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REVIEW ARTICLE

MEDICAL EDUCATION IN REVIEW

The logic behind entrustable professional activity frameworks: A scoping review of the literature

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Abstract

Introduction: Entrustable professional activities (EPAs), discrete profession-specific tasks requiring integration of multiple competencies, are increasingly used to help define and inform curricula of specialty training programmes. Although guidelines exist to help guide the developmental process, deciding what logic to use to draft a preliminary EPA framework poses a crucial but often difficult first step. The logic of an EPA framework can be defined as the perspective used by its developers to break down the practice of a profession into units of professional work. This study aimed to map dominant logics and their rationales across postgraduate medical education and fellowship programmes.

Methods: A scoping review using systematic searches within five electronic databases (Medline, Embase, Google Scholar, Scopus and Web of Science) was performed. Dominant logics of included papers were identified using inductive coding and iterative analysis.

Results: In total, 42 studies were included. Most studies were conducted in the United States (n = 22; 52%), Canada (n = 6; 14%) and the Netherlands (n = 4; 10%). Across the reported range of specialties, family medicine (n = 4; 10%), internal medicine (n = 4; 10%), paediatrics (n = 3; 7%) and psychiatry (n = 3; 7%) were the most common. Three dominant logics could be identified, namely, 'service provision', 'procedures' and/or 'disease or patient categories'. The majority of papers (n = 37; 88%) used two or more logics when developing EPA frameworks (median = 3, range = 1–4). Disease or patient groups and service provision were the most common logics used (39% and 37%, respectively).

Conclusions: Most programmes used a combination of logics when trying to capture the essential tasks of a profession in EPAs. For each of the three dominant logics, the authors arrived at a definition and identified benefits, limitations and examples. These findings may potentially inform best practice guidelines for EPA development.

1 | INTRODUCTION

Entrustable professional activities (EPAs) represent a rapidly evolving concept in health professionals' education that offers clear purpose for the application of competencies. Whereas competencies reflect the capabilities trainees bring to clinical practice,[1] EPAs are the tasks of health care for which these competencies are needed. An EPA is a discrete profession-specific task (or bundle of tasks), typically an identifiable act of patient care, which requires the integration of multiple competencies (including vital knowledge, appropriate skills and attitudes).[2,3] Learners are essentially being groomed for EPAs by performing these tasks, initially under strict supervision and gradually more autonomously. Progression towards becoming competent in an EPA reflects a learner's journey along so-called entrustment-supervision scales. These scales aim to capture the level of supervision a learner requires to ensure safe patient care; with increasing competence, the intensity of supervision should be carefully lowered over time.[4,5] Taken collectively, a set of EPAs can be used to define and inform the framework of a curriculum for specialty training and, in fact, reflects the profession in its core activities. As such, an EPA-based curriculum has the potential to link clinical training and assessment to the work that clinicians actually do in daily practice.[6] Consequently, an increasing number of postgraduate medical training programmes have begun using them to redesign their curricula.[7,8]

EPAs require a carefully constructed approach that can deliver both content validity and acceptance among stakeholders.[9] Although guidelines exist to help guide the developmental process of EPAs,[3,10] deciding what logic to use to draft a preliminary framework poses a crucial and often difficult first step. The logic of an EPA framework can be defined as the perspective used by the developers to break down the practice of a profession into units of professional work.[11] Reported approaches found in extant literature include roles ('Act as the consultant specialist for other disciplines'), procedures ('Safely and efficiently perform common pulmonary and critical care procedures'), disease management ('Management of a patient with sepsis'), patient categories ('Adolescent healthcare') and functions ('Running the outpatient clinic').[7,8] Even within similar disciplines, different approaches have been used. Compare for instance the predominantly 'function-' and 'role-based' EPAs for American Fellowship Training in Pulmonary and Critical Care Medicine[12] with the more 'disease management' orientated EPA-framework of their Dutch counterparts.[13] The 'one size fits all' adage clearly does not hold true for the development of EPA frameworks; customisation based on setting, purpose and/or training programme seems inevitable.

This scoping literature review aimed to map the dominant logics used in the development of EPA frameworks across postgraduate medical education and fellowship programmes and their rationales to potentially inform best practice guidelines for EPA development in addition to highlighting areas for further research.

2 | METHODS

2.1 | Design

A scoping review, an iterative and flexible method to collect, evaluate and present findings from existing research on a topic,[14] was performed. We used a scoping, instead of a systematic review, as we did not seek to be exhaustive but set out to identify and map dominant EPA logics.[15] This was reported in accordance with the Preferred Reporting Items for Systematic Review and Meta-analysis (PRISMA)'s extension for Scoping Reviews.[16]

2.2 | Search strategy

To assess the extent of the body of literature, we used an evidence-based multistage approach to scoping reviews adapted from Khalil et al.[17] Studies from January 2005 until December 2020 were identified using a three-step literature search in order to balance feasibility with breadth and comprehensiveness. The first stage consisted of a limited search of MEDLINE and Embase by screening of text words (Entrustable Professional Activit*) contained in the title and abstract by two authors (MH, MD) independently. The second stage used these text words as search terms across all included databases (adding Google Scholar, Scopus and Web of Science). These databases were chosen to span literature on EPAs and to be as comprehensive as possible when considered together. The full details of the search syntaxes used in this review can be found in the Supporting Information (Appendix 1). The third stage included analysis of the reference lists of all identified reports and articles for additional studies.

2.3 | Study selection

2.3.1 | Inclusion criteria

Eligible for inclusion were studies that (i) either described the logic of developed EPA frameworks and/or provided at least the titles of EPAs for (ii) a postgraduate medical education or a fellowship programme and (iii) were written in English. Included studies were charted in a tabular and narrative format allowing for collation, summarising and reporting of results.

2.3.2 | Exclusion criteria

Papers were excluded if they (i) did not provide an EPA framework in either the main manuscript, supplemental data and/or online supplemental data, making it impossible to analyse the underlying logic; (ii) described only a single EPA and/or EPAs for a part of a (sub)specialty training programme as this may have impacted decisions of size and complexity of the EPAs; and/or (iii) offered an EPA framework for

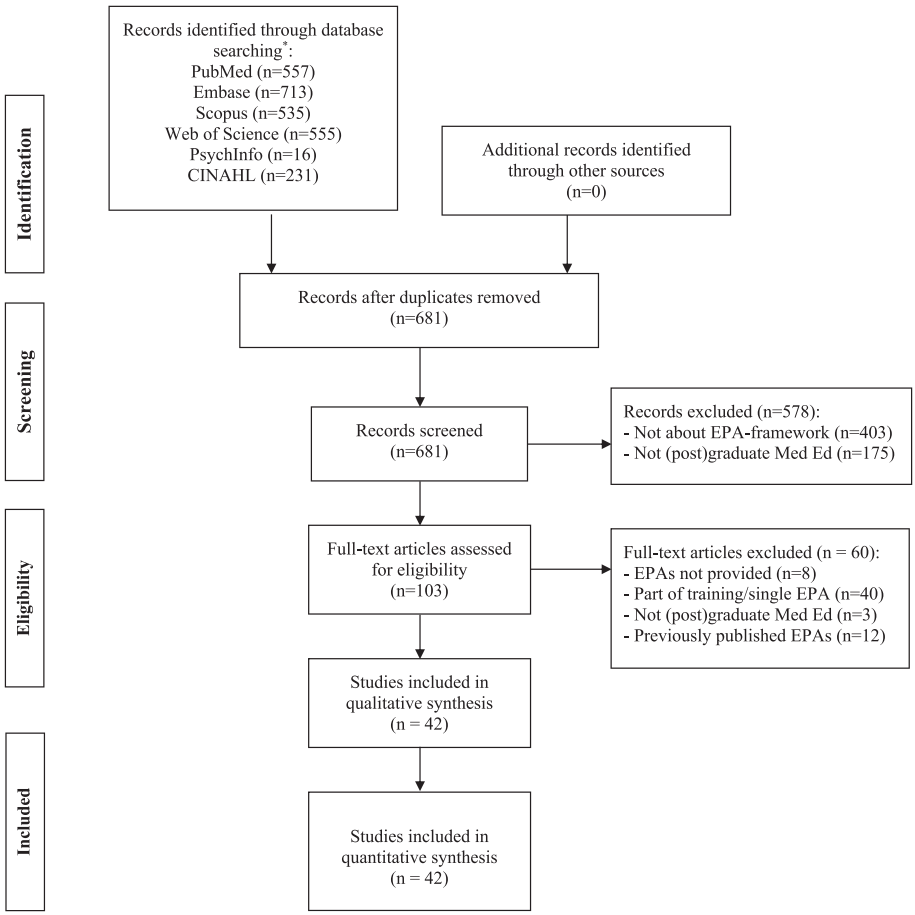

FIGURE 1 Flow diagram for the scoping review process according to the 'Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA)'.[19] *Search strategy all databases: 'Entrustable professional Activit*' AND limit 'English' AND limit '2005–2020', performed 31 December 2020

undergraduates, for the evaluation of newly graduated students entering graduate medical education (GME) and/or for other health professions (e.g., nurses, veterinarians and pharmacists).

2.4 | Screening process

Two authors (MH, MD) independently screened all titles and abstracts returned during the search process, rejecting papers that did not meet the inclusion criteria. If a decision to either include or exclude a paper could not be made based on title and/or abstract, the full text was accessed to inform the decision. If uncertainties still remained at this point, a third author (SG) served as referee to help reach consensus.

2.5 | Categorisation of logic

During the screening process, an inductive coding style using iterative analysis of the data (often referred to as Grounded Analysis) was be used by two authors (MH, MD) independently resulting in draft codes.[18] Hereafter, a team meeting (MH, MD, SG, DT and OtC) was held to discuss a pilot coding of 10 papers and to fine-tune the coding procedure, following which data coding and extraction were performed by MH and MD. Both authors independently read and re-read all of the included papers and coded EPA logics within the papers with the third author (SG) serving as referee for papers when consensus on the logic used was not immediately reached.

3 | RESULTS

In total, the search strategy identified 2607 citations, resulting in 681 citations after de-duplication. Of these, 42 papers were selected for inclusion in this review (for a PRISMA diagram see Figure 1).

3.1 | General characteristics of papers describing the logic of EPA frameworks

Relevant study data (e.g., publication year, country, specialty and level of training) were extracted and tabulated using Microsoft Excel Version 16.54 (Table 1). Key characteristics of included papers are summarised in Table 2. Most studies describing the logic of EPA frameworks for postgraduate or fellowship programmes were conducted in the United States (n = 22; 52%), Canada (n = 6; 14%) and the Netherlands (n = 4; 10%) (Table 2). Across the reported range of

TABLE 1 Included EPA frameworks

	Included EPA framework: authors, journal, date		Surgical/ medical	Location	Resident/ fellow	Number of EPAs	Logics used[a]			
							Service n (%)	Procedure n (%)	Patient/ disease n (%)	Non-EPA n (%)
1	Benstead K et al., *Radiother Oncol*. 2019 Dec;141:1–4.	Radiotherapy	Med	EUR	Resident	14	4 (29)	0 (0)	0 (0)	10 (71)
2	Benstead K et al. *Radiother Oncol*. 2021 Mar;156:19–22.	Clinical Oncology	Med	EUR	Resident	3	3 (100)	0 (0)	0 (0)	0 (0)
3	Bonnie LHA et al., *Educ Prim Care*. 2019 Jan; 30(1):13–21.	Primary Care	Med	NLD	Resident	79	55 (70)	0 (0)	18 (23)	6 (8)
4	Brown CR Jr et al., *Arthritis Care Res (Hoboken)*. 2016 Aug;68(8):1166–72.	Rheumatology	Med	USA	Resident	14	7 (50)	1 (7)	0 (0)	6 (43)
5	Carraccio C et al., *Acad Med*. 2017 Mar; 92(3):324–330.	Paediatrics	Med	USA	Resident	17	7 (41)	1 (6)	6 (35)	3 (8)
6	Caverzagie KJ et al., *Acad Med*. 2015 Apr; 90(4):479–84.	Internal Medicine	Med	USA	Resident	16	6 (38)	0 (0)	3 (19)	7 (44)
7	Cohen BL et al., *Inflamm Bowel Dis*. 2020 Aug 20;26(9):1291–1305.	Gastro-enterology: IBD fellow	Med	USA	Fellow	10	6 (60)	1 (10)	3 (30)	0 (0)
8	Deitte LA et al., *Acad Radiol*. 2016 Mar; 23(3):374–81.	Radiology	Med	USA	Resident	10	5 (50)	1 (10)	0 (0)	4 (40)
9	Fehr F et al., *GMS J Med Educ*. 2017 Nov 15; 34(5):Doc67.	Paediatrics (primary care)	Med	GER	Resident	12	1 (8)	0 (0)	8 (67)	3 (25)
10	Fessler HR et al., *Crit Care Med*. 2014 Oct;42 (10):2290–1.	CCM	Med	USA	Fellow	13	5 (38)	1 (8)	1 (8)	6 (46)
11	Frank LH, *Progress Pediatr Cardiol*. 2017 Mar;44:3–10	Paediatric Cardiology	Med	USA	Fellow	13	4 (31)	1 (8)	4 (31)	4 (31)
12	Garofalo M, Aggarwal R. *Cureus*. 2018 Jul 25; 10(7):e3051.	OBGYN	Med	USA/ Can	Resident	15	15 (100)	0 (0)	0 (0)	0 (0)
13	Hart D et al., *West J Emerg Med*. 2019 Jan; 20(1):35–42.	Emergency Medicine	Med	USA	Resident	11	3 (27)	0 (0)	6 (55)	2 (18)
14	Hauer KR et al., *J Grad Med Educ*. 2013 Mar; 5(1):54–9.	Internal Medicine	Med	USA	Resident	27	8 (30)	0 (0)	14 (52)	5 (19)
15	Hsu D et al., *Pediatr Emerg Care*. 2016 Jun; 32(6):410–8	Paediatric Emergency Medicine	Med	USA	Fellow	6	3 (50)	1 (17)	2 (33)	0 (0)
16	Jerardi KE et al., *Pediatrics*. 2017 Jul;140(1): e20170698.	Paediatric Hospital Medicine	Med	USA	Fellow	6	2 (33)	1 (17)	2 (33)	1 (17)
17	Jurd S et al., *Australas Psychiatry*. 2015 Dec; 23(6):699–705.	Psychiatry	Med	Aus & NZ	Fellow	40	10 (25)	0 (0)	28 (70)	2 (5)

TABLE 1 (Continued)

	Included EPA framework: authors, journal, date		Surgical/ medical	Location	Resident/ fellow	Number of EPAs	Logics used[a]			
							Service n (%)	Procedure n (%)	Patient/ disease n (%)	Non-EPA n (%)
18	Karthikeyan P, Pulimoottil DT. *Indian J Otolaryngol Head Neck Surg*. 2019 Oct; 71(Suppl 1):671–678.	ENT	Surg	IND	Resident	59	27 (46)	22 (37)	4 (7)	6 (10)
19	Kwan J et al., *BMC Med Educ*. 2016 Apr 20;16:117.	Diagnostic Radiology	Med	CAN	Resident	8	2 (25)	2 (25)	2 (25)	2 (25)
20	Landzaat LH et al, *J Pain Symptom Manage*. 2017 Oct;54(4):609–616.e1.	Hospice & Palliative Medicine	Med	USA	Fellow	13	5 (38)	0 (0)	4 (31)	4 (31)
21	Leipzig RM et al., *J Am Geriatr Soc*. 2014 May; 62(5):924–9.	Geriatrics	Med	USA	Resident	12	8 (67)	0 (0)	0 (0)	4 (33)
22	Mallow M et al., *Am J Phys Med Rehabil*. 2017 Oct;96(10):762–764.	Physical Medicine & Rehabilitation	Med	USA	Resident	19	5 (26)	1 (5)	12 (63)	1 (5)
23	McCloskey CB et al., *Acad Pathol*. 2017 Jun 27;4:2374289517714283.	Pathology	Med	USA	Resident	19	13 (68)	5 (26)	0 (0)	1 (5)
24	Moll-Khosrawi P et al., *GMS J Med Educ*. 2020 Sep 15;37(5):Doc52.	Anaesthesiology	Med	GER	Resident	47	0 (0)	0 (0)	47 (100)	0 (0)
25	Moloughney B et al., *Can Med Educ J*. 2017 Jun 30;8(3):e71–e80.	Public Health & Preventive Medicine	Med	CAN	Resident	20	18 (90)	0 (0)	0 (0)	2 (10)
26	Moore D, Young CJ, Hong J. *ANZ J Surg*. 2017 Dec;87(12):1001–1005.	Surgery	Surg	AUS	Fellow	7	2 (29)	3 (43)	1 (14)	1 (14)
27	Myers J et al., *J Palliat Med*. 2015 Aug;18(8):682–90.	Palliative Medicine	Med	CAN	Resident	12	8 (67)	0 (0)	1 (8)	3 (25)
28	Parker TA, Guiton G, Jones MD Jr. *J Perinatol*. 2017 Dec;37(12):1335–1340.	Neonatology	Med	USA	Fellow	16	5 (31)	0 (0)	10 (63)	1 (6)
29	Pinsk M, Karpinski J, Carlisle E. *Can J Kidney Health Dis*. 2018 Jul 17;5:	Nephrology	Med	CAN	Resident	36	7 (19)	1 (3)	24 (67)	4 (11)
30	Quraishi S, Wade W, Black D. *Future Healthc J*. 2019 Oct;6(3):196–203.	Internal Medicine	Med	GBR	Resident	14	3 (21)	1 (7)	5 (36)	5 (36)
31	Rose S et al., *Gastroenterology*. 2014 Jul; 147(1):233–42	Gastro-enterology	Med	USA	Fellow	13	1 (8)	2 (15)	10 (77)	0 (0)
32	Sauer CG et al., *J Pediatr Gastroenterol Nutr*. 2020 Jul;71(1):136–143.	Paediatric Gastro-enterology	Med	USA	Fellow	4	1 (25)	1 (25)	2 (50)	0 (0)
33	Schultz K, Griffiths J, Lacasse M. *Acad Med*. 2015 Jul;90(7):888–97.	Family Medicine	Med	CAN	Resident	36	3 (8)	2 (6)	25 (69)	6 (17)
34	Shaughnessy AF et al., *J Grad Med Educ*. 2013 Mar;5(1):112–8.	Family Medicine	Med	USA	Resident	76	0 (0)	0 (0)	76 (100)	0 (0)

(Continues)

TABLE 1 (Continued)

	Included EPA framework: authors, journal, date		Surgical/ medical	Location	Resident/ fellow	Number of EPAs	Logics used[a]			
							Service n (%)	Procedure n (%)	Patient/ disease n (%)	Non-EPA n (%)
35	Smit Mp et al., *J Grad Med Educ*. 2019 Aug; 11(4 Suppl):158–164.	Paediatrics	Med	NLD	Resident	9	3 (33)	0 (0)	6 (67)	0 (0)
36	Srivastava S et al., *Progress Pediatr Cardiol*. 2017. 44:17–32	Paediatric Cardiology	Med	USA	Fellow	6	0 (0)	1 (17)	5 (83)	0 (0)
37	Taylor DR et al., *Ann Intern Med*. 2018 May 15;168(10):724–729.	Internal Medicine	Med	CAN	Resident	29	16 (55)	2 (7)	10 (34)	1 (3)
38	Valentine N et al., *Med J Aust*. 2019 May; 210(8):354–359.	General Practice	Med	AUS	Resident	13	2 (15)	0 (0)	6 (46)	5 (38)
39	van Bockel EAP et al., *J Crit Care*. 2019 Dec;54:261–267.	ICU	Med	NLD	Fellow	15	0 (0)	0 (0)	15 (100)	0 (0)
40	Weiss A. *Acad Psychiatry*. 2016 Oct;40(5):850–4.	Psychiatry	Med	USA	Resident	15	5 (33)	0 (0)	9 (60)	1 (7)
41	Wisman-Zwarter N et al., *Eur J Anaesthesiol*. 2016 Aug;33(8):559–67.	Anesthesiology	Med	NLD	Resident	45	1 (2)	6 (13)	37 (82)	1 (2)
42	Young JQ et al., *Acad Med*. 2018 Jul;93(7):1048–1054.	Psychiatry	Med	USA	Resident	13	11 (85)	0 (0)	0 (0)	2 (15)
					Total	862	290	57	406	109
					Median	14	5 (31)	1 (3)	5 (33)	2 (11)

Abbreviation: EPA, entrustable professional activity.

[a]For each reported EPA framework (i.e. each individual paper), all EPAs were categorised in one of the three main logics and translated to a percentage of the total number of EPAs used for that specific framework.

TABLE 2 Key characteristics of included studies

Location	No (%)	Grade of physician	No (%)	Specialty	No (%)
USA	22 (52)	Resident	29 (69)	Family Medicine/General Practice/Primary Care	4 (10)
Canada	6 (14)	Fellow	13 (31)	Internal Medicine	4 (10)
The Netherlands	4 (10)			Paediatrics	3 (7)
Australia	2 (5)			Psychiatry	3 (7)
Europe	2 (5)			Anaesthesiology	2 (5)
Germany	2 (5)			Critical Care Medicine	2 (5)
Australia & New Zealand	1 (2)			Gastro-enterology	2 (5)
Great Britain	1 (2)			Paediatric Cardiology	2 (5)
India	1 (2)			Radiology	2 (5)
USA & Canada	1 (2)			Emergency Medicine	1 (2)
				ENT	1 (2)
				Geriatrics	1 (2)
				Hospice and Palliative Medicine	1 (2)
				Neonatology	1 (2)
				Nephrology	1 (2)
				Obstetrics and Gynaecology	1 (2)
				Oncology	1 (2)
				Palliative Medicine	1 (2)
				Pathology	1 (2)
				Paediatric Emergency Medicine	1 (2)
				Paediatric Gastro-enterology	1 (2)
				Paediatric Hospital Medicine	1 (2)
				Physical Medicine and Rehabilitation	1 (2)
				Public Health and Preventive Medicine	1 (2)
				Radiotherapy	1 (2)
				Rheumatology	1 (2)
				Surgery	1 (2)
Total	42 (100)	Total	42 (100)	Total	42 (100)

specialties, family medicine (n = 4; 10%), internal medicine (n = 4; 10%), paediatrics (n = 3; 7%) and psychiatry (n = 3; 7%) were the most common. Furthermore, 69% of the frameworks had been developed for residency (n = 29), 31% for fellowships (n = 13).

3.2 | Variety of EPA-framework logics

A total of 862 EPAs were described in the 42 articles with a median of 14 EPAs per EPA framework (range 3–79) (Table 1). Based on an inductive coding style using iterative analysis of the data, the following *logics* were identified (with examples): 1) *service provision* including clinical services for direct ('Managing nutritional needs of critically ill newborns') and indirect patient care ('Facilitating family meetings') as well as non-clinical health care services ('Evaluating and reporting adverse events involving the transfusion of blood components'); 2) *procedures* ('Performing common critical care procedures, including intubation, bronchoscopy, thoracentesis, central venous catheter placement, and ultrasound'; and 3) *disease or patient groups* ('Identifying and managing patients with noninfectious GI luminal disease') (Table 1). Notably, 13% (n = 109) of all reported EPAs described abilities physicians require to effectively meet the health care needs of the people they serve (e.g. 'Engaging in life-long learning', 'Demonstrating professional behavior'). As these EPAs are not suitable for summative entrustment decisions, this group was categorised as 4) *non-EPAs*.

The majority of papers (n = 37; 88%) used two or more logics in the development of EPA frameworks (median = 3, range = 1–4). Disease or patient groups and service provision were the most common logics used (39% and 37%, respectively) (Table 1).

4 | DISCUSSION

In this review, we found that most programmes use a mix of logics to establish a framework of EPAs. Whereas the developers of those

programmes may, or may not, have deliberately chosen these categorizations, many will have likely spent time to figure what the best approach would be, without finding just one logical categorisation. So far, no recommendations for a 'best' approach[20] have been offered, and differences between medical specialties, and among other health professions educational programmes, seem defensible. In light of the quickly expanding literature, we sought to explore the dominant logics that have been used in practice and to distil recommendations that may be useful for new initiatives to create EPA frameworks.

4.1 | The broad service range of EPAs

In defining EPAs, it is useful to keep their purpose in mind. Multiple publications have elaborated on its definition and how EPAs differ from competencies.[3,10,21] EPAs, as 'units of professional practice', are not necessarily an educational model as they just conceptualise professional tasks.[10] They have primarily been used to develop curricula and create workplace assessment procedures for specialty training; however, defining the essential tasks is not always clear-cut. Furthermore, EPAs are increasingly formulated by national or even international bodies with unique priorities, mandates and purposes.[22–26] This limits the freedom to choose or identify EPAs locally and serves to acknowledge summative entrustment decisions beyond a programme, institution or country. In a foreseeable future, EPAs may be acknowledged by legal bodies, for example, when disputes arise about accountability in case of adverse events with trainees involved[27] or when the legitimacy of a scope of practice is at stake. That stresses the need for a sound formulation of the units of professional practice that can be acknowledged, entrusted and certified as a credential.

In recent years, the potential role of EPAs after training has received more attention.[28,29] Residency coordinators of three Dutch UMCs recently pleaded to give EPAs a core status in recertification.[30] In addition, the use of EPAs naturally fits with requirements of hospital credentialling, such as done by the 'Joint Commission',[31] which ask to specify which employees have which health care privileges and which tasks are to be performed by which trainees under which level of supervision. This serves as an additional purpose of EPAs.

4.2 | Pros and cons of the main logics

The choice of a logic for developing an EPA framework may be difficult, as each approach comes with benefits and drawbacks as discussed below.

4.2.1 | Service provision

These EPAs reflect activities as they are usually scheduled for clinicians and are therefore easily recognised, 'assigned' and/or prohibited. They are broad and general, and entrustment decisions assume adequate experience with procedures and diseases that may be encountered during these services. This makes them less suitable for junior learners.[3] Take for example the EPA 'standard outpatient consultation', a logical and suitable activity for more advanced medical trainees. This EPA will presumably include activities like 'taking a medical history' and 'performing a full standard physical examination', activities that in itself may serve as suitable standalone EPAs for medical students. Furthermore, service provision EPAs may lack case specificity and as a result can be challenging for supervising clinicians to apply.[6] Unless there is careful attention to sampling in assessment, this approach also presumes assessments for a given EPA can be generalised across included patients' presentation.

4.2.2 | Procedures

For some specialties, procedures (or clusters of procedures) can be preferred EPAs (e.g. endoscopies and surgeries); they are clear and well-demarcated tasks that generally can be trained well. The risk of adopting procedures as EPAs is that they may be very small when considered individually and that the focus is on a narrow range of skills.[3,6] Small and thus many procedural EPAs are not inherently problematic, but serious summative entrustment decisions to qualify learners for these are bound to lead to cumbersome procedures.[3,6] Furthermore, these small EPAs incorporate the risk that the focus will narrow to psychomotor skills only, rather than including multiple conditions for trust.

4.2.3 | Disease or patient group

For non-procedural specialties, diseases come to mind quickly; managing patients with disease X sounds like a clear task. A draw-back of diseases as a logic is the disregard of differential diagnosis as a first task. Further, diseases may result in long and detailed lists with the risk of becoming checkbox items of what the learner 'has encountered' rather than having received a formal qualification to handle.[3,6] Analogously to the procedural EPA, it can focus on a narrow range of competencies centred on medical expertise for a disease. Using diseases only as the logic for EPAs may not be useful and practical. In some cases, diseases or disease groups can be a useful logic, for example, when treatment after diagnosis and referral is common practice.

4.2.4 | Non-EPAs

We deemed not all published 'EPAs' as suitable for summative entrustment decisions and hence are less useful as EPAs. We qualified 13% (Table 1) of all EPAs as *non-EPAs*, often describing the abilities physicians require to effectively meet the health care needs of the people they serve. Examples include 'Engaging in life-long learning', 'Demonstrating professional behavior', 'Enhancing patient safety' and 'Advocating for individual patients'. It is difficult envision the transition from a prohibition to perform these activities to permission to do

TABLE 3 Definitions, examples, benefits and limitations of each logic for EPA frameworks

Logic category	Definition	Examples	Benefits	Limitations
1. Service provision	A health care activity that is not specified as a (bundle of) procedure(s), a disease or a patient category. Sometimes called 'function'.	• Consultation to other health care providers • Leading multidisciplinary team meetings • Perioperative assessment and care • Outpatient clinic for common medical conditions • Monitoring, signalling, reporting critical laboratory values	• Suitable for scheduling	• Tasks are less definable and predictable. • Content (diseases) are not specified and must be covered differently. • Usually less suitable for junior learners. • May lack case specificity and can be challenging for supervising clinicians to apply. • Requires careful sampling in assessment to prevent generalisation across included patients' presentation.
2. Procedures	A well-defined diagnostic or therapeutic procedure; surgical or non-surgical.	• Colonoscopy • Complex child delivery • Medical autopsy • Laparoscopic cholecystectomy • Repositioning extremities	• EPAs are well definable • EPAs can be trained well	• Can become long lists of EPAs. • May risk assessment focus on skill only.
3. Diseases or patient groups	Covers the overall management of a specific type of patient, pathology or disease.	• Care for well newborn babies • Managing common acid peptic-related problems • Managing mononucleosis • Managing patients at risk for diabetes	• Medical content can be more comprehensively covered	• Tendency to make long, unmanageable lists of EPAs. • Excludes entrustment for clinical tasks with unpredictable pathology. • May focus on a narrow range of competencies centred on medical expertise for a disease.

Abbreviation: EPA, entrustable professional activity.

so with direct or indirect supervision. We do not dispute the importance of these objectives for training, but they should be incorporated in training in a different way than stand-alone EPAs. Several ways to deal with objectives of training that are not usefully conceptualised as EPAs were recently provided by ten Cate and Schumacher.[32]

Table 3 summarises the definitions, examples, benefits and limitations of each logic.

Several limitations of this study must be considered. First, there is the issue of selection and publication bias as only published EPA frameworks of medical postgraduate and/or fellow training programmes were included. A recent paper that includes a summary of the types of EPAs used by all specialty training programmes in the Netherlands found similar logics and can be seen as a partial 'grey literature' confirmation.[26] In our review, the rationales for the initial EPA frameworks as relates to key stakeholder groups were usually not described. Developers may have started from scratch or have followed guidelines and requirements imposed by governing institutions or national bodies. Next, eligible articles included few (n = 2) from surgical specialties, potentially leading to an underestimation of 'procedures' as a logic. The importance of this type of logic, however, is supported by its higher occurrence in the Netherlands.[26] Some reported EPAs could be categorised in more than one logic category; depending on the set of EPAs, an EPA may be a patient category in the one set and a service in the other.

We encountered many EPA titles that could be improved, if accepted recommendations[10] were followed, which we gave the benefit of the doubt for a logic category. For example, 'Communicates results of exams' might be an early training EPA that would definitely be nested in a more mature EPA, as it is hardly worth considering it a stand-alone unit of professional practice, and it might be better formulated with an infinitive ('Communicating diagnostic exam results'). A limitation of our categorisation is that we rarely had insight into the full EPA description. For example, we qualified 'Prevention' as a non-EPA, but the specifications might have included a bundle or list of very concrete sub-activities that could have made us consider the EPA as belonging to the service provision logic. Certifying clinicians just for 'prevention' lacks the necessary clarity for a summative entrustment decision. Finally, limited studies exist describing the effectiveness or validity of EPAs, and to date, we have no reason to support superiority of any one logic category. Future research should be directed at providing validity evidence for not only the use of EPAs in general but also to support the use (or superiority) of the described logics.

5 | CONCLUSION

This study set out to map the logics used in development of EPA frameworks across postgraduate medical education and fellowship programmes. Three dominant logics could be identified, namely, 'service provision', 'procedures' and/or 'disease or patient groups'. For each logic, a clear definition is provided together with examples, benefits and limitations. When trying to capture the essential tasks of a profession in EPAs, the use of a combination of two or three of the types of logic found seems most suitable. These findings may provide helpful scaffolding for future EPA-framework developers.

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CONFLICT OF INTEREST

We know of no conflicts of interest associated with this publication.

ETHICS STATEMENT

Not applicable.

AUTHOR CONTRIBUTIONS

All authors meet conditions 1, 2, 3 and 4. We confirm that this manuscript is original, has not been published before and is not currently being considered for publication elsewhere. All those listed as authors are qualified for authorship, and all who are qualified to be authors are listed as authors on the byline. As Corresponding Author, I confirm that the manuscript has been read and approved for submission by all the named authors.

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SUPPORTING INFORMATION

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