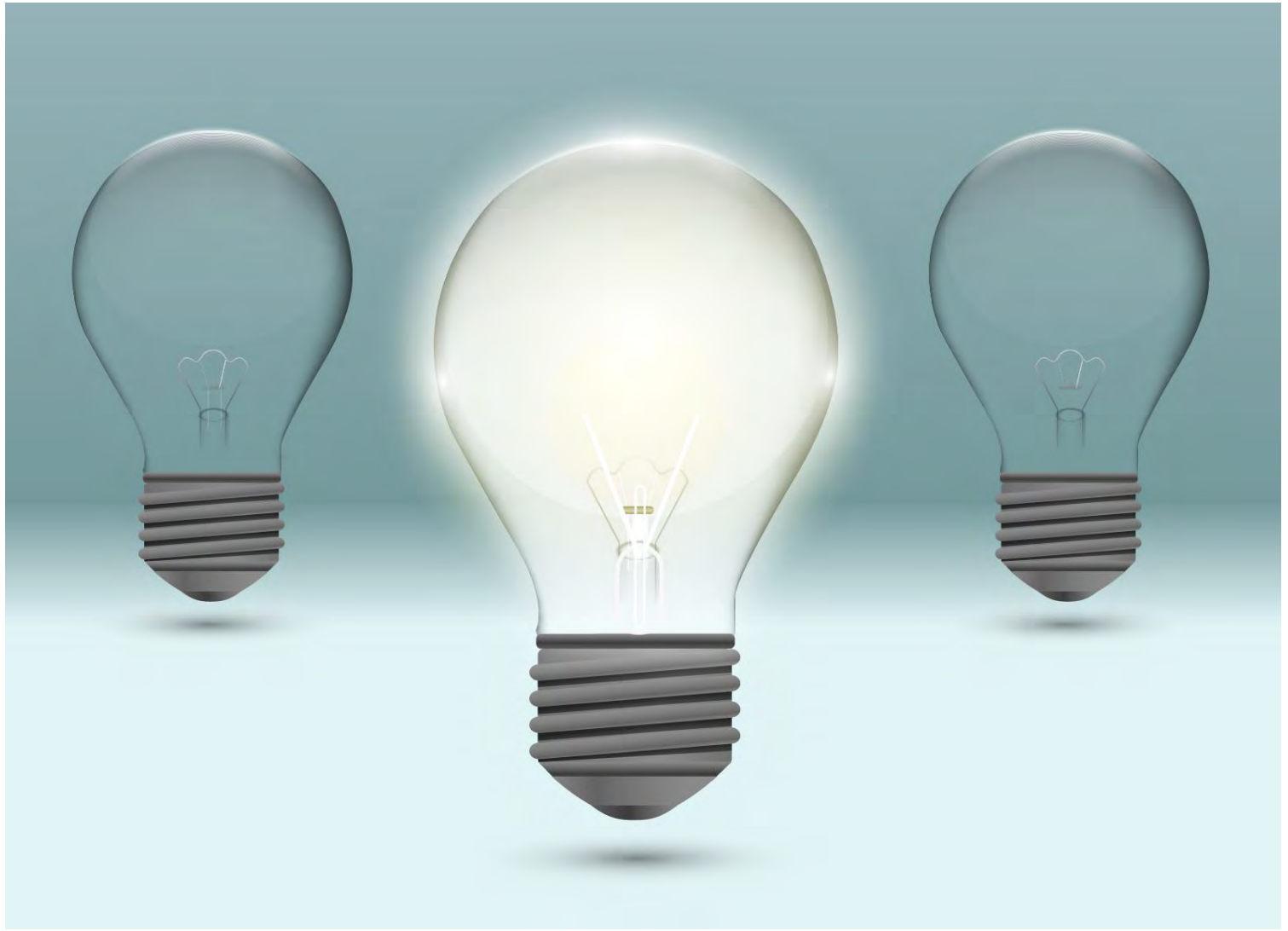
In Health Professions Education

- Promise to employers and public
  - Graduates are capable
  - Graduates will deliver quality & safe patient care
  - They are vs they should be

- Move from monitoring of teaching process (content & time) to ensuring learning outcomes

Not New Concept

- WHO 1978
- Medicine revival in 1990s/2000s



Frank et al., *Medical Teacher* 2010
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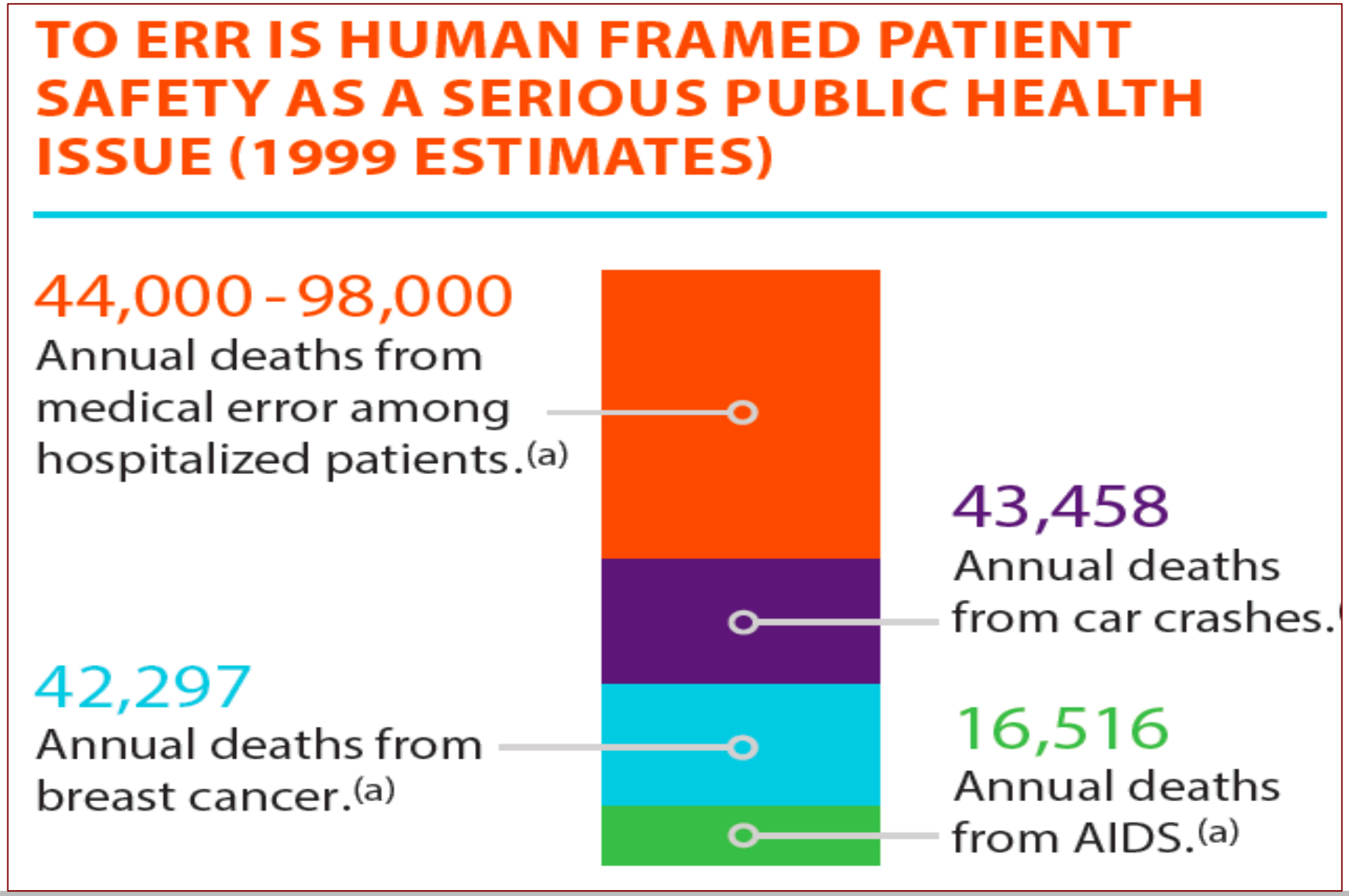
TO ERR IS HUMAN FRAMED PATIENT SAFETY AS A SERIOUS PUBLIC HEALTH ISSUE (1999 ESTIMATES)



Evidence that some graduates not prepared for safe effective practice

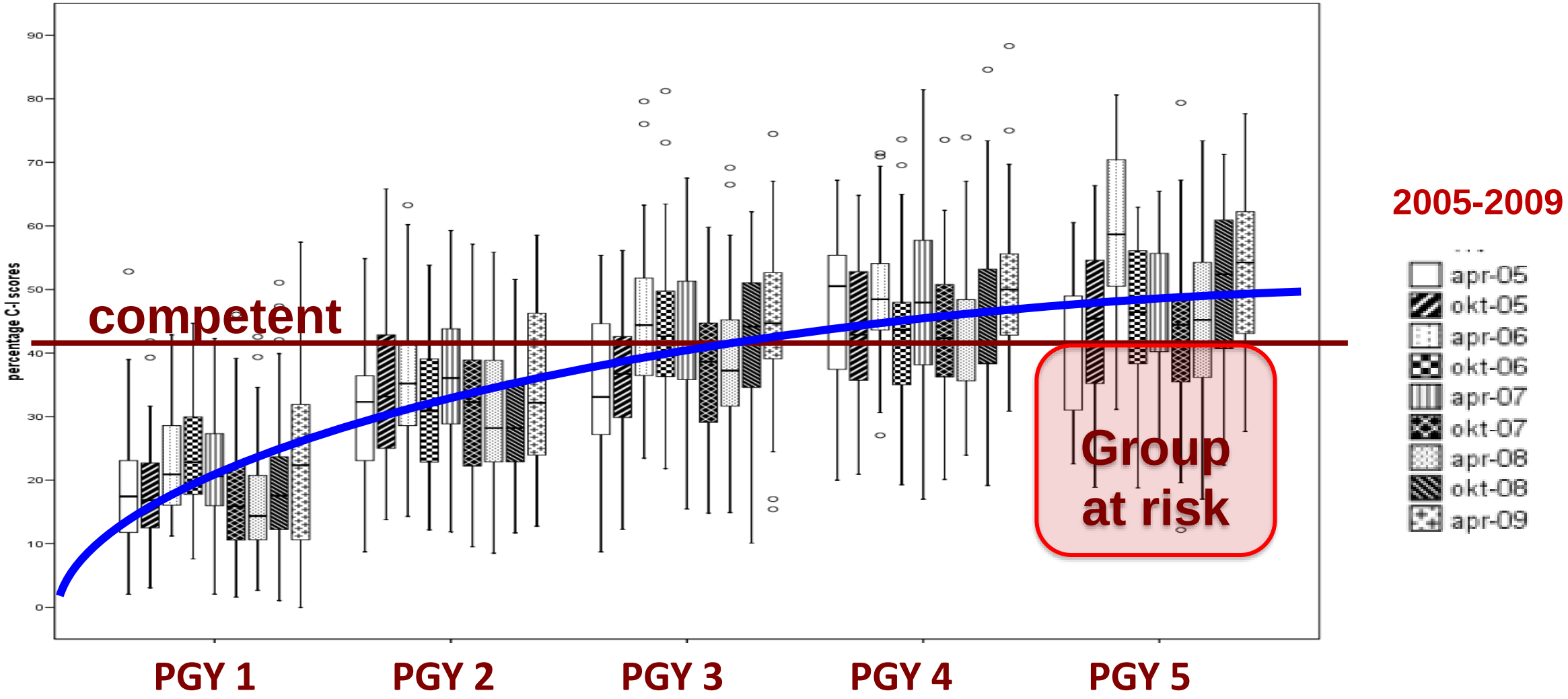
Kohn et al., To Err is Human: Building a Safer Health System 2000

Current Reality

Diagnostic Errors

- Contribute to approx. 10% of patient deaths
- Account for 6-17% of hospital adverse events
- Experienced by >5% of adults seeking outpatient care/year
- Experienced at least once by all Americans in their lifetime

Dutch Radiology Residents Progress Test Scores

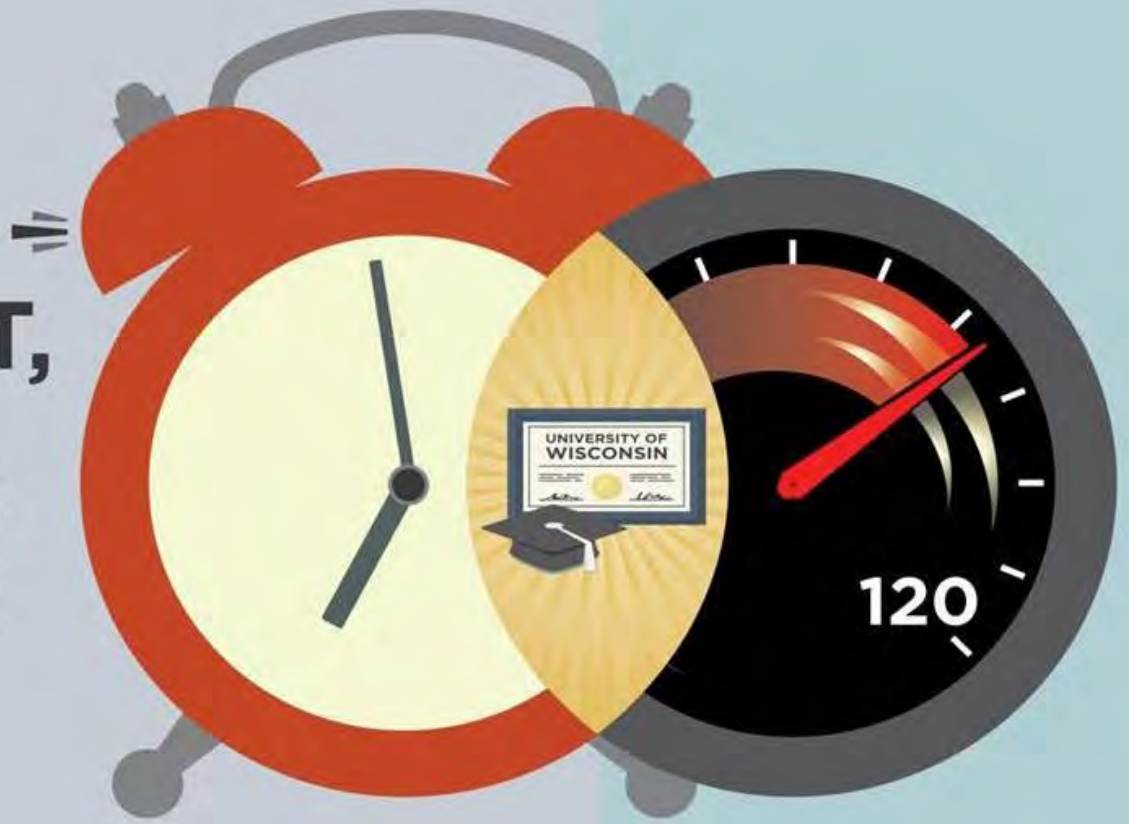


Ravesloot et al., *Medical Teacher* 2012
Graphic from ten Cate

MD Training & Variable Patient Outcomes

- Obstetricians in New York & Florida
  - Vaginal & caesarian deliveries 1992-2010
  - Complication rates (hemorrhage, infection, etc.)
- What matters
  - Where trained (10.3% vs 13.5% complication rate)
  - Experience (↓2% 1st decade, then 1%, then 0.5%)
- What matters most
  - Initial skill (persistent differences > 15 years)

TIME IS
CONSTANT,
BUT
LEARNING IS
VARIABLE



TIME IS
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CONFERENCE
RECOMMENDATIONS
JUNE 14–17, 2017 | ATLANTA, GA
JOSIAH MACY JR FOUNDATION
Achieving Competency-Based, Time-Variable Health Professions Education
Recommendations from the Macy Foundation Conference

Essence of CBE

- Definition: outcome-based (not process-based) education aimed at standard level of proficiency for all graduates

- Critical features:
  - Clear description of desired outcomes and standards (good health professional)
  - Assessment of all learners using these standards
  - Achievement of outcomes/ standards is basis for graduation

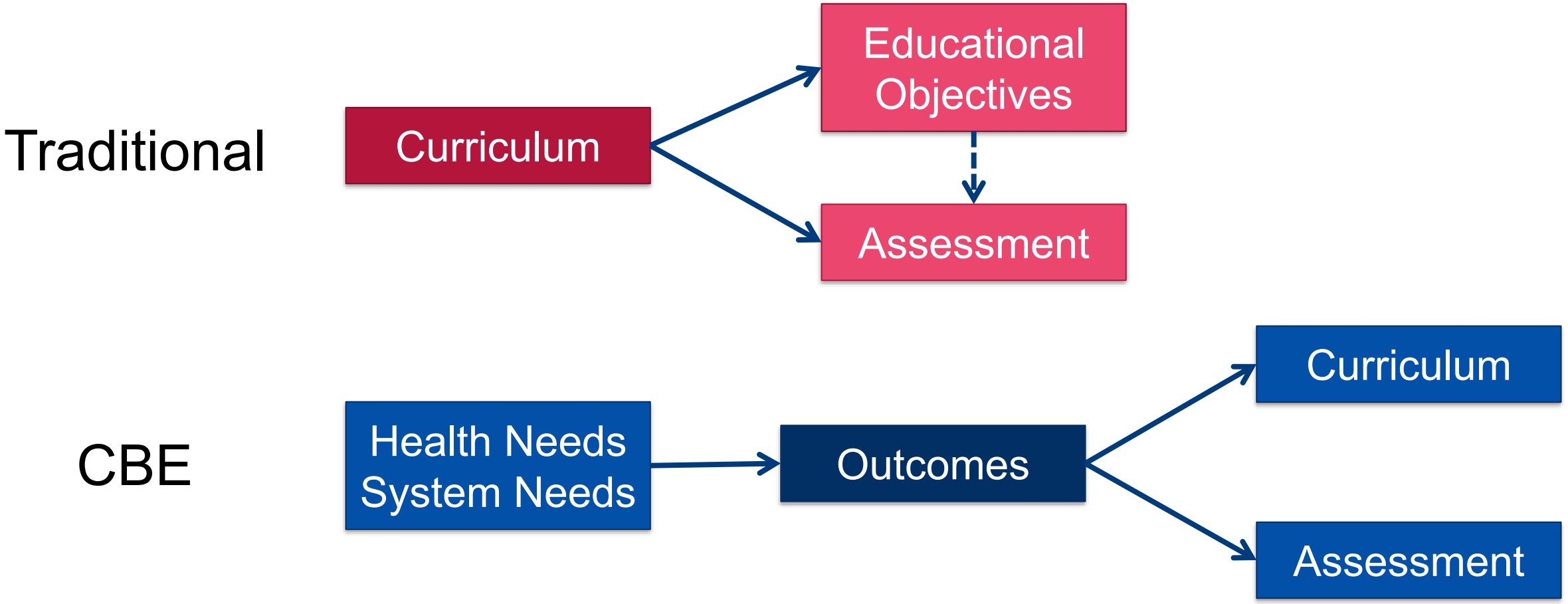
Reminder

- Goal of safer and higher quality care
  - Progression via demonstrated achievement of outcomes/ standards
  - Assessments allow coached progression
- Time is resource, not proxy for competence
  - Competence is **assessed**, not **assumed**
  - Practitioners licensed only when standards met

Operationalizing

CBE

Curricular Models



What are the Ingredients of CBE?

Image from Freepik.com designed by macrovector

1. Outcome Competencies

Component	What it looks like in practice	How it works in principle
Competencies required for practice are *clearly articulated*	Required outcome competencies based on profile of graduate and/or practice-based abilities	Specification of learning outcomes promotes focus and accountability

2. Sequenced Progression

Component	What it looks like in practice	How it works in principle
Competencies and their developmental markers are *sequenced progressively*	Competencies are organized in a way that leads to a logical developmental sequence across the continuum of training or practice	A sequential path supports the development of expertise

3. Tailored Learning Experiences

Component	What it looks like in practice	How it works in principle
Learning experiences *facilitate* the developmental acquisition of competencies	Learning takes place in settings that model practice, is flexible enough to accommodate variation in individual learner needs, and is self-directed	Learning through real life experiences facilitates membership into the practice community and development of competencies

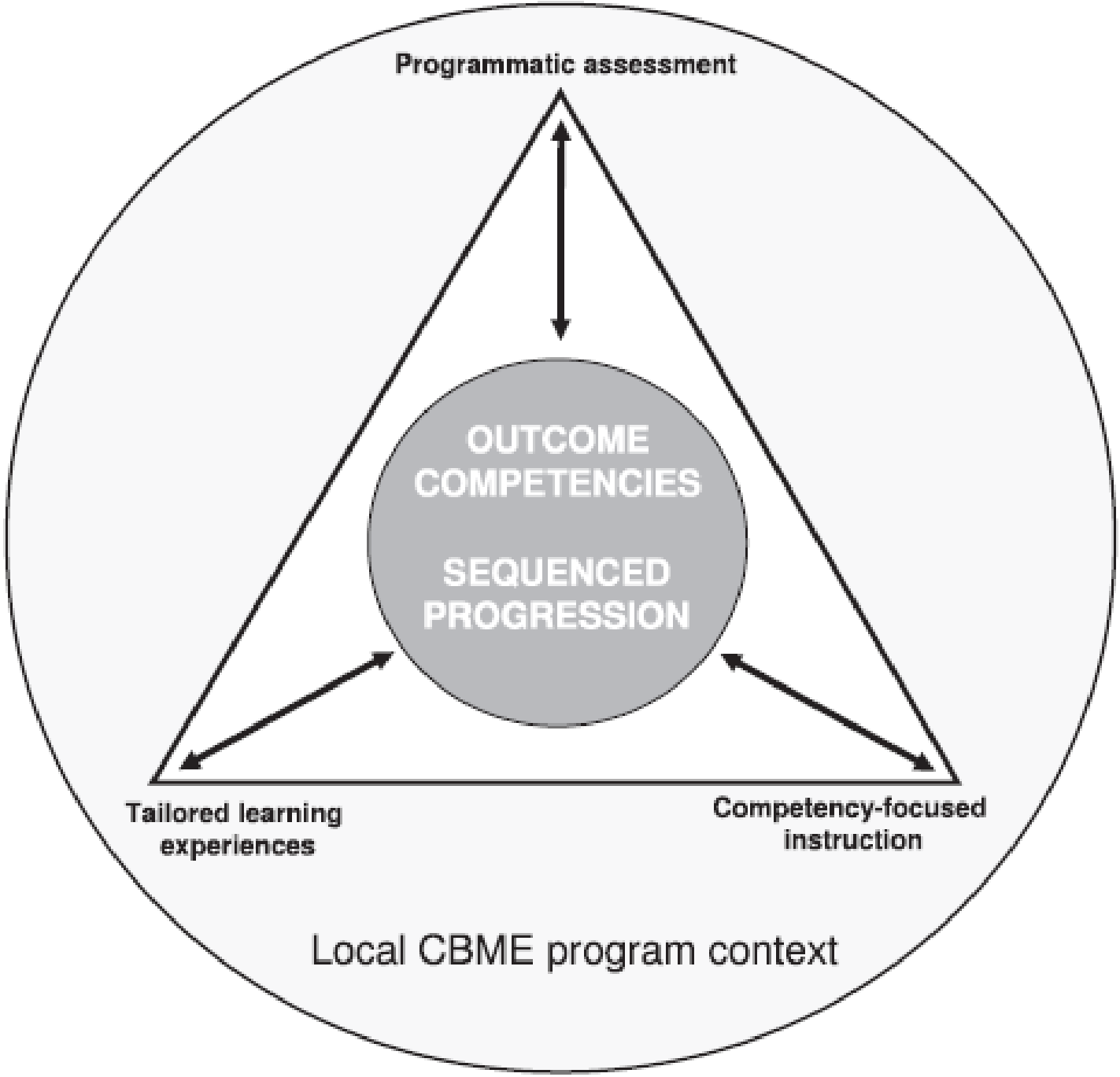
4. Competency-based Instruction

Component	What it looks like in practice	How it works in principle
Teaching practices *promote* the developmental acquisition of competencies	Teaching is individualized to the learner, based on abilities required to progress to the next stage of learning	Development of competence is stimulated when learners are supported to learn at their own pace and stage

5. Program of Assessment

Component	What it looks like in practice	How it works in principle
Assessment practices *support and document* the developmental acquisition of competencies	Learner progression is based on a systematic approach to decision making including standards, data collection, interpretation, observations and feedback	Programmatic assessment systems allow for valid and reliable decision making

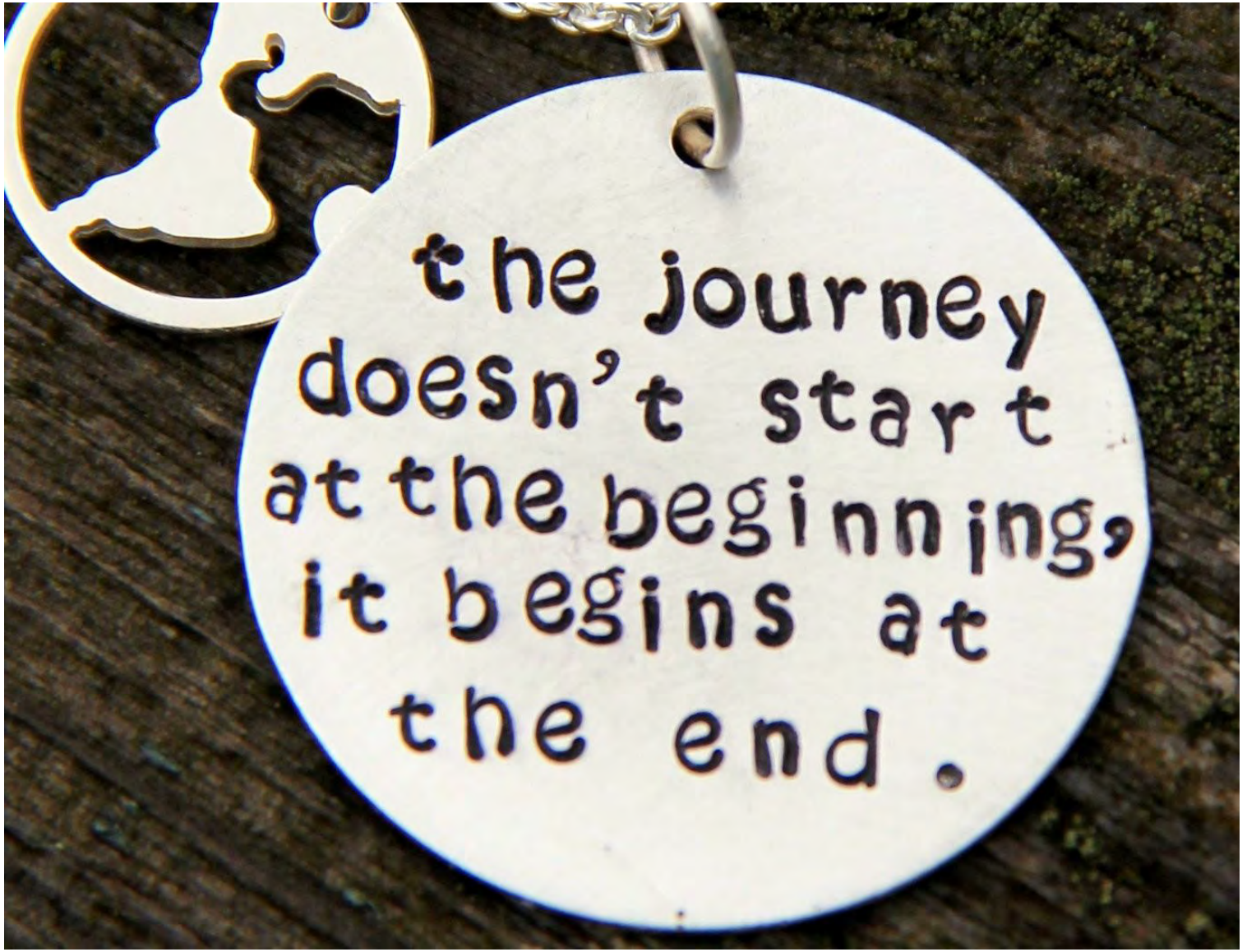
Five Core Components of CBE at Work



Van Melle et al., *Academic Medicine* 2019

Step 1:

Defining Outcome Competencies



Two Main Approaches

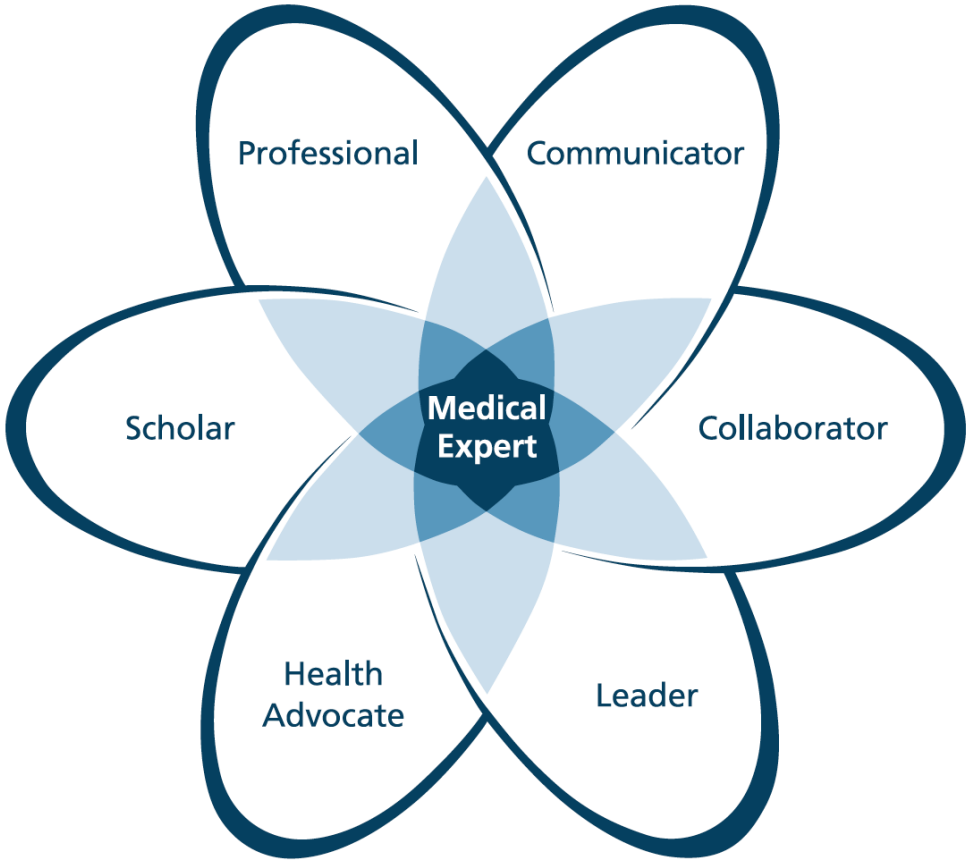
Adapted from ten Cate

Framing Outcomes as Competencies Graduates Should Possess

ACGME Outcome project

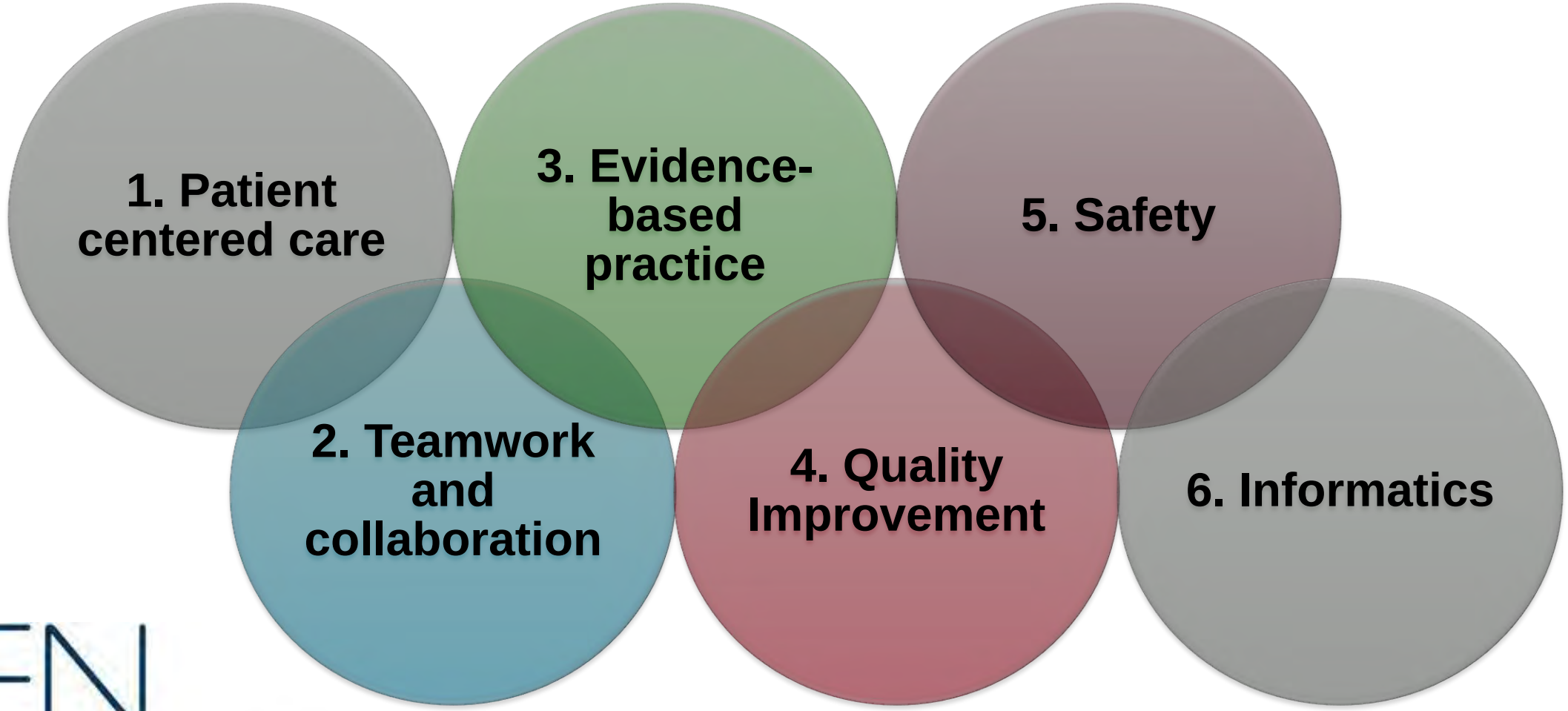
enhancing residency education through outcomes assessment

- Patient care
- Medical knowledge
- Practice based learning & improvement
- Interpersonal and communication skills
- Professionalism
- Systems-based practice



CanMEDS

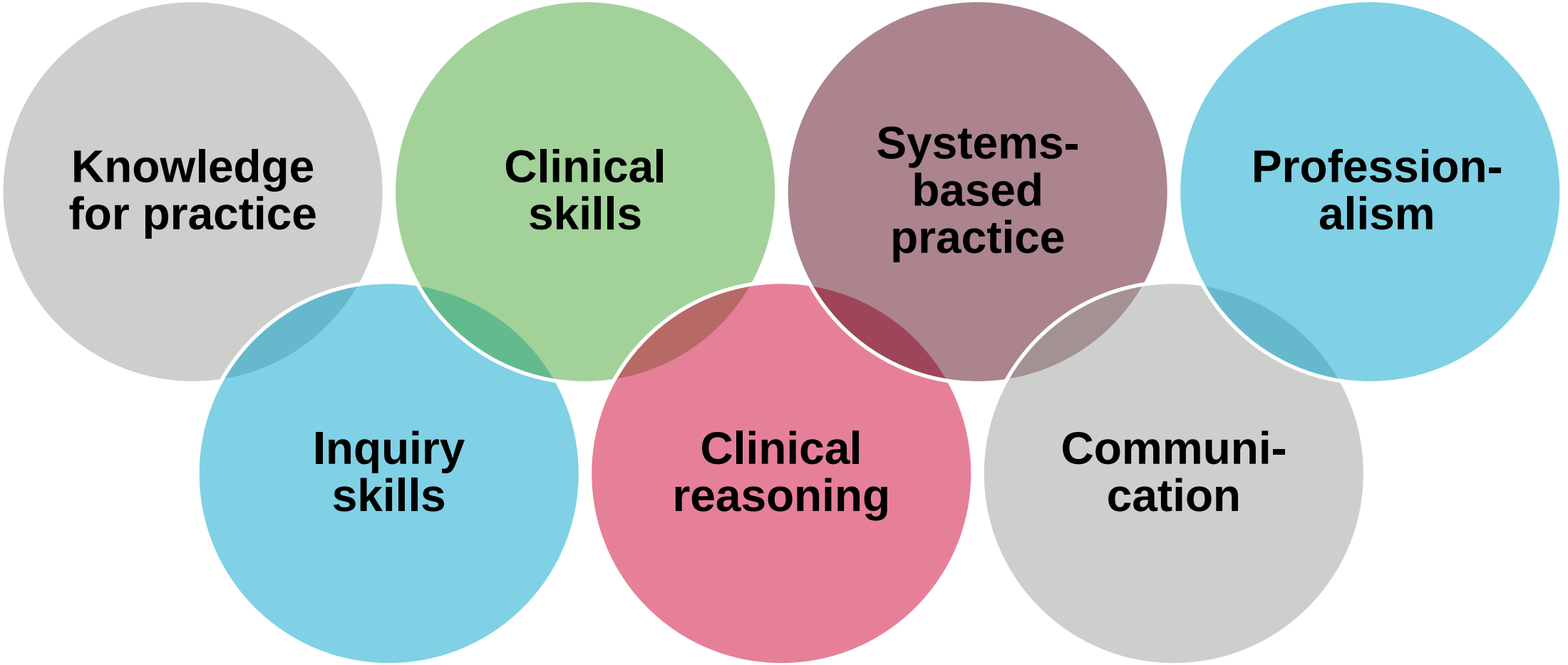
American College of Clinical Pharmacy



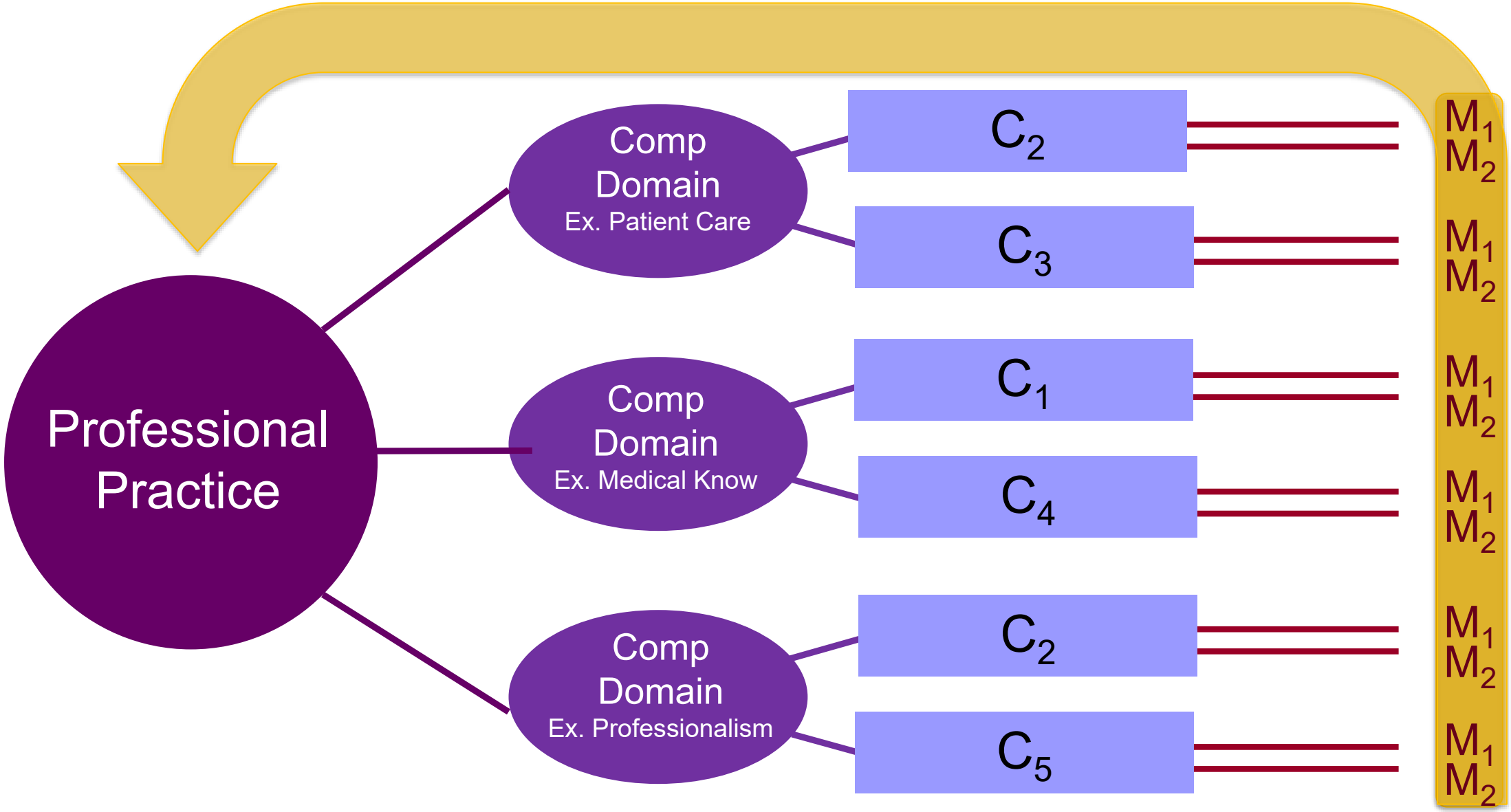
QSEN INSTITUTE

Quality and safety education for nurses

Proposed for PT Residency/Fellowship Programs



Furze et al. *Physical Therapy* 2016



Adapted from AAMC 2014

Concern for Reductionism

- Everything reduced to checklist of competencies
  - Don’t add up to practice
  - Don’t ensure integration & application
- Focus on objective assessments
  - Measuring what is easy vs relevant
  - Assume capabilities are context free

Most Common Competency Approach

- Define competencies
  - Knows traffic rules
  - Can accelerate and brake smoothly
  - Can make right, left, and u-turns
- Ensure competent drivers
  - Pass driver's education classes
  - Pass driver's license test (written + driving)

Determining Competence

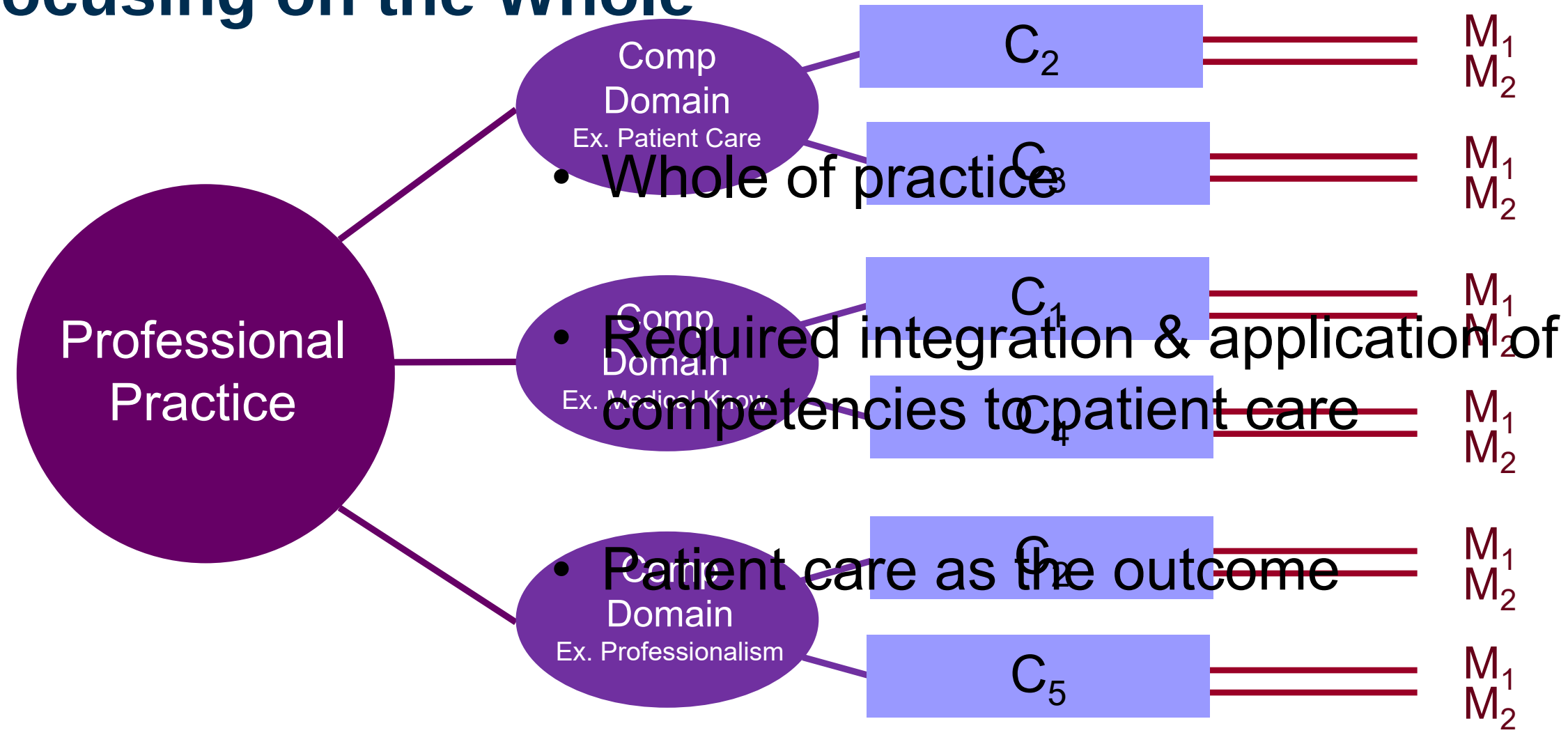
Passed driver's license exams

Can be trusted to drive carefully and safely

Criteria for Choosing a Health Professional

- Years of training?
- Passed all written exams?
- Scores on skills exams?
- Follows protocols and guidelines?
- Can care for patients/ manage cases in best way possible?

Focusing on the Whole



- Whole of practice
- Required integration & application of competencies to patient care
- Patient care as the outcome

Analytic vs Holistic Approach

AI Challenge: Dog or Muffin

Framing Outcomes as Work Graduates Should Be Able to Do

Outcomes as Patient Care Activities

Entrustable Professional Activities (EPAs) are units of professional practice that can be entrusted to a sufficiently competent learner or professional

- Essential concrete clinical activities
- Allow deliberate decisions of “entrustment”
- Portfolio of mastered EPAs = full competence

Example EPAs from Graduate Medical Education

- Manage care of patients with chronic disease (internal medicine)
- Manage high risk childbirth (obstetrics & gynecology)
- Manage psychiatric emergencies (psychiatry)
- Manage a non-OR patient with chronic pain (anesthesia)
- Care for a well newborn (pediatrics)

AAIM 2012; Garofalo et al. *Cureus* 2018; Young et al. *Academic Medicine* 2018; Woodworth et al. *Anesthesia & Analgesia* 2021; ABP 2013

Sample AAMC Core EPAs

- Gather history & perform physical examination
- Prioritize differential diagnosis following clinical encounter
- Recommend and interpret common diagnostic/ screening tests
- Enter & discuss orders/ prescriptions
- Document clinical encounter in patient record
- Provide oral presentation of clinical encounter
- Give/ receive patient handover

Sample Undergraduate Nursing EPAs (Singapore)

- Perform comprehensive health assessments and deliver and evaluate care for patients
- Perform procedures required of a registered nurse
- Recognize patients requiring emergency care, initiate management, assist in resuscitation, and stabilize critically ill patients
- Conduct education for patients, families, or caregivers to improve health through health promotion and disease promotion
- Perform assessments and deliver and evaluate care for patients requiring palliative or end-of-life care in the hospital or community

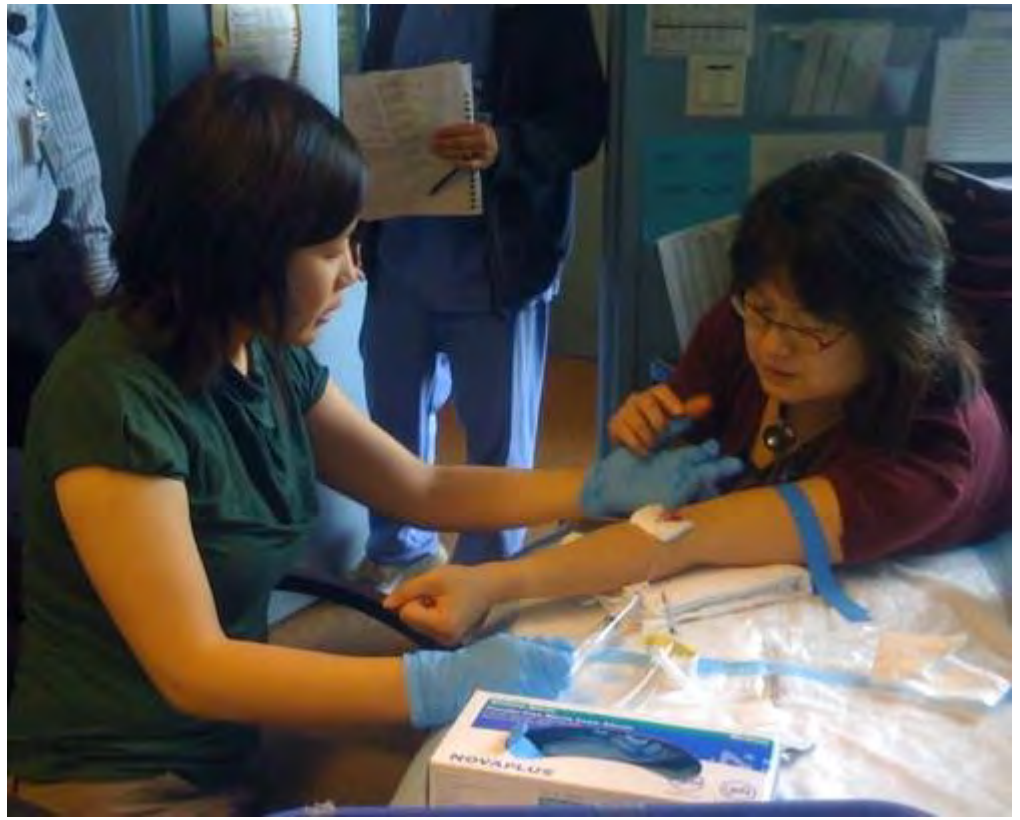
Key Elements of EPA Framework

1. Holistic approach to competencies
2. Links entrustment & supervision to assessment
3. Highlights consequences of assessment

Entrustment/Supervision as Assessment

Shall I trust this learner to…

- Aligns with supervision decisions faculty already make every day
- Results in meaningful advancement in learner responsibility



EPA Entrustment-Supervision Scale

Original (GME) Entrustment Scale	
1	Not allowed to practice EPA
2	Allowed to practice under proactive full supervision
3	Allowed to practice under reactive supervision
4	Allowed to practice EPA unsupervised
5	Allowed to supervise others in practice of EPA

ten Cate et al., *Medical Teacher* 2010

EPA Entrustment-Supervision Scale

Original Scale		Expanded Scale
1	Not allowed to practice EPA	1a. Not allowed to observe 1b. Allowed to observe
2	Allowed to practice under proactive full supervision	2a. As coactivity with supervisor 2b. With supervisor in room ready to step in as needed
3	Allowed to practice under reactive supervision	3a. With supervisor immediately available, all findings/decisions double checked 3b. With supervisor immediately available, key findings/decisions double checked 3c. With supervisor distantly available, findings/decisions reviewed
4	Allowed to practice unsupervised	4a. With supervisor available on call to come provide supervision 4b. With supervisor not available but may provide feedback and monitoring in hindsight
5	Allowed to supervise others	

Chen et al., *Academic Medicine* 2015; ten Cate et al., *Medical Teacher* 2018

Five Factors Influencing Readiness for Entrustment

Capability	knowledge, skills, experience, situational awareness
Reliability	conscientious, predictable, accountable, responsible
Integrity	truthful, benevolent, patient-centered
Humility	recognizes limits, asks for help, receptive to feedback
Agency	proactive toward work, team, safety, personal development

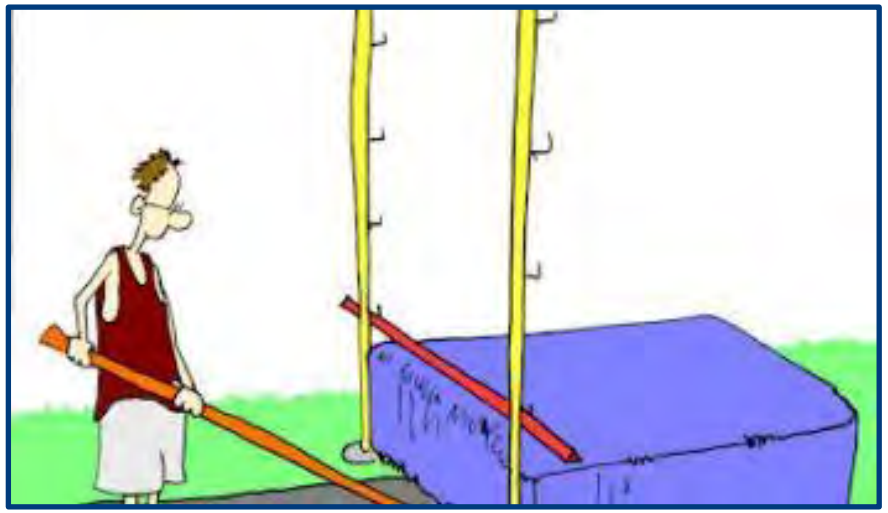
Weighing these factors makes for A RICH entrustment decision

Students: David and Amy

- David
  - expected knowledge/skill
  - identifies gaps
  - asks questions
- Amy
  - impressive knowledge/skill
  - does not ask for help
  - did not report key finding

Criticisms of CBE

1. Philosophical / ideologic concern
   – Fails to promote excellence
   – Same problems as current training
2. Lack of evidence
3. Impact on existing systems
4. Implementation challenges
5. Reductionism



What are the Ingredients of CBE?

1. Outcome competencies
2. Sequenced progression
3. Tailored learning experiences
4. Competency-focused instruction
5. Programmatic assessment

Van Melle et al., *Academic Medicine* 2019
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Recap

- CBE is about ensuring learner outcomes and meeting societal needs
- CBE implementation includes not just defining outcomes, but attention to curriculum (sequenced, tailored experiences, competency-focused) and assessment
- Currently, two main approaches to defining outcomes – competency domains and entrustable professional activities

What Are We Trying to Achieve?

- Adopt a competency framework for health professions education training programs?
  - Define practitioners who are capable of coping with unpredictable requirements of practice
- Implement tools for competency assessment?
  - Provide safe quality care in the context of
- Graduate learners who meet standards at the time of graduation or licensing?
  - Train learners for lifelong learning practice

Thank You

Carrie.Chen@Georgetown.edu