# Competency-Based Medical Education: Understanding the Principles

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# Goals of this webinar…

- To lay the foundation for future sessions in this series;
- To outline reasons why we need to change our current education system, and how CBME may address these;
- To define competency-based medical education (CBME) and common terms that are used when discussing it;
- To enumerate the 5 components of CBME;
- To describe models for implementing CBME across the continuum of medical education.

# Where this webinar fits….

- The Rising Tide of Competency-based Medical Education: A Global View (Jason Frank 2017)

Main messages:

- History of CBME
- Current status of health professions education
- Definition of CBME terms
- Principles of CBME

# Where this webinar fits….

- The Rising Tide of Competency-Based Medical Education: A Global View
- **Competency-Based Medical Education: Understanding the Principles**
- Generating Trust in Entrustment: an update from the AAMC Core EPA Pilot Group
- Integration, competence and expertise: Preparing learners for the future
- Continuity, LICs and Competency-based Education
- Competency based education across the UME-GME continuum: the EPAC program
- …

# Something to think about …

## When does your kid get to drive the car?

- *Competency*
  - Can accelerate and brake smoothly
  - Can approach an intersection and can turn left
- *Competent*
  - Completes driver's education classes
  - Passes driver's license exam
- *Competence*
  - Drives safely on highway or during bad weather
  - Avoids accidents, no traffic tickets

# ‘Competenglish’

Competency – the thing(s) they need to do

Competent – can do all of the things

Competence – does all of the things consistently,

adapting to contextual and situational needs

# In contrast ….When do medical students or residents ‘get the keys to the car’?

- Lots of good assessments …
- Completes set number of rotations of fixed duration
- Absence of bad assessments …
- Survives prescribed years of training…
- Passes the exams

- The program director  or unit chair follows the rules…

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# Challenges and changes in today's medicine

## Profession

- Quality & safety
- Explosion of knowledge
- New technologies
- Scant resources
- Workload
- Teamwork
- Maintaining competence
- Responsibility to society

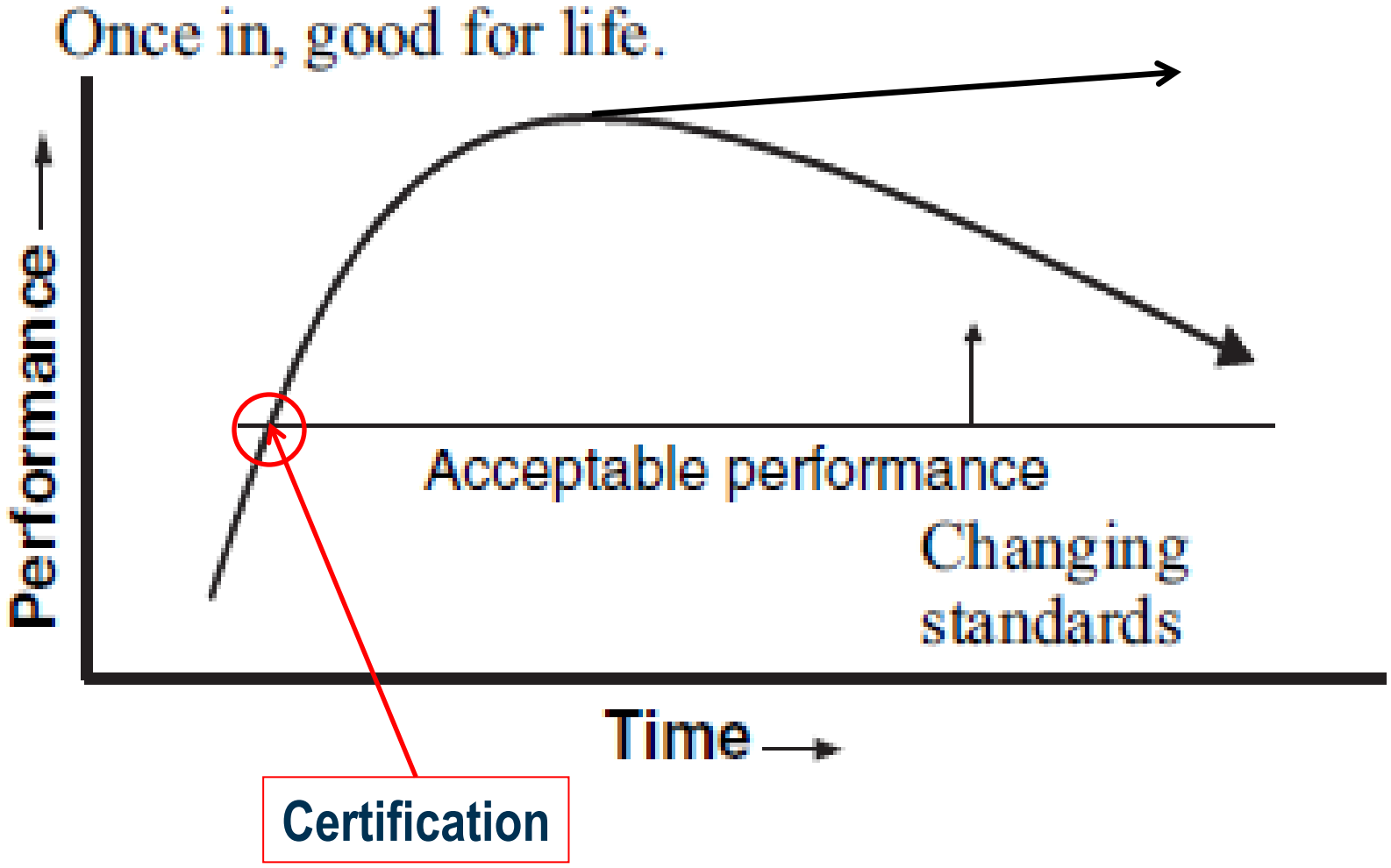
## Patient & public

- Quality & safety
- Access to care

- Compassion
- Communication skills
- Ethics
- Professionalism

How can we as medical educators prepare physicians to be effective in this environment?

# Outcomes: Competence drops over time




*Klass Acad Med 2007*

# Competency Gaps

- Office-based Practice Competencies: skills in…
  - Working in inter-professional teams
  - Clinical IT
  - Population management
  - Reflective practice
  - CQI
- Care Coordination
- Continuity of Care
- Leadership & management
- Systems thinking
- Procedural Skills

*Crosson, Health Affairs 2011*

# Models of undergraduate medical education

- 4 year 'graduate entry' or 5-7 year 'direct entry'
  - Pre-clinical → Clinical
- Preclinical – classroom and laboratory
  - Large classes, didactic, written exams
- Clinical 'rotations'
  - In large academic teaching hospitals
  - Role: observer
  - Written exams, knowledge-based

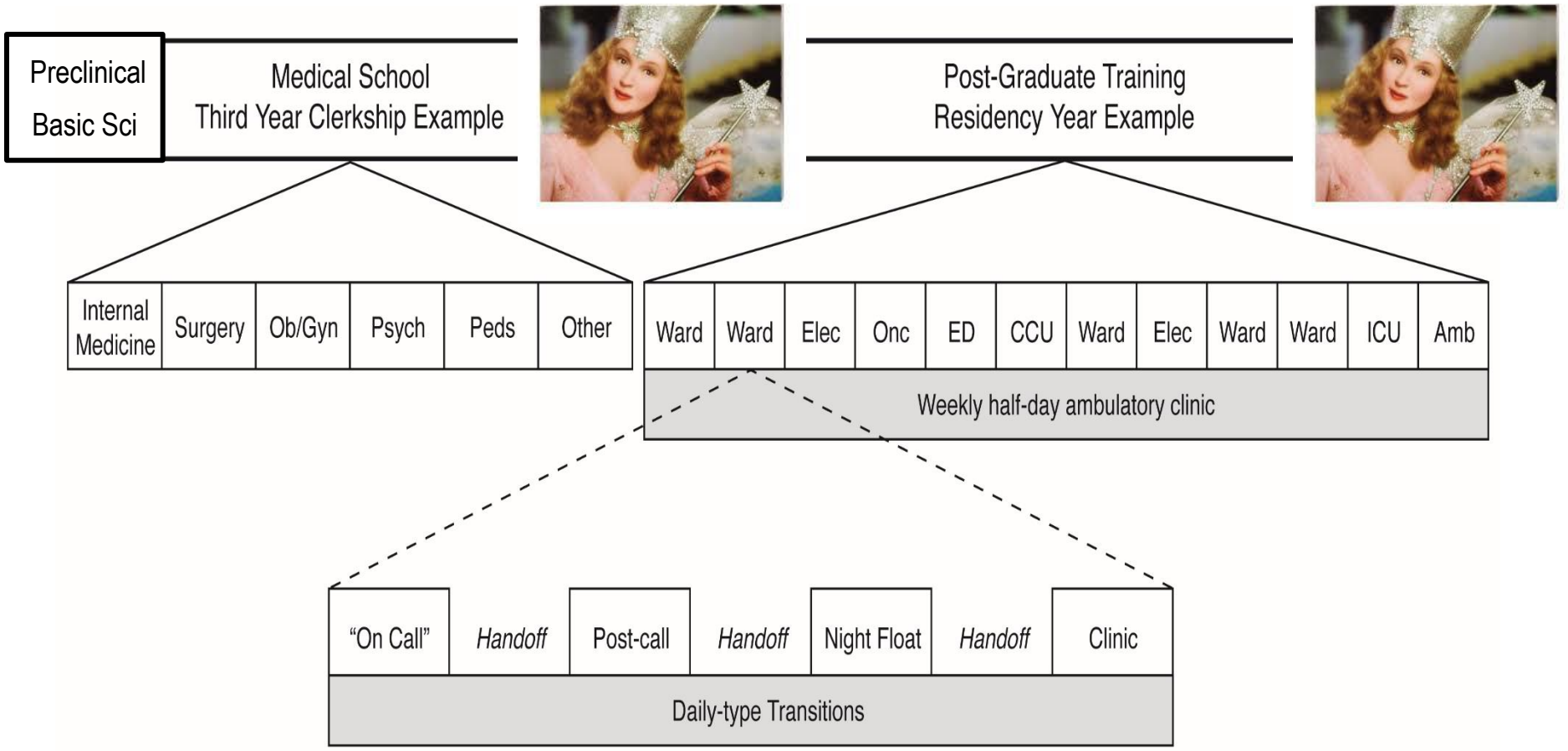
This is changing …

PBL, longitudinal clerkships, technology, flipped class …

# Current models of residency education

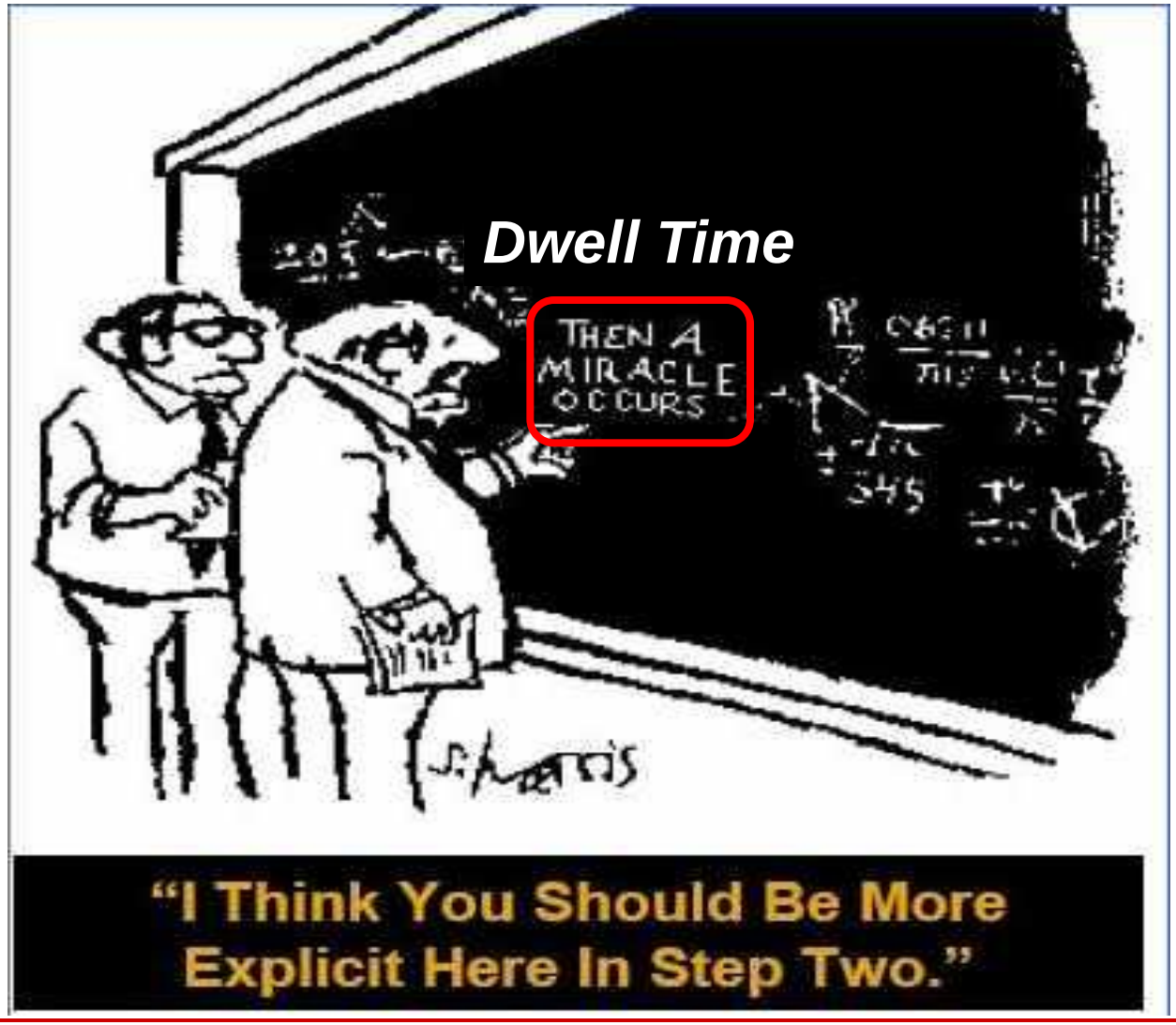
- Apprenticeship – 'work-based learning'
- Assigned to a 'rotation' for a period of time
- Supervised care of patients with 'graduated responsibility'
- +/- a formal curriculum
- 'Core competencies'
- Assessment and advancement based on performance and time spent
- Exit examination: written, clinical

# Medical Education ‘Architecture’



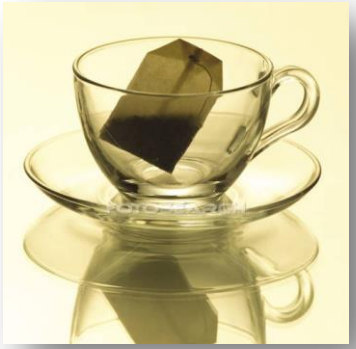

*Holmboe E, Ginsburg S, Bernabeo E. Med Educ. 2011*

# The ‘magic’ in medical education



# Challenges of Modern Medical Education

- Based on time, not ability - length of training fixed
  - 'Service vs education'
  - Heterogeneity of experiences
  - Irrelevant or missing content



The "Tea Steeping Model" of Medical Education

# Challenges of Modern Medical Education

- Based on time, not ability - length of training fixed
  - 'Service vs education'
  - Heterogeneity of experiences
  - Irrelevant or missing content
- Trainees unprepared at many stages & for transitions
- Variable work-based assessment / failure to fail
  - Little direct observation
  - Depend on high stakes exams
- Preparation for practice?
  - Lifelong practice enhancement

# Challenges of Modern Medical Education

- Faculty: overload, burden
  - Teacher-learner relationship affected
  - Need to assess *for* (not *of*) learning
- Few resources
- Education inefficiency
  - Inflexible

- Concerns about patient harm
- Not based on patient needs
- Not meeting society's needs

# Response to critiques of medical education

## The Similarity and Frequency of Proposals to Reform US Medical Education

### Constant Concerns

Nicholas A. Christakis, MD, PhD, MPH

# After the Flexner Report …

The NEW ENGLAND JOURNAL of MEDICINE

REVIEW ARTICLE

MEDICAL EDUCATION

Malcolm Cox, M.D., and David M. Irby, Ph.D., Editors

## American Medical Education 100 Years after the Flexner Report

Molly Cooke, M.D., David M. Irby, Ph.D., William Sullivan, Ph.D., and Kenneth M. Ludmerer, M.D.

MEDICAL EDUCATION SEEMS TO BE IN A PERPETUAL STATE OF UNREST. From the early 1900s to the present, more than a score of reports from foundations, educational bodies, and professional task forces have criticized medical education for emphasizing scientific knowledge over biologic understanding, clinical reasoning, practical skill, and the development of character, compassion, and integrity.[1-4] How did this situation arise, and what can be done about it? In this article, which introduces a new series on medical education in the *Journal*, we summarize the changes in medical education over the past century and describe the current challenges, using as a framework the key goals of professional education: to transmit knowledge, to impart skills, and to inculcate the values of the profession.

From the Department of Medicine, University of California, San Francisco, San Francisco (M.C., D.M.I.); the Carnegie Foundation for the Advancement of Teaching, Stanford, CA (M.C., D.M.I., W.S.); and the Department of Medicine, Washington University, St. Louis (K.M.L.).

N Engl J Med 2006;355:1339-44.



ABRAHAM FLEXNER AND AMERICAN MEDICAL EDUCATION

# After the Flexner Report

- "The need for a **fundamental redesign** of the content of medical training is clear"
- "facts and concepts are best recalled and put into service when they are **taught, practiced, and assessed in the context** in which they will be used"
- "our approaches to the **evaluation** of learners must reach beyond knowledge to **rigorously assess procedural skills, judgment, and commitment** to patients"

# After the Flexner Report

- "for training in skills to be effective, learners at all levels must have the opportunity to compare their performance with a standard and to **practice until an acceptable level of proficiency is attained"**
- "An … honest admission that neophytes cannot perform high stakes procedures at an acceptable level of proficiency demand that we develop **approaches** to skills training **that do not put our patients at risk in service to education"**

# We need doctors who …

- Are optimally prepared for practice
- Can safely provide complex care
- Can work and lead health care teams
- Maintain / improve their competence in changing contexts
- Possess skills and abilities beyond knowledge
  - knowing → doing → being

# We need medical education that …

- Is based on explicit outcomes needed by graduates
  - Transparent to learners, teachers, assessors
- Focuses on individual learner needs
- Ensures physician competence increases over time
- Teaches for competence, aims for excellence
- Promotes life-long learning
- Provides ‘right’ amount of time
- Provides public accountability

# Competency-based Medical Education

"We believe that in the future, expertise rather than experience will underlie competency-based practice and…certification."

*Aggarwal & Darzi, NEJM 2006*

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# Competency-based medical education

An outcomes-based approach to the design, implementation, assessment, and evaluation of medical education programs, using an organizing framework of competencies* [1]

*derived from an analysis of societal and patient needs [2]


1. Frank, Snell et al, Med Teacher 2010

2. Frank et al, Med Teacher 2010


# Fundamental concepts of CBME

- Education must be based on the health needs of the populations served
- Primary focus of education & training should be desired outcomes for learners rather than structure and process of the system
- The formation of a physician should be integrated across the continuum – UGME → PGME → practice

*Caraccio, Snell et al CBME Charter. Acad Med 2016*

# CBME principles

1. Focus on outcomes: graduate abilities
2. Ensure progression of competence
3. Time is a resource, not framework
4. Promote learner centeredness
5. Greater transparency & utility

# **Competency** Defined :

An observable *ability* of a health professional related to a specific activity that integrates knowledge, skills, values, and attitudes.

A specific area of performance that can be described and measured

- Competencies are observable, and can be measured and assessed to ensure their acquisition.
- Competencies can be assembled like building blocks to facilitate progressive development.

*Frank, Snell. Med Teacher 2010, Sklar 2015*

# **Competence** Defined :

The array of abilities (knowledge, skills, behaviors and attitudes) across multiple domains or aspects of performance in a certain context.

- require descriptive qualifiers to define the relevant abilities, context, stage of training.
- multi-dimensional and dynamic
- changes with time, experience, and setting.

Describes a global, general impression
of the adequacy to practice independently

*Frank, Snell. Med Teacher 2010, Sklar 2015*

# Milestones and EPAs

**Milestone:**

A defined, observable marker of an *individual's ability* along a developmental continuum that expresses the stepwise progression of expertise [1]; 'significant point in development' [2]

e.g. Respond to patients' non-verbal communication; use appropriate non-verbal behaviours to enhance communication with patients

**Entrustable Professional Activity (EPA):**

A key *task of a discipline* (profession, specialty, or sub-specialty) that an individual can be trusted to perform without direct supervision in a given health care context, once sufficient competence has been demonstrated[1]

e.g. conduct significant conversations with patients and other providers

*1. Englander, Frank ,Snell et al, Med Teacher 2017*

*2. Holmboe and Hamstra, ACGME*

# Milestones and EPAs

**Milestone:**

- More detailed than competencies
- Clear descriptions, explicit statements
- Expected level of ability
- Observable  - link to feedback

Person

**Entrustable Professional Activity (EPA):**

Task

- Links competency to clinical context
- Reflects a collection of different competencies as applied to the work of the discipline

# Issues Milestones Address

1. Progression of Competence
2. Authentic Assessment
3. Comprehensive Curriculum
4. Faculty guidance
5. Learner transparency
6. Failure to fail

# **Entrustment** defined

In the context of clinical training:

Being given full autonomy to carry out a professional task unsupervised.

The goal of medical education is readiness for unsupervised practice; the outcome of assessment in the workplace be measured in terms of the level of supervision to be provided.

*Ten cate, Snell et al Entrustment Decision Making in Clinical Training. Acad Med 2016*

# Linking EPAs and milestones

Assessing unstable patients, providing targeted treatment and consulting as needed


- Recognize medical instability
- Address primary priorities of resuscitation (ABCs)
- Perform a focused clinical assessment
- Develop a specific differential diagnosis
- Develop and implement preliminary treatment strategies
- Identify the necessity and urgency of consultation for advanced care
- Document clinical encounters to adequately convey clinical reasoning and the rationale for decisions
- Communicate with the receiving physicians or health care professionals during transitions in care


# Caution!

- There are different conceptual approaches to EPAs and milestones in different parts of the world.

- See Englander, Frank ,Snell et al, *Medical Teacher* 2017 for a discussion

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# Van Melle's Core Components of CBME

1. Competencies required for practice are clearly articulated.
2. Competencies are arranged progressively.
3. Learning experiences facilitate the progressive development of competencies.
4. Teaching practices promote the progressive development of competencies.
5. Assessment practices support and document the progressive development of competencies.

*E van Melle in press*

# 1. Competencies required for practice are clearly articulated.

**Domain of competence** defined:

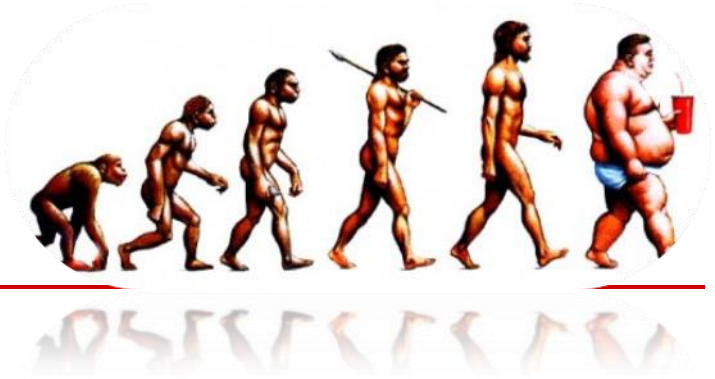
Broad, distinguishable areas of competence that in the aggregate constitute a general descriptive framework for a profession.

Outcomes of training based on societal needs.

*Englander, Frank ,Snell et al, Med Teacher 2017*

# 2. Competencies are arranged progressively.

- Progressive sequencing of competencies
- EPAs and Milestones (developmental markers) facilitate this
- Some competencies form building blocks for further development of competence



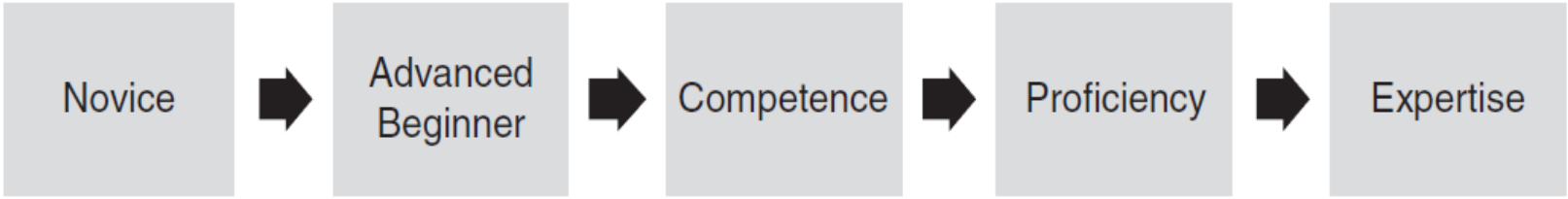



**Figure 2.** Spectrum of skills acquisition (Dreyfus & Dreyfus 1980).

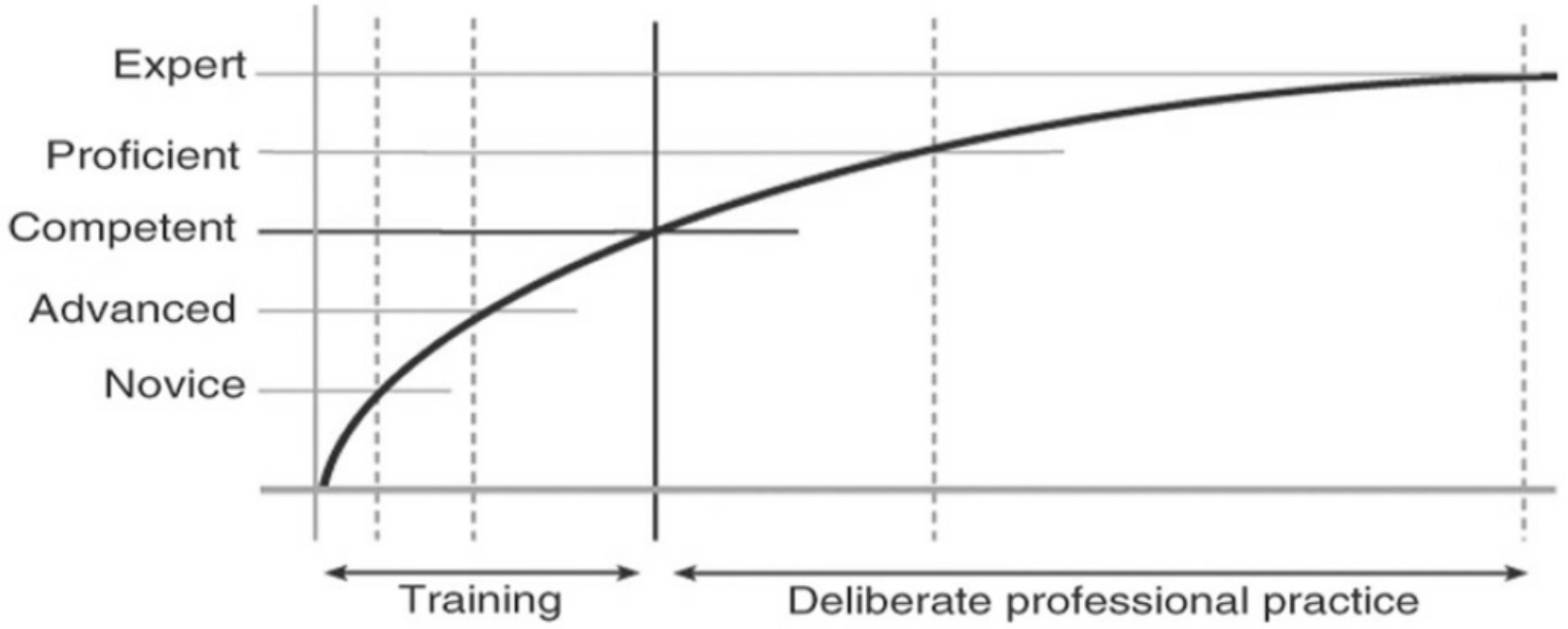



**Figure 3.** General curve of skills acquisition reproduced from ten Cate (2010).

# 3. Learning experiences facilitate the progressive development of competencies.

- Experiences are sequenced to support development of ability,
- Flexible to allow individual variation:  time is a resource, not a driver,
- Learning experiences should resemble practice environment and tied to an ability needed by graduate (Immersion)
- Allow active learning, with application of knowledge
- Allow deliberate practice, coaching and feedback

# 4. Teaching practices promote the progressive development of competencies.

## Preclinical / Extra-clinical

- Problem- and case-based
- Early clinical exposure
- Active learning, groups
- Flipped classrooms

- ‘Learning objectives’ replaced by milestones, EPAs or outcomes
- Fewer lectures

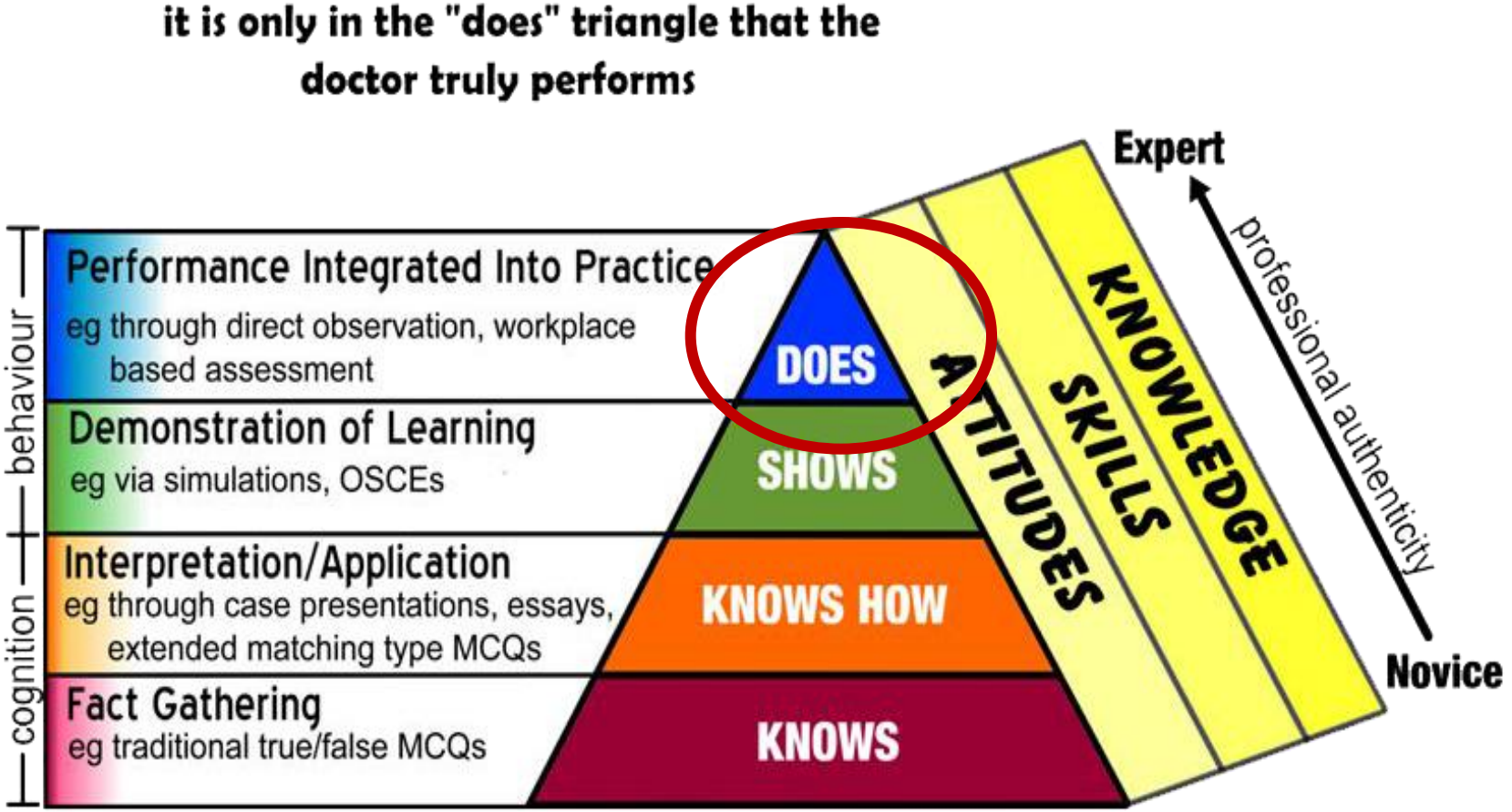
## Clinical

- Learning through experience and application
- Direct observation & feedback, coaching
- ‘Boot camps’
- Advanced simulation methods
- Learner involved in determining learning needs
- Responds to individual needs

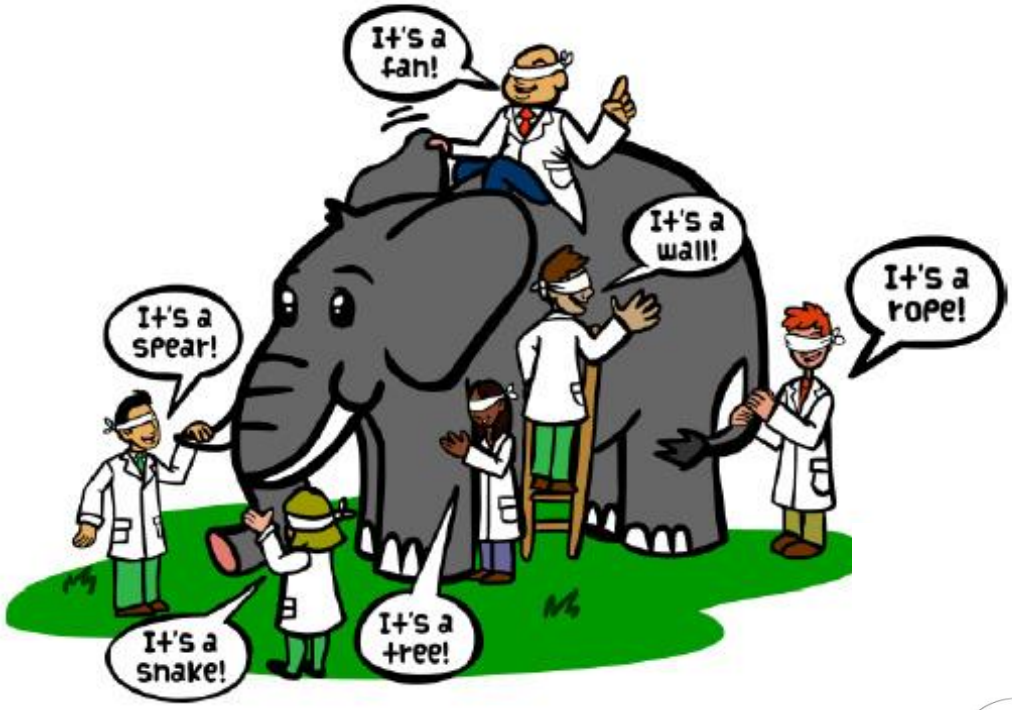
# 5. Assessment practices support and document progressive development of competencies.

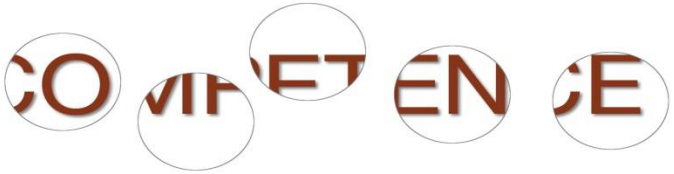
- ‘Real world’ work-based assessment - outcomes related to the learner’s ability to function in practice
- Mapped or blueprinted to competencies: fixed standard
- Includes ongoing, timely, meaningful feedback
- Continuous, comprehensive assessment, with multiple points and methods
- Summative assessment ‘programmatic’ – decision-making system to collate

# Why work-based assessment



# Importance of an Assessment Program



*Caverzagie and Iobst "Windows to Competence"*

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# ‘One World’… Competency Frameworks

# Common competencies within the frameworks

- (Clinical) expertise
- Problem solving
- Health advocacy / prevention
- Communication skills
- Teamwork / collaboration
- Leadership and management
- Teaching skills
- Life-long learning
- Critical appraisal
- Professionalism

# Global Examples

- Australia
- Canada
- Kuwait
- Netherlands
- Saudi Arabia
- Singapore
- South Africa
- USA
- … and others

# Example at the undergraduate level:
*Cleveland Clinic Lerner College of Medicine*

- 9 broad competencies: (medical knowledge, research, clinical skills, reasoning, communication, professionalism, systems, personal development, reflective practice)

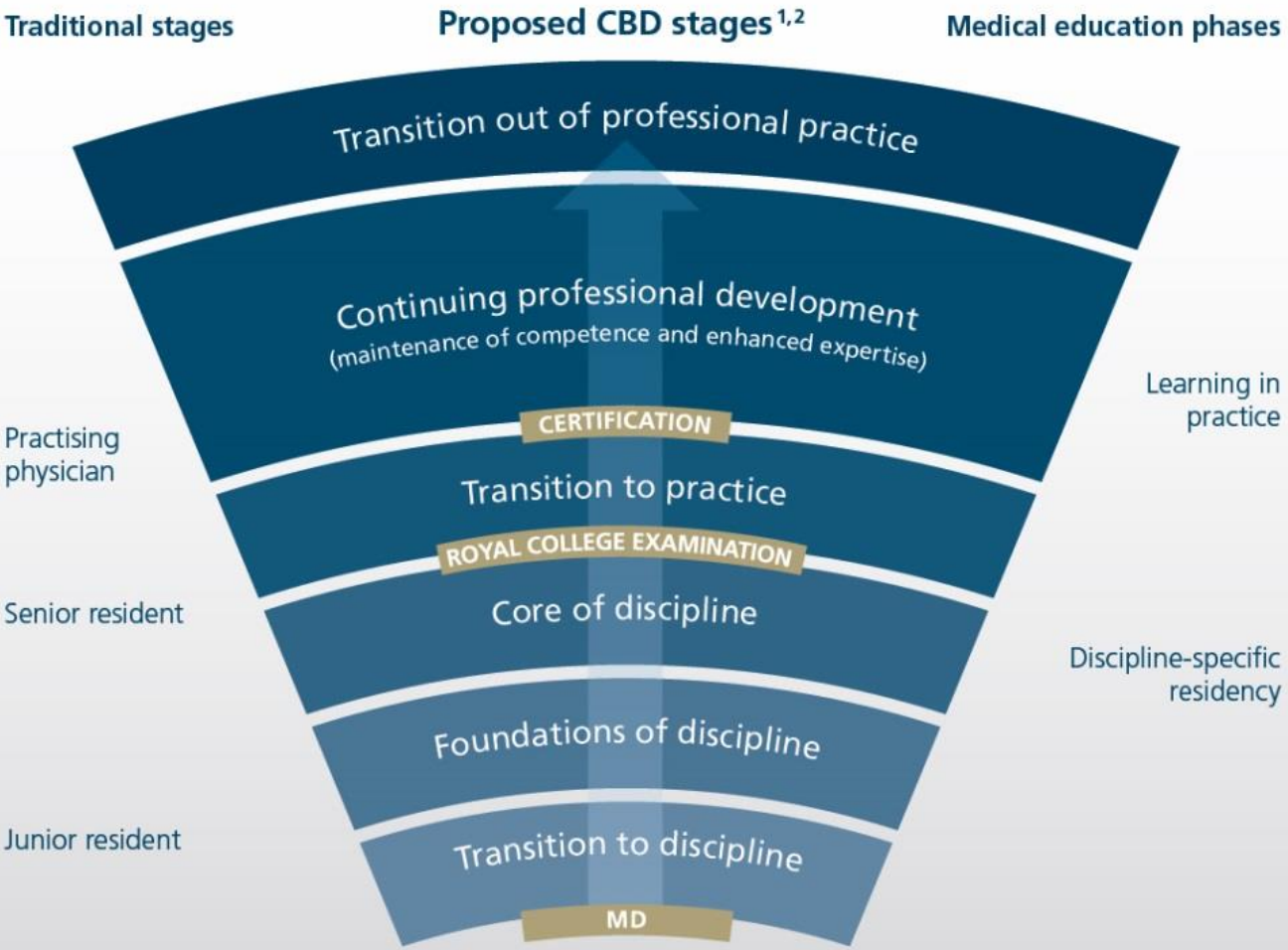
In first 2 years:

- Basic science learning objectives integrated with outcomes in core clinical disciplines
- Learning strategies - PBL, longitudinal clinical experiences, integrative seminars, clinical skills sessions
- Goal of assessment is to enhance learning
- Tools: CAPP, SAQ – feedback → gaps

# Example at the postgraduate level:
# *RCPSC Competence by Design*

- A multi-phase project designed to improve residency education, including the exam process, the accreditation system, and continuing professional practice.
- Competency-based initiative is transforming medical education, and changing physician performance expectations
- Uses CanMEDS framework
- National, all specialties, all programs

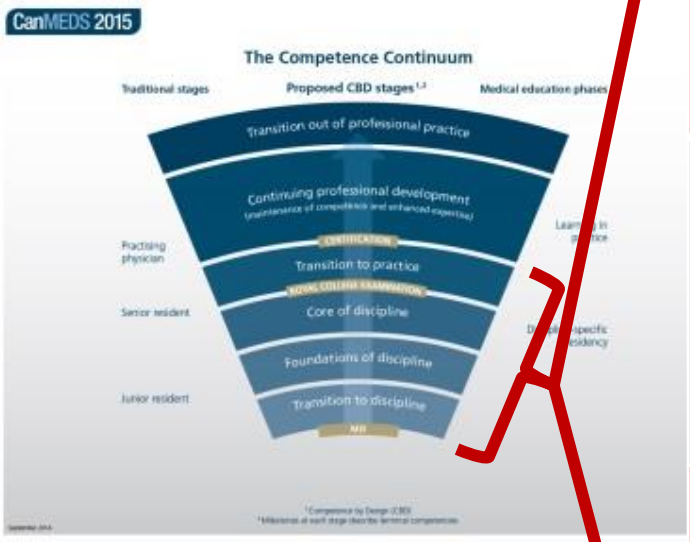
# Stages of competence




[1] Competence by Design (CBD)
[2] Milestones at each stage describe terminal competencies

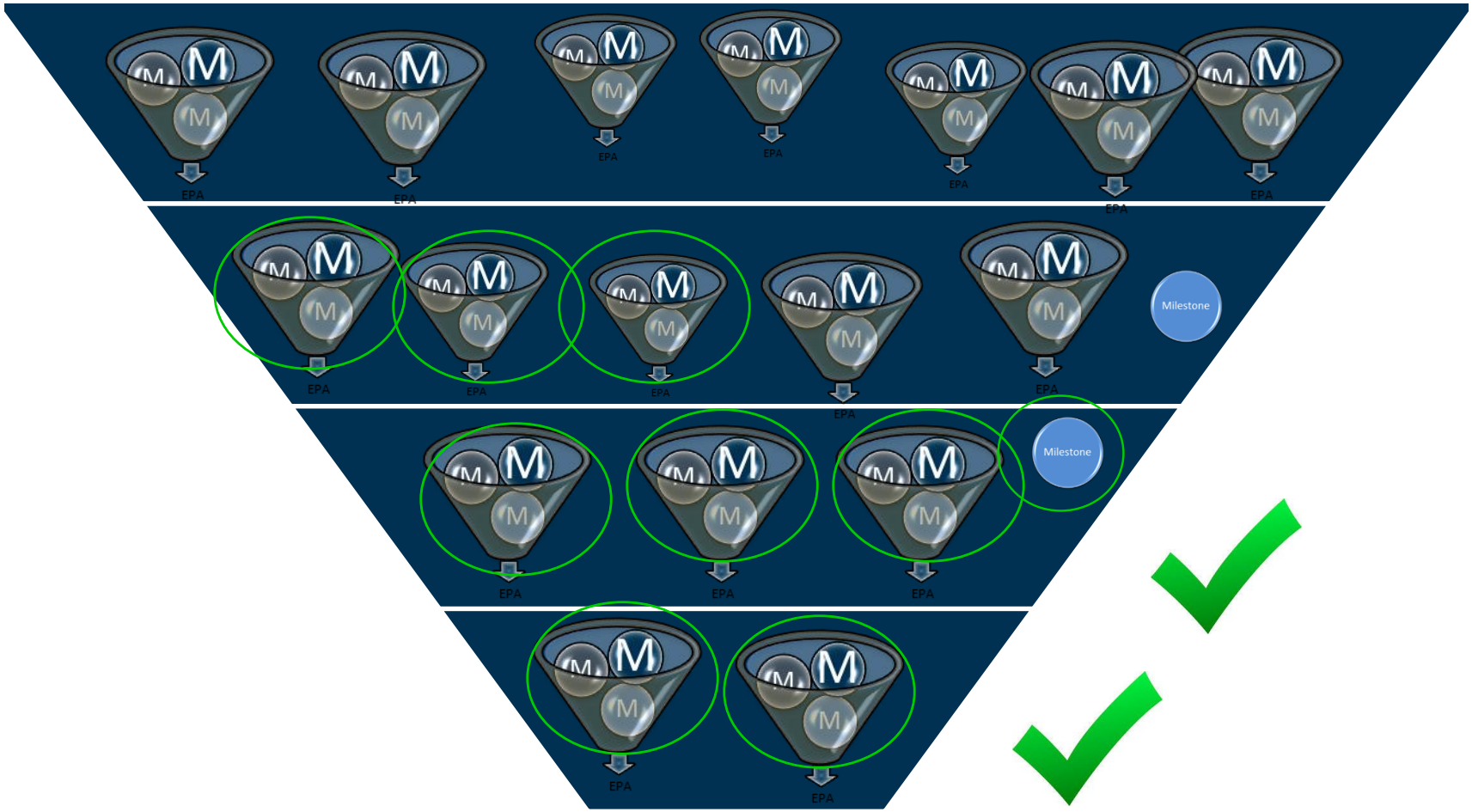
September 2014

# Stages of competence - residency




| | |
|---|---|
| Transition to Discipline | emphasizes the orientation and assessment of new trainees arriving from different medical schools and programs (including outside Canada). |
| Foundation | covers broad-based competencies that every trainee must acquire before moving on to more advanced, discipline-specific competencies. |
| Core | includes the core competencies that make up the majority of a discipline |
| Transition to Practice | the senior trainee should demonstrate readiness to make the transition to autonomous practice. |

# Progression of Competence



- Uses milestones and EPAs to sequence learning experiences

- Work-based formative assessment: observation, feedback, coaching
- Summative assessment: e-portfolio to collect

# What we have talked about…

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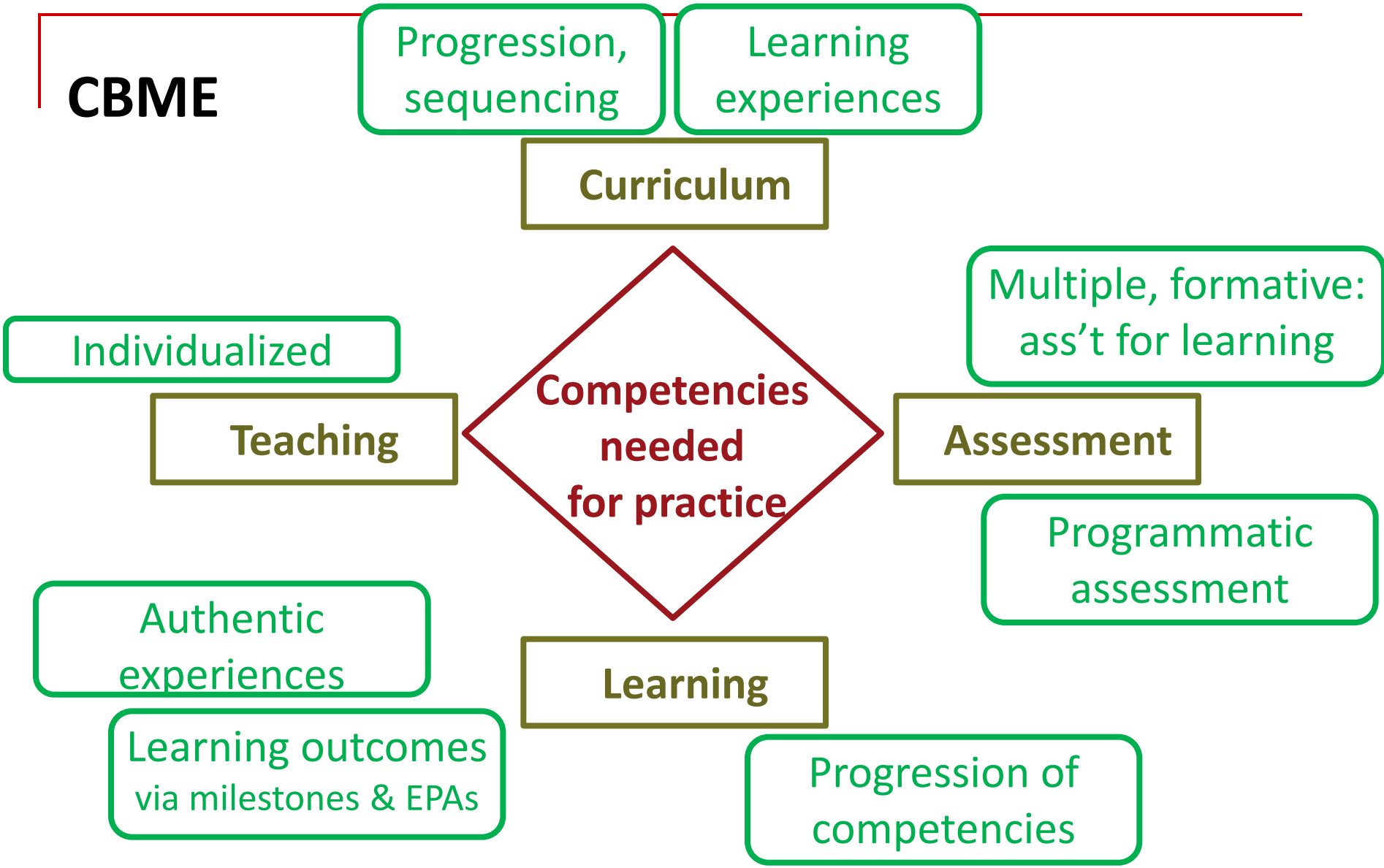
# CBME


Progression, sequencing
Learning experiences
Curriculum
Multiple, formative: ass't for learning
Individualized
Competencies needed for practice
Teaching
Assessment
Programmatic assessment
Authentic experiences
Learning
Learning outcomes via milestones & EPAs
Progression of competencies