Simulation for assessment of Entrustable Professional Activities in an emergency medicine residency program

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Abstract

In 2018, Canadian post-graduate Emergency Medicine (EM) programs transitioned to Competence-by-Design. Residents are now assessed using Entrustable Professional Activities (EPAs). We developed and implemented simulation for assessment to mitigate anticipated challenges with residents completing the required number of observations of resuscitation-based EPAs. Our survey of trainees who participated in these sessions suggests that it may be a feasible and acceptable method for EPA assessment.

Keywords Simulation · Entrustable Professional Activity · Competence-by-Design · Emergency Medicine

Résumé

En 2018, les programmes canadiens d'études supérieures en médecine d'urgence (MU) sont passés à la Compétence par Conception. Les résidents sont désormais évalués à l'aide d'activités professionnelles confiées (APC). Nous avons développé et mis en œuvre une simulation pour l'évaluation afin d'atténuer les défis anticipés avec les résidents effectuant le nombre requis d'observations des APC basés sur la réanimation. Notre enquête auprès des stagiaires ayant participé à ces sessions suggère qu'il s'agit d'une méthode réalisable et acceptable pour l'évaluation de l'APE.

Background

Canadian post-graduate Emergency Medicine (EM) programs have transitioned to Competence-by-Design, a competency-based assessment framework. Residents progress through four stages of training—Transition to Discipline, Foundations of Discipline, Core of Discipline, and Transition to Practice—and are assessed using Entrustable Professional Activities (EPAs) [1]. Before residents can be promoted between stages, they must achieve a target number of assessments for each EPA. A national evaluation of Competence-by-Design implementation reported that one-third of trainees were not promoted to the Foundations phase within the expected time frame and that the average number

of observations for Transition to Discipline EPAs was less than the target number [2].

Due to the short timeframe of the Transition to Discipline and Foundations stages and concerns that very junior residents would not be given sufficient autonomy in the care of critically ill patients to appropriately make entrustment decisions, we were concerned that residents would face challenges obtaining enough observations for EPAs 1.1 and 2.1 occurring in the Transition to Discipline and Foundations stages, respectively [3]. We decided to use simulation-based assessment to supplement clinical experiences for these EPAs.

Purpose/rationale

Simulation for assessment in medical education has been previously described, including for certain EPA assessment [4–6]. We developed and implemented simulation for assessment of EPA 1.1 “Recognizing the unstable/critically ill patient, mobilizing the healthcare team and initiating basic

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Fig. 1 Sample schedule for simulation for assessment of EPA 2.1 (Foundations of Discipline)

	Room A		Room B	
	Case	Resident*	Case	Resident*
08:30-08:45	Peds 1	Res 1	AD 3	Res 2
08:50-09:05	Peds 1	Res 3	AD 3	Res 4
09:10-09:25	Peds 1	Res 2	AD 3	Res 1
09:30-09:45	Peds 1	Res 4	AD 3	Res 3
09:50-10:05	Peds 2	Res 1	AD 4	Res 2
10:10-10:25	Peds 2	Res 3	AD 4	Res 4
10:30-10:45	Peds 2	Res 2	AD 4	Res 1
10:50-11:05	Peds 2	Res 4	AD 4	Res 3
11:10-11:25	Peds 3	Res 1	AD 5	Res 2
11:30-11:45	Peds 3	Res 3	AD 5	Res 4
11:50-12:05	Peds 3	Res 2	AD 5	Res 1
12:10-12:25	Peds 3	Res 4	AD 5	Res 3
12:30-13:30	<i>Break</i>			
13:30-13:45	AD 1	Res 1	AD 6	Res 2
13:50-14:05	AD 1	Res 3	AD 6	Res 4
14:10-14:25	AD 1	Res 2	AD 6	Res 1
14:30-14:45	AD 1	Res 4	AD 6	Res 3
14:50-15:05	AD 2	Res 1	AD 7	Res 2
15:10-15:25	AD 2	Res 3	AD 7	Res 4
15:30-15:45	AD 2	Res 2	AD 7	Res 1
15:50-16:05	AD 2	Res 4	AD 7	Res 3
16:15-16:45	<i>Large Group Debrief</i>			

Approximately 7-10 minutes allotted for each case to run and approximately 5-8 minutes protected for de-briefing thereafter (may vary per case).

Case Legend:

Peds 1	Pediatric pneumosepsis (2.1- Pediatric shock)
Peds 2	Pediatric VF arrest (2.1- Pediatric cardiorespiratory arrest)
Peds 3	Pediatric croup (2.1- Pediatric respiratory distress)
AD 1	Opioid overdose (2.1- Altered mental status)
AD 2	STEMI with VF Arrest (2.1- Cardiorespiratory arrest)
AD 3	Unstable AV Block (2.1- Unstable dysrhythmia)
AD 4	Elderly Altered LOC (2.1- Altered mental status)
AD 5	Pulmonary Edema (2.1- Respiratory distress)
AD 6	Torsades des Pointes (2.1- Unstable dysrhythmia)
AD 7	Ruptured Ectopic (2.1-Shock)

*Residents were not provided with a priori knowledge of the simulation case

life support”, and EPA 2.1 “Initiating and assisting in the resuscitation of critically ill patients”.

Our program has emphasized the goals of learning and practice in our simulation education, and developed psychological safety among learners by reassuring them their performance is not being assessed. Rather than risk compromising our existing program, we created a separate simulation experience for assessment of these EPAs. We conducted a survey-based program evaluation of our approach. Consistent with the standards of the Tri-Council Policy Statement 2 (2018), this survey was exempt from the need for research ethics review.

Description of innovation

The Specialty Training Committee suggests at least ten observations each of EPA 1.1 and EPA 2.1 be recorded, with at least two observations per recommended clinical presentation (altered mental status, cardiorespiratory arrest, unstable dysrhythmia, shock, and respiratory distress) [3]. We designed ten simulation cases each for EPA 1.1 and EPA 2.1 with each resident rotating through all ten cases in each phase (Fig. 1).

Simulation for assessment of EPA 1.1 and EPA 2.1 was scheduled toward the anticipated end of each stage. Each case was run with one simulation-trained embedded nurse and two staff emergency physicians, who alternated as primary assessor and embedded personnel. All participating staff were experienced in simulation and were pre-briefed

on the expectations of the EPAs and use of the entrustment scale. They were also provided with a copy of the EPA, and a case-specific template of anchors modeled on the Emergency Medicine Resuscitation Assessment Tool and Queen's Simulation Assessment Tool to assist with their assessments [7, 8].

We reviewed each EPA, the roles of embedded personnel, the confidentiality of assessment, and the high-frequency low-stakes nature of EPAs with residents during their pre-brief. Residents were the sole participant in each case and were aware their performance was being assessed. Staff debriefed each resident individually following each case and facilitated a group debrief with all residents at the end of the day.

After three cohorts of residents (12 residents total) had participated in at least one session, we conducted a survey-based program evaluation. Eleven residents (92%) completed the anonymous survey. The majority of respondents (10/11) perceived the sessions to be of moderate-to-high educational value, agreed the scores they received were representative of their performance during the session (8/11), and representative of their clinical competency (7/11). All 11 respondents agreed or strongly agreed that they felt safe participating in simulation for assessment sessions and all respondents answered "Yes" to the question of whether or not simulation for assessment should continue to be employed in our program. Only four of eleven respondents felt they would have been able to obtain most or all of the required observations for EPAs 1.1 and 2.1 in the clinical environment alone.

Discussion

Our 3-year experience with simulation for assessment of resuscitation-related EPAs suggests that this is a feasible and acceptable way to ensure residents achieve adequate exposure and practice in recognizing critically ill patients and initiating resuscitation in critically ill simulated patients.

Simulation for assessment may offer benefits not available in the clinical environment. Simulation provides the opportunity for assessment under more direct and standardized conditions without extraneous cognitive load for either resident or assessor. It may also mitigate the previously reported tendency for residents to only select well-done EPAs for observation requests ensuring a consistent training experience and the potential identification of deficits very early in training [9, 10].

Simulation for assessment also has limitations including cost of and access to equipment and personnel, fidelity concerns, and varied correlation between performance in simulation versus workplace environments that should be weighed against the benefits [6, 7, 9].

Prior to launching this initiative, there were concerns whether simulation for assessment would be acceptable to our trainees. The results of our survey suggest that residents felt safe throughout their experience. Directions for future study include assessing staff physician perceptions and challenges of simulation for assessment, and further exploring resident reported discrepancy in perceived real-world competence versus entrustment scoring in the simulation setting.

Summary

Our experience suggests that simulation for assessment of resuscitation-related EPAs is a feasible method for creating opportunities for observation and offers a potential solution for supplementing clinical observation opportunities during short-training stages. In our context, participants still perceived this approach to be safe and of high educational value.

Declaration

Conflict of interest None of the authors have any competing interests or conflict of interests to declare.

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