Beyond Clinical Performance Assessment: Feedback, Learning Goals, and Remediation

2010 Maatsch Lecture

Karen Hauer, MD
Professor of Medicine
Gold Headed Cane Endowed Education Chair
University of California, San Francisco
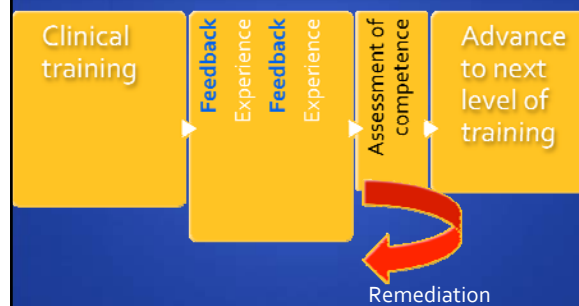
UCSF
University of California
San Francisco

Thank you

- The purpose of the Jack L. Maatsch Visiting Scholar in Medical Education fund is:
  - to stimulate and support interaction around ideas and projects in medical education, with primary focus on the development and assessment of clinical competence related to the full span of professional training.

Medical Training

Clinical training via experience → More experience → Assessment → Advance to next level of training

---

Modern Medical Training

Clinical training → Feedback Experience Feedback Experience → Assessment of competence → Advance to next level of training

Remediation

Outline

- Clinical performance assessment
- Feedback
- Remediation
- Feedback
- Learning goals
  - The importance of formative assessment
  - Clinical performance assessment in the workplace
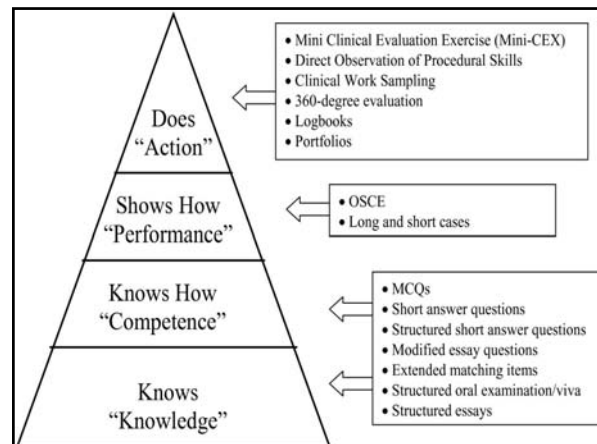- (More on) feedback

---

Is this doctor competent?

Assessment of Competence

- "Professional competence: the habitual and judicious use of communication, knowledge, technical skills, clinical reasoning, emotions, values, and reflection in daily practice for the benefit of the individual and community being served"

- Developmental continuum from novice → → competent → → expert

Epstein RM, Hundert EM. JAMA 2002
Carracio et al. Acad Med 2008

Pyramid diagram:

- Does "Action"
  - Mini Clinical Evaluation Exercise (Mini-CEX)
  - Direct Observation of Procedural Skills
  - Clinical Work Sampling
  - 360-degree evaluation
  - Logbooks
  - Portfolios
- Shows How "Performance"
  - OSCE
  - Long and short cases
- Knows How "Competence"
  - MCQs
  - Short answer questions
  - Structured short answer questions
  - Modified essay questions
  - Extended matching items
  - Structured oral examination/viva
  - Structured essays
- Knows "Knowledge"

National Studies of Medical Student Clinical Skills Assessment and Remediation

- Karen E. Hauer, MD
- Carol S. Hodgson, PhD
- David Irby, PhD
- Kathleen Kerr, BA
- Patricia O'Sullivan, EdD
- Varun Saxena, MD
- Arianne Teherani, PhD

- A series of studies supported by the Josiah Macy, Jr. Foundation

---

Forces Influencing Clinical Skills Assessment

- 1990's: Josiah Macy, Jr. Foundation funded 6 regional consortia for undergraduate SP assessment (California CPX consortium)

- 1999: ACGME endorses 6 competencies, emphasizes outcomes of graduate training

- 2004: National Board added licensing requirement - USMLE Step 2 CS

Purpose

- To characterize clinical skills assessment programs nationally

- To explore how USMLE Step 2 CS will impact in-house clinical skills assessment programs

- To identify methods used for standard setting and remediation

---

Results: Clinical Skills Assessment Programs

Timing in Curriculum	Clinical Skills Assessment Program
During/end 1st year	66 (73%)
During/end 2nd year	82 (90%)
During 3rd year	64 (70%)
End of 3rd or during 4th year	76 (84%)

Hauer et al. Acad Med 2005

Feedback to students

- A critical purpose of the in-house exam
  - All schools gave all students some feedback
- Debate about optimal balance of formative and summative feedback

Hauer, Acad Med 2006

Lowest scoring students received the most feedback

It gives me an opportunity to take a student who has an odd affect and now there's data. Instead of me just saying, 'Gee, this may be a problem; you don't make good eye contact,' I can say now, 'This is a problem. You're not making good eye contact. It's been noted in your clerkships and, here on the OSCE, you did poorly.

Barriers to giving students feedback

- Maintaining exam security
- Limited faculty time
- Resources: balancing goals for teaching, formative and summative assessment
- Focusing students on concepts, not cases or checklists

Risks of competency-based assessment

- Focus on minimally acceptable performance
- No motivation toward lifelong learning
- Emphasis on discrete tasks rather than complex performance

- *Wash hands*
- *Say "that must be hard"*
- *Ask patient what she thinks is going on*

Student perspective: preparing for USMLE Step 2 CS
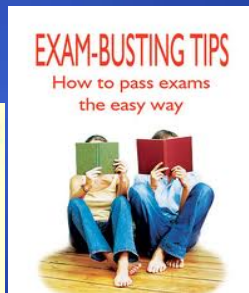
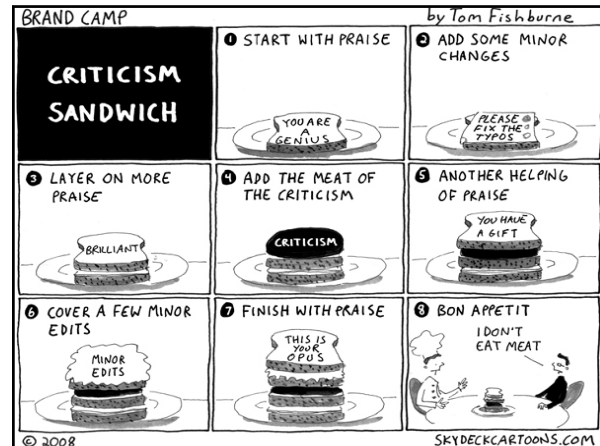## Barrier to feedback: faculty skill

Redefining feedback

- Current feedback models are limited
  - Reductionist
  - Hierarchical, diagnostic
  - Educator-driven, one-way

Archer, Med Educ 2010

BRAND CAMP by Tom Fishburne

CRITICISM SANDWICH

❶ START WITH PRAISE — YOU ARE A GENIUS
❷ ADD SOME MINOR CHANGES — PLEASE FIX THE TYPOS
❸ LAYER ON MORE PRAISE — BRILLIANT
❹ ADD THE MEAT OF THE CRITICISM — CRITICISM
❺ ANOTHER HELPING OF PRAISE — YOU HAVE A GIFT
❻ COVER A FEW MINOR EDITS — MINOR EDITS
❼ FINISH WITH PRAISE — THIS IS YOUR OPUS
❽ BON APPETIT — I DON'T EAT MEAT

© 2008   SKYDECKCARTOONS.COM

Student performance problems and remediation

Remediation as feedback for the students most in need

Student performance problems

Types of (inter-related) problems in clinical performance assessments

1. Technique errors
2. Cognitive: knowledge, clinical reasoning
3. Non-cognitive: communication, professionalism

Hauer, et al. Acad Med 2007

Non-cognitive problems: communication and professionalism

- Poor insight or resistance to exam process
  - Lack of respect/empathy
  - Blaming test environment rather than one's own deficiencies
- Most challenging to remediate - maladaptive personality styles

Problems receiving the feedback

Implications

- Insight crucial for remediation

- Promoting reflection may facilitate students' ability to incorporate changes in their approach to patients

Remediation techniques

Clinical	Independent
• Preceptorships • Remediation within clerkships • Special clinical rotations	• Independent study (Web module, reading) • Student reviews exam recording alone
Precepted video review •Precepted review of exam recording	**Organized group activities** • Practice with SPs • Skills workshops, or group discussions

Saxena V et al. Acad Med 2009

Use of Remediation Activities

Remediation Activity	Overall	History	PE	Knowledge	Clinical Reasoning	Professionalism	Communication
Clinical Activities	1.9	1.9	1.8	2.0	1.4	1.7	1.8
Independent Study	2.6	2.4	2.4	2.6	2.4	2.0	2.4
Precepted Video Review	3.4	3.3	3.2	3.0	3.1	3.2	3.6
Organized Group Activities	2.8	2.7	2.2	2.3	2.3	2.2	2.7

1 = never, 3 = half the time, 5 = always

Saxena V et al. Acad Med 2009

Confidence in exam and remediation

| I am confident in:	Mean
our exam scores	4.1
our ability to **diagnose** student problems	4.0
our ability to remediate history taking, physical exam	3.8
our ability to remediate communication	3.6
our ability to remediate clinical reasoning	3.2
our ability to remediate knowledge	3.1
our ability to remediate professionalism	2.9
I am satisfied with our school's remediation process	3.5

1 = strongly disagree, 5 = strongly agree

Much uncertainty about remediation

- Schools invest significant resources in analyzing why a student failed
  - Confidence in diagnosis is high
  - Confidence in remediation is low

- Schools use resource non-intensive remediation activities (Precepted Video Review) most, and resource intensive activities (Clinical Activities) least

- Institutions that required retest are most satisfied with their remediation process.

Challenges of remediating late in medical school

- I passed all of my core clerkships…

- I am busy doing my subinternship…

- I have to do 4 visiting "audition" rotations…

- Residency applications are due…
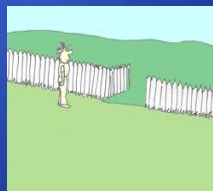
Is there a better way?

Remediation of Physicians across the Continuum from Medical School to Practice: a Thematic Review of the Literature

KE Hauer, A Ciccone, TR Henzel, P Katsufrakis, SH Miller, WA Norcross, MA Papadakis, DM Irby

Acad Med 2009

Narrative literature review of remediation

Study criteria
1. Deficiencies in an individual's performance identified through an assessment process
2. Attempt is made to provide remedial education
3. Reassessment after remediation

## 13 published studies of remediation

	Deficit	Identification	Intervention	Outcome
UME	Knowledge, clinical skills	Written or SP exam	Faculty video review, SP practice, tutorials	Retest - knowledge or SP exam
GME	Knowledge	In-training exam	Individual study plan, mentor, clinical rotations	Exam scores
CME	MD practice	Chart review, interviews	Individualized	Chart or practice review

Using the learning sciences to guide remediation

Knowledge deficit	Help build strong knowledge structures and representations (schema, scripts, exemplars, prototypes)
Knowledge and skills deficits	deliberate (conscious and focused) practice with feedback
Professionalism problem	explicit instruction, guided practice, mentored reflection, observation and interaction with role models
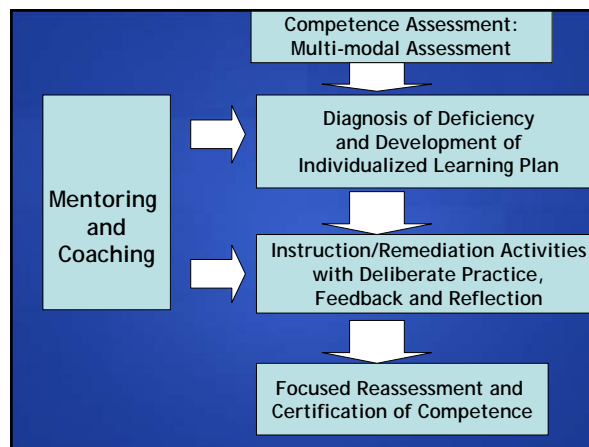
Costs of remediation

- Resource intensive interventions for a small number of learners
- Creating efficiencies
  - "referral centers" – collaborative across institutions
  - Span UME/GME/CME
  - Promote learner self-assessment of skills

Feedback and formative assessment

- Formative assessment
1. teacher and learner clarify expectations: learning intentions and criteria for success
2. teacher provides feedback
3. learner is activated as owner of own learning (self-assessment, learning goals)

Black, Wiliam. Educ Assess Eval Acc. 2009

Lifelong learning

- Performance assessment
- Individual feedback
- Performance benchmarking
- Goal setting
- Performance improvement

Hojat et al, Medical Teacher, 2003

The inaccuracy of self-assessment

Self-assessed ability

Low   Average   High

Actual ability

Davis D et al, JAMA 2006

Feedback complexity affects effectiveness of feedback

- Verification (right/wrong, % correct)
- Right answer, try-again until right
- Elaborated
- Hints/cues, error analysis
- Informative tutoring

Shute VJ. Review Educ Rsch 2008

Recipient characteristics affect effectiveness of feedback

- High performers benefit from feedback that is:
  - Delayed
  - Facilitative (hints, cues, challenges)

- Low performers benefit from feedback that is:
  - Immediate
  - Directive
  - Providing scaffolding

Shute VJ, Review Educ Rsch 2008

How do our own students hear and incorporate feedback from the CPX?

Students' self-assessment after a standardized patient exam

	Feedback	Self-assessment
1	None	• Poor correlation with actual performance • Students did rank order their skills accurately (history, exam, communication)
2	Individual video review	• Students downgraded their performance rating, particularly the low performers • Still a poor correlation between self-assessed and actual performance
3	Individual video review + performance benchmarks	• Improved accuracy of self-assessment – modest correlation • Correlation improved most for the low performers

Srinivasan et al, Med Educ 2007

Influences on learning goals

- All feedback is filtered through the recipient's own self-assessment

- Which factors influence students' learning goals after OSCE cases AND feedback (faculty scores, comments)?
  - Student, case, faculty feedback?

- Students' self-assessments most strongly informed learning goals

Eva et al, Acad Med 2010

Goal orientation

Learning orientation: desire to learn new skills

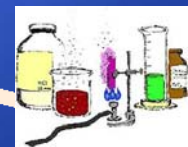Performance orientation: desire to demonstrate competence

"I care about this material and want to be a superb doctor"

"I want to get an 'A'"

Goal orientation

Learning orientation: desire to learn new skills

Performance orientation: desire to demonstrate competence

Reformed vision of curriculum
- Diverse learners
- Socialization
- Authenticity
- Challenging, problem solving

Cognitive, constructivist learning theories
- Construct knowledge in social context
- New learning influenced by prior knowledge, culture
- Metacognition
- Deep understanding, transfer

Assessment
- Challenging higher order tasks
- Learning processes, outcomes
- Ongoing, integrated with teaching
- Self-assessment
- Clear expectations

Shepard, Educ Res 2009

Curricular goals in the era of competency based assessment

- Goal: to standardize learning outcomes and assess competencies over time AND individualize the curriculum...
- Could argue for
  - a structured supplemental curriculum for practice and feedback
  - shift from remediation to individualized curriculum

Cooke, Irby, O'Brien. Educating Physicians: A Call for Reform of Medical School and Residency. 2010.

What if we move from a paradigm of remediation to one of formative assessment and individualized learning plans?

Changing our approach to remediation

Predicting Failing Performance on a Standardized Patient Exam (CPX)

- Which medical school assessment measures identify students at risk of failing CPX?
  - Retrospective case-control study
- Results: students flagged even once in student progress meetings or clerkships ->
  - increased risk of failing CPX in communication
  - no predictors of failing H & P

Chang et al. Acad Med 2009

Clinical Skills Guidance Program

- Goals:
  - Partner with the student progress committee and advisory college mentors
  - Create a competency-based supplemental curriculum for H&P and communication for at-risk students through the clinical core year

---

Curriculum activities

- Student completes written reflection and own *learning goals* with advisory college mentor and clinical skills guidance faculty
  1. Student watches faculty narrated video cases
  2. Student - clinical skills guidance faculty: individual performance review, learning plan (Gap analysis)
  3. Standardized patient workshop
  4. High-stakes standardized patient exam (CPX)

The importance of formative assessment

- Feedback must be conceptualized as a supported sequential process rather than a series of unrelated events.
- Requires established, longer-term professional relationships

Archer. Med Educ 2010

Next steps: feedback in the workplace

- Sociocultural theory of learning: learn through active participation in work of a community
- Clinical workplace learning: oriented toward the central goal of helping patients
  - guided participation to engage learners in patient care, challenge to perform at higher levels of competence
  - supervisor adapts level of support and feedback to learner's needs

Dornan T et al. Med Educ 2007

Faculty and student perceptions of evaluation in two clerkship models

- Traditional block clerkships and longitudinal integrated clerkship
- Longitudinal clerkship:
  - Multiple simultaneous preceptorships (developmental)
  - Longitudinal preceptors (relationships)
  - Brief structured clinical observations (bedside teaching, feedback)
- Survey of preceptors, students in each clerkship model

Mazotti L et al. Med Educ, in press
McGaghie WC et al. Acad Med 1995

Greater satisfaction and confidence with evaluation in the LIC

- Preceptors and students favored evaluation in the LIC on three factors (p≤.01):
  1. validity of evaluation process
  2. quality of clinical skill evaluation
  3. willingness to provide constructive feedback

Informed self-assessment

-> Conditions: environment, relationships, personal attributes

-> Tensions

Info sources	• External • Internal
Interpretation of info	• Reflect, filter • Emotion, confidence
Response to info	• Ignore/reject • Accept

Sargeant et al, Acad Med 2010

Lessons learned from a clinician/administrator/researcher

1. Collaborate; build strong teams
2. Clinical and teaching venues are a 'lab'
3. Recognize unanswered questions
4. Intersect theory with day-to-day educational work
5. Plan ahead to study curricular interventions
6. Look outside your comfort zone – other learners, other fields

Summary

- Psychometrically sound summative assessment, while important, does little in isolation to advance learning
- For low performers, surprisingly little evidence guides remediation
- Formative assessment promotes learning for all learners
  - Promote individualized articulation of next steps
  - Facilitate constant feedback loops

Thank you

Questions??

References

- Archer JC. State of the science in health professional education: effective feedback. Med Educ 2010; 44:101-8.
- Black P, Wiliam D. Developing the theory of formative assessment. Educ Assess Eval Acc 2009. 21:5-31.
- Carraccio CL, Benson BJ, Nixon LJ, Derstine PL.Eva KW. From the educational bench to the clinical bedside: translating the Dreyfus developmental model to the learning of clinical skills. Acad Med 2008;83:761-7.
- Chang A, Boscardin C, Chou CL, Loeser H, Hauer KE. Predicting failing performance on a standardized patient clinical performance examination: the importance of communication and professionalism skills deficits. Acad Med. 2009;84:S101-4.
- Cooke M, Irby DM, O'Brien BC. Educating physicians: a call for reform in the twentieth century. Josiah-Bass. 2010

References

- Davis DA, Mazmanian PE, Fordis M, Van Harrison R, Thorpe KE, Perrier L . Accuracy of physician self-assessment compared with observed measures of competence. JAMA. 2006;296:1094-1102.
- Epstein RM, Hundert EM. Defining and assessing professional competence. JAMA. 2002;287:226-35.
- Eva KW, Munoz J, Hanson MD, Walsh A, Wakefield J. Which factors, personal or external, most influence students' generation of learning goals? Acad Med. 2010;85:S102-5.
- Hauer KE, Hodgson CS, Kerr KM, Teherani A, Irby DM. A national study of medical student clinical skills assessment. Academic Medicine. 2005;80:S25-9.
- Hauer KE, Teherani A, Kerr KM, O'Sullivan PS, Irby DM. Impact of the United States medical licensing examination step 2 clinical skills exam on medical school clinical skills assessment. Acad Med. 2006;81:S13-6.

- Hauer KE, Teherani A, Kerr KM, O'Sullivan PS, Irby DM. Student performance problems in medical school clinical skills assessments. Acad Med. 2007;82:S69-72.
- Hauer KE, Teherani A, Irby DM, Kerr KM, O'Sullivan PS. Approaches to medical student remediation after a comprehensive clinical skills exam. Med Educ. 2008; 42;104-110
- Hauer KE, Teherani A, Kerr KM, Irby DM, O'Sullivan PS. Consequences for students of poor performance on a medical school standardized patient comprehensive assessment. Acad Med. 2009;84:663-8.
- Hauer KE, Ciccone A, Henzel TR, Katsufrakis, P, Miller SH, Norcross WA, Papadakis MA, Irby DM. Remediation of physicians across the continuum from medical school to practice: a thematic review of the literature. Acad Med 2009; 84:1822-32.
- Hojat M, Nasca TJ, Erdmann JB, Frisby AJ, Veloski JJ, Gonnella JS. An operational measure of physician lifelong learning: its development, components and preliminary psychometric data. Med.Teach 2003;;25:433-7.

- Mazotti L, O'Brien BC, Tong L, Hauer KE. Faculty and student perceptions of evaluation in two clerkship models. In press, Med Educ.
- McGaghie WC, Richards BF, Petrusa ER, et al. Development of a measure of medical faculty attitudes toward clinical evaluation of students. Acad Med 1995;70:47-51.
- Sargeant J et al. The processes and dimensions of informed self-assessment: a conceptual model. Acad Med 2010;85:1212-20.
- Saxena V, O'Sullivan PS, Teherani A, Irby DM, Hauer KE. Remediation techniques for student performance problems after a comprehensive clinical skills exam. Acad Med. 2009;84:669-76.
- Shute VJ. Focus on formative feedback. Review Educ Rsch 2008.
- Srinivasan M, Hauer KE, Der-Martirosian C, Wilkes M, Gesundheit N. Does feedback matter in practice-based learning? Impacting the accuracy of medical student self-assessment after a multi-institutional clinical performance examination. Med Educ. 2007;41:857-65