# Triangulation in Outcome-Based Education (OBE) Evaluation

Undergraduate Pediatric Education Curriculum (UPEC)
4th Q&A Forum
PPS Annual Convention

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Road Map

- Roles of assessment

- Assessment in relation to OBE curriculum

- Learning targets

- Triangulation as a process

- Different assessment methods and tools

- Application to PPS OBE curriculum
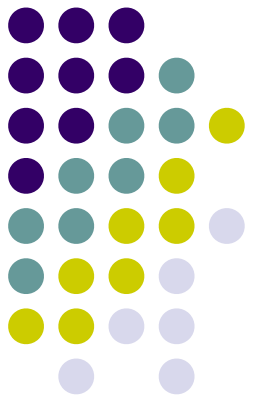
Everyone has questions

Assessments give answers

How can I do better on the next test?

How can I gauge whether my class is understanding this lesson?

Classroom:

- Support learning during instruction
- Certify learning after instruction

Examples:

- Descriptive feedback
- Work products
- Unit quizzes and exams

How can I tell if my 3rd year med students are all learning?

How can I identify which schools need the most support w/ the OBE curriculum?

How do we raise the standard in our medical schools all over the country?

How do we ensure that all med students have equal access to quality education?

School and Region:

• Evaluate program effectiveness
• Measure student growth
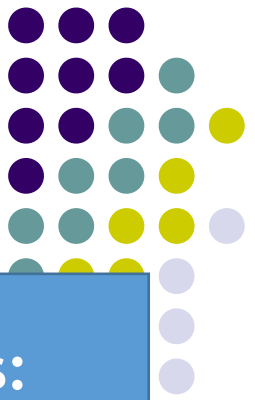• Support placement, intervention, remediation

Examples:

• Diagnostic tests
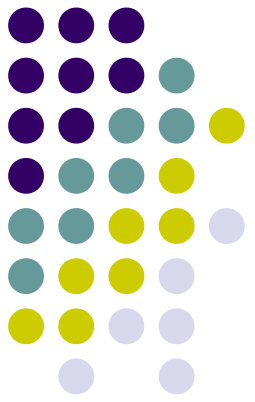• Benchmark assessments
• Interim growth measures

National:

• Understand achievement trends
• Evaluate school performance
• Determine access & equality

Examples:

• Statewide accountability tests
• National Assessments
• International Assessments test

Assessment Literacy

Knowledge and Skills of students UNCLEAR

How can you measure with quality by an assessment?

Teachers and Students UNCLEAR on what to learn

How can an assessment provide guidance on meeting learning objectives?
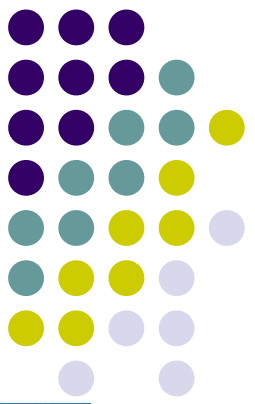
Students

LEARNING TARGETS

Teachers
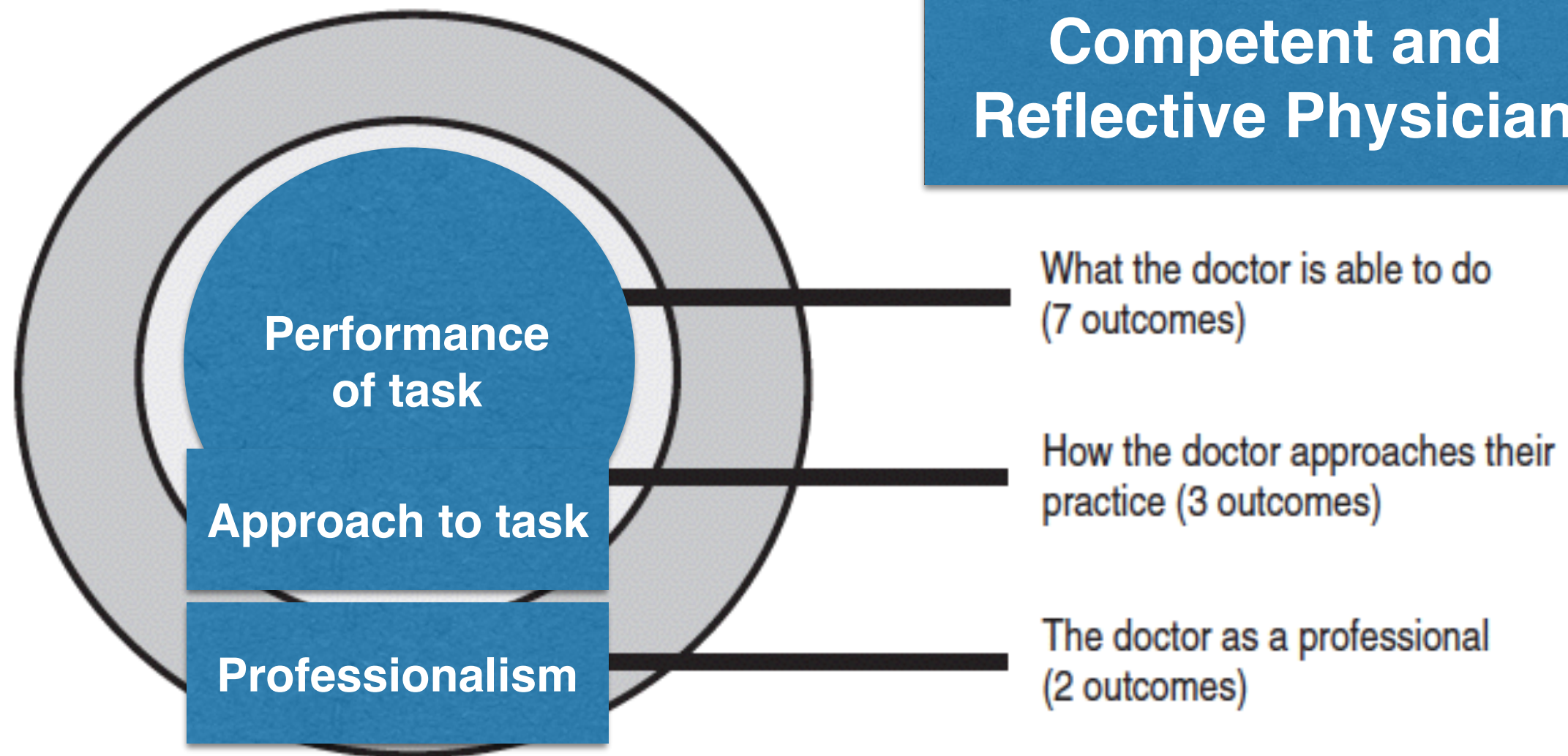
Outcome Based Education

Competent and Reflective Physician

Performance of task

Approach to task

Professionalism

What the doctor is able to do (7 outcomes)

How the doctor approaches their practice (3 outcomes)

The doctor as a professional (2 outcomes)
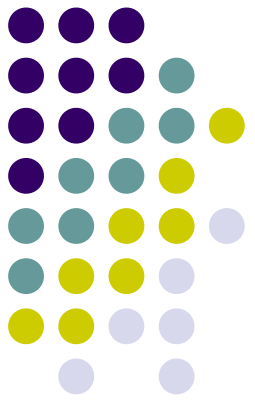
Three Circle Model representing educational outcomes

Shumway J and Harden R. AMEE Guide 25: The Assessment of learning outcomes for the competent and reflective physician, Medical Teacher, Vol. 25, No. 6, 2003, pp. 569–584

Learning Targets

- Content standards, year level expectations, lesson objectives

- Communicated clearly, and in advance to students

Clear areas to be assessed
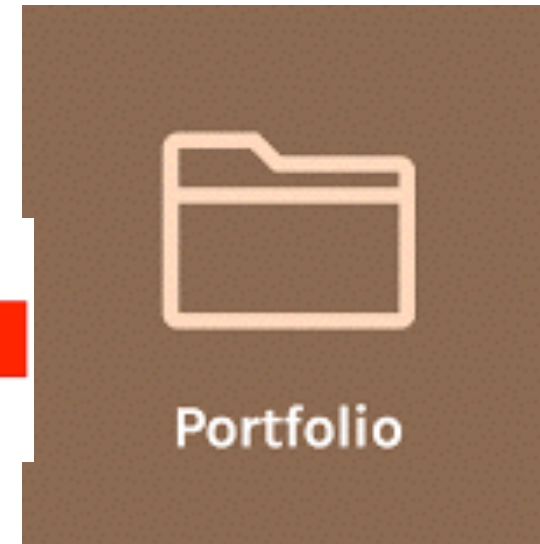
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Tasks/ activities reflect targets

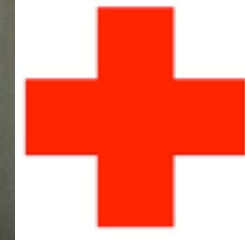✔ ─────────
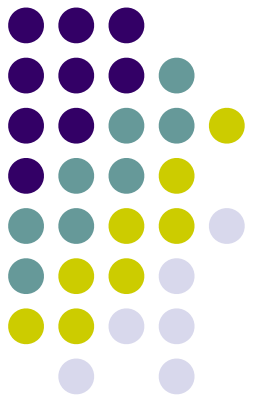
Assessment methods that fit targets

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CLARIFYING LEARNING TARGETS

Triangulation: Process

+ **+** Portfolio **=**
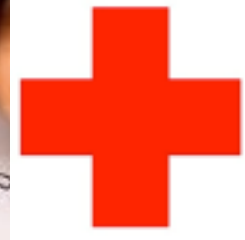
| Informed educational decision making: ASSESSMENT RESULTS' INTERPRETATION | Creates a MORE COMPLETE PICTURE of student learning / needs | All results with SIMILAR CONCLUSIONS—> More confident in assessment and how to address student's needs |

How to triangulate

- Begin with your institutional story- mission, strategic plan (institutional priorities), program assessment in place (Nelson, 2010)

- Identify sources of assessment- objectives for tool, who does the assessment, collection, formative vs summative

- Triangulate- quantitative vs qualitative, competencies assessed

- Decision-making- formative vs summative, status of student, needs, how to meet needs

- Reporting and feedback

Selecting data sources

Questions to ask:

1. What data we actually have

2. What it measures

3. How it can be used

Key sources of information:

1. Classroom-based

2. Formative assessment

3. Summative assessment

4. Skills diagnostics and universal screeners

5. Brief curriculum-based assessments of targeted skills

Miller's Pyramid (1990)

PROFESSIONALISM

DOES Action — Faculty observation

SHOWS HOW Performance — Standardized patients (OSCE)

KNOWS HOW Competence — Extended matching

KNOWS Knowledge — MCQ Exam

Miller G. The assessment of clinical skills/competence/performance. Acad Med 1990;65:S63-S67
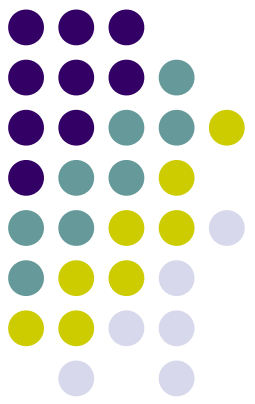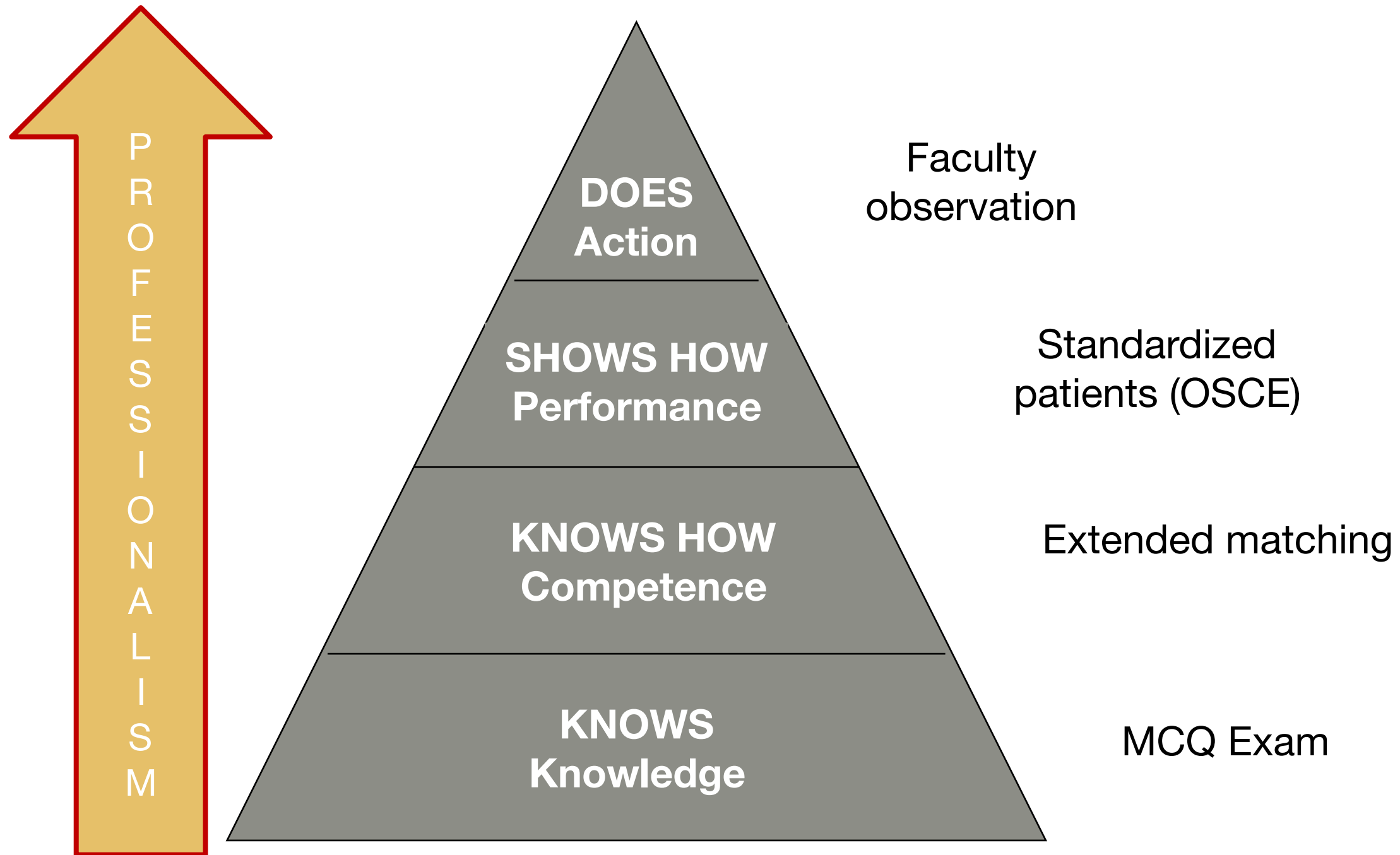
Triangulation in Assessment
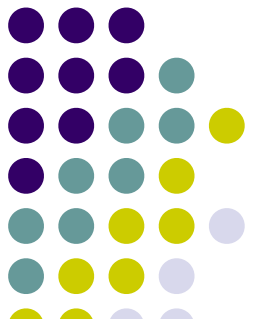
Outcomes		EMI[1]	CRQ[2]	OSCE	Portfolio
1	Clinical skills	xxx	xxx	xxx	xx
2	Practical procedures	xx	xx	xxx	xx
3	Investigating a patient	xx	xx	xxx	xx
4	Patient management	xxx	xxx	xxx	xx
5	Health promotion and disease prevention	xx	xx	xxx	xx
6	Communication skills	x	x	xxx	xxx
7	Information handling	xx	xx	x	xxx
8	Understanding of basic, clinical and social sciences	xxx	xxx	x	xxx
9	Appropriate attitudes ethical and legal responsibility	xx	xx	xx	xxx
10	Decision making, clinical reasoning	xxx	xxx	xxx	xxx
11	Role of the doctor	x	x	xx	xxx
12	Personal development	x	x	xx	xxx

[1] EMI (Extended Matching Items), [2] CRQ (Constructed Response Questions)
x – considered for use,   xx – appropriate and is currently used,   xxx – most appropriate assessment method

Table 6: Final examination grid in Dundee outcome-based curriculum

Friedman Ben David M, et al. AMEE Guide 24. Med Teacher Vol 23, No.6, 2001

PPS proposed program outcomes

CHED Learning Outcomes	PPS Outcomes for graduates of pediatric residency training
1. Demonstrate clinical competence	1. Clinical competence
2. Communicate effectively	2. Communication and interpersonal skills
3. Lead and manage health care teams	3. Leadership and management skills
4. Engage in research activities	4. Evidence-based practice (Practice – based learning)
5. Collaborate within inter-professional teams	5. Inter-professionalism
6. Utilize systems-based approach to healthcare	6. System – based practice
7. Engage in continuing personal and professional development	7. Continuing professional development
8. Adhere to ethical, professional and legal standards	8. Professionalism
9. Demonstrate nationalism, internationalism and dedication to service	9. Nationalism and internationalism
10. Practice the principles of social accountability	10. Social accountability
	11. Community – oriented practice

PPS proposed program outcomes

PPS Outcomes for graduates of pediatric residency training	Assessment Tools
1. Clinical competence	Check if tool appropriately measures the desired learning outcome
2. Communication and interpersonal skills	
3. Leadership and management skills	
4. Evidence-based practice (Practice – based learning)	
5. Inter-professionalism	Give interpretation of results as a faculty
6. System – based practice	
7. Continuing professional development	
8. Professionalism	Decision-making
9. Nationalism and internationalism	
10. Social accountability	Impact on student learning/ needs
11. Community – oriented practice	

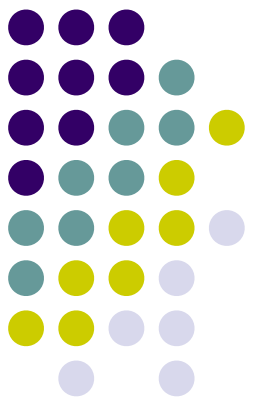| Learning Outcome	Content	T-L Strategies	Resources	Evaluation
Clinical competence - patient care - medical knowledge - technical procedural skills - values and attitudes	Clinical basis of the diagnosis Epidemiology, etiology, pathophysiology, and clinical manifestation of the diagnosis Clinical basis of the Differential Diagnosis/diagnoses (if needed)	Bedside rounds Preceptorials Audit Conferences	Nelson's Textbook of Pediatrics CPGs PPS Policy Statements AAP Policy Statements	Clinical evaluation grades OSCE MiniCEX Conference grades
	Normal laboratory parameters Gold Standard of diagnosis Pathophysiology of the illness	Bedside rounds Preceptorials Audits	Nelson's Textbook of Pediatrics CPGs PPS Policy statements AAP Policy statements Journals	Clinical evaluation grades OSCE MiniCEX Conference Grades

| Assessment Category		Representative Instruments
Written Assessments		Essay Short Answer Questions Completion Questions Multiple Choice Questions (MCQs) Extended Matching Items (EMIs) Modified Essay Questions (MEQs) Patient Management Problems (PMPs) Progress Test Dissertation Report
Clinical/Practical Assessments		Long Cases Practical Examination Spot Examination Objective Structured Clinical Examination (OSCE) Objective Structured Practical Examination (OSPE) Objective Structured Long Examination Record (OSLER) Group Objective Structured Clinical Examination (GOSCE)
Observation		Tutor's report Checklists Rating scales Patient report
Portfolio and Other Records of Performance		Logbooks Portfolios Procedural Logs
Peer and Self-Assessment		Peer report Self-report

Written Assessments

- Essay
- Short answer questions
- Completion questions
- Multiple choice questions (MCQs)
- Extended matching items (EMIs)
- Modified essay questions (MEQs)
- Patient management problems (PMPs)
- Progress test
- Dissertation
- Report

Case and Swanson (1993)
Extended Matching Items
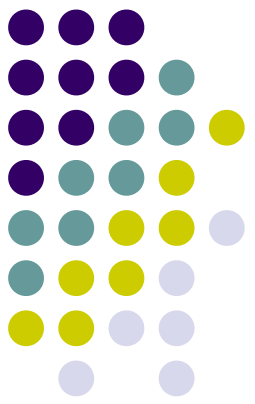
- ## Description

  - consist of theme description, a series of options (up to 26), a lead-in and a series of short cases or vignettes

- ## Indications

  - assessment of decision making or problem solving skills

  - cover large knowledge base/hour of testing time

  - large number of students are to be tested

Extended Matching Items
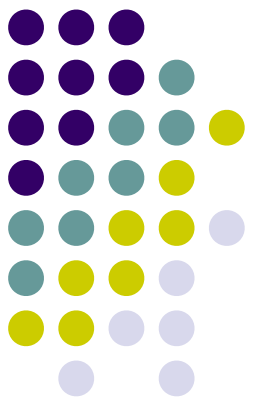
Theme: Diagnosis (Respiratory Tract)

Options:

    a. Asthma   d. Laryngotracheomalacia   g. Cystic fibrosis

    b. Pneumonia   e. Epiglottitis   h. Diphtheria

    c. Tuberculosis   f. Bronchiolitis   i. Pharyngitis

Lead-in:

For each of the ff cases select the most likely diagnosis

Extended Matching Items

Vignettes:

1. A 4 year old boy presents in the ER with cyanosis. He has a 1 week history of cough and fever, associated with poor appetite. On PE, RR= 85/min, with intercostal and subcostal retractions, rales on all lung fields. On x-ray you note infiltrates in the lung parenchyma.

2.
a. Asthma	d. Laryngotracheomalacia	g. Cystic fibrosis
b. Pneumonia	e. Epiglottitis	h. Diphtheria
c. Tuberculosis	f. Bronchiolitis	i. Pharyngitis

3.
a. Asthma	d. Laryngotracheomalacia	g. Cystic fibrosis
b. Pneumonia	e. Epiglottitis	h. Diphtheria
c. Tuberculosis	f. Bronchiolitis	i. Pharyngitis

Written Assessments

	Essay	Short Answer	Multiple-Choice	Extended-Matching
Application of Knowledge	Excellent	Good	Poor	Good, can be improved with justification
Assessment	Excellent	Good	Poor	Poor to good if justification is required
Coverage of Topic	Poor	Good	Excellent	Excellent
Reliability of Score	Poor to Fair	Good	Excellent	Excellent
Ease of Scoring	Poor	Moderate	Excellent	Excellent
Preparation time	Minimal to Moderate	Moderate	Large, if properly done	Moderate
Total Costs	Large	Moderate	Low**	Low**
Cheating (Sneak-a-Peek)	Most Difficult	Difficult	Easy	Easy unless justification is required

Table 1. Relative characteristics of 4 types of examinations.*

Wilson RB, Case, SM. Extended MatchingQuestions: An Alternative to MCQs or Free Response Questions. Journal of Veterinary Medicine Education. 1993: Vol. 20, Number 3

Constructed Response Questions (CRQ)

- **Tests contain questions that require the test taker to produce the answer**

- **Take longer to answer than MCQs, limited number of questions to answer at a given time**

- **Performance may vary from one set of questions to another**

- **Responses tend to be time-consuming to score**

- **Higher cost of testing and longer time required to compute and report the scores**

CRQ Scoring
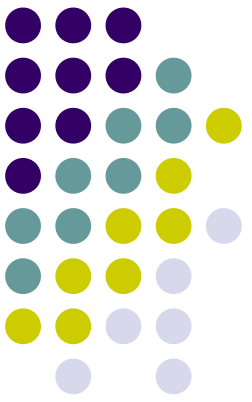
- Requires judgment
- Different scorers can award different scores to same response

ANALYTICAL SCORING	**HOLISTIC SCORING**
Rubric contains features of response to focus on and points to award to each feature	Rubric contains statements describing the characteristics of a typical response at each score level

Key Features Exam
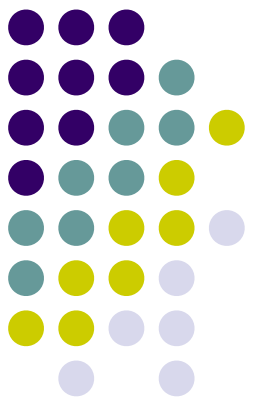
A 5 year old girl was brought to you for high grade fever of 5 days duration. The mother noted she had poor appetite and activity and would complain of abdominal pain and vomiting. She noted that her stools were "blackish" in color. On PE, BP was 80/50, HR 128, RR 35, with note of flushed skin. No overt bleeding noted. Abdominal exam showed generalized tenderness on palpation.

List down 3 differential diagnoses for this case:
1. Dengue Fever/ Hemorrhagic Fever (1 pt)
2. Typhoid Fever (1 pt)
3. Systemic Viral Illness (1) pt

What are the first 3 management steps that should be performed?
1. Insert IV fluids for hydration (1 pt)
2. Monitor bleeding parameters through CBC (1 pt)
3. Insert an NGT (0.5 pt)
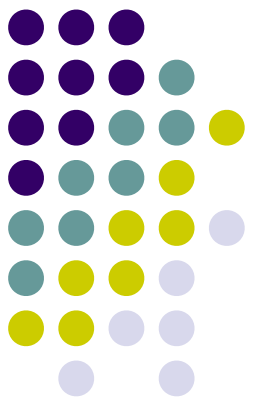
Clinical/ Practical Assessments
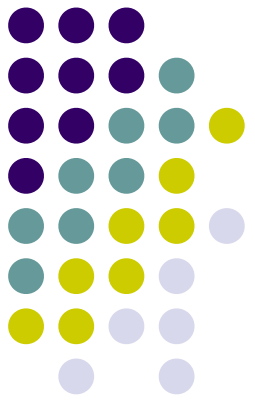
- Long cases
- Practical exam
- Spot exam
- Objective structured clinical examination (OSCE)
- Objective structured practical examination (OSPE)
- Objective structured long examination record (OSLER)
- Group objective structured clinical examination (GOSCE)

Clinical/ Practical Assessments

	Characteristic feature/s	**Strengths**	**Weaknesses**	**Modifications**
Long cases	Unobserved student does hx & PE on px then presents diagnosis & plan to examiner	Evaluates student's performance w/ real px Presents complete & realistic clinical challenges	Problems with reproducibility (Case specificity of problem solving, differences between examiners, variability in the aspects of an encounter evaluated)	More student-patient encounters Examiners: use stat model, train them, increase their number Increase # of aspects of a competence assessed & standardize across examiners

Norcini J. The death of the long test? BMJ 2002, Vol 324, pp 408-409

Clinical/ Practical Assessments

OSPE

Inferior wall infarct

Electrophysiological Data

A Diagnosis of Myocardial infarction was made
Anatomical Information:
A model of heart is provided with labelled coronary arteries
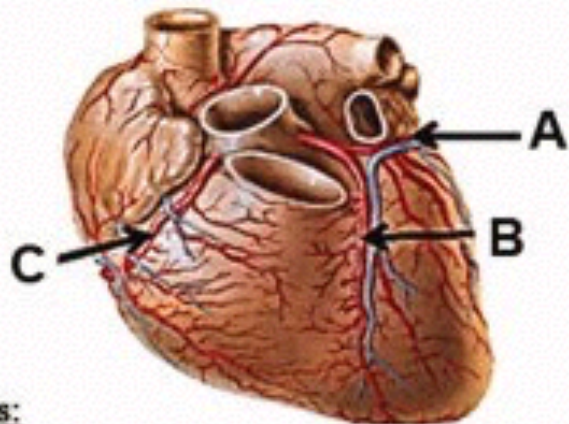
Questions:
Which of the labelled arteries is responsible for myocardial infarction shown in the case above?

Answer: C; right coronary causes inferior wall infarct.

Spot examination

A Labelled Heart Model is provided
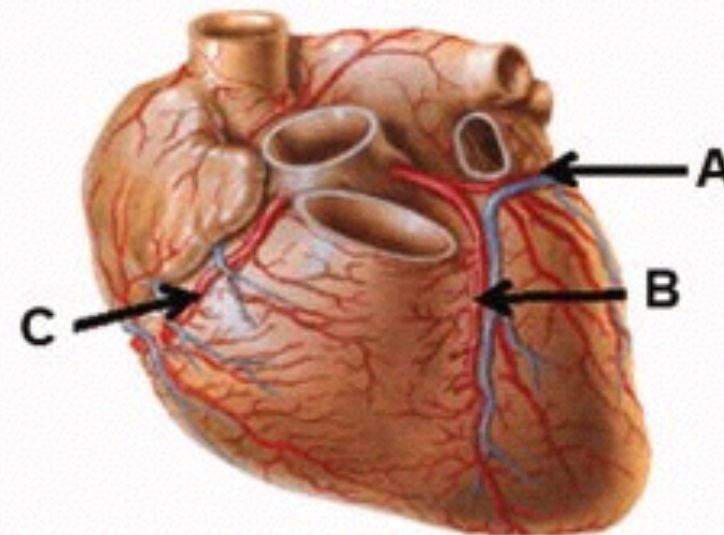
Questions:
1. Identify the vessels labelled A, B and C
2. Name two branches of C

Answers:
1 A. Left circmflex; B. Left anterior descending; C. Right coronary
2 SA nodal artery, Posterior inter-ventricular artery

Yaquinudin et al. What is OSPE in anatomy?Anatomical Sciences Education. March 2013, 6 (2)

Observation

Tutor's Report

Checklist

Rating Scale

Patient's Report

PBL Essential Elements Checklist

Whatever form a project takes, it must have these Essential El...

Does the Project . . .?

FOCUS ON SIGNIFICANT CONTENT
At its core, the project is focused on teaching students important knowledge and skills, derived from standards and key concepts at the heart of academic subjects.

DEVELOP 21st CENTURY SKILLS
Students build skills valuable for today's world, such as critical thinking/problem solving, collaboration, and communication, which are taught and assessed.

ENGAGE STUDENTS IN IN-DEPTH INQUIRY
Students are engaged in a rigorous, extended process of asking questions, using resources, and developing answers.

ORGANIZE TASKS AROUND A DRIVING QUESTION
Project work is focused by an open-ended question that students explore or that captures the task they are completing.

ESTABLISH A NEED TO KNOW
Students see the need to gain knowledge, understand concepts, and apply skills in order to answer the Driving Question and create project products, beginning with an Entry Event that generates interest and curiosity.

ENCOURAGE VOICE AND CHOICE

History taking (*accurate, efficient*)

1	2	3	4	5	NA
poor	borderline	satisfactory	good	outstanding	

Physical Examination (*logical sequence, appropriate, informs patient*)

1	2	3	4	5	NA
poor	borderline	satisfactory	good	outstanding	

Clinical Reasoning / Diagnosis (*interpretation findings, judgment, efficiency*)

1	2	3	4	5	NA
poor	borderline	satisfactory	good	outstanding	

Patient Management (*adequate, addresses patient's needs/concerns*)

1	2	3	4	5	NA
poor	borderline	satisfactory	good	outstanding	

Communication with patient (*structure, communication skills, empathy*)

1	2	3	4	5	NA
poor	borderline	satisfactory	good	outstanding	

Professionali... ...atient's needs)

1	2	3	4	5	NA
poor	borderline	satisfactory	good	outstanding	

Patient Satisfaction Survey

Dear Patient: According to our records, you recently visited **the provider named above.** Pleas... us your opinion about the service you received **from this provider**. Your responses will be kept strictly confidential. Thanks for your help.

PLEASE RATE THE FOLLOWING:

	Excellent	Very Good	Good	Fair	Poor	Does Not Apply
A. YOUR APPOINTMENT:						
1. Ease of making appointments by phone	5	4	3	2	1	N/A
2. Appointment available within a reasonable amount of time	5	4	3	2	1	N/A
3. Getting care for illness/injury as soon as you wanted it	5	4	3	2	1	N/A
4. Getting after-hours care when you needed it	5	4	3	2	1	N/A
5. The efficiency of the check-in process	5	4	3	2	1	N/A
6. Waiting time in the reception area	5	4	3	2	1	N/A
7. Waiting time in the exam room	5	4	3	2	1	N/A
8. Keeping you informed if your appointment time was delayed	5	4	3	2	1	N/A
9. Ease of getting a referral when you needed one	5	4	3	2	1	N/A

B. OUR STAFF:
1. The courtesy of the person who t...
2. The friendliness and courtesy of th...
3. The caring concern of our nurses/...
4. The helpfulness of the people who... billing or insurance

5. The professionalism of our lab or x-ray staff	5	4	3	2	1	N/A

Portfolio & Other Records of Performance
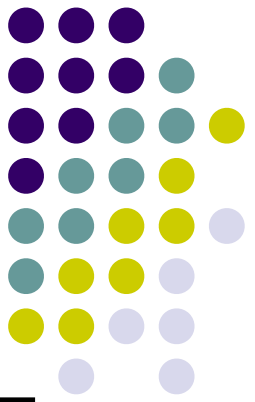
PLEURAL PARACENTESIS

Numbers required:

Observer status = 4	Assistant status = 4	Performed under supervision = 4	Independently performed = 12

S.No	Date	Resident Level	MR #	Competency Level *OS, AS, PS, IP	Complications (if any)	Signature of Consultant/ Senior Resident

Procedural Log

Portfolio

Home

View All Site Content
Scholarly Work
- My Publications & Presentations
- Research Activity
- Reading Library
- My EBM Portfolio
- Mentoring
- Exams

Procedure Log

Evaluations
- MyEvaluations
- Evaluation Letters
- Self Evaluation
- Procedure Practicum

Conference Attendance

Schedules

Curriculum and Learning Objectives

Other
- My Links
- My Calendar
- Miscellaneous
- My Pictures

Recycle Bin

Background

Education

M.D., University of Virginia School of Medicine, 2003
B.S.M.E., The University of Arizona, 1998

Postgraduate Training

Chief Resident, Internal Medicine - University of Pittsburgh Medical Center, 2007
Residency, Internal Medicine - University of Pittsburgh Medical Center, 2006
Internship, Internal Medicine - University of Pittsburgh Medical Center, 2004

Areas of Interest, Specialization and Research

Hepatology
Medical Education

Featured documents

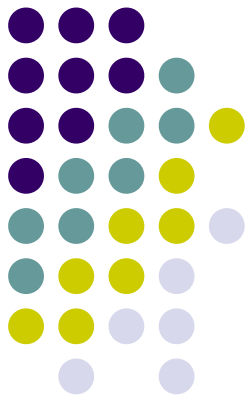| Type	Name	File Size
	Curriculum Vitae - David Brokl	95 KB

Add new document

Edit background

Useful Links
- ROC system (placeholder)
- GI Division website
- Health Sciences Library
- MARS
- GI Career Documents

Add new link

David A. Brokl, M
Gastroenterology Fellow,

Case Logbook

Carrier

Date: 2/15/2011

Age: 25

Gender: male

(Male) (Female)

February	26	2009
March	27	2010
April	28	2011
May	29	2012
June	30	2013

MRN: 23-45-77

Procedure:

Central Line

Abdominal paracentesis

Advanced cardiac life support

Arterial line placement

no complications

(Use Selected Procedure)   Finished Notes

(Delete Procedure Type Selected)

<Type here to Enter Custom Procedure>

Role: primary

Supervisor: Dr. Jones

Location: County Hospital

(Main Page)   (Delete)

Save Modified Record to Database

Peer and Self Assessment

Peer Evaluation Report

Junior Resident Shift Feedback Card–Emergency Medicine (FRONT)

JUNIOR RESIDENT:_____ DATE_____ SUPERVISING PHYSICIAN:_____

1. Rate the Overall performance ON THIS SHIFT with a circle or 'x' on the line below.

AS EXPECTED

| Performing > 1 yr Below PGY level | Somewhat behind for level | Somewhat ahead for level | Much better than Expected for level | Consultant Level |

2. Using 2 or 3 of the following CanMEDS Roles, explain where the resident needs to improve to move up a level on the above scale. Provide specific examples for the assessments.

N = NEEDS ATTENTION; S = PARTICULAR STRENGTH

	Assessment	Example(s)
MEDICAL EXPERT:		
-Can APPROACH most presenting problems	N S	_____
-Safe basic procedural skills	N S	_____

JUNIOR Resident Shift Feedback Card–Emergency Medicine (BACK)

	Assessment	Example(s)
SCHOLAR: (Inquisitive, Evidence-based, uses IT well)	N S	_____
MANAGER: (Considers resource issues, efficient)	N S	_____
HEALTH ADVOCATE: (Knows determinants of health, advocates for patient)	N S	_____
COMMUNICATOR: (Patient interactions, case presentations, charting)	N S	_____
COLLABORATOR: (Collegial, understands roles)	N S	_____
PROFESSIONAL: (Punctual, responsible, has integrity, ethical)	N S	_____

3. GENERAL COMMENTS:

STAFF SIGNATU...

Self Evaluation Report

Baseline
2013 - 2018

Name: Juan de la Cruz   Year Level: I   Semester: 1st
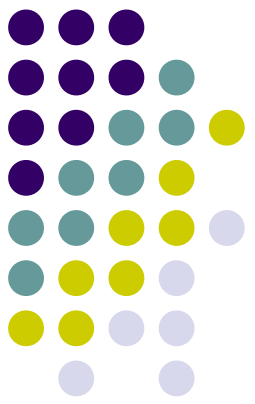
I. COMPETENCIES

Rating Scale
Use (●) to assess present degree of competency

Where I — Incompetent
C — Competent

1. Solver of community health problem
2. Basic physician
   2.1 Clinical Diagnosis
   2.2 Paraclinical Diagnosis
   2.3 Treatment
   2.4 Advice
3. Emergency medicine
4. Self-directed learner
5. Educator
6. Researcher
7. Administrator of a health care unit
8. Manager
9. Board Passer

PPS proposed program outcomes

| PPS Outcomes for graduates of pediatric residency training	Assessment Tools
1. Clinical competence	Is the student clinically competent? Can the student communicate well with patients and colleagues?
2. Communication and interpersonal skills	
3. Leadership and management skills	Take note of good practices, those that need improvement, other learning needs
4. Evidence-based practice (Practice – based learning)	
5. Inter-professionalism	
6. System – based practice	Aside from PASS/FAIL What else do can we do for this student to help hm achieve the learning outcome?
7. Continuing professional development	
8. Professionalism	
9. Nationalism and internationalism	
10. Social accountability	Feedback Take action
11. Community – oriented practice	

How to triangulate

- Begin with your institutional story- mission, strategic plan (institutional priorities), program assessment in place (Nelson, 2010)

- Identify sources of assessment- objectives for tool, who does the assessment, collection, formative vs summative

- Triangulate- quantitative vs qualitative, competencies assessed

- Decision-making- formative vs summative, status of student, needs, how to meet needs

- Reporting and feedback

Summary
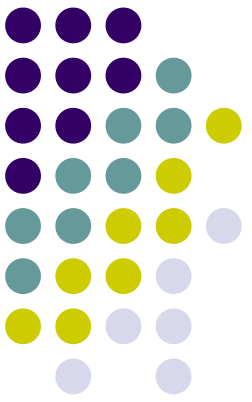
- Faculty and trainees should be cognizant of clear learning targets to be assessed
- Assessment should reflect future learning outcomes based on such targets
- Triangulating assessment methods/tools allow for more informed decision making on interpretation of results
- Better interpretation provides a better picture of a trainee's learning status and needs
- Knowledge of trainee needs is crucial in providing program assessment feedback

"Assessment (should be) a human and humanistic process rather than a process of jumping through hoops and submitting forms"

Karen H Nelson Associate Vice President for Institutional Effectiveness & Professor of Psychology 6 December 2010