Entrustable professional activities and transitions across the continuum of training and practice

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Abstract

Transitions of trainees in the health professions to new contexts, to new training stages, and to unsupervised health care practice are critical learning periods where entrustable professional activities (EPAs) can play a pivotal role. For entrustment decisions, the critical questions are: are trainees prepared for a next phase, often with more autonomy, and are graduates prepared for the requirements of practice, often unsupervised?

This chapter addresses EPA-related issues from the perspective of these transitions and how they apply to the entire continuum of education and practice. Supervision plays a key role, both before transitions and after.

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Introduction

Transitions are ubiquitous in health professional training—from classrooms to the clinical workplace, from one clinical environment to another, from supervised to unsupervised practice, from one institution to another, from prelicensure to licensed practitioner, and, in general, from training to practice. Entrustment with entrustable professional activities (EPAs) can reflect a transition on a granular level, as entrustment decisions bring trainees into situations where they have a greater responsibility and autonomy to act. EPAs have been defined as units of professional practice that trainees must be prepared to perform without supervision after a period of training. Originally proposed for postgraduate medical training,[1] EPAs were soon embraced by undergraduate programs. Accounts of proposals or uses of EPAs have now been published in all health professions. Given that EPAs define a profession, they are also suitable for individuals in practice after training, for instance to recognize when they have gaps in their abilities or when new activities are added to the profession that they did not encounter before completing training.

Entrustment with health care tasks does not occur only at the end or after completion of training. Even if formal regulation of the permission to practice health care is linked to credentialing, licensing, or board certification, supervised execution of health care tasks happens from the moment a trainee starts their first clinical rotation and a preceptor assigns and supervises professional tasks.[2] Even after completion of all training, a specialist may encounter new areas of work not experienced before. How practicing physicians acquire new knowledge and skills varies and may be different for unfamiliar surgical[3] and medical[4] tasks, but the assumption of responsibility for new professional activities is relevant across the continuum of education and practice. In other words, EPAs do not necessarily represent an educational construct; in fact, 'units of practice' constitute professional work, not educational exercises.

Figure 16.1 shows the transitions with the continuum from an international perspective, acknowledging the great variety of stages in training and practice worldwide. Each of these stages
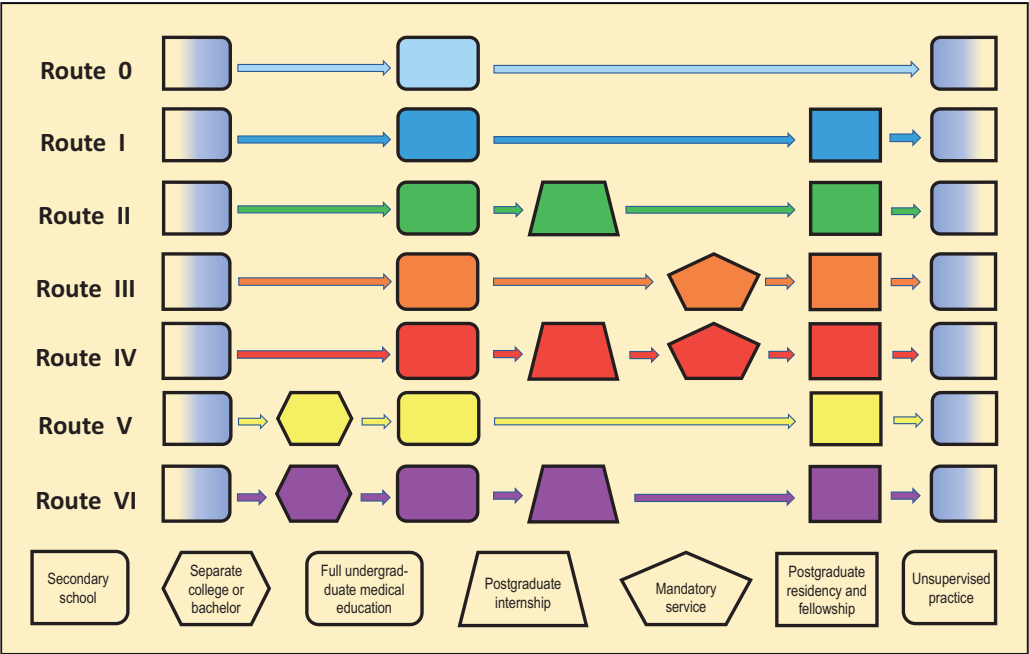

Figure 16.1: Transitions within the medical continuum worldwide. Adapted from Wijnen-Meijer et al. (2021).[5]

> **Box 16.1: A theoretical note: developing situation awareness after transitions.**
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> Passing the threshold for summative entrustment with a health care task (an EPA) is a significant transition moment. Following Dreyfus's skill development model (novice–advanced beginner–competent–proficient–expert), this is when a trainee would be 'competent.'[10,11] Passing this threshold, that is, becoming allowed to work unsupervised, either within training or after training, is only the beginning of a trajectory toward proficiency and expertise. In an excellent overview, US Air Force industrial engineer Endsley (2018) explains the crucial role of developing situation awareness (SA) and how this occurs in three stages toward expertise: *perception* of relevant situational cues, *comprehension* of the dynamics in the environment, and *projection*, i.e., forecasting of relevant future happenings, illustrating this with examples from team sports, aviation, and medicine.[12] The mastery of an EPA at the threshold moment of readiness for unsupervised execution does not yet imply the automation of task execution that is needed for a high case load and robust execution under variable circumstances, because full SA has not been reached. A lower case load with ample time for each case is needed initially after a transition, also to avoid overload, feelings of moral injury (able, but not having enough time to do the job well), and burnout.[13]

may employ EPAs, while intermittent service periods can benefit from qualifications for EPAs. For each stage, the preceding phase should prepare trainees to work at a designated level of supervision.

Assuming clinical responsibility of professional work is a critical transition point. Transitions, from classroom to clinical phases of education and from education to practice, have always caused concerns.[6] Moving from possessing knowledge to executing clinical responsibilities is especially stressful. The weeks and months after such transitions have been called 'critically intensive learning periods.'[7] While preparation for such transitions can often be optimized, they are unavoidable difficult phases of professional growth that pose immense opportunities to learn to become resilient.[8] The first time a trainee passes the threshold of competence and is initially entrusted with unsupervised task execution, performance can be high-quality, but is not routinized and may take time.[9] After that transition, the development of situation awareness helps to speed up task execution and allows the increase of caseloads (Box 16.1).

In this chapter, we address critical issues related to EPAs and the continuum of education and practice, including its transitions. While competency-based education (CBE) has dominated the language of health professions *education*, competency-based *practice* throughout a clinical career is really its eventual purpose.[14]

Preparing early trainees for first EPAs

EPAs can be envisioned for early trainees but, as they reflect contributions to patient care activities for which one can (and must) become qualified, classroom education can never fully prepare trainees for EPA entrustment. Examples of legitimate EPAs for early trainees, however, can be found. For instance, some programs require medical students to become an emergency medical technician in the first year[15] or offer work in a supervised but student-run clinic for underserved populations (patient triage, history and physical examinations, patient education, and laboratory and immunization procedures).[2] These can also be offered as electives leading to formalized health care activities that require qualification and permission.

As early trainees (and their patients) are highly vulnerable, adequate training and supervision and clear regulations are of utmost importance. If well secured, however, such experiences are highly valuable. They provide an orientation to the profession to strengthen (or redirect) convictions of career choice. In addition, they provide a relevant context for the effort needed for foundational, canonical knowledge acquisition. This vertical curricular integration combines the *knowing, doing*, and *being* from the outset of professional training and identity formation, and is likely to prepare trainees for transition to more responsibilities.[16]

True entrustment with contributions to care in undergraduate education

Prelicensure trainees are often restricted in their autonomy to contribute to patient care. While that is needed and justified for the sake of patient (and trainee) safety, strong restrictions will cause more significant transition gaps after graduation compared to a more gradual preparation of trainees for responsibility. In international comparisons, the freedom of senior, but prelicensure, trainees differs vastly. In some jurisdictions, senior prelicensure trainees may not do much more than a physical and history, fully checked by a licensed attending, while in other settings prelicensure trainees can bear a significant weight of primary patient care with limited and indirect supervision. In terms of the Chen-adapted entrustment–supervision scale,[17] these variations before graduation range from 3a (all findings double-checked) for only limited tasks to 4a (remote supervision, reachable by phone) for quite significant tasks, including uncomplicated child delivery, as an example. Heavy responsibilities prepare learners well, but patient safety requires clear regulation of supervision. This dichotomy is where summative entrustment decisions, after adequate assessment of trainees, are critical to convince collaborators and the public that significant responsibilities are justified.

Entrustable professional activities and the transition to residency

EPAs define a circumscriptive profession. For EPAs for medical school, this is the entire profession of medicine, but in a general sense. EPAs achieved in medical school must prepare pluripotent (not pluricompetent) students for a diverse range of fields, from psychiatry to neurosurgery. Thus, EPAs at the transition from medical school to residency deserve special consideration. The Association of American Medical Colleges (AAMC) in the US navigated this issue by defining the EPAs they believed any practicing physician should potentially need to perform, regardless of specialty,[18,19] with the additional expectation that these would fit with subsequent EPAs for various specialties. The AAMC developed a set of 13 Core EPAs for Entering Residency (AAMC Core EPAs), such as developing differential diagnoses, ordering and interpreting common tests, documenting clinical encounters, and contributing to a culture of safety and improvement.[19]

The first specialty in the US attempting to align undergraduate and postgraduate EPAs was pediatrics. As part of a time-variable pilot (Education in Pediatrics Across the Continuum, or EPAC), pediatric educators mapped their general pediatrics EPAs[20] to the AAMC Core EPAs and transitioned medical students in this small pilot to pediatric residency early, based on their individual readiness.[21,22] Next, they aligned the general pediatrics EPAs to EPAs for each pediatric subspecialty for individuals who complete fellowship training. This includes EPAs common to general pediatrics and every subspecialty, such as 'Leading a team' and 'Serving as a consultant for other healthcare workers providing care to children.'[23]

Entrustment decisions and the transition to new training contexts

As trainees progress through the training continuum, there are both formative and summative considerations regarding an individual's readiness to execute a given EPA. The focus on EPAs can

effectively improve feedback and progression along a developmental trajectory,[24–26] but summative entrustment decisions regarding readiness to practice EPAs in new contexts are important. Some programs award a 'statement of awarded responsibility' (STAR) when readiness for unsupervised practice has been demonstrated for an activity, a common practice among all Dutch postgraduate medical and nursing programs that serves as an informal mini-certification.[1,27] Testifying to this readiness may serve just to complete a training stage, such as in Canada's Competence-by-Design (CBD) model,[28] or to proceed to greater autonomy and responsibility in patient care. The CBD model requires learners to achieve mastery of a set of EPAs before progressing to their next context, which is devoted to other EPAs. A risk of this model is that trainees feel they need to 'chase' ratings for EPAs, not to allow for practicing with more autonomy but to tick off a program requirement.[29]

EPA qualifications also serve an important role in transitioning into completely new training environments, like the transition from undergraduate medical education (UME) to graduate medical education (GME). As noted above, in the US, the AAMC Core EPAs were developed and piloted in UME, and data suggest that there is an association between perceived readiness to perform these EPAs with transition to GME training.[30] Data also demonstrate that readiness to execute these AAMC Core EPAs may be lacking at the time of transition.[31,32] These data can be used to identify gaps that exist between UME and GME training, which serves as further evidence for the need to think about CBE and assessment as a genuine continuum to mitigate the abrupt transitions that are a part of many medical education systems.[14,18,33]

Transportability of summative entrustment decisions

Before formal licensing and specialty certification, summative decisions for EPAs at level 4 of supervision (basically, 'allowed to practice unsupervised, with oversight only') serve to qualify senior trainees to exercise responsibilities that are compatible with a posttransition phase. These summative decisions or STARs can be translated to digital badges[34] and should be acknowledged by members of the health care team. However, trainees can transition to a new context, for instance to a different, affiliated hospital during training. The question then arises as to the extent to which STARs uphold in this new context. Should new supervisors accept the trainee's STAR status and can they be allowed to work autonomously during night shifts? The recommendation is twofold: to basically accept the status in the new context, but also to incorporate an orientation phase, including sufficient observation to confirm the STAR status. For new environments, the recommendation thus is: 'trust, but verify.'

In nursing, where transition programs are widely used to support graduates in a practice environment,[35] a Dutch nationwide EPA model was recently created for postgraduate training to provide more flexibility to address both career development and the needs of health care[36] by using the concept of transdisciplinary EPAs.[37]

EPAs and transitions from training to full practice

Entering the first phase of full responsibility in practice following training is a critically important step.[38,39] Readiness to execute EPAs can serve as the basis for the decision to enter practice, and they provide an opportunity to clearly define the entrance requirements needed for practice in a profession or specialty.[40] However, in the siloed medical education systems that exist in many contexts, there may be inconsistency regarding how prepared a graduate needs to be at the time of transition into practice. Using the example of pediatrics in the US, EPAs were developed to define the activities expected of pediatricians and pediatric subspecialists, and, as these have been investigated over the last few years, data demonstrate substantial variability in graduates' preparedness to execute these activities at the conclusion of training. In general pediatrics, less than 80%

**Box 16.2: Transition-to-practice models that focus
on oversight of junior attendings.**

- 'Promotion-in-place' is a US pilot program that allows residents to graduate in a time-variable fashion into a fully certified independent role within the residency institution, the advantage being that close supervision and support remains available during the early independent period.[44]
- Several US procedural specialty boards require the newly graduated surgeon to collect detailed information on a full, consecutive case series that is then reviewed at the time of their oral board examination, providing a window into the match between the individual's readiness for entrustment in a specific practice context.
- Comprehensive cardiac sonography was recently defined in 24 very specific EPAs, 10 of which were rated as core for postgraduate training, seven as requiring supervision after postgraduate training, and eight as requiring additional focused training and supervision for certified cardiologists.[45]

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of graduating residents in one study demonstrated readiness for unsupervised practice for 6 of the 17 general pediatric EPAs[41] and, in the pediatric subspecialties, program directors suggested that unsupervised practice should not be the minimum expectation at the time of graduation for most EPAs.[42,43]

Considering transitions, it may not be realistic to list unsupervised practice as the strict minimum expectation for transitioning to full certification as a health professional. Rather than viewing the ongoing need for some supervision as deficiencies of individual trainees, or a deficiency in a training program, we suggest that this represents an ongoing, dynamic entrustment interface that must be negotiated not only at the time of certification and transition to practice but in an ongoing fashion throughout a practitioner's career. This recognizes both individual variability and contextual variability. Box 16.2 provides some examples.

Consider veterinary training and the readiness to manage emergency care for domestic animals. The variety of medical conditions, in the variety of potential animals, cannot all be taught and confirmed in undergraduate veterinary education. For every recent vet there will be deficiencies (and continued postgraduate residency is not the norm in veterinary medicine). Veterinary graduates are qualified but not *fully* competent.[46]

The notion of 'readiness for practice' is not absolute. The newly graduated practitioner *must* ensure further skill development, requiring the availability of a more experienced backup practitioner and special practice sessions.[46] In addition, the adaptation to the context may regard very different new skills. Clinical competency committees, qualifying trainees for the completion of training, should therefore reliably evaluate the trainee's *ability to recognize* the need for support and guidance. The designation 'not yet ready to be entrusted' is a signal to the learner (and the system) that extra support will be needed. To return to the realm of emergency veterinary practice, Figure 16.2 shows a recent Dutch project to negotiate on Day 1 after the transition to this new environment, how much supervision will be needed and for how long.[47] Similar approaches may be developed in transition phases for other health professions.

Once further into practice, a role for EPAs can be envisioned in the ongoing maintenance and updating of skills for practitioners. An important competency 'edge' for every practitioner involves adjusting to changing circumstances over a career. At the person level, 'disuse atrophy' may lead to de facto loss of readiness for critical activities, with implications for both continuing education and for ongoing certification.[48] EPAs can clarify where the edges are. At the context level,

EPA Checklist for new employees in emergency veterinary care

Essential EPAs in emergency veterinary care	For this EPA I estimate I require this level of supervision*					I strive to be ready for unsupervised practice after X months					
	1	2	3	4	5	0	1	2	3	4	5
Initial treatment of a dog or cat with...											
1 trauma, bleeding(en), wound(s)											
2 cardiorespiratory arrest (needing CPR)											
3 epilepsy											
4 dilated stomach/volvulus (excl. surgical intervention)											
5 dysuria / stranguria / pollakiuria											
6 intoxication											
7 dyspnea											
8 luxatio bulbi											
9 acute glaucoma											
10 acute blindness											
11 perforated cornea											
12 dystocia (including caesarean section)											
13 pyometra (including hysterectomy)											
14 dental urgency											
15 acute heart failure (myocardial, pericardial, arrhythmia)											
16 diarrhea, vomiting and/or abdominal pain											
17 anemia											
18 acute paresis/paralysis											
19 foreign body in nose/oropharynx, larynx, trachea, esophagus											
20 heatstroke											
21 allergic reaction											
22 diabetic ketoacidosis/hyperglycaemia											
23 determining indication and performing euthanasia											

*Level of supervision
1. Ready to be present but not enacting the EPA
2. Ready to practice this EPA with supervisor physically present
3. Ready to practice this EPA with indirect (on-call) supervision
4. Ready for unsupervised practice
5. Ready to provide supervision to junior learners

| Name: ... | Date: ... | Discussed with supervisor: ... |

Figure 16.2: Example of a self-evaluation tool to negotiate supervision needs after transition.

practice is likely to keep changing rapidly over the course of a practitioner's career. New EPAs can arise with others being sunsetted, as practice evolves. For example, six collaborating emergency medicine organizations maintain a practice model, termed the 'Model of the Clinical Practice of Emergency Medicine' and made up of three main 'dimensions'—patient acuity, physician tasks, and physician competencies[49]—with the tasks dimension aligning with the EPA framework. This collaborative model, with the emergency medicine community coming together to ensure ongoing relevance of the guiding elements of a profession, ensures that inclusive cocreated frameworks strike the right balance between protecting the public and respecting individual practitioner autonomy. Another example is from physician assistant training, where EPAs are being added to the individual's portfolio after training.[50]

A next step could be to define for individual specialists what the core activities are, for all in their specialty must be ready to perform at any time (defining the common ground of the specialty), and what one's individual, dynamic portfolio of additional EPAs[14] shows they are ready to perform at a specific moment.

EPAs are usually associated with a single program, in either postgraduate or undergraduate education. In this chapter we have argued how EPAs can play a pivotal role across the educational continuum, and particularly around moments of transition. The role of supervision, a key variable in guarding the safety and quality of care, and simultaneously fostering the development of learners, cannot be stressed enough in this process.

Figure justifications

Figure 16.1 was adapted from Wijnen-Meijer et al. (2021).[5] Figure 16.2 was taken from ten Cate & Favier, 2022.[47]

Competing interests

The authors declare that they have no competing interests.

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