Competency-Based Education and Entrustable Professional Activities (EPAs) in the context of medical skills training

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Overview

1. Competency-based medical education
2. Entrustable professional activities
3. Entrustment decision making
4. Skills training and simulation
Competency-Based Medical Education

• First mentioned 1978 (McGaghie et al, WHO)

• Revival around 2000: Canada (CanMEDS), USA (ACGME Outcome project), UK (Tomorrow’s Doctors)

• Why: dissatisfaction with quality of care, training models, and supervision & patient safety
More deaths from hospitalization than car crashes, breast cancer, AIDS

TO ERR IS HUMAN FRAMED PATIENT SAFETY AS A SERIOUS PUBLIC HEALTH ISSUE (1999 ESTIMATES)

44,000 - 98,000
Annual deaths from medical error among hospitalized patients.\(^{(a)}\)

42,297
Annual deaths from breast cancer.\(^{(a)}\)

43,458
Annual deaths from car crashes.

16,516
Annual deaths from AIDS.\(^{(a)}\)

Kohn et al 2000
Findings A database review of malpractice cases involving surgical residents found that 70% of cases involved elective surgery and 69% named a junior resident, while lack of direct supervision by attending physicians was cited in 55% of cases.
Essence of CBME

• Goal: securing safer and higher quality practice by improved training and assessment

• Better, broader, more valid description of the physician

• Outcome-based, not process based

• From *assuming* competence to *assessing* competence

• The aim: licensing physicians, register specialists only when they meet standards

• Based on competence, not just on time in training
Competency frameworks

USA

Canada
Competency frameworks

General acceptance worldwide, but...

- CBME frameworks tend to become analytical and detailed
- Competencies are sometimes rather abstract and general
- Clinical teachers struggle with assessment
Analytic framework approach

The doctor:
- Medical expert
- Collaborator
- Communicator
- Manager / Leader
- Health advocate
- Scholar
- Professional

Interactions:
- With nursing staff
- With family
- With patients
- With colleagues
- With trainees
- Consultation
- Breaking bad news
- Explain medication
- With children
- With elderly
- ...
The CanMEDS 2015 competency framework
739 components (across all specialties)

<table>
<thead>
<tr>
<th>Role</th>
<th>161 key concepts</th>
<th>28 key competencies</th>
<th>116 enabling competencies</th>
<th>434 milestones (excl CPD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical expert</td>
<td>16</td>
<td>5</td>
<td>21</td>
<td>77</td>
</tr>
<tr>
<td>Communicator</td>
<td>27</td>
<td>5</td>
<td>18</td>
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<td>13</td>
<td>68</td>
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<tr>
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<td>13</td>
<td>24</td>
</tr>
<tr>
<td>Scholar</td>
<td>39</td>
<td>5</td>
<td>27</td>
<td>85</td>
</tr>
<tr>
<td>Professional</td>
<td>25</td>
<td>4</td>
<td>16</td>
<td>67</td>
</tr>
</tbody>
</table>
Entrustable Professional Activities
Competent Group at risk

Radiology Progress Test scores 2005-2009 for all Dutch residents
Entrustable Professional Activities

Units of professional practice (tasks) that may be entrusted to a learner to execute unsupervised, once he or she has demonstrated the required competence.

Shift of focus: from individual competencies to the work that must be done.
E.P.A.

- **Entrustable**: acts that require trust – by colleagues, patients, public

- **Professional**: confined to occupations with extra-ordinary qualification and right

- **Activities**: tasks that must be done

EPAs ground competencies in daily practice
Specifications: EPAs should be...

1. Part of essential professional work in a given context
2. Requiring adequate knowledge, skill and attitude, generally acquired through training
3. Leading to recognized output of professional labor
4. Usually confined to qualified personnel
5. Independently executable, not a necessary part of other EPA
6. Executable within a time frame
7. Observable and measurable in process and outcome, leading to a conclusion ('well done' or 'not well done')
8. Reflecting one or more of the competencies to be acquired

(still similar to) ten Cate, 2005
Competencies versus EPAs

- EPAs: units of work / tasks that must be done
- Competencies: qualities of individuals

- One can possess competencies; one cannot possess EPAs
### Competencies versus EPAs

<table>
<thead>
<tr>
<th>Competencies</th>
<th>EPAs</th>
</tr>
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<tbody>
<tr>
<td><strong>person-descriptors</strong></td>
<td><strong>work-descriptors</strong></td>
</tr>
<tr>
<td>knowledge, skills, attitudes, values</td>
<td>Essential units of professional practice</td>
</tr>
<tr>
<td>• content expertise</td>
<td>• discharge patient</td>
</tr>
<tr>
<td>• health system knowledge</td>
<td>• counsel patient</td>
</tr>
<tr>
<td>• communication ability</td>
<td>• lead family meeting</td>
</tr>
<tr>
<td>• management ability</td>
<td>• design treatment plan</td>
</tr>
<tr>
<td>• professional attitude</td>
<td>• Insert central line</td>
</tr>
<tr>
<td>• scholarly skills</td>
<td>• Resuscitate patient</td>
</tr>
</tbody>
</table>

Ten Cate et al 2010
Does it fit?

Task (EPA) to be done

Person with competencies
**EPAs require multiple competencies**

<table>
<thead>
<tr>
<th>Competency</th>
<th>EPA1</th>
<th>EPA2</th>
<th>EPA3</th>
<th>EPA4</th>
<th>EPA5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical expert</td>
<td>++</td>
<td>++</td>
<td>+</td>
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<td>++</td>
</tr>
<tr>
<td>Professional</td>
<td>+</td>
<td>+</td>
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</table>

Assessment focused on EPAs

Pangaro & ten Cate 2013
Operational definition of competence

When a professional activity is mastered
• ...at a threshold level
• ...that permits trust
• ...to act unsupervised

Competent: stage in a development continuum
Growth of competence over time

- novice
- advanced
- competent
- proficient
- expert

Ready for unsupervised practice

Dreyfus & Dreyfus 1986; ten Cate et al, 2010
Competency curves of one trainee

Justified entrustment decisions

Competition
threshold

training  deliberate professional practice

EPA1  EPA2  EPA3  EPA4  EPA5

Compe-

tence

Justified entrustment decisions

ten Cate et al 2010
A different trainee

Justified entrustment decisions

Loss of trust

Compe-
thres-

training
deliberate professional practice?

EPA1
EPA2
EPA3
EPA4
EPA5

ten Cate et al, 2010
Growth of competence – decrease of supervision

- Expert
- Proficient
- Competent
- Advanced
- Novice

Summative decision for unsupervised practice

Observe

2 direct
3 indirect
4 distant
no

Shades of decreasing supervision
An individualized workplace curriculum

<table>
<thead>
<tr>
<th>Graded supervision allows for</th>
<th>PGY1</th>
<th>PGY2</th>
<th>PGY3</th>
<th>PGY4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1   Observing the activity</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>2   Acting with direct supervision present in the room</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>3   Acting with supervision available within minutes</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>4   Acting unsupervised, i.e. under clinical oversight</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5   Providing supervision to juniors</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Portfolio of: trainee Jones

<table>
<thead>
<tr>
<th>EPA a</th>
<th>PGY1</th>
<th>PGY2</th>
<th>PGY3</th>
<th>PGY4</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>4</td>
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<tr>
<td>EPA b</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>EPA c</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>EPA d</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>
EPA approach serves flexibility

• Serves clarity in the objectives of training

• **Serves Intra-trainee variation**: trainees do not reach competence for everything on last day of training

• **Serves Inter-trainee variation**: different prior knowledge and skills, learning ability, general attitude

• **Serves Context variation**: variable clinical opportunities, local practice (epidemiology, facilities, culture), education-mindedness of staff
Entrustment decision making
Problems of workplace-based assessment

- Generosity error (too high scores – *failure to fail*)
- Halo (generalizing from observing one feature)
- Not reproducible (context differences)
- Idiosyncratic (observer/rater differences)
- Unclear standards (often *no* standards)
- Scores unclearly based on proficiency, effort, development, or reference group performance.
A reliable test

1. Standardized – equal for all candidates
2. Power to discriminate between individuals
3. Reproducible scores if re-administered
The trouble with assessment in the workplace

- **DOES**
  - Cannot meet reliability requirements

- **SHOWS HOW**
  - May be made reliable with much effort

- **KNOWS HOW**
  - Can be made reliable

- **KNOWS**
  - Can be made very reliable
Entrustment as assessment

Good questions, good answers: construct alignment improves the performance of workplace-based assessment scales

Jim Crossley,1 Gavin Johnson,2 Joe Booth3 & Winnie Wade3

BJA Advance Access published March 17, 2014

British Journal of Anaesthesia Page 1 of 9
doi:10.1093/bja/aeu052

Can I leave the theatre? A key to more reliable workplace-based assessment


Entrustment as Assessment: Recognizing the Ability, the Right, and the Duty to Act

Olle ten Cate, PhD

The Challenge

Competency- and milestone-based frameworks are designed to improve assessment of learners on broad domains, such as

Rip Out Action Items

Program directors should:
1. Ensure that faculty, residents, and staff understand EPA
Entrustability scales

Entrustability Scales: Outlining Their Usefulness for Competency-Based Clinical Assessment
Janelle Rekman, MD, Wade Gofton, MD, MEd, Nancy Dudek, MD, MEd, Tyson Gofton, PhD, and Stanley J. Hamstra, PhD

Validity of Level of Supervision Scales for Assessing Pediatric Fellows on the Common Pediatric Subspecialty Entrustable Professional Activities
Richard B. Mink, MD, MACM, Alan Schwartz, PhD, Bruce E. Herman, MD, David A. Turner, MD, Megan L. Curran, MD, Angela Myers, MD, MPH, Deborah C. Hsu, MD, MEd, Jennifer C. Kesselheim, MD, EdM, Carol L. Carraccio, MD, MA, and the Steering Committee of the Subspecialty Pediatrics Investigator Network (SPIN)
From traditional scales to entrustability / supervision scales

10 Outstanding
9 Excellent
8 Very good
7 Good
6 Average
5 Marginal
4 Fail
3 Poor
2 Very poor

Exceeds expectations
Meets expectations
Below expectations

- I need to explain everything
- We can do this together
- I can watch the learner do it
- I can briefly leave the room
- I can leave until she calls
- I can leave the hospital
- Learner ready for independence
Five levels of supervision, reflecting increasing trust in trainee autonomy

1. Be present but no permission to enact EPA
2. Practice EPA with direct (pro-active) supervision
3. Practice EPA with indirect (re-active) supervision

[threshold]

4. Unsupervised practice allowed (distant oversight)
5. May provide supervision to junior learners

Ten Cate et al 2010
Levels of supervision

1. Observation only
Levels of supervision

2. Direct, proactive, supervision
3. Indirect, reactive, supervision
Levels of supervision

4. Oversight – distant supervision
Levels of supervision

5. Providing supervision to junior
Entrustment decisions as assessment

Entrustment decisions for medical trainees combine three acknowledgments:

• of competence to act (ability)
• of readiness for privilege to act (right)
• of readiness for service (duty)
General qualities that enhance trust

1. **Ability** (skillfulness and experience)
2. **Integrity** (truthfulness, benevolence)
3. **Reliability** (conscientiousness, stable behavior)
4. **Humility** (observe own limits, willing to ask help)
Factors determining an entrustment decision (ED)

- **Trainee** factors (‘trustworthiness’ – ability, integrity, reliability and humility)
- **Supervisor** factors (‘propensity to trust’ and acquaintance with learner)
- Perceived **benefits** (educational and contextual)
- Perceived **risks** (for patients, environment, self)

\[ ED = f \left( \frac{T \times S \times \text{benefits}}{\text{risks}} \right) \]
How the EPA concept developed

- 2005: first suggestion to think of EPAs
- 2007: proposal to use EPAs in postgraduate programs
- 2010: first EPA-based program for Physician’s Assistants training Netherlands
- 2011: first EPA proposal for postgraduate medical education in psychiatry Australia
- 2014-15: EPAs for Entering Residency USA, Canada
- 2015: Entrustability scales development
Uptake of the EPA concept in the literature

Articles/yr on EPAs according to Google Scholar

"Entrustable" in title
"Entrustable professional activity" anywhere
EPAs are being implemented in many programs worldwide: examples
EPAs, Skills and Simulation
Recommended full EPA Description

1. EPA title
2. Specifications and limitations
3. Most relevant competency domains
4. Required knowledge, skills, attitudes and experience
5. Sources of information to assess progress (basis of formal entrustment)
6. Which entrustment/supervision level expected at which stage of training (implications of entrustment)
7. Expiration date (optional)
Required Knowledge, Skills, Attitudes and Experience

• Which knowledge, skills, attitudes are expected before student can be trusted to carry out is EPA? This information will guide students / residents

• Are there any numbers of procedures or other experience that must be completed before entrustment can be considered?

• This may include having passed a skills test or having performed X procedures in simulation
**Resuscitation of the multiple trauma patient in the Emergency Room (PGY 4 Anaesthesiology)**

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2</strong></td>
<td>Resuscitation of trauma patients of all age groups, in the Emergency Room. Active participation in the trauma team. Assessment and control of vital functions. Pain management in trauma patients. No limitations</td>
<td></td>
</tr>
</tbody>
</table>
| **3** | ✓ Medical expert  
✓ Communicator  
✓ Collaborator | ✓ Manager  
☐ Health advocate | ☐ Scholar  
☐ Professional |
| **4** | Trauma mechanisms & pathophysiology; Organization of trauma care; Collaboration in the trauma team; Trauma diagnoses & treatment; Primary & secondary survey; Trauma airway management; Emergency IV$^1$ & IO$^2$ access; Emergency thoracostomy; Hemorrhage / massive transfusion; Emergency Room registration procedures |
| **5** | 5 SPOs and 5 trauma CBDs (different days and assessors), incl. trauma airway management, emergency IV & IO access and emergency thoracostomy; LPO over >3 weeks (MSF); 2 trauma simulator achievement tests passed |
| **6** | Level 4 (unsupervised practice) in PGY 4 of anaesthesiology training |
| **7** | Six months after non-practice |
Ready to be trusted

Chung et al 2010
Essential purpose of EPAs

Actual contribution to healthcare without the need to double check

• Measuring and reporting a blood pressure
• Admitting and documenting a patient
• Inserting a urinary catheter
• Performing a lumbar puncture
• Running the Monday morning clinic
• Performing the cholecystectomy
• Requesting and organ donation

Entrustment based on skills tests is generally insufficient for entrustment
Entrustment for EPAs becomes relevant in clinical practice

<table>
<thead>
<tr>
<th>Self-directed and ‘passive’ classroom learning</th>
<th>‘active’ classroom learning</th>
<th>Clinical skills training with the use of simulation</th>
<th>Learning in clinical practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge needed to perform</td>
<td>Understanding needed to perform (and communication skills)</td>
<td>Integration of knowledge and skills in standardized conditions</td>
<td>Integration of all competencies in situ with unstandardized conditions</td>
</tr>
<tr>
<td>Entrustment not relevant</td>
<td>Entrustment not relevant</td>
<td>Entrustment not yet relevant</td>
<td>Entrustment is relevant</td>
</tr>
</tbody>
</table>
Simulation – strengths and limitations

Strengths - mimicking the true world of health care to:
• Provide experiences that are important but rare
• Allow for repetitive practice until mastery
• Avoid harm to patients and context
• Slow down practice where learning asks for it
• Standardize practice to enable reliable assessment

Limitations – its does not provide:
• Full commitment, engagement, responsibility in care
• Full scope of unpredictable practice
• Optimal evaluation of non-technical skills/behaviors
When does EPA entrustment require simulation training and assessment only?

• When skills *cannot* be performed in practice while entrustment *is needed*
  – *Basic life support skills at graduation from medical school*

• When situations are rare or unpredictable but require essential skills
  – *Rare diseases*
  – *Resolving collaboration conflicts*
To wrap up

- Competency-based education is a movement to stay
- EPAs have become popular worldwide as framework to connect competencies to clinical practice
- Entrustment decision making is recent but quickly emerging approach to assessment
- Simulation and skills training is important but not enough for entrustment
References

- ten Cate, O., Snell, L. & Carraccio, C., 2010. Medical competence: the interplay between individual ability and the health care environment. Medical Teacher, 32(8), pp.669–75.