

Entrustable Professional Activities (EPA) from theory to practice

Pedro Tanaka, MD, PhD (Medicine), MACM, PhD (Education)
Clinical Professor



Outline

Introduction

Statement of Purpose / Research Questions

Methodology

Results

Discussion



Core Components and Theories of CBME

CBME CORE COMPONENTS				
Frameworks: Competencies	Sequential Progression	Tailored Learning Experiences	Competency-focused Instruction	Programmatic Assessment
THEORIES				
-Social accountability -Backwards design	-Dreyfus model -Entrustment and supervision -Surface & deep learning	-Situating learning -Deliberate practice -SRL -Professional identity development	-Zone proximal development -Constrictive friction -learner centered -Cognitive apprenticeship	-Programmatic Assessment -Formative assessment



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Statement of Purposes

Develop and Validate	Create	Examine
Develop and validate EPAs for clinical anesthesia year 1 (CA-1) (post graduate year 2 (PGY2)) residents in Anesthesia Residency Programs in the United States;	Create an EPA-aligned workplace-based assessment tool for the specialty of anesthesiology;	Examine validity of the tool using Messick's unified validity framework (1995) (content, response process, and consequences).



Research Questions

1. What are sources of validity evidence in the development of EPAs?
2. How reliable (internal consistency) is this new workplace-based assessment tool?
3. What are sources of validity evidence for the EPA-aligned workplace-based assessment tool?
4. How do anesthesia attendings make entrustment decisions for residents (Content, Response Process, Internal Structure, Relations to other variables, and Consequences) ?
5. How does the assessment tool support feedback for learning (consequences)?



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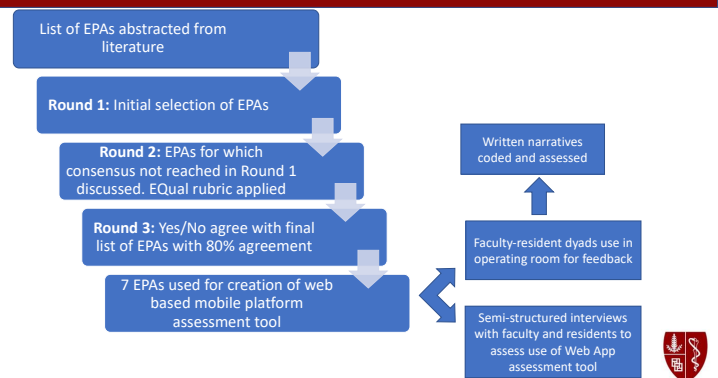
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EPA Web App

The screenshot shows a mobile application interface for 'Complete Evaluation'. It includes a header with the time '4:23' and a back button. The main content area is titled 'EPA Tool Anesthesia (2020 v2)' and 'Today'. Below this, there is an 'Evaluation Target' section with a dropdown menu showing 'Aya Abou-Nasr'. The form is divided into several sections with checkboxes and text input fields:

- 1. Select resident level: ***
 - CA-1
 - CA-2
 - CA-3
- 2. Please select only one EPA you wish to submit: ***
 - Perform preoperative assessment of ASA 1/2 patient undergoing a minor surgical procedure
 - Perform preoperative assessment of ASA 3/4 patient undergoing a minor surgical procedure
 - Basic airway management
 - Perform an anesthesia induction of an ASA 1 or 2 patient without a difficult airway for a minor surg
 - Provide intraoperative care of ASA 1 or 2 patient undergoing a minor surgical procedure
 - Emergence of an ASA for 2 patient with a normal airway after undergoing a minor surgical procedure
 - Perform neuraxial anesthesia
- 3. Please select level of supervision based on your observation: ***
 - Resident has knowledge and some skills but not allowed to perform the EPA
 - Resident may act under proactive supervision (i.e. residents seek help with almost all steps)
 - Resident may act under reactive supervision (i.e. faculty intervene when needed)
 - Resident may act independently (i.e. at attending level)
 - Resident may act as a supervisor and instructor
- 4. Please list the factors that influence your decisions on the level of supervision ***
- 5. Please provide specific feedback: ***

At the bottom, there is a green button labeled 'SUBMIT EVALUATION'.



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Data summary

Delphi: 3 Rounds with 14 experts. Start with 111 possible EPAs. EQual rubric (40 EPAs). Listed 14 curricular EPAs for CA1. Study 7 EPAs.

Reliability: Cohort of 31 residents generated 1,116 observations. 186 observations for each EPA.

Utility: Semi-structured interviews with 14 faculty and 16 residents. Generated 396 excerpts in 4 domains (12 themes)

Complexity of entrustment decisions: Semi-structured interviews with 14 faculty and 1,116 comments from the Web App. Generated 1,163 excerpts in 7 domains.

Feedback quantitative: Analysis of 1,116 comments regarding orientation and relevance

Feedback Qualitative: Analysis of 1,116 comments generated 1,599 sub-competency specific responses



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EPAs selected for the study

Perform preoperative assessment of ASA 1 or 2 patient undergoing a minor surgical procedure
Perform preoperative assessment of ASA 3 or 4 patient undergoing a minor surgical procedure
Basic airway management
Perform an anesthesia induction of an ASA 1 or 2 patient without a difficult airway for a minor surgical procedure
Provide intraoperative care of ASA 1 or 2 patient undergoing a minor surgical procedure
Emergence of an ASA 1 or 2 patient with a normal airway after undergoing a minor surgical procedure



D-study showing changes in projections in reliability estimates

EPA	Observations	G Coefficient	Phi Coefficient
1	24	0.418	0.402
2	24	0.684	0.664
3	24	0.480	0.468
6	24	0.598	0.598



Consolidated Framework for Implementation Research

Intervention Characteristics	Characteristic of Individuals	Outer Setting	Inner Setting
<ul style="list-style-type: none"> Evidence strength and quality Adaptability Complexity 	<ul style="list-style-type: none"> Personal use Other Personal Attributes Knowledge and Beliefs Self-efficacy 	<ul style="list-style-type: none"> Learner Needs Constructive Feedback Quality of Narrative Comments 	<ul style="list-style-type: none"> Implementation



Theoretical Domains Framework

Knowledge

Skills

Beliefs about capabilities

Reinforcement

Environmental context and resources

Intention

Memory, attention, and decision processes



Distribution of the orientation and relevance of narrative comments

raw number of comments and (%) of all 1116 comments

Orientation / Relevance	Very Irrelevant	Irrelevant	Relevant	Very Relevant
Very Critical	1 (0.1)	2 (0.2)	7 (0.6)	3 (0.3)
Critical	4 (0.4)	45 (4.0)	359 (32.2)	120 (10.7)
Modest Praise	24 (2.2)	54 (4.8)	292 (26.2)	146 (13.1)
High Praise	0 (0)	4 (0.4)	25 (2.3)	30 (2.7)



Core Competency Subcompetency	n	%
Patient Care		
Pre-Anesthetic Evaluation	159	9.9
Peri-Operative Care and Management	185	11.6
Application and Interpretation of Monitors	53	3.3
Intra-Operative Care	622	38.9
Airway Management	257	16.1
Situational Awareness and Crisis Management	53	3.3
Medical Knowledge		
Clinical Reasoning	17	1.1
Practice-Based Learning and Improvement		
Evidence-Based and Informed Practice	42	2.7
Reflective Practice and Commitment to Personal Growth	58	3.6
Professionalism		
Professional Behavior and Ethical Principles	17	1.1
Accountability/Conscientiousness	47	2.9
Interpersonal and Communication Skills		
Patient- and Family-Centered Communication	31	1.9
Interprofessional and Team Communication	58	3.6
Total	1599	100

Mapping of written in feedback comments to the ACGME competencies



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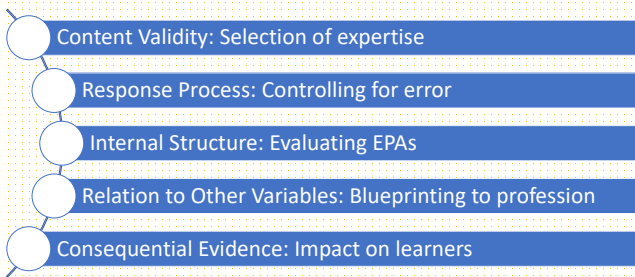
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EPA construct validity



Reliability

- Two EPAs (Perform preoperative assessment of ASA 3 or 4 patient; and Emergence of an ASA 1 or 2 patient with a normal airway) were more effective in discriminating differences in resident performance. Both can be used for both formative and summative assessment.
- Two other EPAs (Perform preoperative assessment of ASA 1 or 2 patient and Basic airway management) were less effective in reflecting nuances in resident performance.



Utility of the Web App

- Provided a tool for discussion
- Incorporated as part of the usual workflow
- Substitute for an already existing form of evaluation
- Clinical demands and competing priorities
- Another task in an already busy environment
- Provided opportunity for reflection
- New to the culture



Complexity of Entrustment Decisions



Accelerate Entrustment

Conceptual knowledge of the task and environment

The conversation about planning care
Discussion on decision making process



Detract Entrustment

Previous negative interaction
Production pressure



Feedback

- Narrative comments were overall split between modest praise and critical, and the majority were relevant (specific and actionable).
- Five of the six ACGME competencies were represented in these comments.
- Feedback is reconceptualized.
- Recognize many of the milestones described in sub-competencies.



Conclusion

This study sought to look for robust validity evidence in using EPAs through a Web App as part of the developmental process and reinforce the concept of assessment as learning. The results explored the validity of the EPA construct, the reliability and utility of the Web App, how faculty made entrustment decisions while supervising residents in the operating room, and the quality of feedback. The process described in this study presents a road map for other graduate medical education programs interested in incorporating EPAs as part of an assessment program.

