

Competency Based Medical Education (CBME): Starting with an Outcome to Build an Evaluation System and Curriculum

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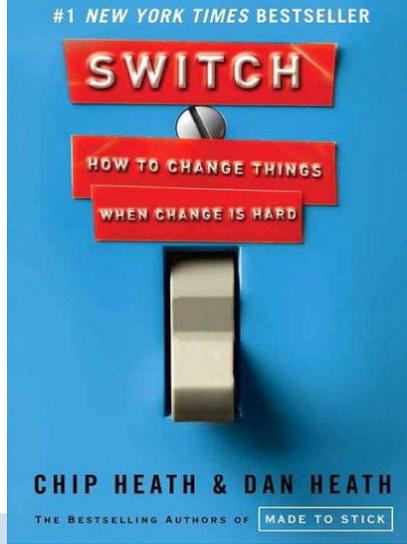
New Program Director Retreat

February 2019

Goals & Objectives

- Define competency based medical education education (CBME)
- Differentiate milestones versus entrustable professional activities (EPA)
- Review how programs can use defined milestones and EPAs to
 - Build rotation evaluation tools and systems to evaluate learners
 - Assess program curriculum and evaluation system
 - Define and write goals and objectives

SWITCH



Motivation

- *Public Accountability
- *Improves Accreditation
- *Helps the learner know what to master
- *Using EPAs/Milestones can make reports to CCC, G/O, program evaluation more substantive
- *Put resources where it matters most

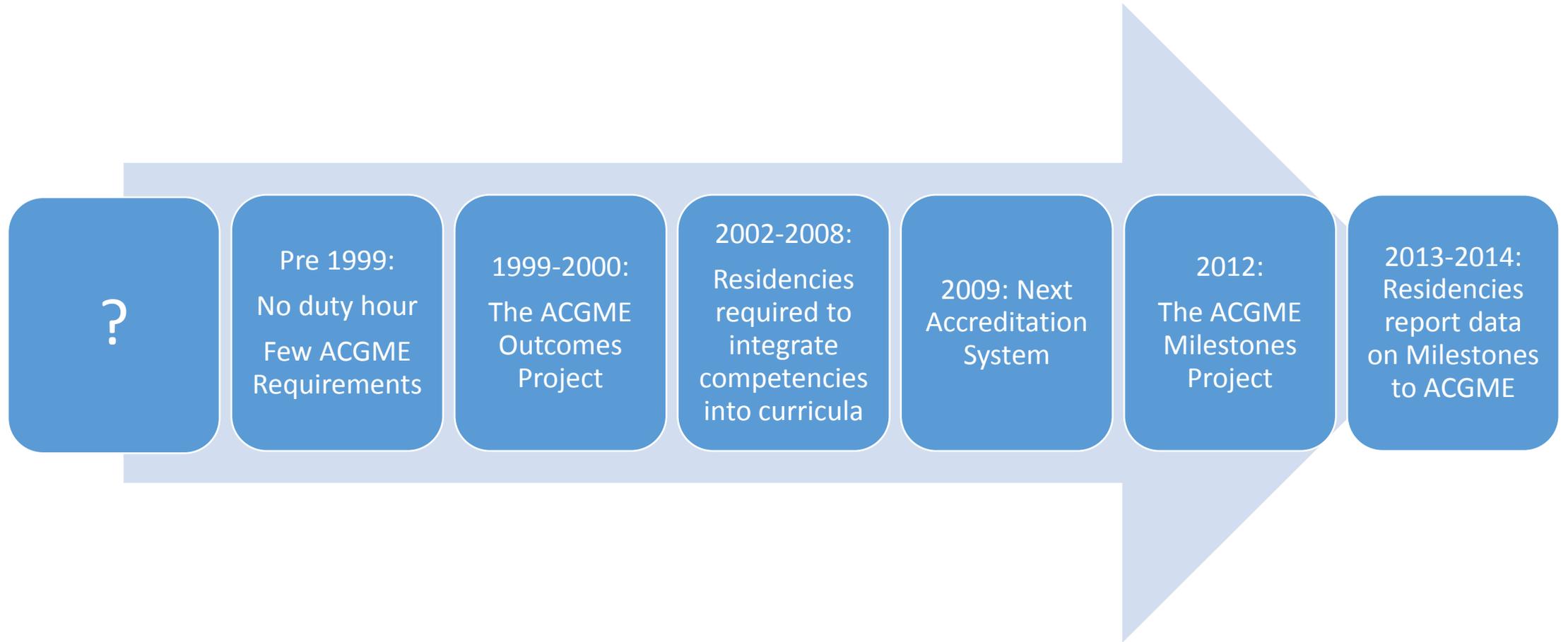
Shape the Path

- Review (Define) Specialty EPAs and Milestones
- Apply concepts to rotation evaluations and link evaluation questions to subcompetencies
- Apply concepts to assess program curriculum and evaluation system
- Apply concepts to improve goals & objectives
- Ask CCC to get involved in this process

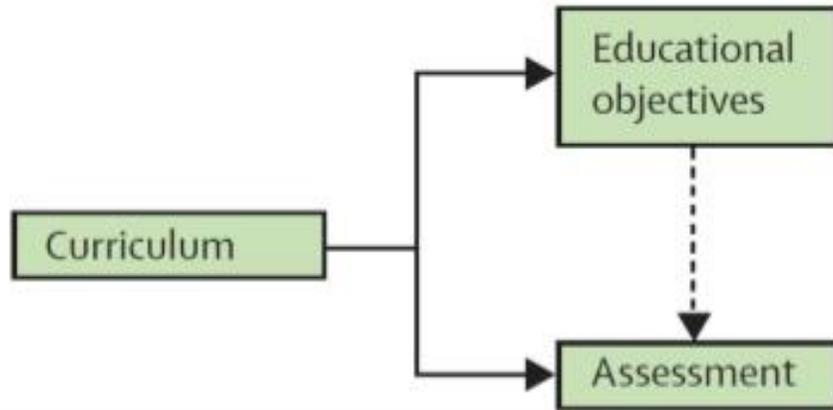
Direction

- Understand CBME, EPAs, Milestones
- Utilize the scope of CBME to ensure that our programs are providing our trainees the best education to become physicians that provide quality care

CBME- History in GME

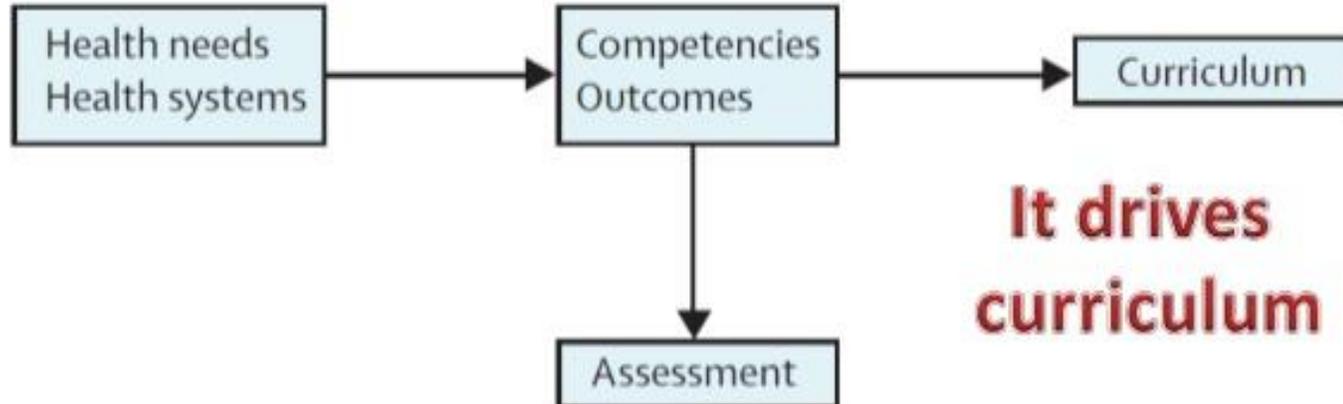


Traditional model



**Curriculum
drives it**

Competency-based education model

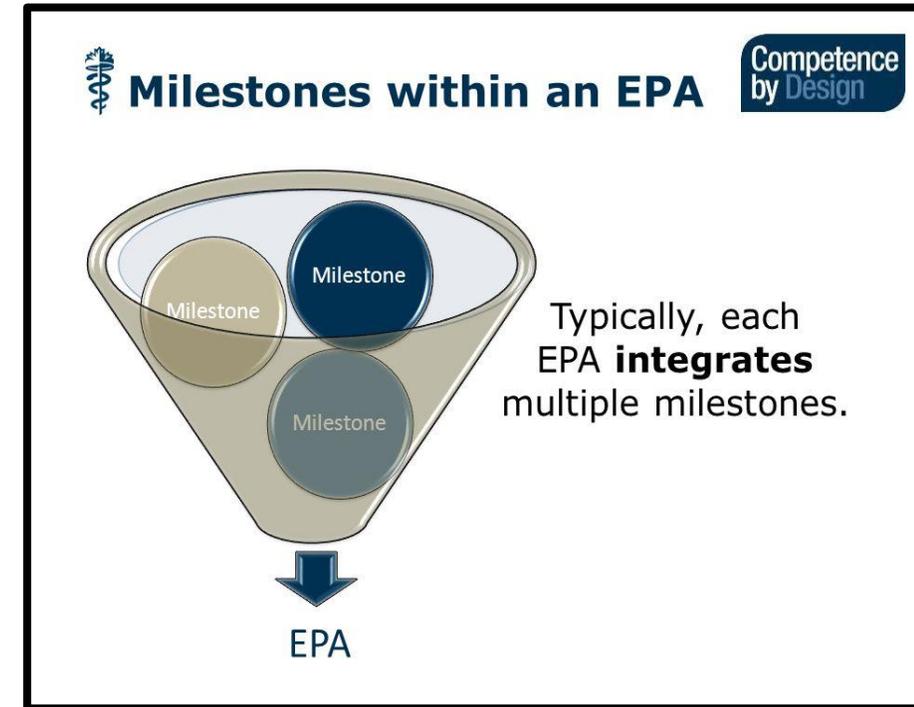


**It drives
curriculum**

CBME is “an outcomes-based approach to the design, implementation, assessment and evaluation of a medical education program using an organizing framework of competencies”

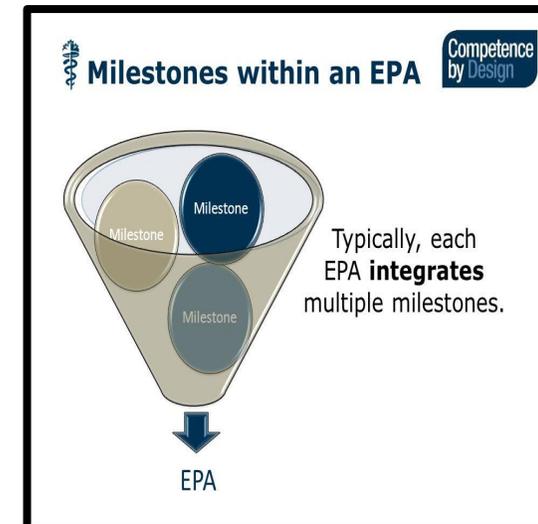
The evolution of the 6 Core Competencies: Milestones and EPAs

- Entrustable Professional Activity: An essential **task** of a "discipline" that an individual can be trusted to perform independently in a given context
 - “What we see physicians do”
- Milestone: A defined, observable marker of an individual's **ability** along a developmental continuum
 - “How we measure how physicians do”



Riding a Bike is an EPA of being a Kid

EPA	Can Ride A Bike Safely				
Observable Practice Activities					
Competencies	Equipment	Safety	Bicycle Etiquette	Endurance	
Milestone	Knows Right Size bike to use	Can Balance	Can Propel Forward	Knows Hand signals	
Narrative Do you trust them? What you are watching that describes the EPA.	Rides 100 feet without falling	Rides with a helmet	Riding in same direction as traffic using hand signals	Rides for over 8 hours at once	



Association of Family Medicine Residency Directors (AFMRD) List of 20 EPAs: 1-10

1. Provide a usual source of comprehensive, longitudinal medical care for people of all ages.
2. Care for patients and families in multiple settings.
3. Provide first-contact access to care for health issues and medical problems.
4. Provide preventive care that improves wellness, modifies risk factors for illness and injury, and detects illness in early, treatable stages.
5. Provide care that speeds recovery from illness and improves function.
6. Evaluate and manage undifferentiated symptoms and complex conditions.
7. Diagnose and manage chronic medical conditions and multiple co-morbidities.
8. Diagnose and manage mental health conditions.
9. Diagnose and manage acute illness and injury.
10. Perform common procedures in the outpatient or inpatient setting.

Association of Family Medicine Residency Directors (AFMRD) List of 20 EPAs: 11-20

11. Manage prenatal, labor, delivery and post-partum care.
12. Manage end-of-life and palliative care.
13. Manage inpatient care, discharge planning, transitions of care.
14. Manage care for patients with medical emergencies.
15. Develop trusting relationships and sustained partnerships with patients, families and communities.
16. Use data to optimize the care of individuals, families and populations.
17. In the context of culture and health beliefs of patients and families, use the best science to set mutual health goals and provide services most likely to benefit health.
18. Advocate for patients, families and communities to optimize health care equity and minimize health outcome disparities.
19. Provide leadership within inter-professional health care teams.
20. Coordinate care and evaluate specialty consultation as the condition of the patient requires.

General Competency

Subcompetency

Developmental progression or set of MILESTONES

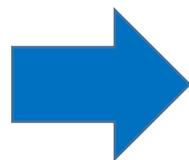
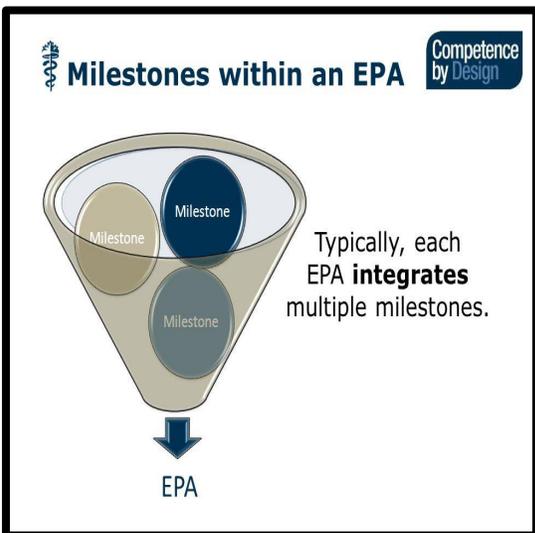
PC-1 Cares for acutely ill or injured patients in urgent and emergent situations and in all settings. Family physicians provide accessible, quality, comprehensive, compassionate, continuous, and coordinated care to patients in the context of family and community, not limited by age, gender, disease process, or clinical setting, and by using the biopsychosocial perspective and patient-centered model of care.

Milestone Description

Milestone Level

Has not achieved Level 1	Level 1	Level 2	Level 3	Level 4	Level 5
	<ul style="list-style-type: none">Gathers essential information about the patient (history, exam, diagnostic testing, social context)	<ul style="list-style-type: none">Consistently recognizes common situations that require urgent or emergent medical careStabilizes the acutely ill patient utilizing appropriate clinical protocols and guidelines	<ul style="list-style-type: none">Consistently recognizes complex situations requiring urgent or emergent medical careAppropriately prioritizes the response to the acutely ill patientDevelops appropriate diagnostic and therapeutic management plans for less common acute conditions	<ul style="list-style-type: none">Coordinates care of acutely ill patient with consultants and community servicesDemonstrates awareness of personal limitations regarding procedures, knowledge, and experience in the care of acutely ill patients	<ul style="list-style-type: none">Provides and coordinates care for acutely ill patients within local and regional systems of care

The Link between EPAs and Milestones



Assessing Residents

Three Different Tools

GOOD trainees
DO these well.

EPA's

1. Titrate insulin
2. Manage ventilator
3. Treat pain
4. Share decision making
5. Hand-off properly

We see residents **DO** these things

Competencies

1. Patient Care
2. Medical Knowledge
3. Professionalism
4. Communication Skills
5. System Based Practice
6. Practice Based Learning

We measure residents with these

Milestones (Sub-competencies)

ICS 1	PC 1 PC 2 PC 3	MK 1 MK 2	SBP 1 SBP 2	PBL 1 PBL 2 PBL 3	PF 1 PF 2
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EPA/Milestones Examples in GME- Family Medicine

- Family Medicine EPA 8: Diagnose and manage mental health conditions
- Subcompetency/Milestones Linked to EPA 8:
 - PC 1: Cares for acutely ill patients- Level 4
 - PC 2: Cares for patients with chronic conditions- Level 3
 - PC 4: Manages unclear diagnoses- Level 4
 - MK2: Applies critical thinking- Level 3
 - SBP4: Coordinates team based care- Level 3
 - Prof2: Professional conduct and accountability- Level 2
 - Prof3: Demonstrates humanism- Level 3
 - ICS1: Develops relationships with pts and families- Level 4
 - ICS2: Communicates effectively with pts and families- Level 3

Group Activity 1

- Using EPA 14 and 13 for Family Medicine
 - EPA 14: Manage care for patients with medical emergencies
 - EPA 13: Manage inpatient care, discharge planning, transitions of care
- Decide which sub-competencies would apply to this EPA and mark Yes next to the subcompetencies that your group think applies to each EPA

AFMRD Consensus

- EPA 14: Manage care for patients with medical emergencies
 - PC1, MK1, SBP2, SBP4, ICS1, ICS2, ICS3
- EPA 13: Manage inpatient care, discharge planning, transitions of care
 - PC1, PC5, SBP1, SBP2, SBP4, Prof1, Prof2, Prof3, ICS2, ICS3, ICS4

Association of Family Medicine Residency Directors- Linking EPAs to Milestones

EPA Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
PC1 Cares for acutely ill patients	-	Lvl 3	Lvl 2-	-	Lvl 2-	-	-	Lvl 4	Lvl 2-	-	Lvl 3	Lvl 3	Lvl 4	Lvl 3-	-	-	-	-	-	-
PC2 Cares for patients with chronic conditions	Lvl 4-	-	Lvl 2-	-	Lvl 3-	-	Lvl 3	Lvl 3-	-	-	-	Lvl 5-	-	-	Lvl 3-	-	Lvl 3-	-	Lvl 4-	-
PC3 Disease prevention and health promotion	Lvl 4	Lvl 4-	-	Lvl 4-	-	-	Lvl 3-	-	-	-	Lvl 3-	-	-	-	Lvl 3	Lvl 4	Lvl 3	Lvl 3	Lvl 3-	-
PC4 Manages unclear diagnoses	Lvl 4-	-	-	-	Lvl 3	Lvl 4-	-	Lvl 4-	-	-	-	-	-	-	Lvl 4-	-	-	-	-	Lvl 3
PC5 Performs appropriate procedures	-	-	-	-	-	-	-	-	Lvl 4	Lvl 4	Lvl 4-	-	Lvl 4-	-	-	-	-	-	-	Lvl 4
MK1 Performs appropriate procedures	-	-	-	-	-	Lvl 4-	-	-	-	Lvl 4	Lvl 4-	-	-	Lvl 4-	-	-	-	-	-	-
MK2 Applies critical thinking	-	Lvl 2	Lvl 2	Lvl 3-	-	Lvl 4	Lvl 3	Lvl 3	Lvl 4-	-	Lvl 2	Lvl 4-	-	-	-	Lvl 4	Lvl 3-	-	-	-
SBP1 Cost conscious care	-	Lvl 3	Lvl 2-	-	Lvl 3	Lvl 4-	-	-	-	-	-	-	Lvl 3-	-	-	Lvl 2-	-	-	-	Lvl 3/4
SBP2 Emphasizes patient safety	-	Lvl 2-	-	-	-	-	Lvl 3-	-	-	Lvl 4	Lvl 2-	-	Lvl 4	Lvl 4-	-	Lvl 3-	-	-	Lvl 4-	-
SBP3 Advocates for individual and community health	-	-	-	Lvl 3-	-	-	-	-	-	-	-	-	-	-	-	Lvl 3-	-	Lvl 4-	-	-
SBP4 Coordinates team based care	Lvl 3	Lvl 3	Lvl 2-	-	Lvl 3-	-	Lvl 3	Lvl 3	Lvl 3-	-	Lvl 3	Lvl 3	Lvl 3	Lvl 4	Lvl 3-	-	-	-	Lvl 4	Lvl 2

Build rotation evaluation tools using EPAs then linking to subcompetencies to generate milestone reports

Creating rotation evaluations using EPAs

- Step 1: What EPAs will the trainee perform during the rotation?
 - Emergency Medicine Rotation for FM resident
 - EPA 3: Provide first contact access to care for health issues and medical problems
 - EPA 9: Diagnose and manage acute illness and injury
 - EPA 10: Perform common procedures in the emergency department
 - EPA 14: Manage care for patients with medical emergencies
 - EPA 20: Coordinate care and evaluate specialty consultation as the condition of the patient requires
- Step 2: Turn these EPAs into questions on the rotation evaluation
 - EPA 14: How well did the resident provide patient care with medical emergencies?
- Step 3: Identify how the EPAs and subcompetencies link
- Step 3: Apply same Likert scale as milestones
- Step 4: Create rotation evaluation and link to subcompetencies

Creating rotation evaluations w/ EPAs linked to subcompetencies

Step 1: EPA 13: Manage inpatient care, discharge planning, transitions of care

Step 2:

Q1: Please evaluate the discharge planning provided to patients by the resident

Q2: Please evaluate the inpatient care provided to patient by the resident

Step 3: This evaluation questions linked to

PC1, PC5

SBP1, SBP2, SBP4

Prof1, Prof2, Prof3

ICS2, ICS3, ICS4

Competency based Faculty Evaluation of the Resident

MK 1 ▾ Please rate the resident's level of Medical Knowledge.

Please rate the resident's level of Interpersonal and Communication Skills.

PC 6 ▾ PC 2 ▾ Please rate the resident's level of Patient Care.

PC 7 ▾ PC 10 ▾

PC 9 ▾

PBLI 1 ▾ Please rate the resident's level of Professionalism.

SBP 2 ▾ SBP 1 ▾ Please rate the resident's level of Systems Based Practice.

SBP 3 ▾

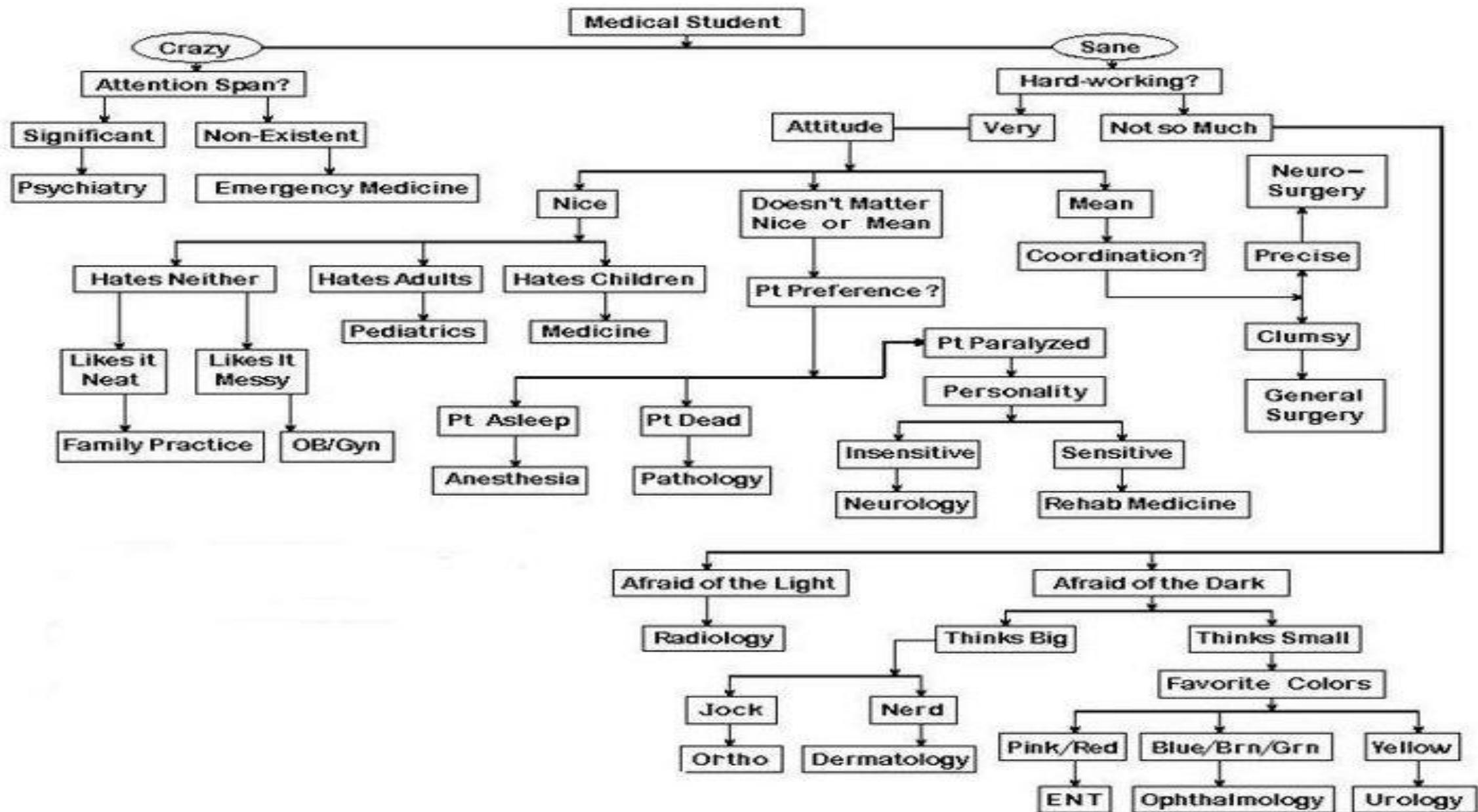
Reports for the CCC: Linking rotation questions to subcompetencies

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	Inconsistently able to acquire accurate historical information in an organized fashion	Consistently acquires accurate and relevant histories from patients	Acquires accurate histories from patients in an efficient, prioritized, and hypothesis-driven fashion	Obtains relevant historical subtleties, including sensitive information that informs the differential diagnosis
Does not use physical exam to confirm history	Does not perform an appropriately thorough physical exam or misses key physical exam findings	Seeks and obtains data from secondary sources when needed	Performs accurate physical exams that are targeted to the patient's complaints	Identifies subtle or unusual physical exam findings
Relies exclusively on documentation of others to generate own database or differential diagnosis	Does not seek or is overly reliant on secondary data	Consistently performs accurate and appropriately thorough physical exams	Synthesizes data to generate a prioritized differential diagnosis and problem list	Efficiently utilizes all sources of secondary data to inform differential diagnosis
Fails to recognize patient's central clinical problems	Inconsistently recognizes patients' central clinical problem or develops limited differential diagnoses	Uses collected data to define a patient's central clinical problem(s)	Effectively uses history and physical examination skills to minimize the need for further diagnostic testing	Role models and teaches the effective use of history and physical examination skills to minimize the need for further diagnostic testing
Fails to recognize potentially life threatening problems				

AVERAGE	RESPONSES	PRIOR REVIEW
3.19 2.74 Peer	9 6 Evaluators	3.0 June 2018
1 N/A response		

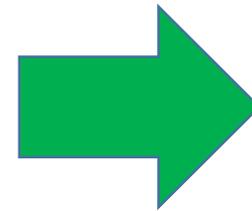
Question	Demonstrates the ability to manage and triage calls that come in from the nursing staff.	NORMALIZED 3.00 1 response
Question	Manages a patient seen in clinic for a chronic medical condition.	NORMALIZED 3.50 2 responses
Question	Manages a patient seen in clinic for an acute medical condition.	NORMALIZED 3.25 2 responses
Question	Manages the day to day care of a patient admitted to the hospital on the medicine service.	NORMALIZED 3.00 1 response
Question	Performs all tasks associated with admitting a patient to the hospital.	NORMALIZED 3.00 1 response
Question	Performs all tasks associated with providing consultative services. This includes appropriate evaluation of the patient..	NORMALIZED 3.00 2 responses



Assess program curriculum/assessment
system

Riding a Bike is an EPA of being a Kid

EPA	Can Ride A Bike Safely				
Observable Practice Activities					
Competencies	Equipment	Safety	Bicycle Etiquette	Endurance	
Milestone	Knows Right Size bike to use	Can Balance	Can Propel Forward	Knows Hand signals	
Narrative Do you trust them? What you are watching that describes the EPA.	Rides 100 feet without falling	Rides with a helmet	Riding in same direction as traffic using hand signals	Rides for over 8 hours at once	



- Curriculum
 - Educate about Bike Safety Rules
 - Skill Practice at each skill milestone
 - Build endurance
- Assessments
 - May need to assess subcompetencies/milestones rather than the EPA itself

Residency Common Program Requirements: Medical Knowledge

- ACGME: “Residents must demonstrate knowledge of established and evolving biomedical, clinical, epidemiological and social-behavioral sciences, as well as the application of this knowledge to patient care”

MK-1 Demonstrates medical knowledge of sufficient breadth and depth to practice family medicine					
Has not achieved Level 1	Level 1	Level 2	Level 3	Level 4	Level 5
	Demonstrates the capacity to improve medical knowledge through targeted study	<p>Uses the American Board of Family Medicine (ABFM) In-Training Examination or American College of Osteopathic Family Physicians (ACOFP) In-Service Examination resident scaled score to further guide his or her education</p> <p>Demonstrates capacity to assess and act on personal learning needs</p>	Achieves an ABFM In-Training Examination or ACOFP In-Service Examination resident scaled score predictive of passing the certification examination	Appropriately uses, performs, and interprets diagnostic tests and procedures	Demonstrates life-long learning

Knowing this Outcome:
 -Define Curriculum
 -Define Assessment

FM EPA 10 (perform common procedures) or MK milestone (interprets diagnostic test)

- Focus on x-rays and EKGs.
- FM residency curriculum
 - Rotation in pulm/critical care, readings/practice of reading films on rotation, assigned to present and read films during didactics
 - Rotation in cardiology/ccu, readings/practice of reading EKGs on rotation, assigned to present and read EKGs during didactics
- FM residency assessment
 - EKG quiz after CCU rotation for PGY 2
 - CXR quiz for MICU rotation for PGY 2
 - Evaluation has questions asking attendings to evaluate whether residents can perform these skills

Using Milestones to Assess Program Curriculum

Competency	Current Curriculum	Preferred Evaluation Methods	Current Program Evaluation Methods
Medical Knowledge		Standardized Exams; Chart Recall; Questioning/Discussions	
Milestones:			
Patient Care		Direct observation; Simulation/Standardized patients; Multisource feedback; Medical record audit	
Milestones:			
Professionalism		Multisource feedback; Direct observation Standardized feedback; Portfolio	
Milestones:			
Interpersonal Skills and Communication		Direct Observation; Multisource feedback Standardized patients	
Milestones:			
Practice Based Learning and Improvement		Chart audit; EBM tools; chart audits; self assessment; qi/ps projects; portfolios; ILP	
Milestones:			

Using Milestone Reports to Assess Program Curriculum

Family Medicine Competency and Milestones (n=22)	MSM Family Medicine June 2018			National Family Medicine June 2016		
	PGY 1	PGY 2	PGY 3	PGY 1	PGY 2	PGY 3
Patient Care – PC-1 - Cares for acutely ill or injured patients in urgent and emergent situations and in all settings	1.5	3.0 – 3.5	4.0 – 4.5	1.5 - 2.5	3.0 – 3.5	4.0
PC-2 - Cares for patients with chronic conditions	1.5 – 2.0	3.0 – 4.0	4.0 – 4.5	1.5 – 2.5	3.0 – 3.5	4.0 – 4.5
PC-3 - Partners with the patient, family, and community to improve health through disease...	1.5 – 2.5	2.5 – 3.0	3.5-4.5	1.5 – 2.5	2.5 – 3.5	3.5 – 4.0
PC-4 - Partners with the patient to address issues of ongoing signs, symptoms, or health...	1.5 – 2.5	2.5 – 4.0	4.0 – 4.5	1.5 – 2.5	2.5 – 3.5	3.5 – 4.0
PC-5 - Performs specialty-appropriate procedures to meet the health care needs of individual...	1.5 – 2.0	2.5-3.0	4.0 – 4.5	1.5 – 2.5	2.5 – 3.5	3.5 – 4.0
Medical Knowledge – MK-1 - Demonstrates medical knowledge of sufficient breadth & depth to practice family medicine	1.5 – 2.5	1.5 – 3.0	4.0 – 4.5	1.5 – 2.5	2.5 – 3.5	4.0
MK-2 - Applies critical thinking skills in patient care	1.5 – 2.5	2.5 – 3.5	4.0 – 4.5	1.5 - 2.5	3.0 – 3.5	3.5 – 4.0
Systems-Based Practice – SBP-1 - Provides cost-conscious medical care	2.0 – 3.0	3.0 – 3.5	4.0 – 4.5	1.5 - 2.0	3.0 – 3.5	3.5 – 4.0
SBP-2 - Emphasizes patient safety	2.0 – 2.5	2.5 – 3.5	4.0 – 4.5	1.5 – 2.0	2.5 – 3.0	3.5 – 4.0
SBP-3 - Advocates for individual and community health	2.0 – 2.5	2.0 – 3.5	4.0 – 4.5	1.5 – 2.5	2.5 – 3.0	3.5 – 4.0
SBP-4 - Coordinates team-based care	2.0 – 3.0	3.0 – 4.0	4.0 – 4.5	2.0 – 2.5	3.0 – 3.5	4.0 – 4.5
Practice-Based Learning & Improvement – PBLI-1 - Locates, appraises, and assimilates evidence from scientific...	1.0 – 1.5	2.0 – 2.5	4.0 – 4.5	1.5 – 2.0	2.5 – 3.0	3.5 – 4.0
PBLI-2 - Demonstrates self-directed learning...	1.5 – 2.0	3.0	4.0 – 4.5	2.0 – 2.5	3.0 – 3.5	3.5 – 4.0
PBLI-3 - Improves systems in which the physician provides care	1.0 – 1.5	2.0 – 2.5	3.0 – 3.5	1.5 – 2.0	2.5 – 3.0	3.0 – 4.0
Professionalism – PROF-1 - Completes a process of professionalization	2.0 – 2.5	3.0 – 3.5	4.0 – 4.5	1.5 – 2.5	3.0 – 4.0	4.0 – 4.5
PROF-2 – Demonstrates professional conduct and accountability	1.5 - 2.5	3.0 – 3.5	4.0 – 4.5	1.5 – 2.5	2.5 – 3.5	3.5 – 4.0
PROF-3 – Demonstrates humanism and cultural proficiency	2.0 – 2.5	3.0 – 4.0	4.0 – 4.5	2.0 – 2.5	3.0 – 3.5	4.0
PROF-4 - Maintains emotional, physical, and mental health; and pursues continual personal...	2.0 – 2.5	3.0 – 3.5	4.0 – 4.5	2.0 – 2.5	3.0 – 3.5	3.5 – 4.0
Interpersonal & Communication Skills – ICS-1 - Develops meaningful, therapeutic relationships with patients and families	2.5 – 3.0	3.0 – 4.0	4.0 – 4.5	2.0 – 2.5	3.0 – 4.0	4.0 – 4.5
ICS-2 – Communicates effectively with patients, families, and the public	1.5 – 2.5	3.0 – 3.5	4.0 – 4.5	1.5 – 2.5	3.0 – 3.5	4.0
ICS-3 - Develops relationships & effectively communicates with...	1.5 – 3.0	3.0 – 3.5	4.0 – 4.5	2.0 – 2.5	3.0 -3.5	3.5 – 4.0
ICS-4 – Utilizes technology to optimize communication	2.0	3.0 – 4.0	4.0 – 4.5	1.5 – 2.5	3.0 – 3.5	3.5 – 4.0

Define and write goals and objectives

Using EPAs and Milestones to Write Rotation Goals & Objectives

- Goals:
 - Can be defined as the EPAs that relate to that rotation
- Objectives:
 - Can be defined as each subcompetencies or milestones that relate to achieving the EPA

Sample Goals and Objectives ER rotation for FM Using EPAs and Milestones:

- Objectives:

- EPA 3: Provide first contact access to care for health issues and medical problems
- EPA 9: Diagnose and manage acute illness and injury
- EPA 10: Perform common procedures in the emergency department
- EPA 14: Manage care for patients with medical emergencies
- EPA 20: Coordinate care and evaluate specialty consultation as the condition of the patient requires

- Competency Based Goals from Linked EPA/Milestones Example:

- MK

- Anticipates expected and unexpected outcomes of the patient's clinical condition and data

- PC

- Consistently recognizes common situations that require urgent/emergent medical care

- ICS

- Creates a non-judgmental safe environment to actively engage patients

Conclusion

Motivation

- *Public Accountability
- *Improves Accreditation
- *Helps the learner know what to master
- *Using EPAs/Milestones can make reports to CCC, G/O, program evaluation more substantive
- *Put resources where it matters most

Shape the Path

- Review (Define) Specialty EPAs and Milestones
- Ask CCC where program could improve evaluation
- Apply concepts to rotation evaluations and link evaluation questions to subcompetencies
- Apply concepts to assess program curriculum
- Apply concepts to define goals & objectives

Direction

- Understand CBME, EPAs, Milestones
- Utilize the scope of CBME to ensure that our programs are providing our trainees the best education to become physicians that provide quality care

Resources for Further Development

- ACGME Workshop: Developing Faculty Competencies in Assessment: A Course to Help Achieve the Goals of Competency-Based Medical Education (CBME)
- Nasca TJ, Philibert I, Brigham T, et al. The next GME accreditation system—rationale and benefits. *N Engl J Med*. 2012;366(11):1051–6
- Carraccio C, Wolfsthal SD, Englander R, et al. Shifting paradigms: from Flexner to competencies. *Acad Med*. 2002;77(5):361–7
- Frank JR, Snell LS, Cate OT, et al. Competency-based medical education: theory to practice. *Med Teach*. 2010;32(8):638–45
- Holmboe E, Durning SJ. Practical Guide to the Evaluation of Clinical Competence. Elsevier Publishers. 2nd Edition.
- Video Understanding EPAs <https://www.youtube.com/watch?v=pSBs9Mg-GIM>