

Accreditation Council for Graduate Medical Education

Realizing the Promise of CBME and Assessment to Improve Learning and Clinical Outcomes

Disclosures

- Employed by the ACGME
- I receive royalties from Mosby-Elsevier for a textbook on assessment
- I am a member of the board of NBME and Medbiquitous

Outline

- Competency-based medical education
 - What is it?
 - Transformation and the current state of healthcare
 - Nostalgialitis Imperfecta
- Reform and implications of competency-based medical education
- Work-based assessment and programs of assessment

Pair and Share

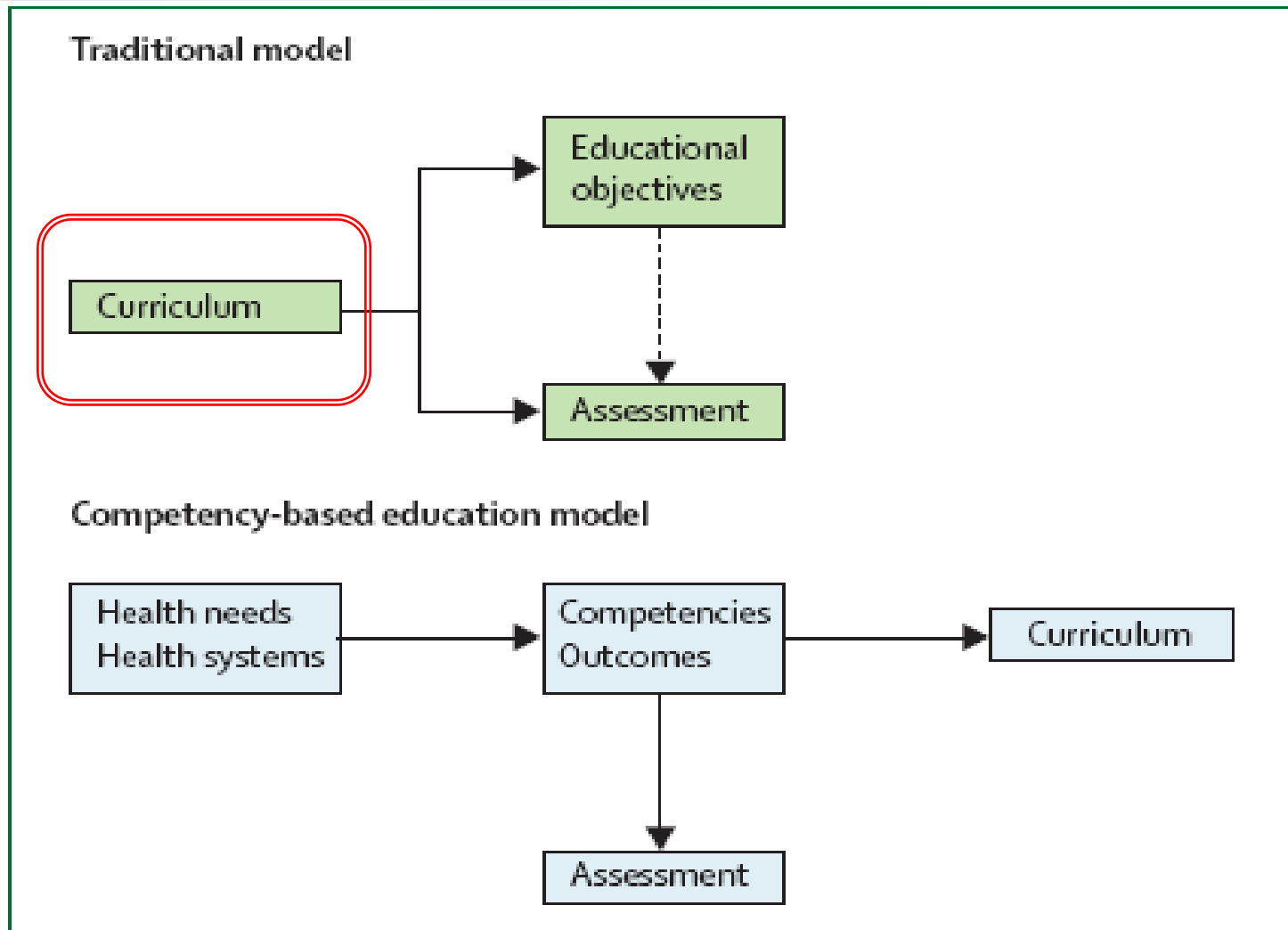
What does competency-based medical education mean to you?

Early Principles: CBME

- World Health Organization (**1978**):
 - *“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.”*

McGaghie WC, Miller GE, Sajid AW, Telder TV. Competency-based Curriculum Development in Medical Education. World Health Organization, Switzerland, 1978.

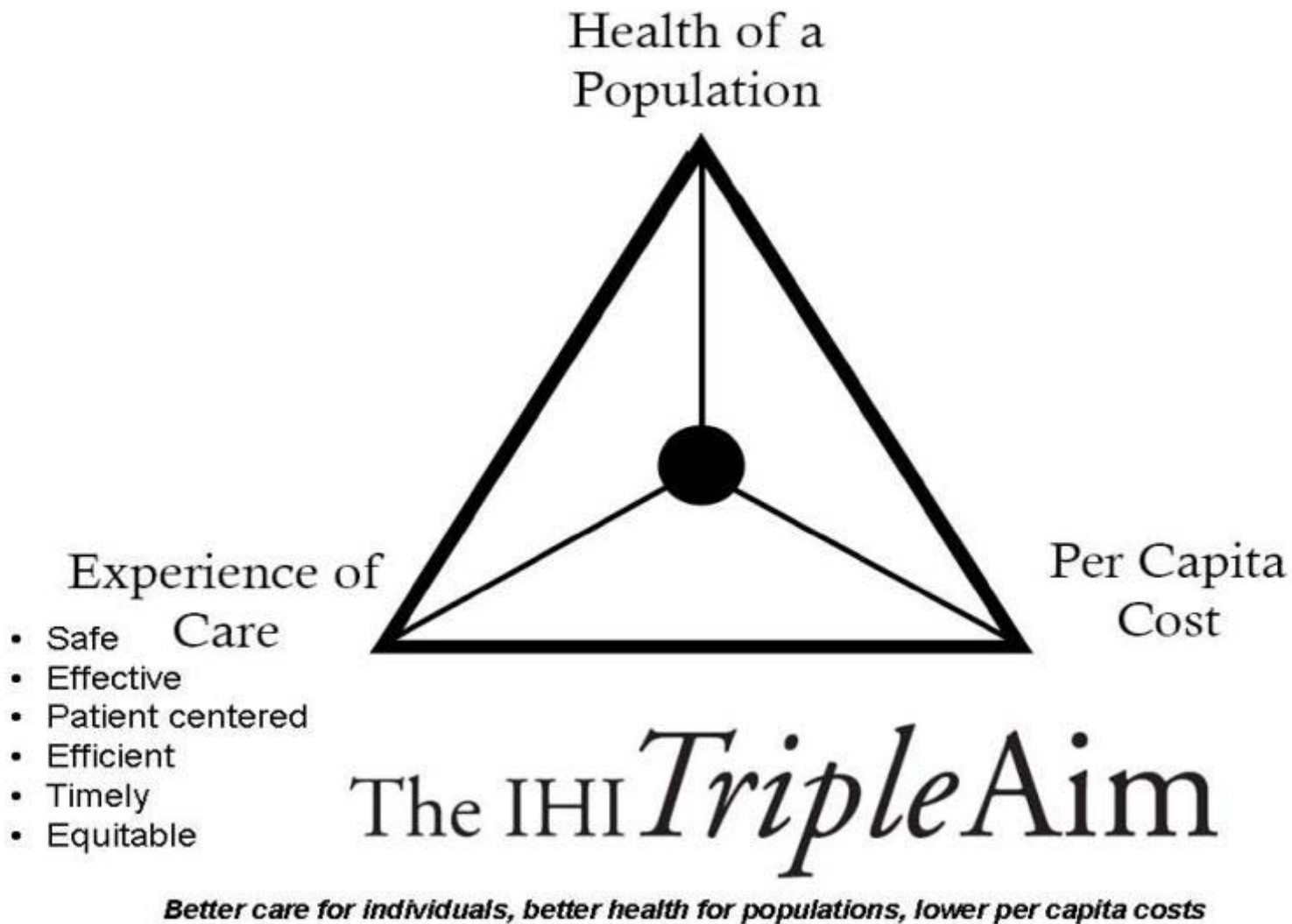
CBME: Start with System Needs



Frenk J, et al. Health professionals for a new century: transforming education to strengthen health systems in an interdependent world. Lancet. 2010

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What Are The Outcomes?



CBME Today

An outcomes-based approach to the design, implementation, assessment and evaluation of a medical education program using an organizing framework of competencies¹

¹Frank, JR, Snell LS, ten Cate O, et. al. Competency-based medical education: theory to practice. Med Teach. 2010; 32: 638–645

Fundamental Characteristics of CBME

- Graduate outcomes in the form of achievement of predefined desired competencies are the goal.
- Competencies are derived from the needs of patients, organized into a coherent guiding framework.
- Time is a resource for learning, not the basis of progression of competence.
- Teaching and learning experiences are sequenced to facilitate an explicitly defined progression of ability in stages.

Fundamental Characteristics of CBME












- Learning is tailored to the learner's individual progression in some manner.
- Numerous direct observations and focused feedback contribute to effective learner development of expertise.
- Assessment is planned, systematic, systemic, and integrative.

Current Realities: Health System to Training System Performance

EXHIBIT ES-1. OVERALL RANKING

COUNTRY RANKINGS

Top 2*
Middle
Bottom 2*

											
	AUS	CAN	FRA	GER	NETH	NZ	NOR	SWE	SWIZ	UK	US
OVERALL RANKING (2013)	4	10	9	5	5	7	7	3	2	1	11
Quality Care	2	9	8	7	5	4	11	10	3	1	5
Effective Care	4	7	9	6	5	2	11	10	8	1	3
Safe Care	3	10	2	6	7	9	11	5	4	1	7
Coordinated Care	4	8	9	10	5	2	7	11	3	1	6
Patient-Centered Care	5	8	10	7	3	6	11	9	2	1	4
Access	8	9	11	2	4	7	6	4	2	1	9
Cost-Related Problem	9	5	10	4	8	6	3	1	7	1	11
Timeliness of Care	6	11	10	4	2	7	8	9	1	3	5
Efficiency	4	10	8	9	7	3	4	2	6	1	11
Equity	5	9	7	4	8	10	6	1	2	2	11
Healthy Lives	4	8	1	7	5	9	6	2	3	10	11
Health Expenditures/Capita, 2011**	\$3,800	\$4,522	\$4,118	\$4,495	\$5,099	\$3,182	\$5,669	\$3,925	\$5,643	\$3,405	\$8,508

Notes: * Includes ties. ** Expenditures shown in \$US PPP (purchasing power parity); Australian \$ data are from 2010.

Source: Calculated by The Commonwealth Fund based on 2011 International Health Policy Survey of Sicker Adults; 2012 International Health Policy Survey of Primary Care Physicians; 2013 International Health Policy Survey; Commonwealth Fund *National Scorecard 2011*; World Health Organization; and Organization for Economic Cooperation and Development, *OECD Health Data, 2013* (Paris: OECD, Nov. 2013).

AHRQ Quality Report

Measure Focus	Measure Name/Description	Baseline Rate	Most Recent Rate	Aspirational Target
Aspirin Use	Outpatient visits at which adults with cardiovascular disease are prescribed/maintained on aspirin	47% ¹³	53% ¹⁴	Increase to 65% by 2017
Blood Pressure Control	Adults with hypertension who have adequately controlled blood pressure	46% ¹⁵	53% ¹⁶	Increase to 65% by 2017
Cholesterol Management	Adults with high cholesterol who have adequate control	33% ¹⁷	32% ¹⁸	Increase to 65% by 2017
Smoking Cessation	Outpatient visits at which current tobacco users received tobacco cessation counseling or cessation medications	23% ¹⁹	22% ²⁰	Increase to 65% by 2017

Arnie Milstein 2010

- *Since physician graduates of American medical education organizations typically lead or heavily influence US health care delivery, one source of indirect, broad, outcome-based evidence [of the effectiveness of the medical education enterprise] is the overall performance of the US health care system. The width of the performance gaps on the aims of effectiveness, safety and efficiency understandably reduces society's confidence that physicians are adequately honoring their Hippocratic promises.*

**Milstein A. *Trailing Winds and Personal Risk Tolerance: An External Perspective on the Opportunity for Medical Educators to Fulfill Their Social Contract Permanently.*
Presented at ABIMF Summer Forum, August 2010**

Nostalgialitis Imperfecta

- Syndrome characterized by the following signs and symptoms:
 - “When I was an intern...<i>insert superlative</i>”
 - “Medicine was so much better 25 years ago”
 - Reality: *Not really...*
 - “Younger physicians today are less professional, skilled, etc. because of <i>insert favorite complaint</i>”

Faculty and Clinical Skills

“Evidently it is not deemed necessary to assay students’ and residents’ clinical performance once they have entered the clinical years. Nor do clinical instructors more than occasionally show how they themselves elicit and check the reliability of the clinical data...”

Faculty and Clinical Skills

To a degree that is often at variance with their own professed scientific standards, attending staff all too often accept and use as the basis for discussion, if not recommendations, findings reported by students and residents without ever evaluating the reporter's mastery of the clinical methods utilized or the reliability of the data obtained."

Faculty and Clinical Skills

*From **George Engel***

*1976 editorial on JAMA study highlighting
deficiencies of student and resident's basic
clinical skills*

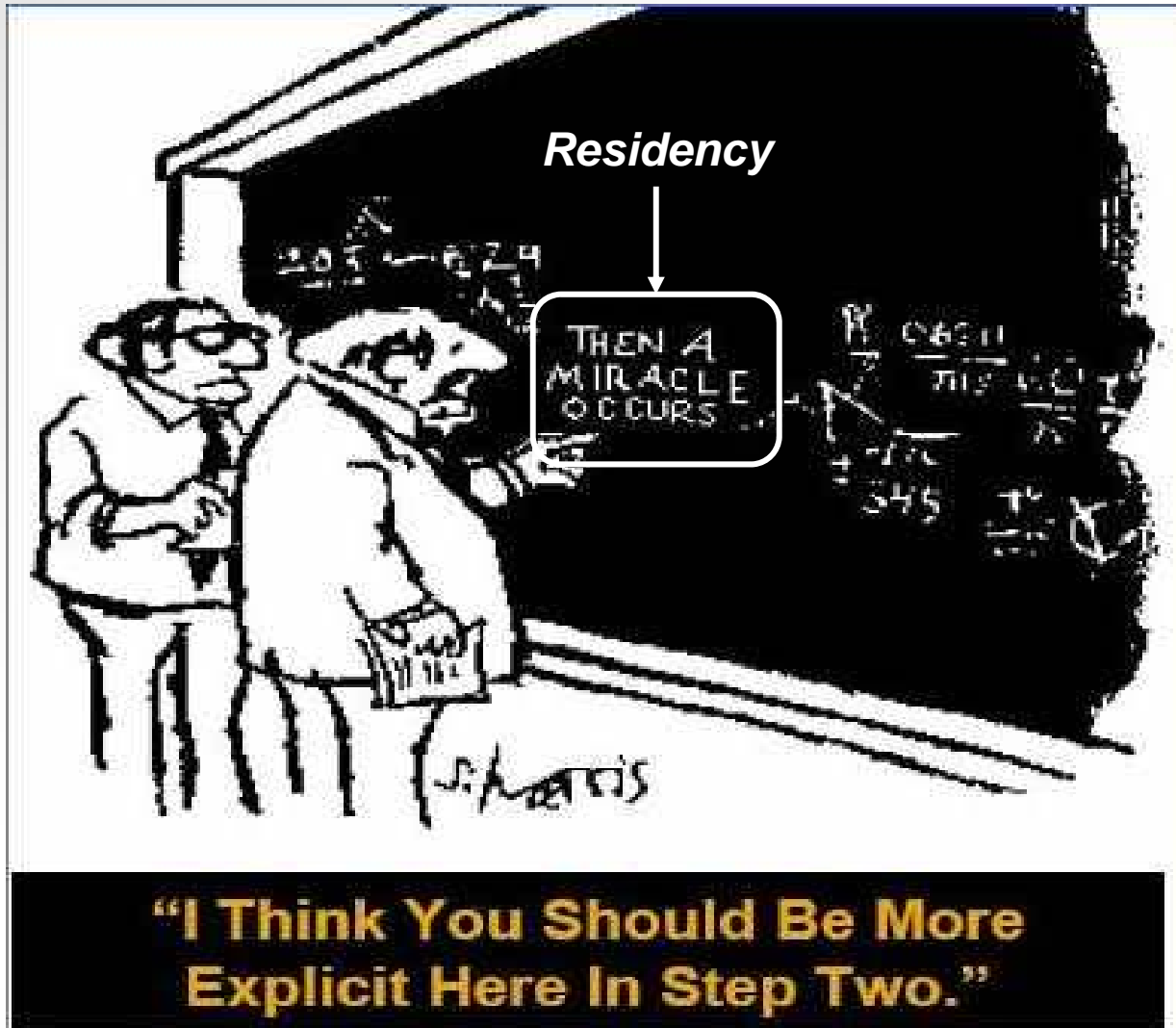
Diagnostic Errors



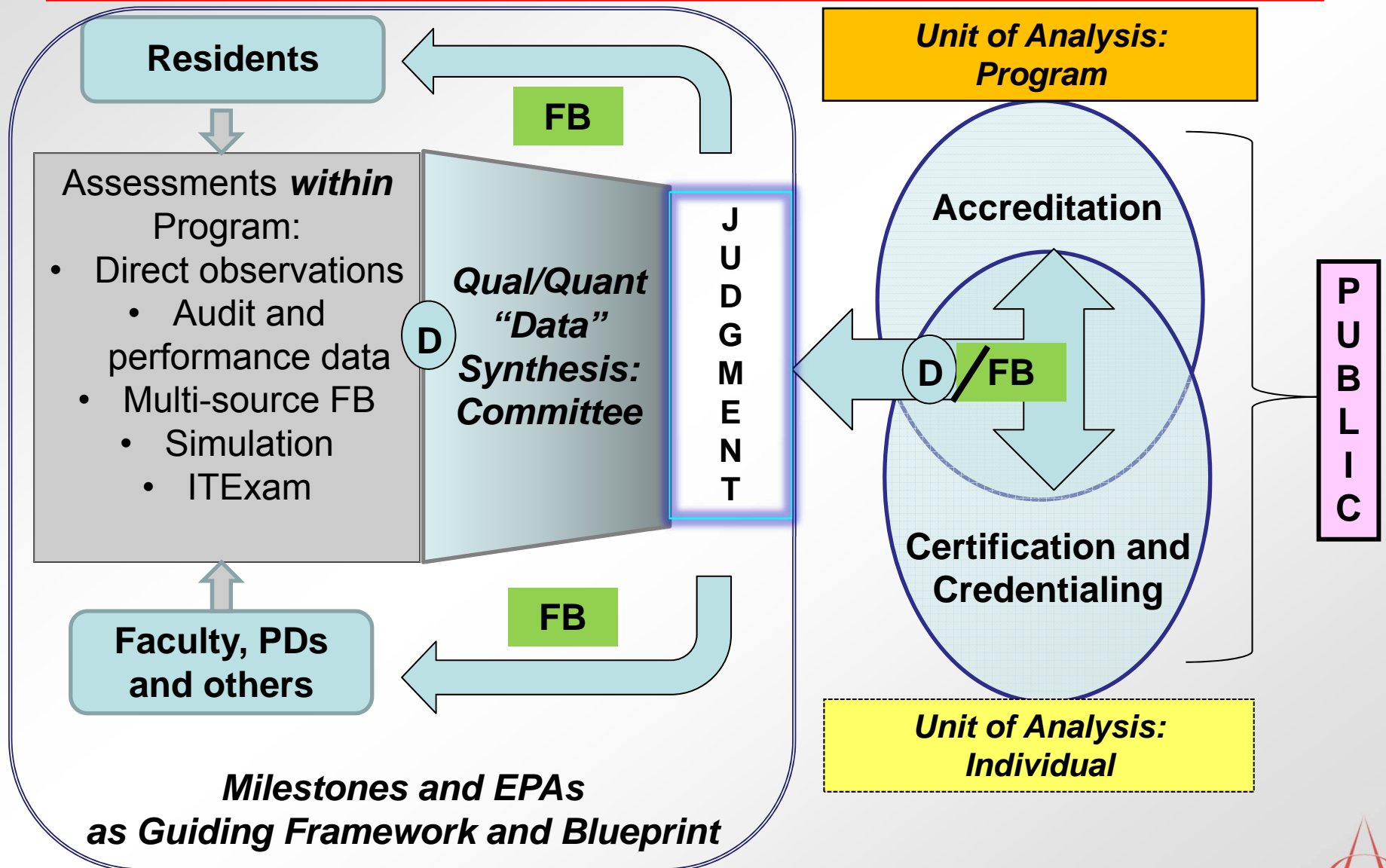
IOM Report Released September 2015

- At least 5 percent of U.S. adults who seek outpatient care each year experience a diagnostic error.
- Postmortem examination research shows diagnostic errors consistently contribute to ~ 10 percent of patient deaths.
- Diagnostic errors account for 6 to 17 percent of hospital adverse events.

The “Miracle” of Medical Education

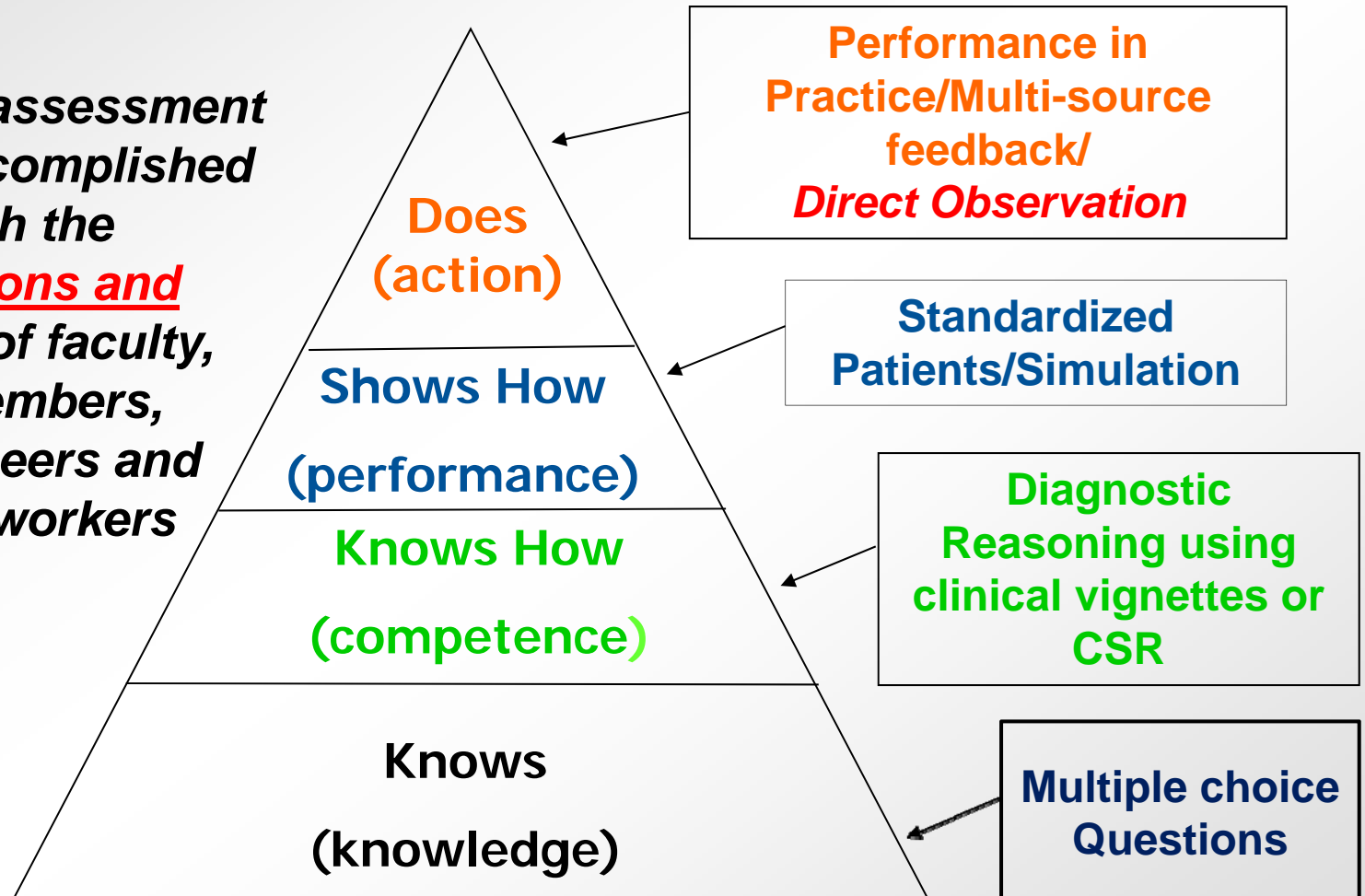


Professional Self-Regulation: Assessment

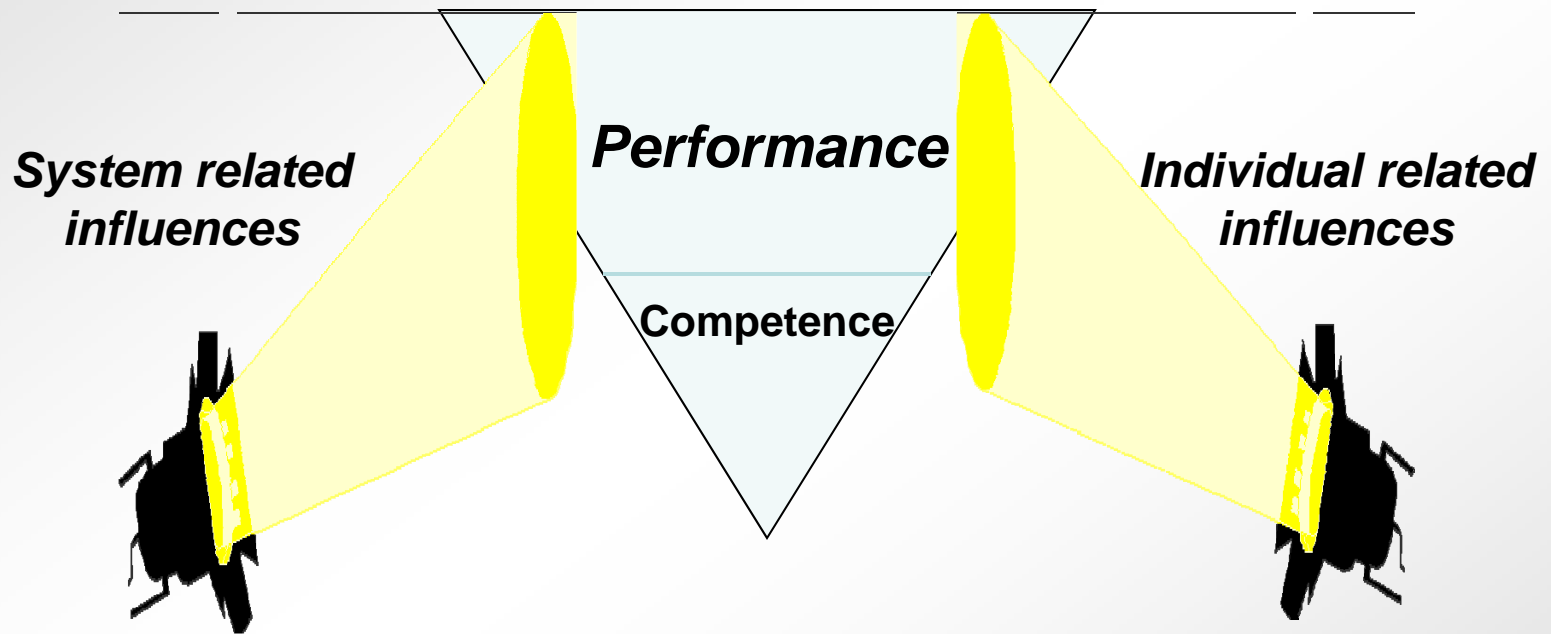


Assessing for the Desired Outcome

Work-based assessment is mostly accomplished through the observations and questions of faculty, team members, patients, peers and other co-workers



Cambridge Model: “Righting” the Pyramid

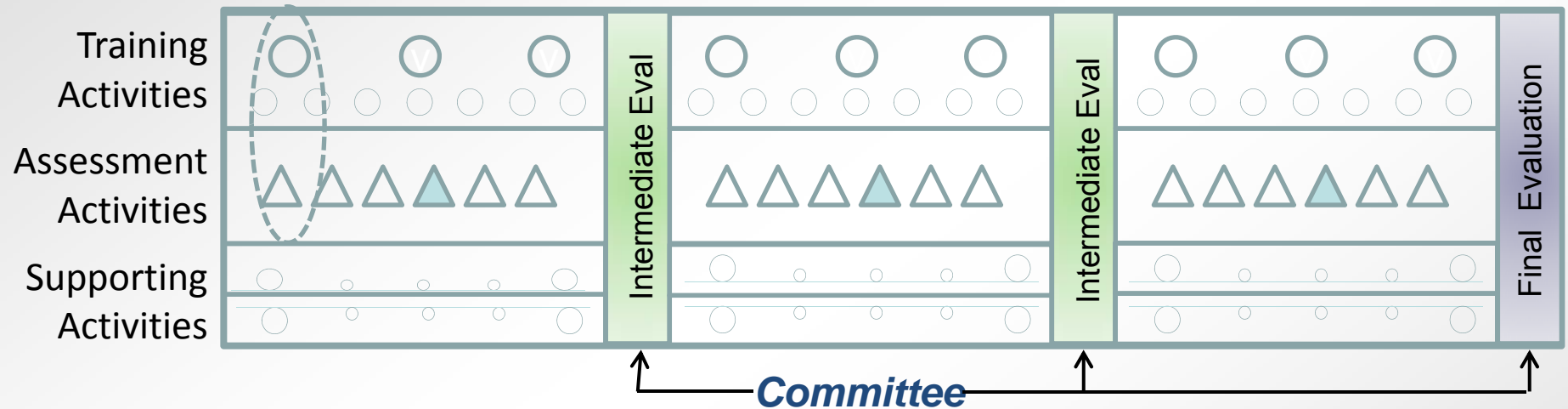


Work-based assessment has to be the primary focus of our assessment systems

Rethans, Norcini, et al, 2002

Model For Programmatic Assessment

(With permission from CPM van der Vleuten)



○ = learning task

○ = learning artifact

△ = single assessment data-point

△ = single certification data point for mastery tasks

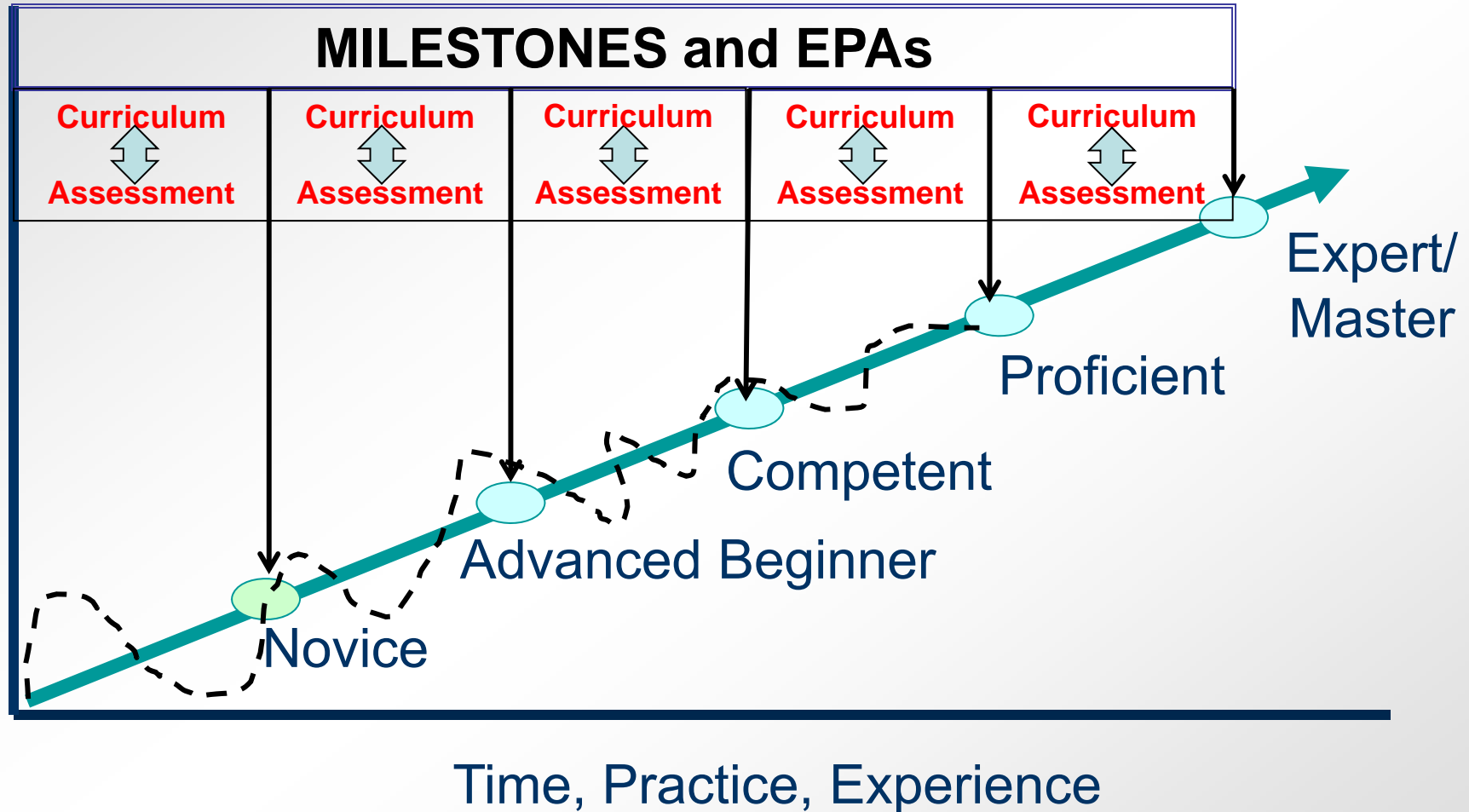
○—○ = learner reflection and planning

○—○ = social interaction around reflection (supervision)

○ (dashed) = learning task being an assessment task also

Time →

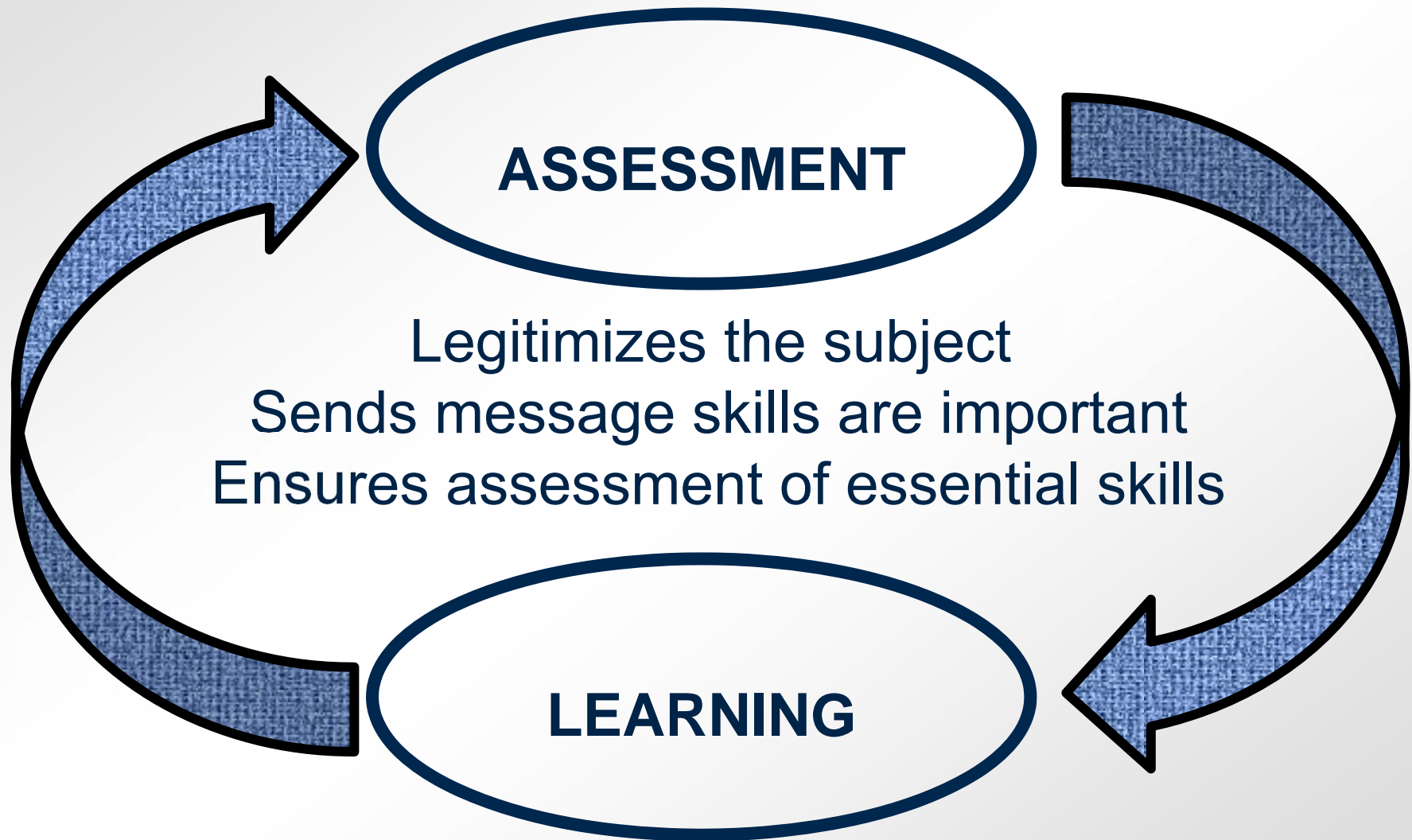
Dreyfus & Dreyfus Development Model



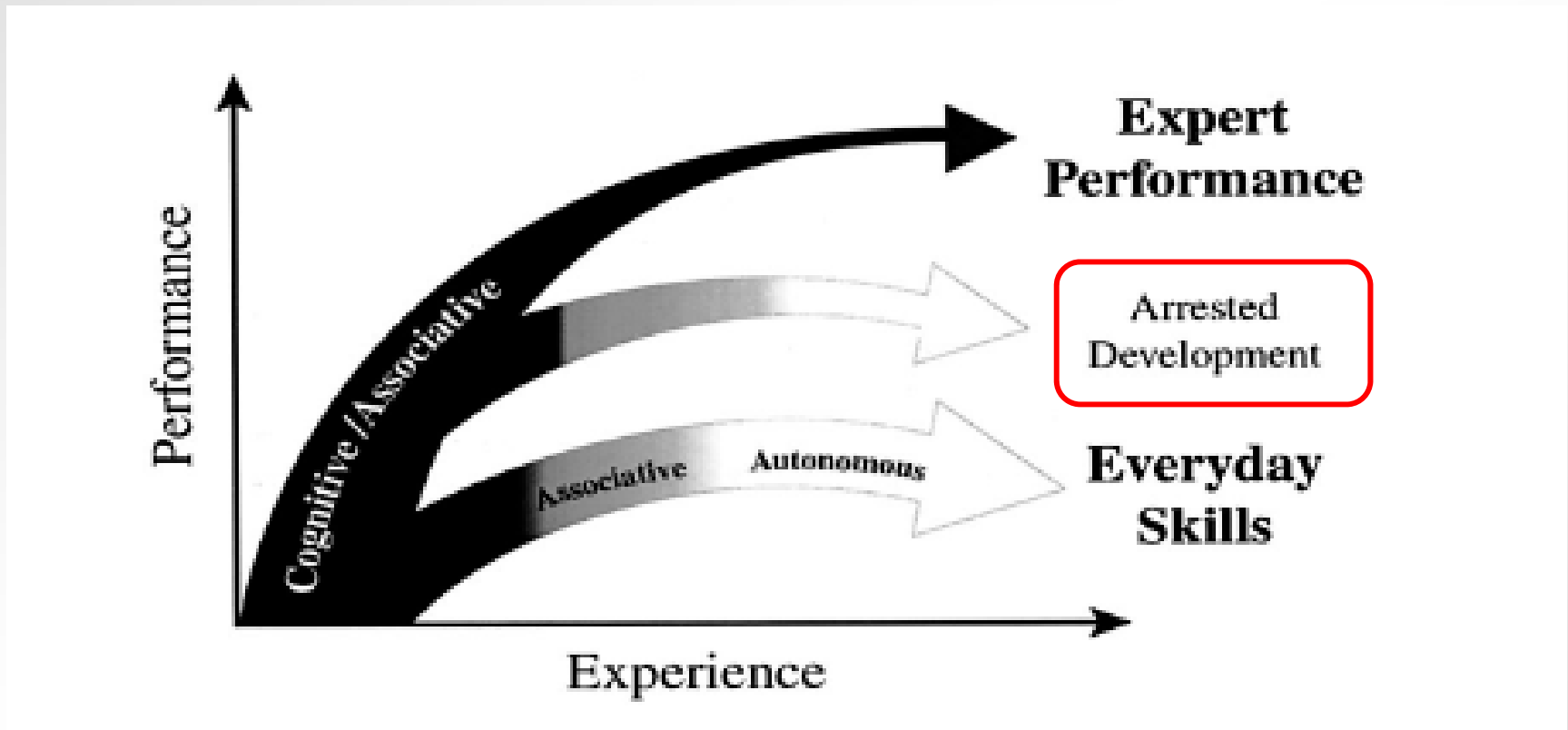
Dreyfus SE and Dreyfus HL. 1980
Carraccio CL et al. Acad Med 2008;83:761-7

Importance of Effective Observation and Work-based Assessment

Direct Observation: Assess Core Skills



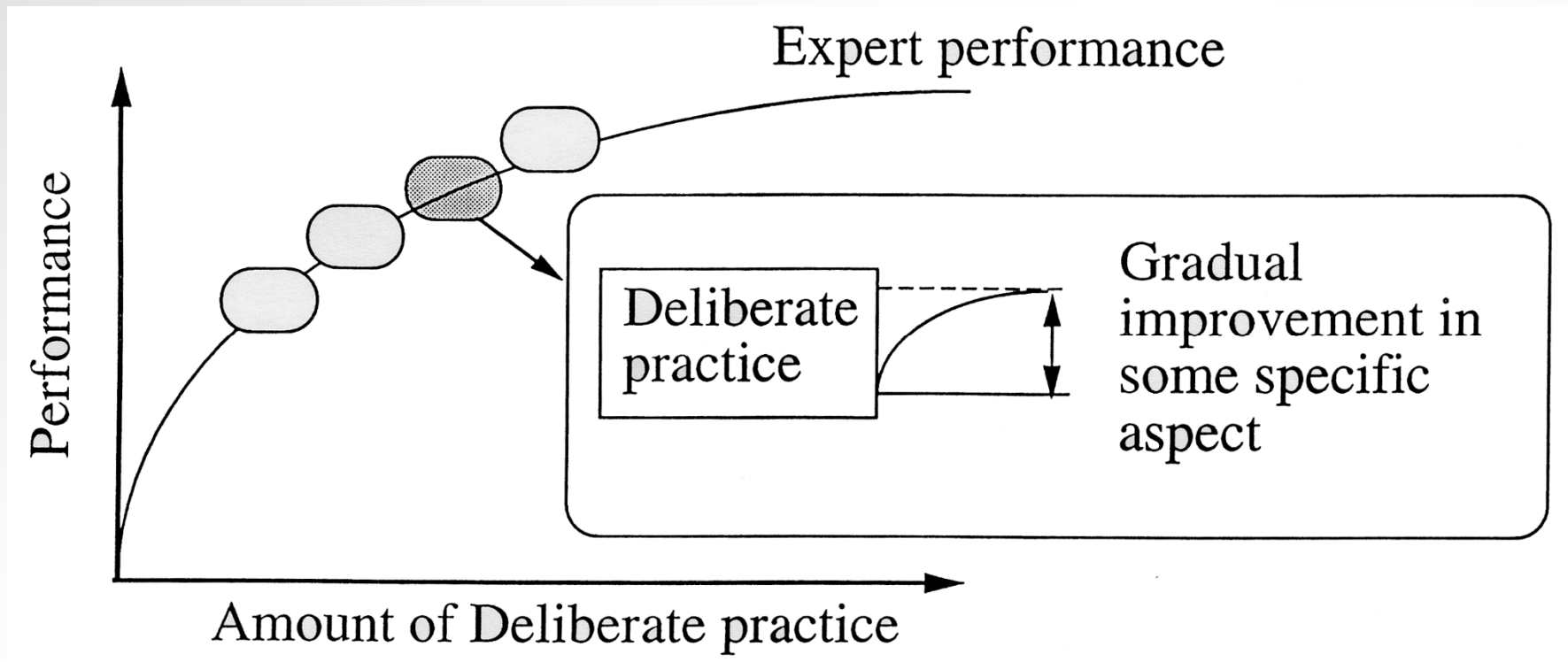
Expert Performance vs. Everyday Skills



Ericsson KA. Acad Med. 2004

Design and Sequencing of Training Activities

- * Monitor students' development
- * Design and select training tasks for individual students



Professional teachers and coaches

From Anders Ericsson: Used by Permission

The Role of the Coach



- “They observe, they judge, and they guide”
- “That one twenty-minute discussion gave me more to consider and work on than I’d had in the past five years”
- “Medical practice is largely unseen by anyone who might raise one’s sights. I’d had no outside ears and eyes.”

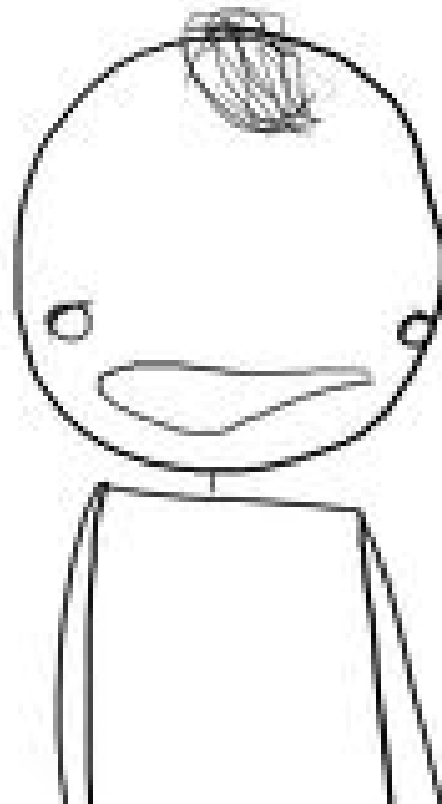
Atul Gawande, New Yorker 10/3/2011

Do We Need More Assessment Methods?

Common Assessment Methods

- Descriptive evaluation by teachers
- Records of clinical encounters
- External/ internal evaluations
 - MCQ
 - Key features/script concordance
 - Short answer questions/essays
- Simulation/OSCES
- Checklists
- Rating scales
- Oral examinations
- Chart (record) reviews
- Standardized patients
- A-V reviews
- Educational prescription contracts
- Portfolios
- 360 evaluation
- Patient logs

How to Choose?



I'm a little
overwhelmed,
guys.

Assessment Utility

Utility Elements of Assessment

- Validity
- Reliability
- Educational impact
- Acceptability
- Cost effectiveness

**Trainee Learning
& Assessment**

Van der Vleuten. *Adv Health Sci Educ*. 1996

- Identify gap between resident performance and desired outcome

**Ensure high quality
patient**

Inform supervision

Educational Impact

Educational Effect

“The assessment motivates those who take it to prepare in a fashion that has educational benefit.”

Catalytic Effect

“The assessment provides results and feedback in a fashion that creates, enhances, and supports education; it drives future learning forward.”

Norcini J et al. Med Teach 2011;33:206-14

Frame of Reference Construct Alignment

1 2 3 4 5 6 7 8 9

Unsatisfactory

Satisfactory

Superior

Below
Expectation

At Expectation

Exceeds
Expectation

NORMATIVE

Not
What I Do

Close to
What I Do

What I Do
(or better)

SELF

1 2 3 4 5 6 7 8 9

????

????

????

GESTALT

Missing evidence
based elements

Most evidence
based elements

All evidence
based elements

BEST PRACTICE

Rethinking Our Frame of Reference

- Importance of appropriate supervision
- Entrustment

Trainee performance* X

Appropriate level of supervision**

Must = Safe, effective patient-centered care

* a function of level of competence in context

**a function of attending competence in context

Construct Aligned Scales

Good questions, good answers: construct alignment improves the performance of workplace-based assessment scales

Jim Crossley,¹ Gavin Johnson,² Joe Booth³ & Winnie Wade³

Crossley J, Johnson G, Booth J, Wade W. Good questions, good answers: construct alignment improves the performance of workplace-based assessment scales. *Medical Education* 2011; 45: 560–569

Cognitive Load

Cognitive Load

- There is a limit as to how much you can ask faculty to observe and capture
 - Clinical units: complex environment
 - Selective attention
- Byrne et. al. (Med Educ 2014)
 - Average cognitive load for faculty judging OSCE stations was higher than anesthesia trainees during induction for routine surgery
 - OSCE had 21-22 items in an 8 minute station

Cognitive Load

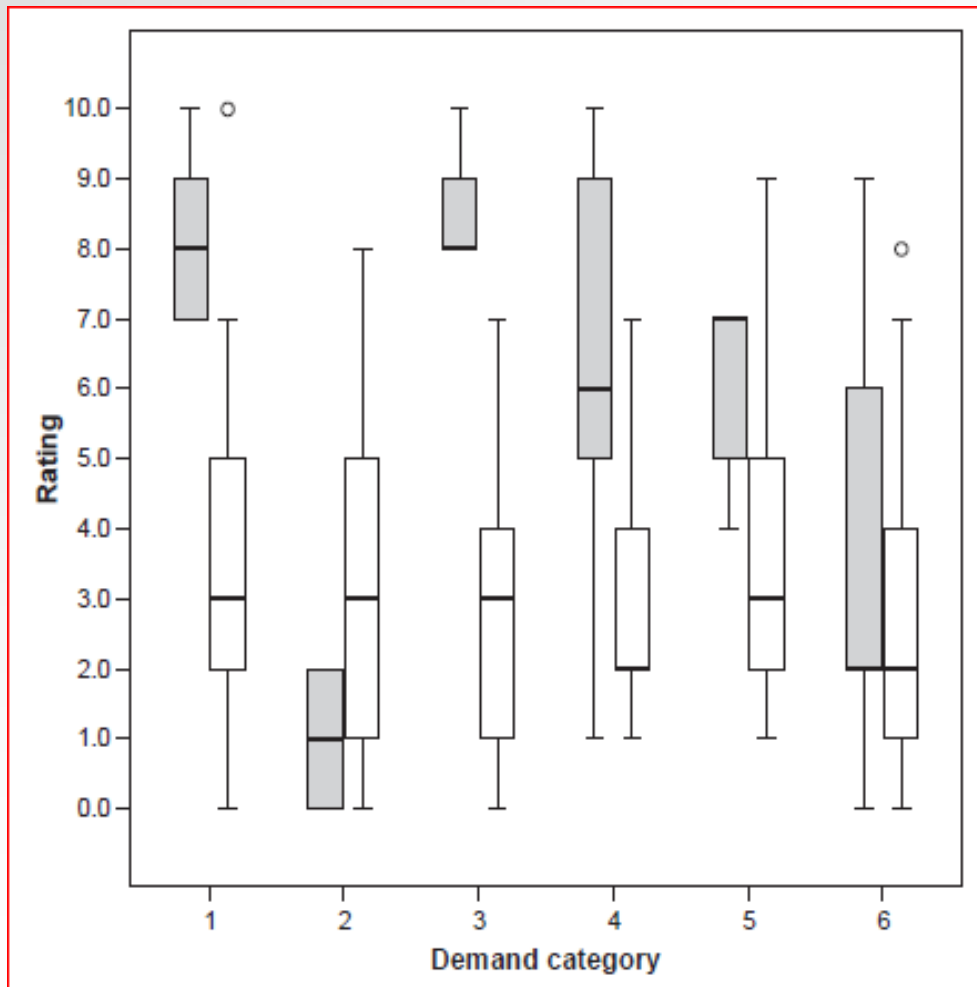


Figure 3 Comparison of NASA–Task Load Index (NASA-TLX) scores in the study subjects (grey boxes) and trainee anaesthetists (white boxes).

Demand categories:

- 1 = mental demand
- 2 = physical demand
- 3 = temporal demand
- 4 = performance/success
- 5 = effort
- 6 = frustration

Byrne A, Tweed N, Halligan C. A pilot study of the mental workload of OSCE examiners. *Med Educ.* 2014; 48: 262-67.

Cognitive Load and Milestones

- With few exceptions the reporting Milestones should not be used as a faculty evaluation form
- Reporting Milestones best used as a framework to guide synthetic, aggregate judgments

Creating Assessment Programs

- Competence is specific, not generic. Sample across contexts, assessors, time
- Use multiple assessment methods
- Quantitative not necessarily better than qualitative
- Move assessment back to workplace
- Use credible standards
- Validity resides in instrument user

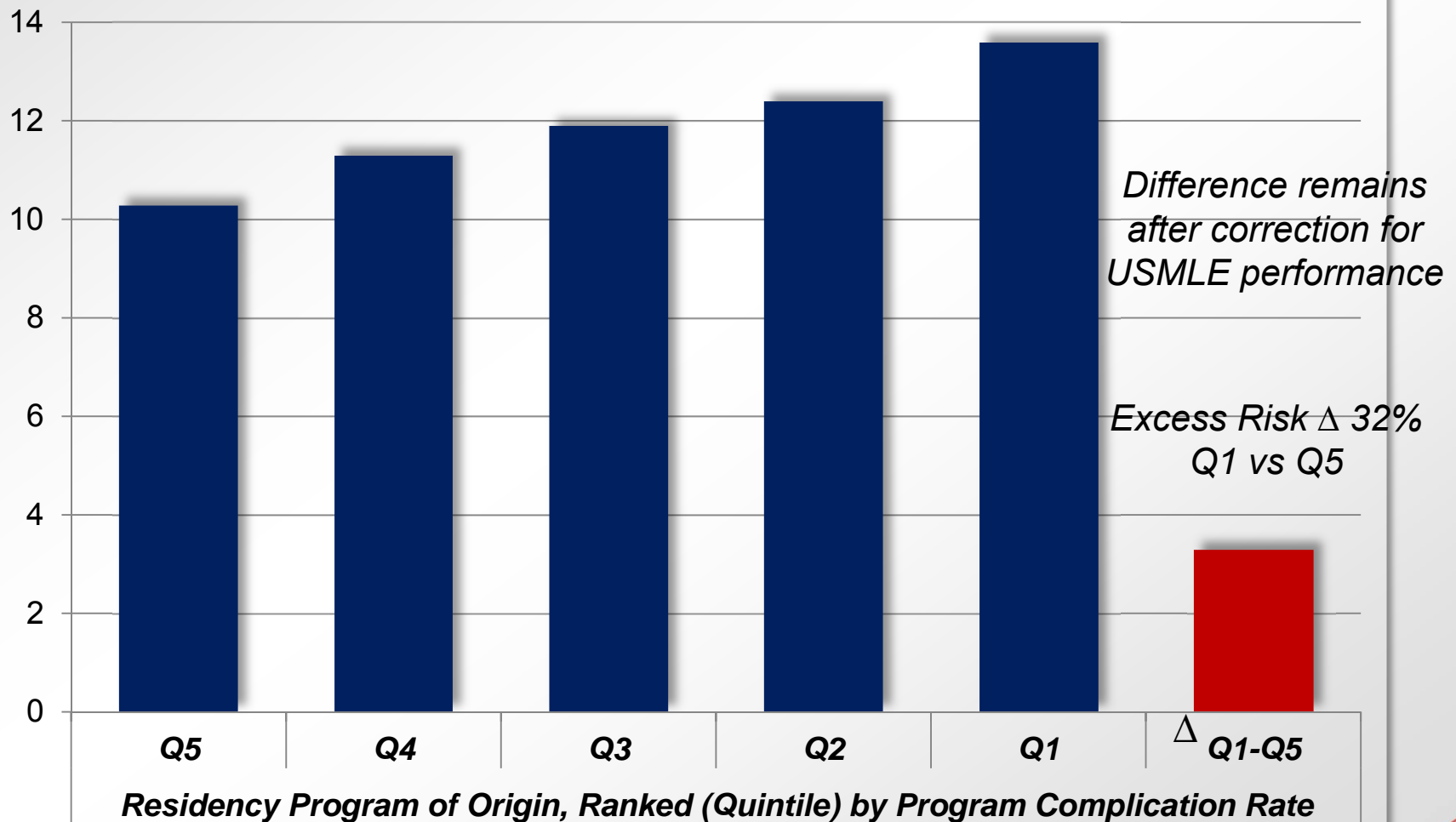
Van der vleuten CPM et al Med Educ 39:309–17.
Van der vleuten CPM et al. Best Practice & Research Clinical
Obstetrics and Gynaecology. 2010(24):703–19

How Much Does the Institutional Environment and Structure of the Training Program Really Matter?

Evaluating Residency Programs Using Patient Outcomes

JAMA 2009;302(12):1277-1283. Asch, DA, et.al.

Rate of Major Obstetric Complications by Graduates (%)



Choosing a Residency

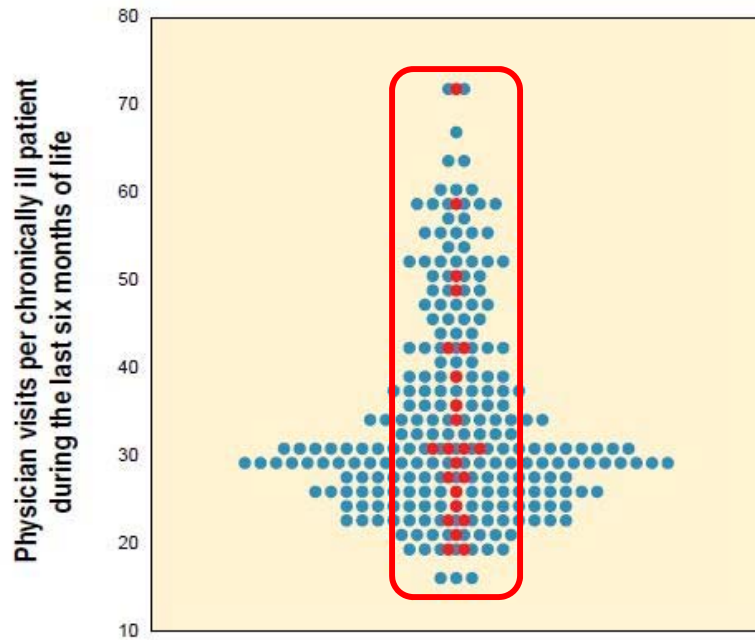


Figure 2. Average number of physician per chronically ill Medicare patient during the last six months of life among patients receiving most of their care at teaching hospitals (2010 deaths)

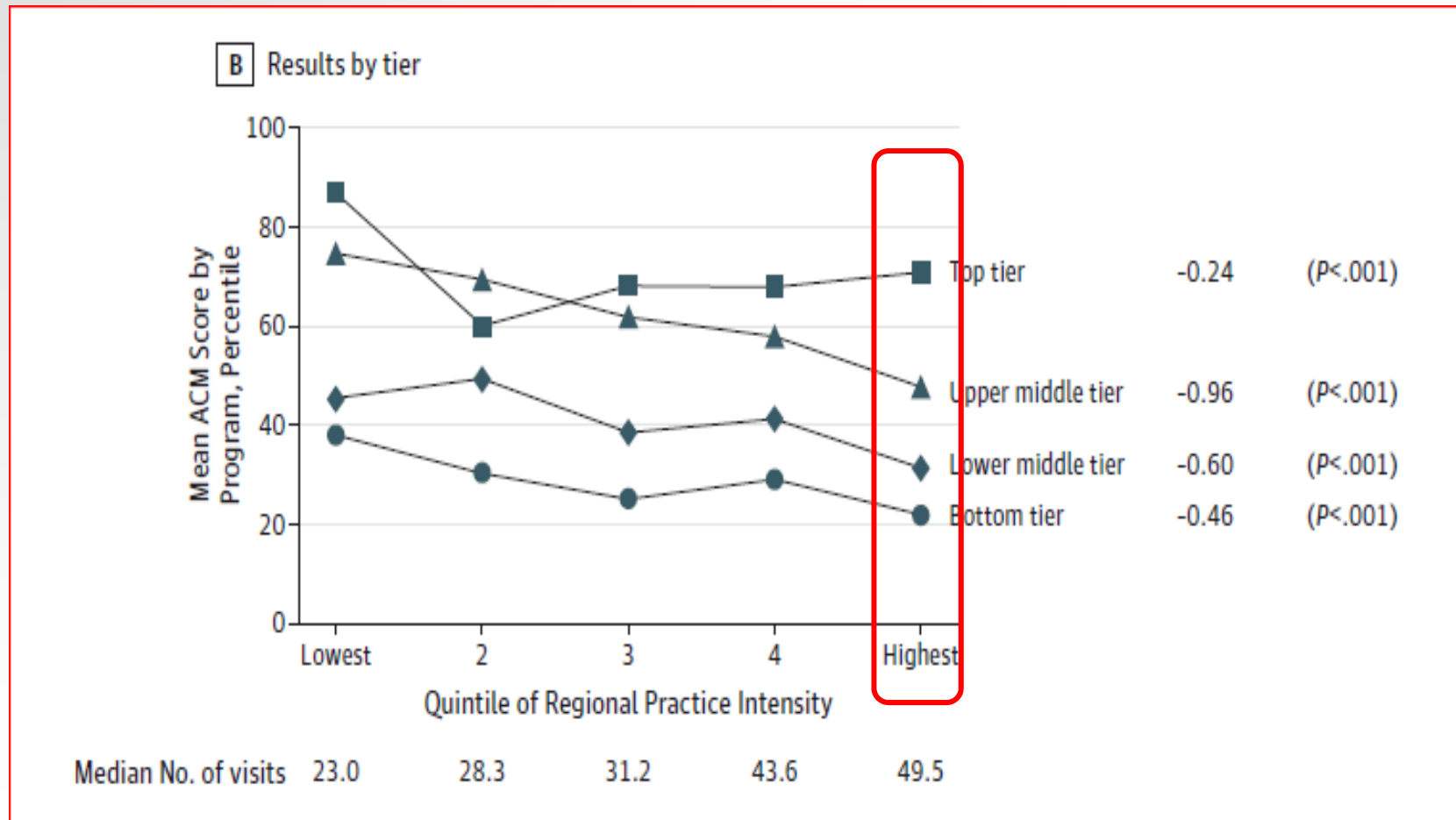
Average # of physician visits in last six months of life (teaching hospitals in red)

From:

What Kind of Physician Will You Be?

**Variation in Health Care and Its Importance for Residency Training
Dartmouth Institute for Health Policy & Clinical Practice 2012**

Environment and Conservative Practice



Sirovich BE, Lipner RS, Johnston M, Holmboe ES. The Association Between Residency Training and Internists' Ability to Practice Conservatively. JAMA IM. 2014.

Environment and Conservative Practice

Table 3. Adjusted Patient Expenditures for Primary Care^a

	Years of Practice							
	All Physicians		1-7 Years		8-15 Years		16-19 Years	
	β (95% CI) ^b	P Value	β (95% CI)	P Value	β (95% CI)	P Value	β (95% CI)	P Value
Physicians, No.	2851		480		1694		677	
Medicare beneficiaries, No.	491 948		60 996		302 869		128 083	
Training HRR spending ^c								
Low	Reference		Reference		Reference		Reference	
Average	0.05 (0.00 to 0.09)	.04	0.22 (0.01 to 0.44)	.04	0.01 (-0.04 to 0.07)	.70	0.06 (-0.04 to 0.17)	.23
High	0.07 (0.02 to 0.12)	.007	0.29 (0.13 to 0.45)	<.001	0.08 (0.02 to 0.15)	.02	-0.02 (-0.12 to 0.07)	.63

Chen C, et. al. Spending Patterns in Region of Residency Training and Subsequent Expenditures for Care Provided by Practicing Physicians for Medicare Beneficiaries. *JAMA*. 2014;312(22):2385-2393. doi:10.1001/jama.2014.15973.

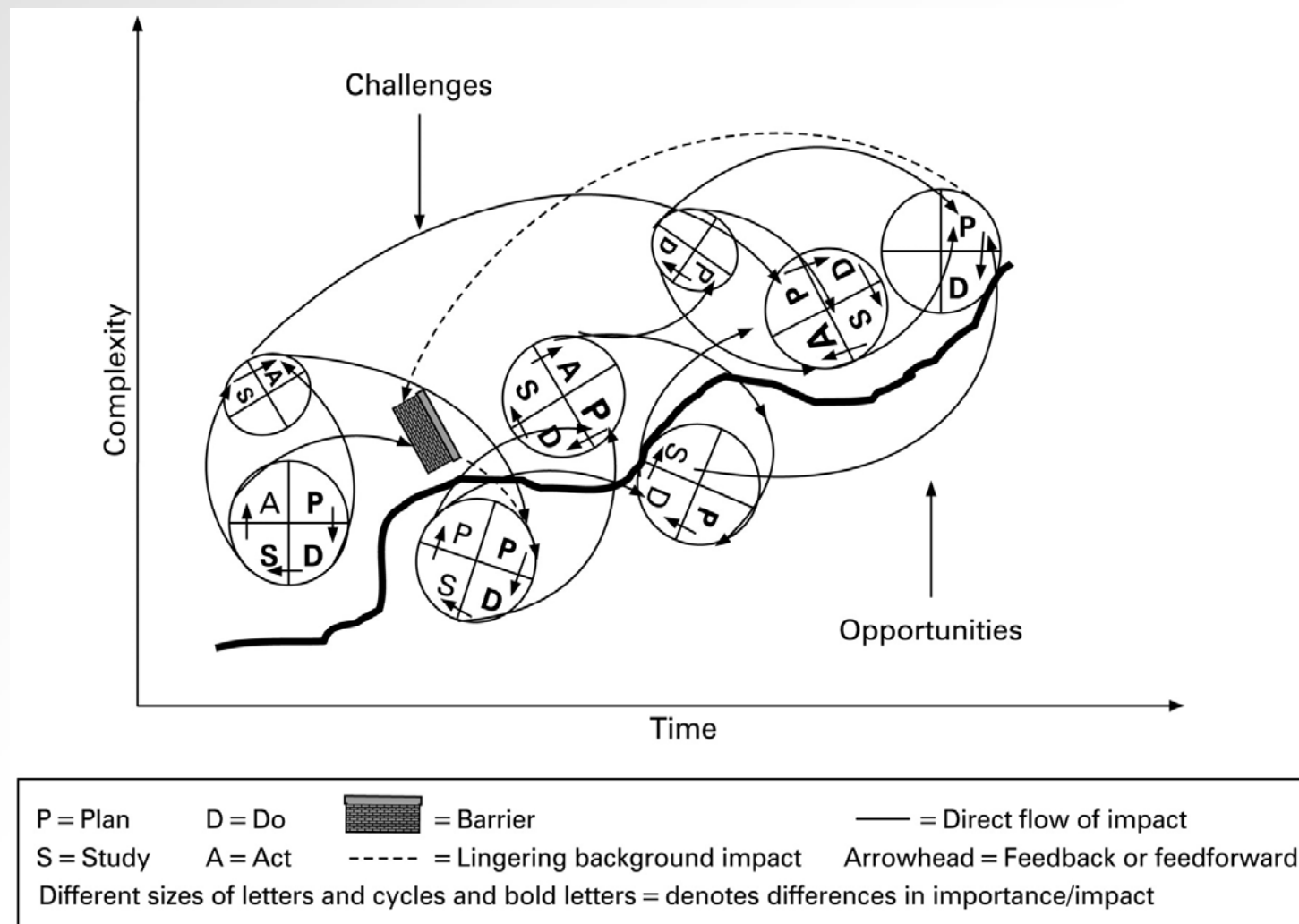
The Reality of Assessment Methods



There is NO HOLY GRAIL of Assessment:

***George Box: “All models are wrong,
some are useful”***

Milestone Journey: Revised Conceptual Model of Rapid Cycle Change



Tomolo A M et al. Qual Saf Health Care 2009;18:217-224

Thank You and Questions

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<http://journals.lww.com/academicmedicine/toc/publishahead>.
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