Competency Based Graduate Medical Education

Moving from process to outcomes

February 4, 2014
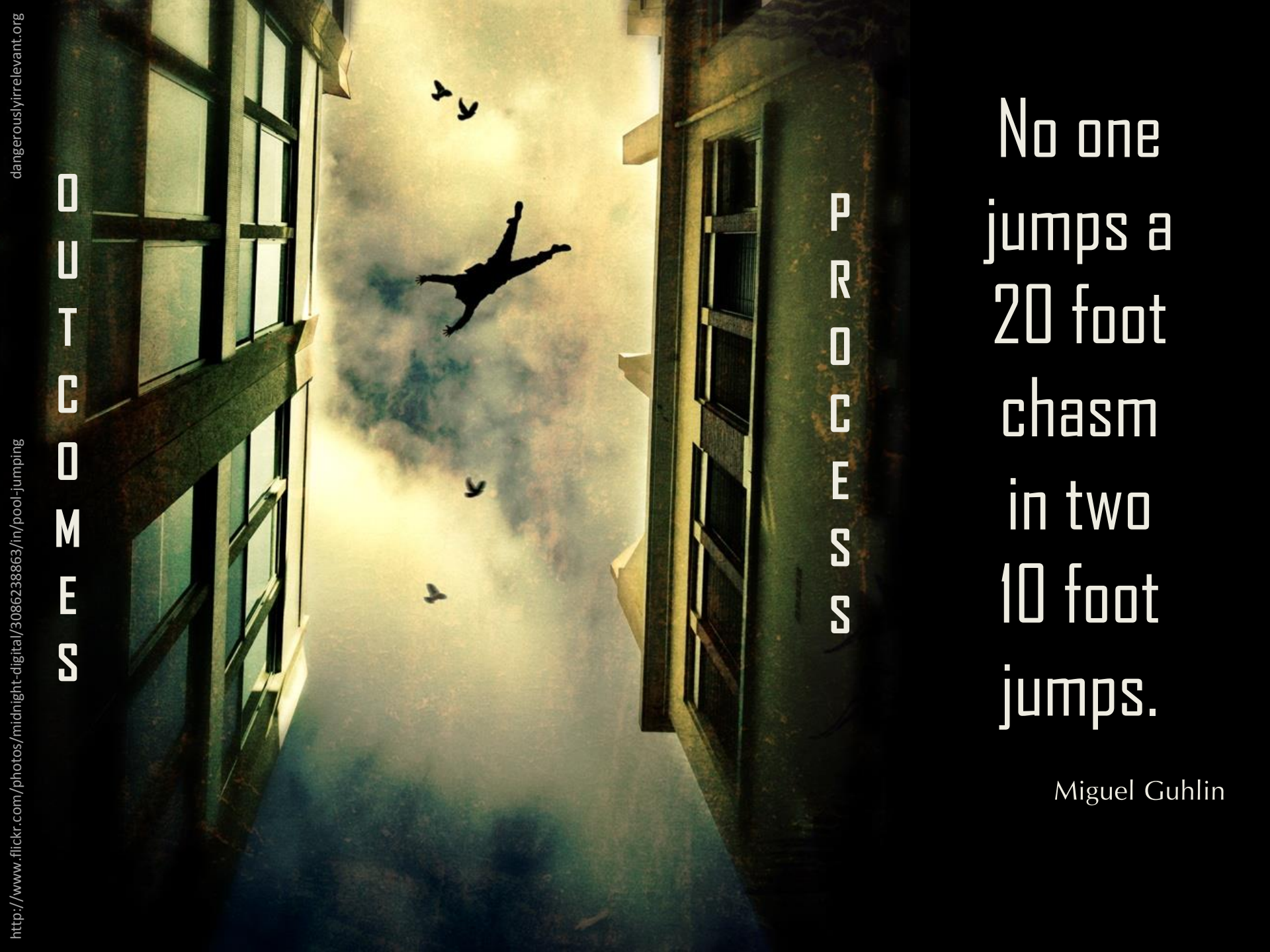
Andy Varney, MD

Competenglish

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

- Competency – An observable ability of a health professional related to a specific activity that integrates knowledge, skills, values, and attitudes. Since competencies are observable, they can be measured and assessed to ensure their acquisition. Competencies can be assembled like building blocks to facilitate progressive development.

- Competence – Possessing the array of abilities (knowledge, skills, and attitudes) across multiple domains or aspects of performance in a certain context. Statements about competence require descriptive qualifiers to define the relevant abilities, context, and stage of training. Competence is multi-dimensional and dynamic. It changes with time, experience, and setting.

- Milestone – A significant point in development that helps to define the appropriate developmental trajectory of a trainee. They identify the discrete knowledge, skills, and attitudes expected of learners as they progress through training.

- Narrative Streams – Developmental milestones-based descriptions of trainee competence in the six ACGME general competency domains. Each Narrative Stream corresponds to a competency domain within each of the six General Competencies and describes developmental progress across that competency domain in a horizontal fashion from left to right.

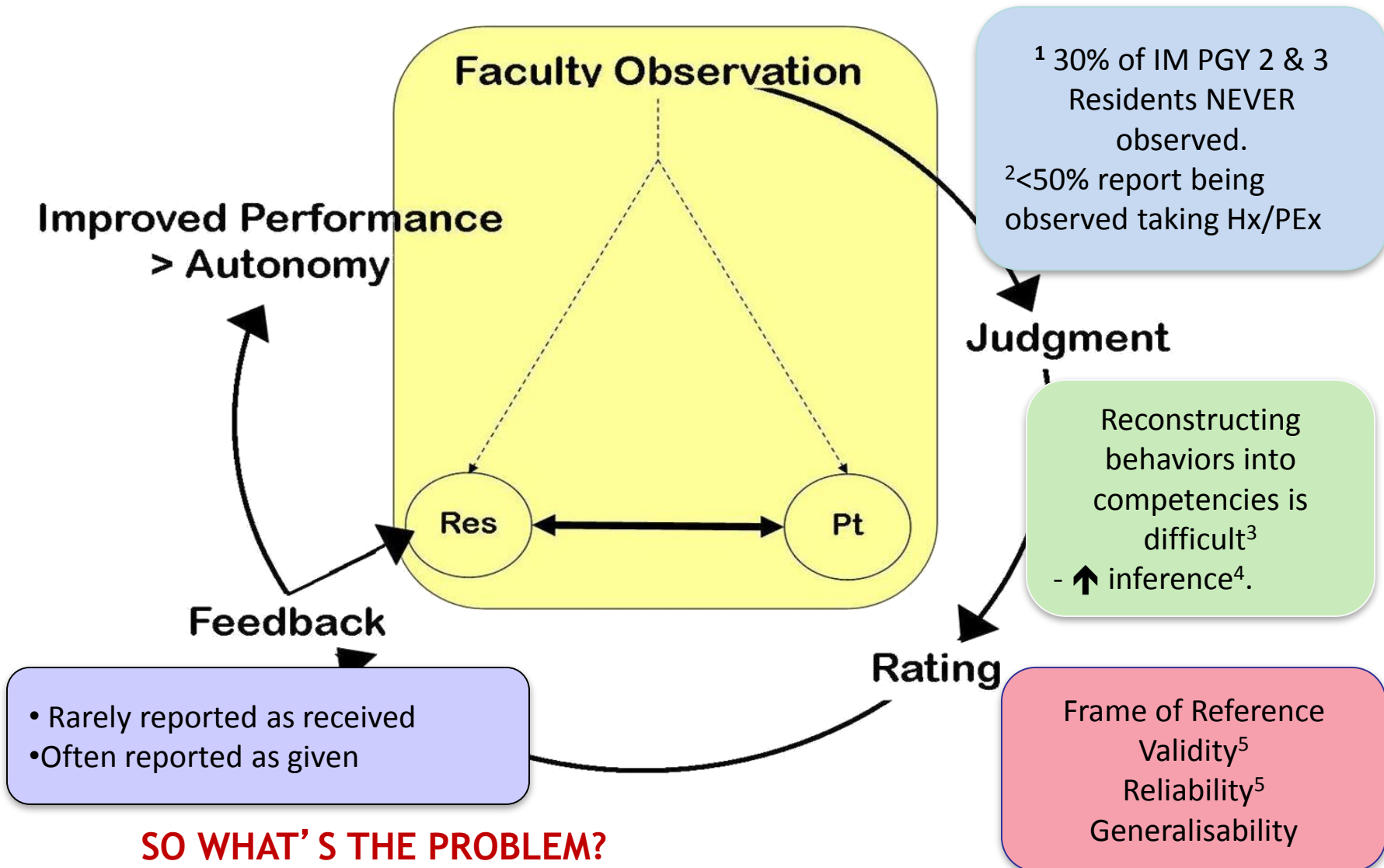No one jumps a 20 foot chasm in two 10 foot jumps.

Miguel Guhlin

OUTCOMES

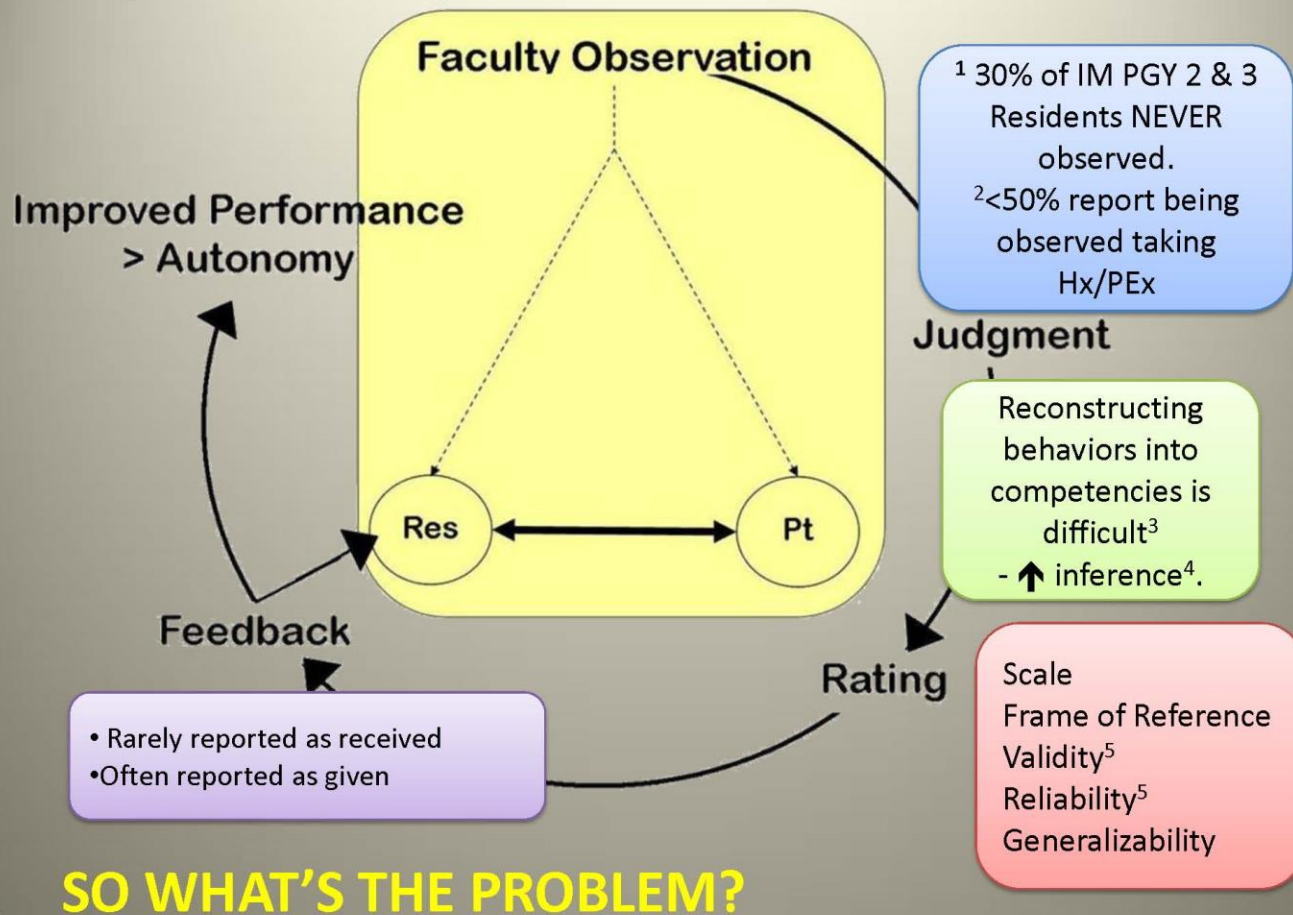PROCESS

COGNITIVE PERCEPTUAL MODEL OF CLINICIAN EDUCATORS

Faculty Observation

Improved Performance > Autonomy

Res ⟷ Pt

Feedback

Judgment

Rating

[1] 30% of IM PGY 2 & 3 Residents NEVER observed.
[2] <50% report being observed taking Hx/PEx

Reconstructing behaviors into competencies is difficult[3]
- ↑ inference[4].

Frame of Reference Validity[5]
Reliability[5]
Generalisability

• Rarely reported as received
• Often reported as given

SO WHAT'S THE PROBLEM?

Cognitive Perceptual Model of Clinician Educators

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Res ↔ Pt

Feedback

Rating

Scale
Frame of Reference
Validity[5]
Reliability[5]
Generalizability

• Rarely reported as received
• Often reported as given

SO WHAT'S THE PROBLEM?

1. ABIM 2009 Fast Track Data
2. JGIM 2008: 23(7); 1010-1015
3. Opening the black box of clinical skills assessment Kogan, JR et al, Med Educ 2011; 45; 1048-1060
4. Opening the black box of clinical skills assessment Kogan, JR et al, Med Educ 2011;45; 1048-1060
5. Factor Analysis Methods and Validity Evidence: Wetzel, A, Acad Med 2012; 87; 1060-1069.

Medical Education Trend 2000- present

Fixed length, variable outcome

**Competency Based Education**

Variable length, defined outcome

Structure/Process
- Knowledge acquisition
- Single subjective measure
- Norm referenced evaluation
- Evaluation setting removed
- Emphasis on summative

Competency Based
- Knowledge application
- Multiple objective measures
- Criterion referenced
- Evaluation setting: DO
- Emphasis on formative

Caraccio et al 2002
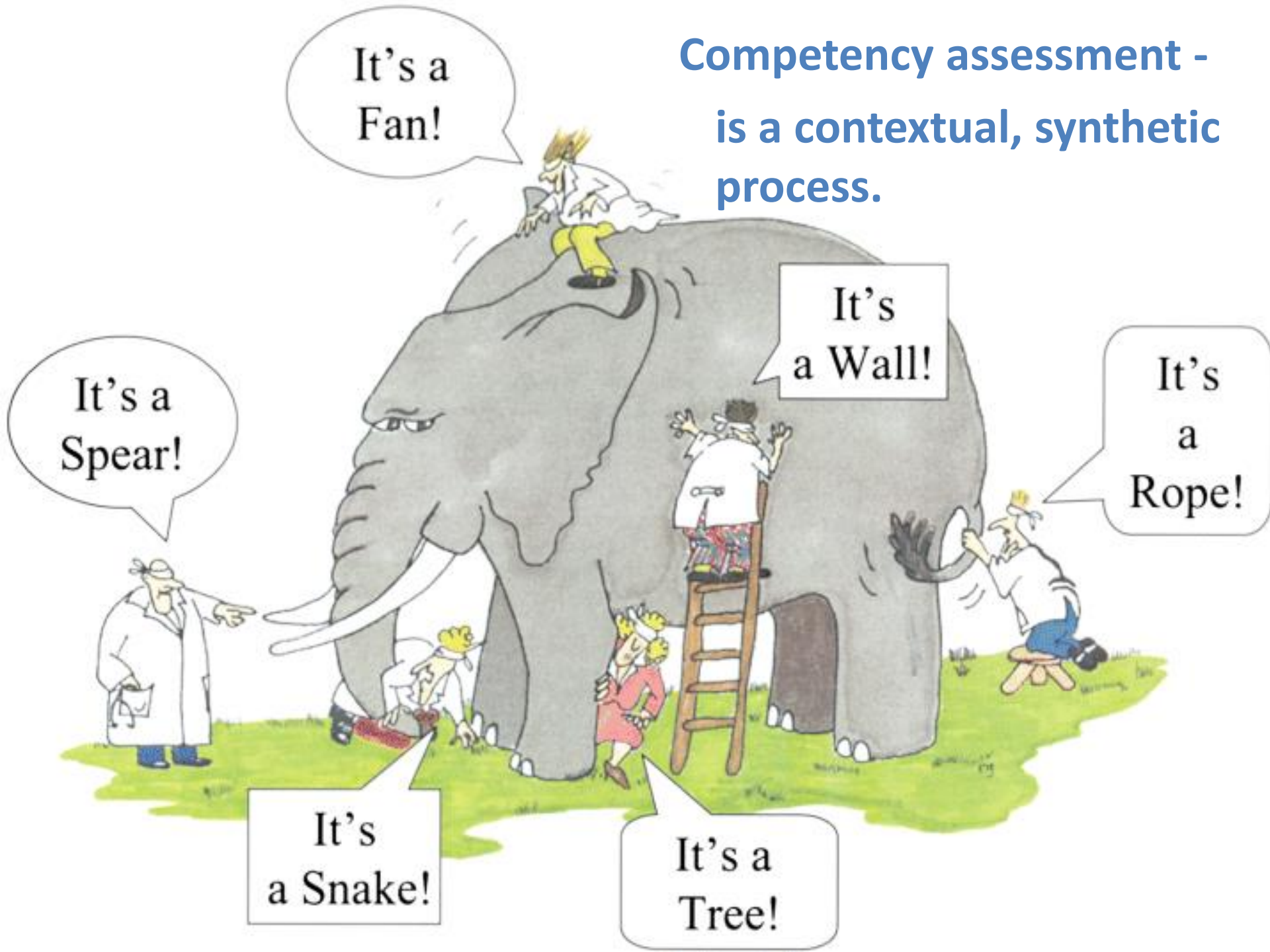
MEDICAL KNOWLEDGE:

Learner Level: Check the boxes if the resident meets the criteria.

Biological Sciences:

❑ The resident can recall the basic anatomy, physiology, microbiology, pathology and pharmacology to care for patients with respiratory and critical illness.

Clinical Sciences:

❑ The resident is able to recognize common clinical presentations of critically ill patients admitted to the ICU

Procedural Knowledge:

❑ The resident understands the indications and contraindications for invasive procedures in the ICU.

Manager Level: The resident must meet all of the Learner Level before they can meet any of the Manager Level.

Biological Sciences:

❑ The resident can manage patients with critical illness that requires the integration of anatomy, physiology, microbiology, pathology, pharmacology

and neuroscience principles, including common diagnostic test interpretation.

Clinical Sciences:

❑ The resident demonstrates sufficient knowledge to stabilize critical ill patients and utilize technology and therapeutics to diagnose and treat patients with critical illnesses.

Procedural Knowledge:

❑ The resident demonstrates the manual dexterity and procedural knowledge required to safely and successfully perform invasive procedures in the ICU.

Teacher/Leader Level: The resident must meet all of the Learner and Manager levels before they can meet this criteria.

❑ The resident is proficient in the competency of medical knowledge and functions as a team leader while teaching these skills to the medical team.

Medical Knowledge

On the grading scale choose the selection that corresponds to the boxes you have checked. If you did not directly observe the resident as a Learner, Manager or Teacher use "Unable to Assess" and move on to the next competency.

Fails all	Achieves one of the Learner Level.	Achieves two of the Learner level.	Achieves all of the Learner Level.	Achieves all of Learner and one of the Manager Level.	Achieves all of the Learner and two of the Manager Criteria.	Achieves all of the Learner and Manager levels.	Achieves all levels and is a Teacher and Leader	Unable to Assess
●	●	●	●	●	●	●	●	●

Comments
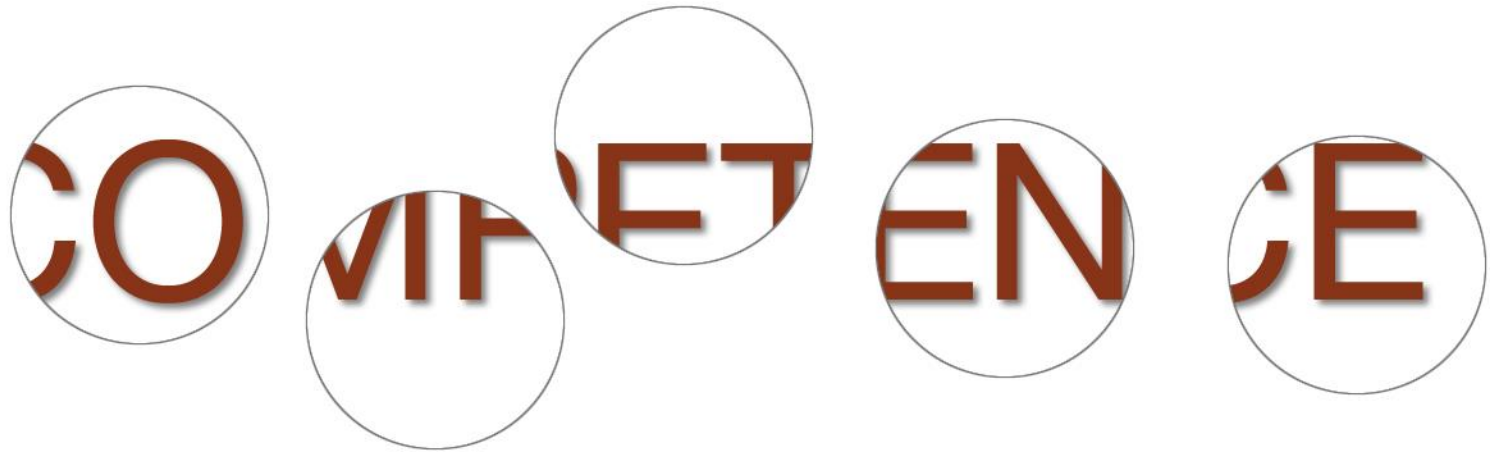
COMPETENCE

EPA - Lead and work within interprofessional teams

CO

Maintain climate of mutual respect and shared values

EPA - Lead and work within interprofessional teams

Engage in collaborative communication

EPA - Lead and work within interprofessional teams

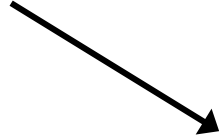**Identify and understand roles of team members**

EPA - Lead and work within interprofessional teams

Manage diverse opinions with goal optimizing patient care

Accept feedback

EPA - Lead and work within interprofessional teams

COMPETENCE

Accept feedback

EPA - Lead and work within interprofessional teams

COMPETENCE

Maintain climate of mutual respect and shared values

Identify and understand roles of team members

Manage diverse opinions with goal optimizing patient care

Engage in collaborative communication

COMPETENCE

Standard of Measurement: Entrustment

I.   Resident has knowledge and some skill, but is not allowed to perform the EPA independently.

II.   Resident may act under proactive, ongoing, full supervision.

III. Resident may act under reactive supervision, i.e., supervision is readily available on request.

IV.   Resident may act independently.

V.   Resident may act as a supervisor and instructor

Ten Cate O, Snell L, Carraccio C. Medical competence: the interplay between individual ability and the health care environment.
Med Teach. 2010;32⊗8):669-75
Crossley J, Johnson G, Booth J, Wade W. Good questions, good answers: construct alignment improves the performance of
Workplace-based assessment scales. Med Educ. 2011 Jun;45(6):560-9

Entrustment = Trustworthiness [1,2]

- Grounded in 4 attributes of Learners
  - Knowledge and skill
  - Discernment – insight/awareness limitations [2]
  - Conscientiousness
  - Truthfulness
- Entrustment implies a level of competence.

1) Kennedy et al ACAD Med; 83 (lo suppl): 589-92
2) Eva, KW, Regher ACAD Med 2005; 80-reflect in action > reflect on action

Entrustment: Construct Alignment

1	2	3	4	5
Resident requires complete direction to accomplish the task	Resident may initiate a task, but requires proactive, ongoing supervision	Resident may act under reactive supervision, supervision is available upon request	Resident may act independently	Resident may act as a supervisor and instructor

NAS 'Reporting' Milestones: aka, The Educational Milestones

NAS Milestones

The Educational Milestones

What are the Educational Milestones?

The Milestones are observable developmental steps moving from beginning resident to the expected level of proficiency at graduation from residency, ultimately, the level of expert/master. The Milestones for each specialty have been developed by an expert panel made up of members of the RRCs, the ABMS certifying board, program directors and residents. The Milestones are organized under the six competencies and describe a trajectory of progress from neophyte towards independent practice. The benefits of the Milestones is that they articulate shared understanding of expectations, set aspirational goals of excellence, provide a framework and language for discussions across the continuum, and ultimately track what is most important – the educational outcomes of the residency program.

The Educational Milestones

Educational milestones (developmentally based, specialty-specific achievements that residents are expected

In each specialty, the milestones result from a close collaboration among the ABMS certifying boards, the review committees, medical-

The aim is to create a logical trajectory of professional development in essential elements of competency

Specialty Milestones Snapshot

	Emergency Medicine	Internal Medicine	Neurological Surgery	Orthopaedic Surgery	Pediatrics	Diagnostic Radiology	Urology
# Major Milestones	23	23	25	41	20	12	29
Patient Care	14	5	9	16	5	2	10
Medical Knowledge	1	2	8	16	1	2	2
ICS	2	3	2	2	2	2	4
PROF	2	5	2	2	5	1	6
PBLI	1	4	2	2	4	3	2
SBK	3	4	2	3	3	2	3
Narrative descriptions vs. specific competency-based	Mixed	Narrative	Highly specific	Highly specific	Narrative	Mixed	Highly specific
Specific examples for achievement of level	Some examples embedded	No	N/A	N/A	No	Some examples embedded	Yes
Assessment suggestions	Yes	No	No	No	No	Yes	Yes

Sullivan G, Simpson D, Cooney T, Beresin E. A Milestone in the Milestones Movement: the JGME Milestones Supplement. JGME: 2013, 5(1):1-4

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

Does not use physical exam to confirm history

Relies exclusively on documentation of others to generate own database or differential diagnosis

Fails to recognize patient's central clinical problems

Fails to recognize potentially life threatening problems | Inconsistently able to acquire accurate historical information in an organized fashion

Does not perform an appropriately thorough physical exam or misses key physical exam findings

Does not seek or is overly reliant on secondary data

Inconsistently recognizes patients' central clinical problem or develops limited differential diagnoses | Consistently acquires accurate and relevant histories from patients

Seeks and obtains data from secondary sources when needed

Consistently performs accurate and appropriately thorough physical exams

Uses collected data to define a patient's central clinical problem(s) | Acquires accurate histories from patients in an efficient, prioritized, and hypothesis-driven fashion

Performs accurate physical exams that are targeted to the patient's complaints

Synthesizes data to generate a prioritized differential diagnosis and problem list

Effectively uses history and physical examination skills to minimize the need for further diagnostic testing | Obtains relevant historical subtleties, including sensitive information that informs the differential diagnosis

Identifies subtle or unusual physical exam findings

Efficiently utilizes all sources of secondary data to inform differential diagnosis

Role models and teaches the effective use of history and physical examination skills to minimize the need for further diagnostic testing |
| ☐ ☐ | ☐ ☐ | ☐ ☐ | ☐ ☐ | ☐ ☐ ☐ |
| Comments: | | | | |

How will the Milestones be used?

- In the NAS each program is required to form a Clinical Competency Committee (CCC)

- CCC will use data from assessment tools and faculty observations to evaluate the resident's progress and competency toward achieving the Milestones

- CCC makes a consensus decision on the progress of each resident in the program and provides recommendation to the program director

Things to know about Milestone based evaluations:

- Expected benefits
  - Behaviorally anchored
  - Potentially more objective
  - Standardize expectations for teachers and learners
  - Accelerate change for learners
  - Increase dispersion and information content of scores with reduced common cognitive errors:
    - Central tendency -- giving the similar score to disparate individuals across different traits
    - Halo or horn effect -- allowing past experience or reputation to influence scores
    - Compensation – usually balancing a low score by exaggerating performance in another area
- Expected limitations
  - Assessment spread too thin: too many behaviors unevenly assessed undermining fairness and standardization, and difficult to validate.
  - More subtle skills may not be effectively captured.
  - Severity error – the tendency for behavioral evaluations to accentuate specific failures over general competency.
- Questions answered
  - Mechanics: Reporting Milestones for each discipline developed or in final phase
  - Construct development and alignment can help
  - Rotational assessments are formative and CCC makes summative judgments

Central Tendency in evaluations

- Impact:
    - Residents receive false reassurance
    - Information regarding specific strengths and weaknesses is lost
    - Negative promotion decisions have inadequate support

- Source:
    - *Grouping too many behaviors in a single question*
    - *Use of a calendar-relative standard.*
    - *High stakes impact and relationship issues.* Social pressures may push faculty to cushion negative evaluations.
    - *Lack of clarity on how to weigh a single failure in relation to an overall pattern of behavior, natural ability, and likely future performance.*
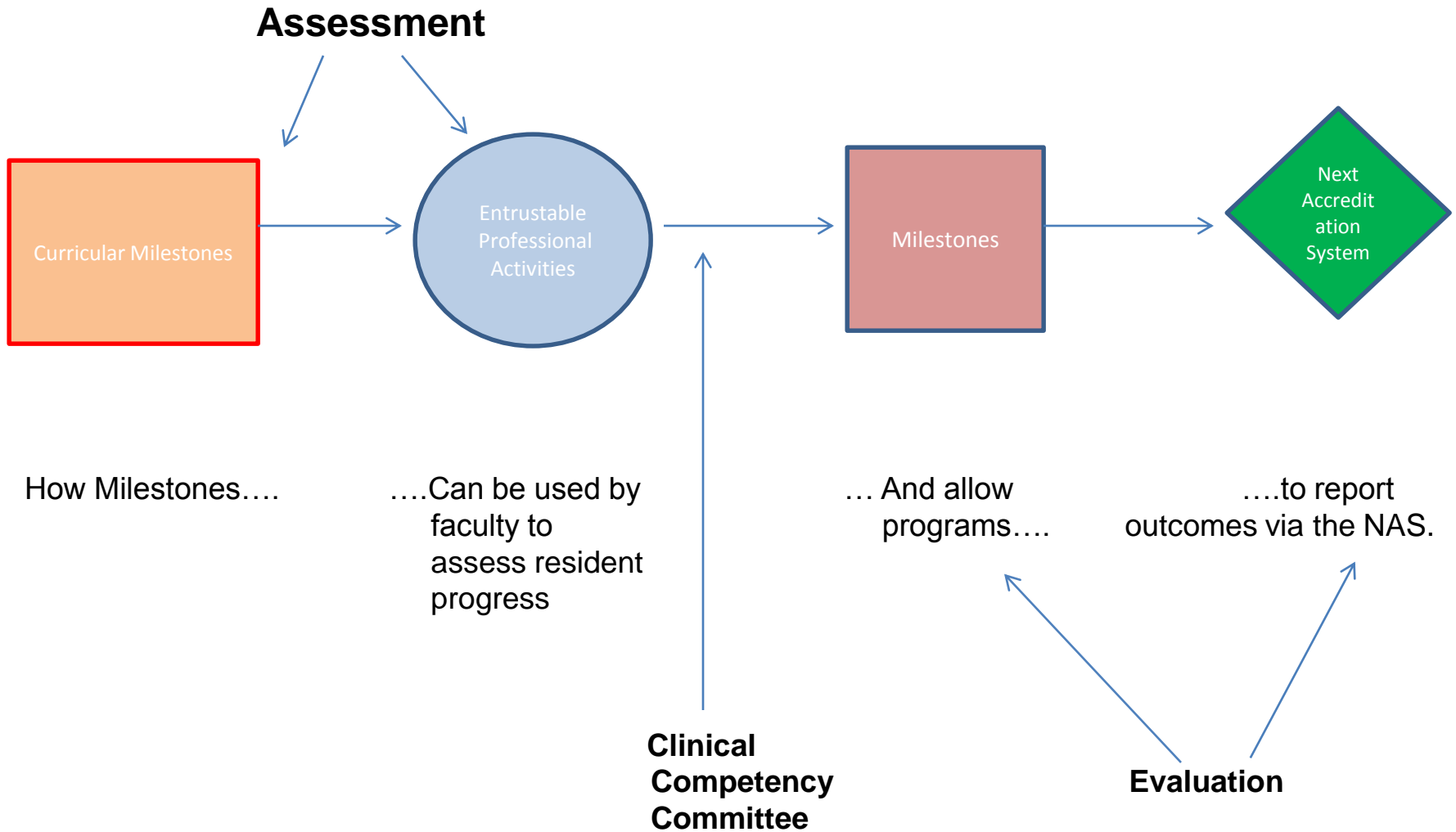
Determining how to evaluate a milestone

- What is the Goal of assessment?
  - **Capacity**
    - Has necessary knowledge, skills, and attitude to perform successfully
    - Usually measured in recall based tests, verbal questioning or in simulations.
    - Often thought of as a medical student or internship level measurement, but could apply in any setting where a learner is about to start a new activity.
  - **Ability**
    - Performs skill successfully under observation (at least once)
    - Measured formally on CEX's, procedure observations, OSCE's, and intermittently through observation on rounds.
    - As the observations are anecdotal they often captures extremes of performance – failures and extraordinary success. They should be treated as formative data. Learners can be incorrectly labeled
  - **Frequency**
    - On going measurement of the successful performance of a skill. Per human resources literature, frequency tests are best predictors of future performance.
    - Usually measured through frequent simple measures as a percent of events above a threshold. Clinical outcome data from electronic data can be presented this way.
    - Supervisors have more inter-rater agreement when they are asked to estimate frequency of good performance, then when asked to rate an employee's ability based on specific successes and failures. I.e., they should count all failures equally, discounting the severity of failure.

Role of CCC

- Members of CCC make a consensus decision on the progress of each resident

- Offer a group perspective to program director

- Serve as an early warning system for residents failing to progress

A Paradigm Shift – From Process to Outcomes

Assessment

Curricular Milestones

Entrustable Professional Activities

Milestones

Next Accreditation System

How Milestones….

….Can be used by faculty to assess resident progress

… And allow programs….

….to report outcomes via the NAS.

Clinical Competency Committee

Evaluation

Competency Domains

- Medical Knowledge
- Patient Care
- Interpersonal And Communication Skills
- Systems Based Practice
- Practice Based Learning
- Professionalism

Evaluators

- Attending
- Peer
- Self
- Nurses Case Managers
- Patients
- Office Staff

Process Flow

Trainee → Clinical Competency Committee → Promotion

Clinical Competency Committee → Termination

Clinical Competency Committee → Performance Below Standards → Root Cause Analysis 8 "D"s

Root Cause Analysis 8 "D"s → Remediation

Root Cause Analysis 8 "D"s → Probation
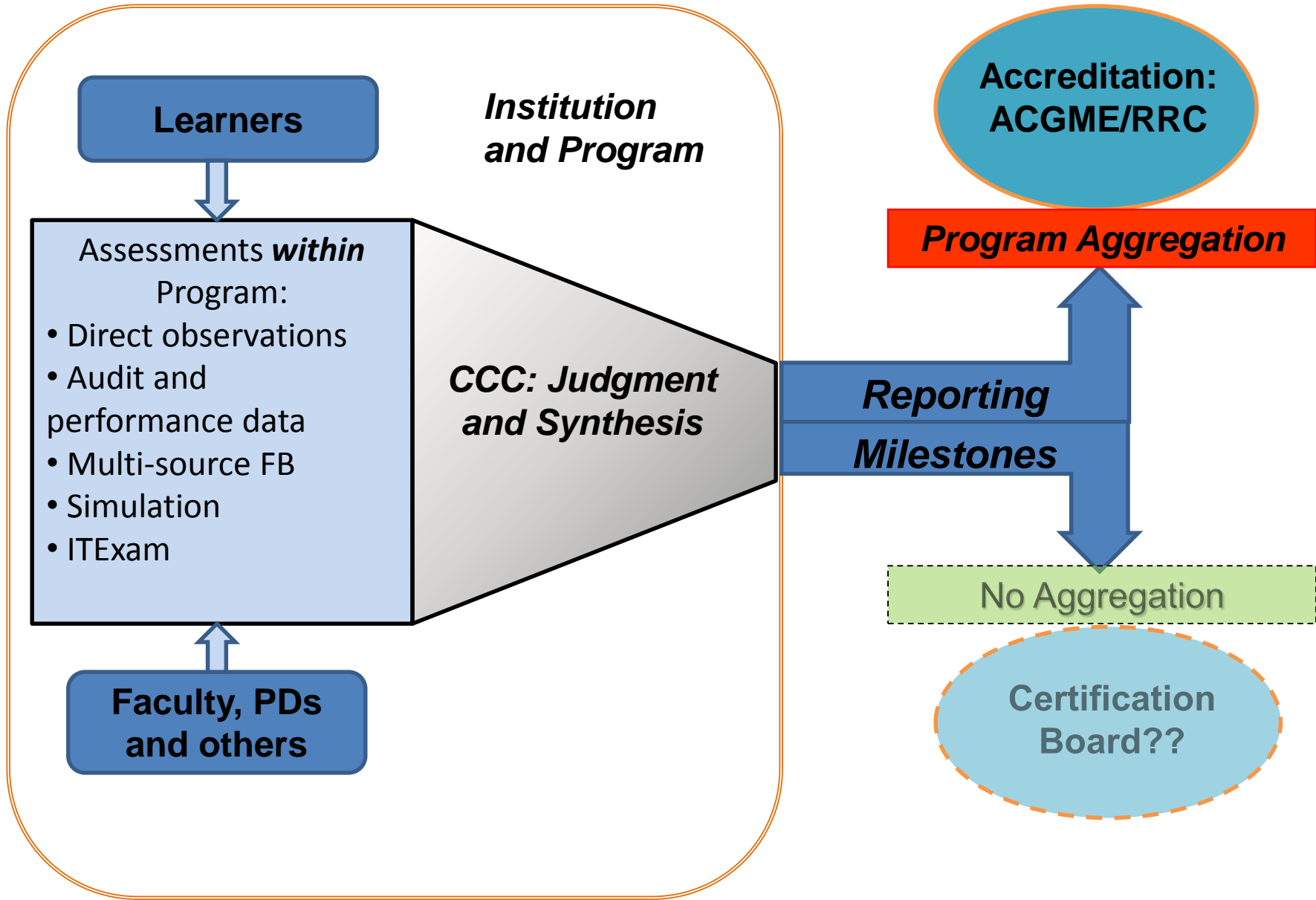
Value of Group Discussion / Decisions

- More likely to uncover deficiencies in knowledge and professionalism (UME)
  - Hemmer; Acad Med 1997, 2001
- Better predicts poor internship performance
  - Lavin; Acad Med 1999
- Society--benefit of doubt
  - Gaglione; Acad Med, 2005
- Case-based faculty development
  - Hemmer, Acad Med, 2000

Value of Group Discussion (2)

- Improved inter-rater reliability, reduced range restriction in multiple domains
  - Thomas; JGIM 2011
- Detected additional 18% of resident deficiencies requiring remediation
  - Schwind; Acad Med 2004
- No individual dominates discussions
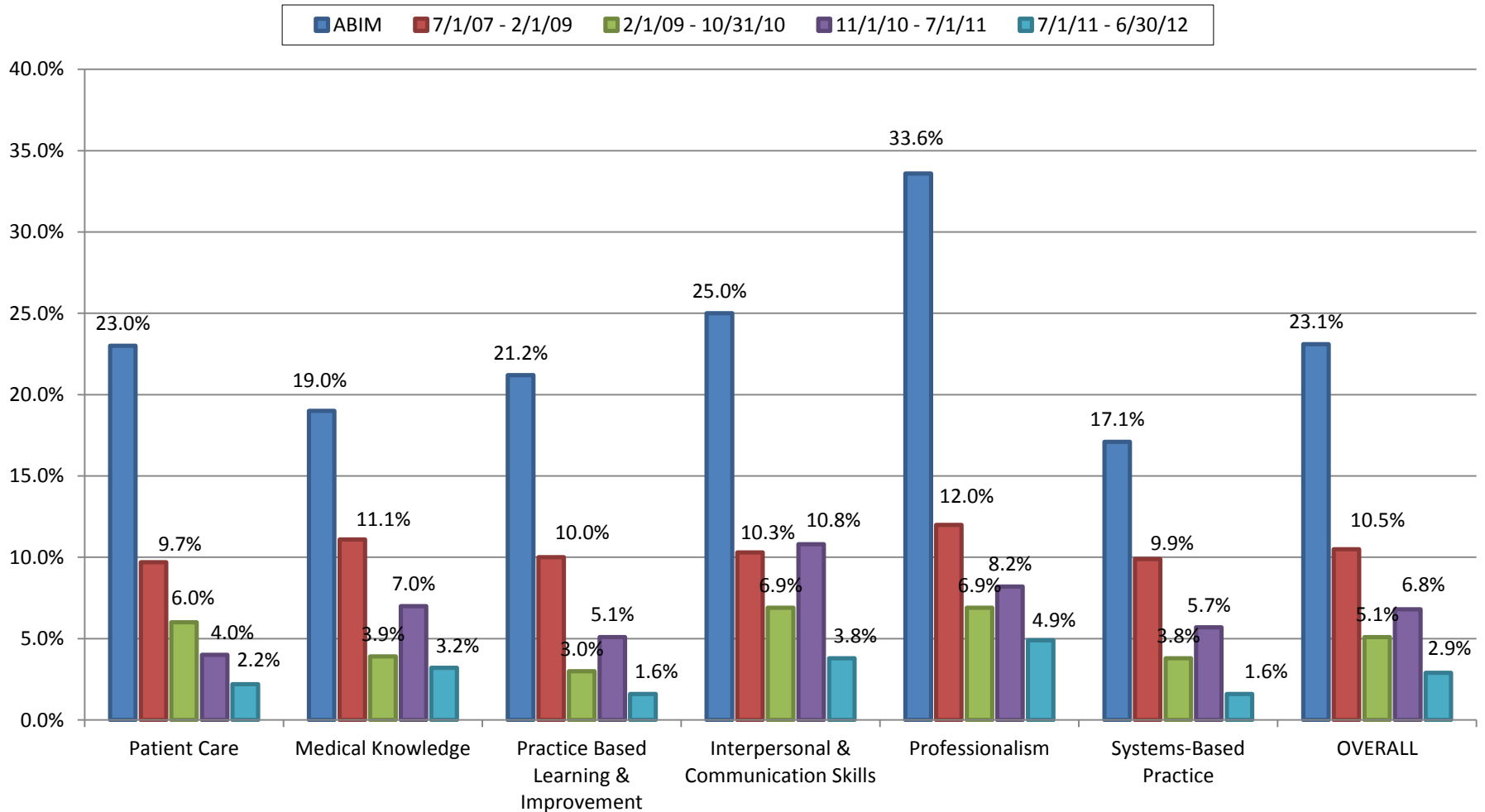 - Williams, TLM 2005; Gaglione 2005

Assessments and Milestones

"The CCC will review and use assessment data including faculty member assessments of residents on rotations, self-evaluations, peer evaluations, and evaluations by nurses and other staff members."

"Each program may continue to use its current resident assessment tools and phase in tools developed specifically for the milestones when these become available."
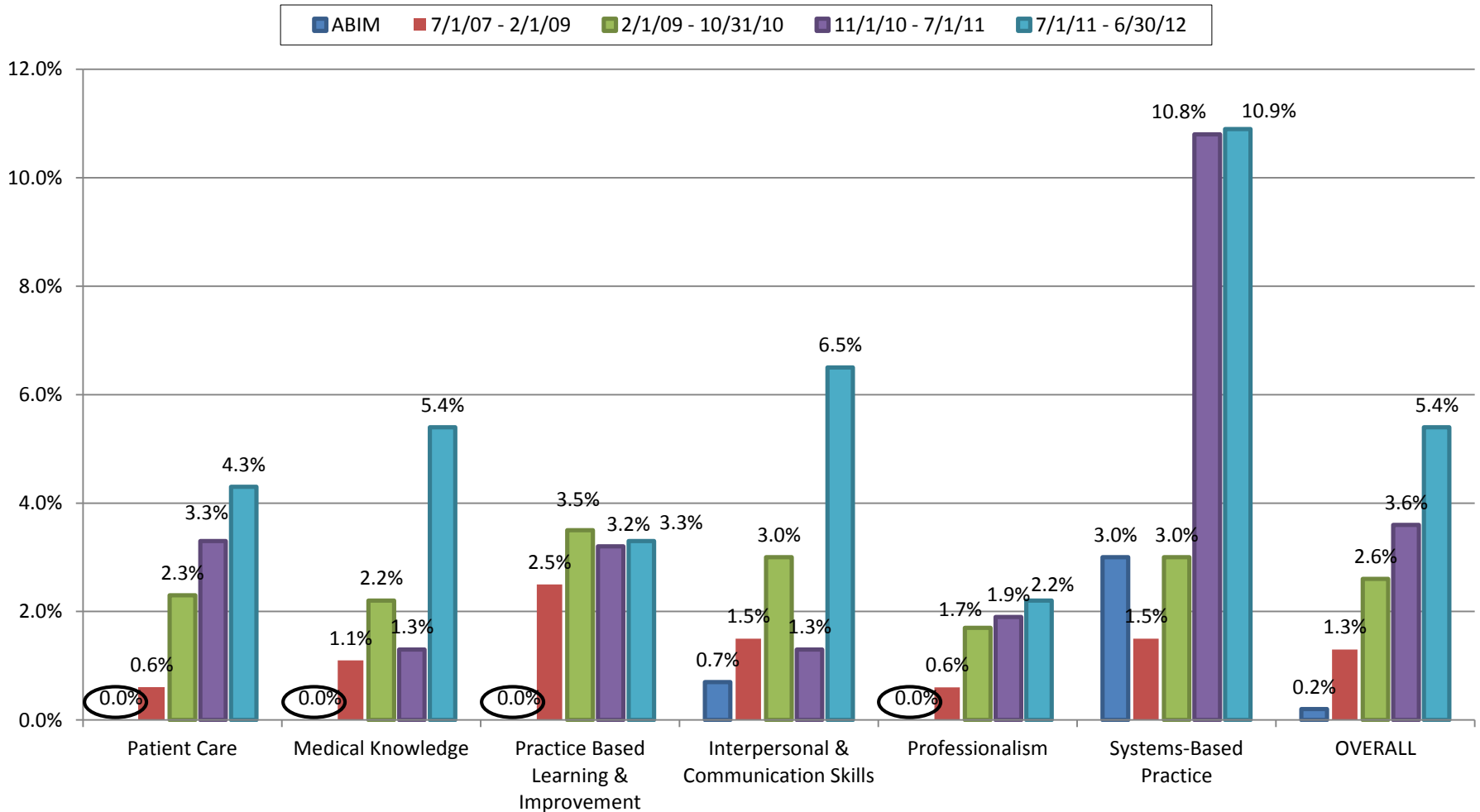
**Competency Based Assessment
Effect of Construct Alignment**

RESULTS AND OUTCOMES – CoBRA - Impact on grade inflation
% of time an intern received an 8

Legend: ABIM | 7/1/07 - 2/1/09 | 2/1/09 - 10/31/10 | 11/1/10 - 7/1/11 | 7/1/11 - 6/30/12

Patient Care: 23.0%, 9.7%, 6.0%, 4.0%, 2.2%
Medical Knowledge: 19.0%, 11.1%, 3.9%, 7.0%, 3.2%
Practice Based Learning & Improvement: 21.2%, 10.0%, 3.0%, 5.1%, 1.6%
Interpersonal & Communication Skills: 25.0%, 10.3%, 6.9%, 10.8%, 3.8%
Professionalism: 33.6%, 12.0%, 6.9%, 8.2%, 4.9%
Systems-Based Practice: 17.1%, 9.9%, 3.8%, 5.7%, 1.6%
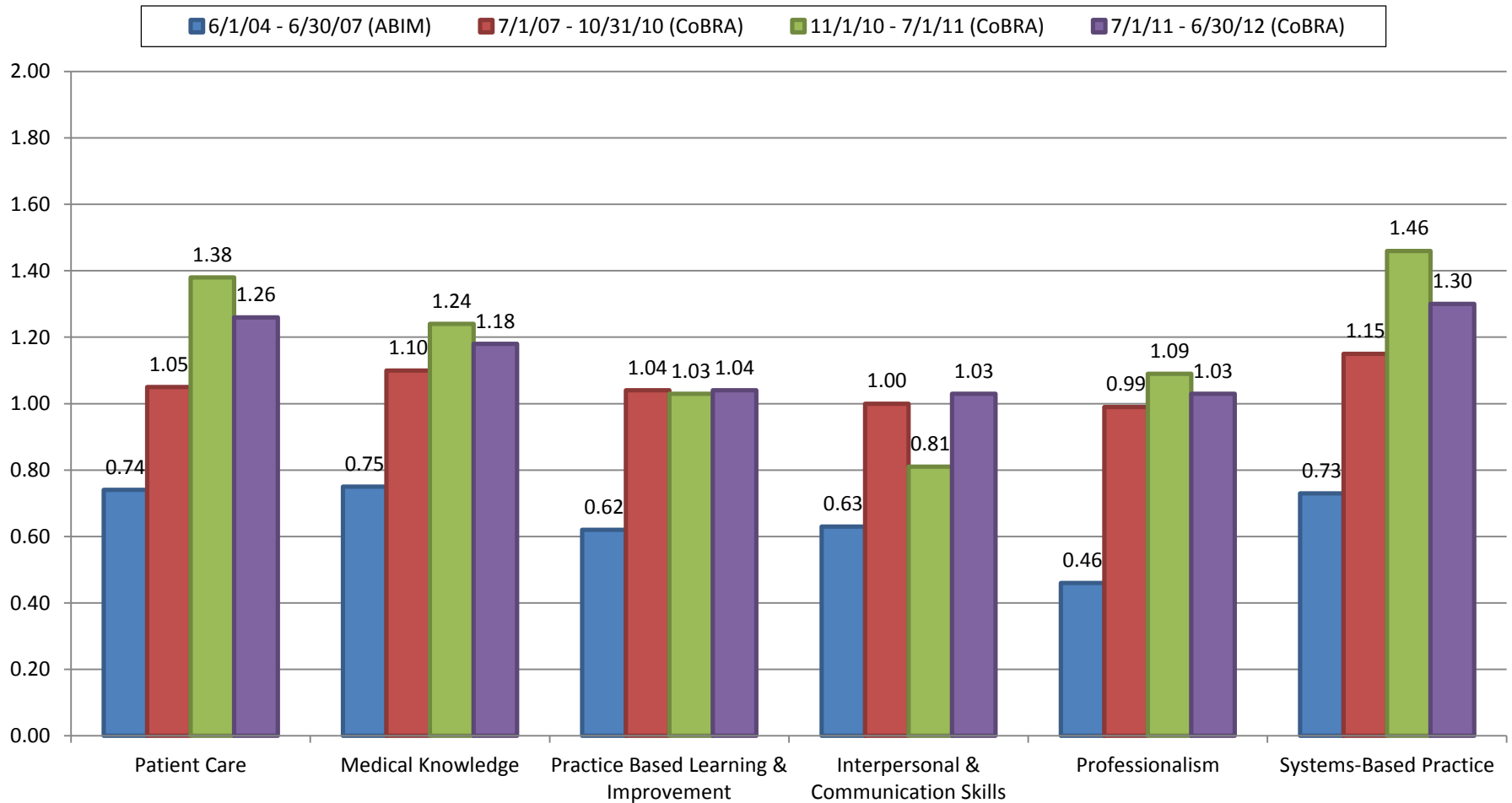OVERALL: 23.1%, 10.5%, 5.1%, 6.8%, 2.9%

Competency Based Assessment
Effect of Construct Alignment

Result and Outcomes – CoBRA – Impact on use of left side of scale
% of time a PGY1 resident received a 3

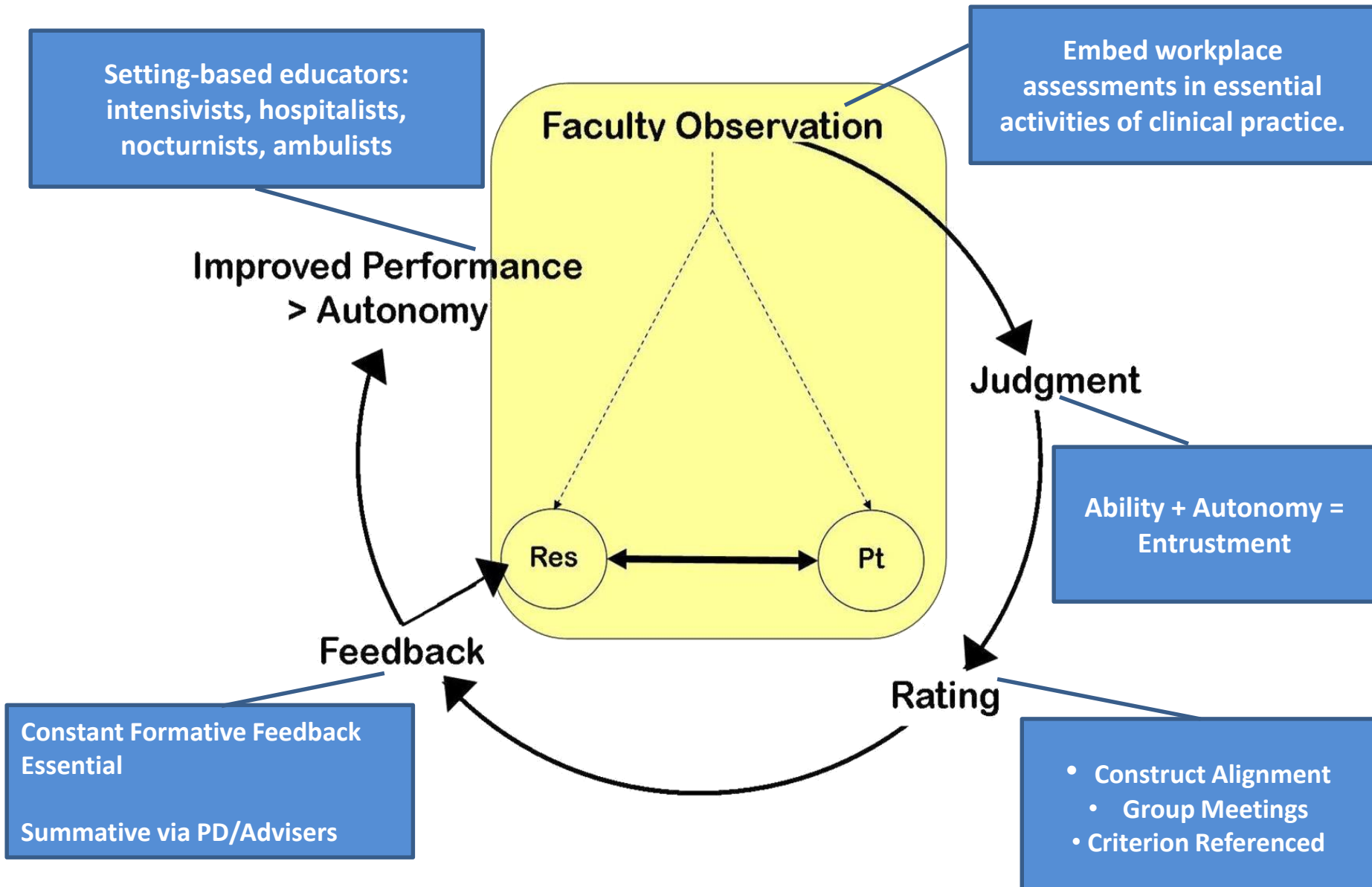Legend: ABIM | 7/1/07 - 2/1/09 | 2/1/09 - 10/31/10 | 11/1/10 - 7/1/11 | 7/1/11 - 6/30/12

Competency Based Assessment
Effect of Construct Alignment

DIFFERENCE BETWEEN PGY 1 AND 3 RESIDENT ACROSS
ACGME Competencies – Increased Assessor discrimination

SO ARE THERE ANY ANSWERS?

Setting-based educators: intensivists, hospitalists, nocturnists, ambulists

Embed workplace assessments in essential activities of clinical practice.

Faculty Observation

Improved Performance > Autonomy

Res

Pt

Judgment

Ability + Autonomy = Entrustment

Feedback

Rating

Constant Formative Feedback Essential

Summative via PD/Advisers

- Construct Alignment
- Group Meetings
- Criterion Referenced

Faculty Development

Creating Change:

Advancing Competency-Based Assessments

Your clinician-educator faculty are the people who must generate and sustain the commitment for authentic workplace assessments.

But First:
Have the faculty agreed….

1) There is a problem that needs attention?

2) On the definition of the problem/issue?

3) To work together on the problem/issue?

4) How to work together on the problem/issue?

5) On the solution(s) to the problem/issue?

6) On any implementation plan and action steps?

Goal: Facilitate your clinician-educators to assess what really matters.

- What outcomes, behaviors, skills, attitudes are important?
- What can be observed or inferred within our current workflow?
- What could we change in our workflow to improve direct observation of what matters?
- Ask the faculty to frame across ACGME competencies using criterion behaviors or discipline milestones.
- Start organically/synthetically creating champions for direct observation and CBA.

Starting Over

- Understand the context for change before you act
- Define shared values and engage clinician-educators in positive action
- Create transparency and safety for developing each contribution to the whole. Remember it is an iterative process.
- Share Power and Influence to create a shared mental model.
- Coaching/Mentoring demonstrates commitment to your faculty
- Help your faculty create "better" tools to measure what matters.

Opportunities for CBA GME collaboration

- SIU GME Toolkit: – articles, Q sorts, curricular milestones, tools to assist, samples.

- SIU GME: Work together to advance?
  - Procedural competency
  - Entrustable Professional Activities
  - Focused workshops to sharpen skills

Thanks for your attention!

Questions ? Suggestions?
Comments?