Entrustable Professional Activities framework for assessment in pre-doctoral dental education, developed using a modified Delphi process.

Vidya Ramaswamy, Ph.D., Associate Director for Curriculum & Program Evaluation, University of Michigan School of Dentistry, Ann Arbor, MI 48109.

Mark Fitzgerald; DDS, MS, Associate Dean CBCE, University of Michigan School of Dentistry, Ann Arbor, MI 48109.

Theodora Danciu, D.M.D., D.M.Sc., Director of Engaged Learning and Assessment, University of Michigan School of Dentistry, Ann Arbor, MI 48109.

Romesh Nalliah; DDS, MHCM, Associate Dean for Patient Services, University of Michigan School of Dentistry, Ann Arbor, MI 48109.

Tracy de Peralta, DMD, Ph.D., MClinEd, Senior Associate Dean of Academic Affairs and Innovation, School of Dental Medicine, University of Colorado Anschutz Medical Campus Aurora, CO 80045.

Stephanie M. Munz, DDS, FSCD, Program Director, General Practice Residency, Michigan Medicine, Ann Arbor, MI 48109.

Carol Anne Murdoch-Kinch, DDS, Ph.D., FDS, RCS(Ed), Dean, Indiana University School of Dentistry, Indianapolis, IN 46202

Running title; EPA

Corresponding author: Vidya Ramaswamy, Tel: (734) 647 4218/fax: 734 764 1922/

Email: ramaswav@umich.edu

ABSTRACT

Purpose/Objectives

The purpose of this study was to define and develop a set of Entrustable Professional Activities (EPAs) for dental education using a modified Delphi consensus approach. EPAs define the core tasks that a graduating dentist needs to perform independently in practice. The EPA framework facilitates assessment of competencies as they manifest in the tasks and independence needed to be ready for practice.

Methods

Feedback was obtained from participants about a list of EPAs, with modifications made after each of the 3 rounds, using a modified Delphi approach. Phase 1 included attendees at the ADEA Fall 2017 meeting (n=35) who participated in an EPA workshop primarily composed of academic deans. The Phase 2 "reactor panel" consisted of 10 dental schools' academic deans and other individuals with expertise and interest in dental curriculum and assessment (n=31). Phase 3 participants were attendees at the ADEA CCI 2019 meeting (n=91) who also participated in a two-day EPA workshop.

Results

In phase 1, overall ratings for acceptability of the EPAs were satisfactory. In phase 2, the next iteration of EPAs was judged as satisfactory for inclusion in curriculum, match well with clinical practice and clarity. In phase 3, the EPAs were judged as satisfactory for being an "entrustable, essential, and important task of the profession". Qualitative feedback suggested wording, measurability and specific focus of EPA statements is important.

Conclusions

A preliminary set of EPAs was designed for pre-doctoral dental education through a systematic, careful consensus building approach involving a diverse set of participants.

Keywords: Entrustable Professional activities, EPA (s); trust; Delphi, Assessment;

Competency based education.

INTRODUCTION

Dental education has recently developed an interest in Entrustable Professional

Activities (EPAs) as a useful framework for assessment of competency. [1-5] The concept of

EPAs has been adopted in many health professions education programs since it was

introduced in 2005. [6] Why has this framework gained in popularity? The EPA framework

expands upon the competency-based education concept to facilitate assessment of trainees'

abilities (competencies) and readiness for practice through the assessment of performance of

the tasks associated with the job and its specified roles within an authentic workplace setting.

[2,7] Competencies are comprised of knowledge, skills and attitudes. In contrast, EPAs are units

of professional practice, the core observable activities of a profession.[8,9] Each EPA requires

multiple competencies to perform, and therefore assessment of an EPA leads to a more

holistic assessment of competency. [9] EPAs denote the highest level of clinical competence

according to the Miller's pyramid which conceptualizes clinical performance in terms of 4

hierarchical levels: knows; knows how; shows how; and does. An EPA is an evaluation at the

"does" level in the Miller's pyramid which denotes clinical performance in workplace like

settings. [10,11] Figure 1 modified from Englander et al. [12] [13] illustrates the value of the EPA

framework in assessing patient care.

EPAs bridge the gap between internal attributes of the professional, and the tasks

required of the professional in clinical practice. Instead of evaluating whether trainee A is

competent in a particular knowledge, skill or attitude, this framework evaluates whether

trainee A can be trusted to perform an activity (using a collective combination of knowledge,

skills, or attitudes), at a specified level of supervision and independence. A comparable
analogy here is a teen with a recently acquired driver's license who has passed the particular
requirements but who yet cannot be trusted to drive independently under all possible
circumstances such as on an icy road or in tedious traffic conditions. Similarly, we need to be
certain that all our graduates can be entrusted to independently perform necessary and core
activities required of the profession. Herein lies the advantage of an EPA framework (Figure
1). By focusing on actual behavior rather than individual competencies, the EPA framework
allows a profession to assess trust and thereby effectively manage risks. [2,14]

EPA statements are constructed using specific guidelines. [15-17] First of all, the title of
an EPA should be a recognized and discrete core activity. It should not be too broad or too
specific. The EPA description should include multiple assessment methods, and there should
be guidance to define for learners their stage of progress towards independence and overall
competence (milestones).

How does one define a set of core activities (EPAs) in a profession? This is
essentially standard-setting, and evidence supports the value of consensus building in setting
professional standards. [18] A recent review of EPAs in graduate medical education identified
the most frequently used method was to develop an initial set of EPAs through a working
group and review it through further deliberation. [19] The most common consensus building
approaches identified included surveys, the Delphi method, and stakeholder deliberation. [20]
This review highlighted the need for a more standardized approach to the development of
EPAs, one that includes development, implementation, and assessment. Only four studies in
this systematic review adhered to the 3 steps of initial development, expansion and
validation. [17]

In our study, we used the Delphi method as a core process to build and assess consensus. The Delphi approach has been used to define EPAs in different health profession disciplines [18] and specialties in medical education, including [20] internal medicine, [21] pharmacy, [22] nursing [23] and veterinary medicine [24]. In this method, a group of experts (from different locations) are asked individually for feedback through a survey. There are multiple rounds of data collection, and modifications are made after each round.

The objective of this paper is to describe the consensus building approach used to develop, expand and validate the proposed EPAs for pre-doctoral education and present the results. [19] We describe the Delphi process that we used to develop the EPAs, obtain nationwide expert feedback and prepare for clinical implementation. We present data produced from several surveys, and from stakeholder deliberation and feedback from a series of workshops that were used to modify the draft EPAs with the goal creating a set of EPAs that best represents the intended educational outcomes of pre-doctoral dental education.

METHODS

This study (HUM00132427) was determined to be exempt by the Institutional Review Board (IRB-HSBS) at the University of Michigan.

Core Advisory Group: At the University of Michigan School of Dentistry a core advisory group (CAG, n=7) representing diverse educational and clinical expertise and social backgrounds (community-based education, general dentistry, oral and maxillofacial pathology, hospital dentistry, oral medicine, and dental curriculum and assessment) was formed to oversee the project. The CAG approached this project as a professional learning community with simultaneous goals to learn about EPAs as well as develop a draft of core activities for pre-doctoral dental education. For this exercise we defined general dentistry as "primary care dentistry". After a yearlong review of EPAs in multiple disciplines such as

pediatrics, internal medicine, and family medicine, the CAG decided to model a first draft of EPAs based on family medicine [25] as it most closely aligned with the "primary care across the lifespan" nature of general dentistry. The CAG group met regularly over 3 years (2017 to 2019). The initial list of EPAs was further revised using the Delphi approach through feedback from 3 groups sequentially.

The CAG presented a two day in person workshop on EPAs at the ADEA CCI conference in June 2019 [4] with the addition of a faculty co-presenter from with UNC Adams School of Dentistry, who had developed a set of EPAs for pre-doctoral dental education[1]. On the first day, participants were presented the concepts as well as the draft EPA framework over a three-hour session. On the second day, participants were invited for a two-hour discussion session. The workshop focused on current gaps and challenges in assessment for competency-based education and explained why the EPA framework would be of relevance to dental education. Core elements of the EPA framework were explained including the different elements in EPA construction. Challenges and solutions for incorporating EPAs into dental education were presented.

Delphi Participants: Table 1 provides details about the Delphi process participants in the three phases. Participants included academic deans, and educational representatives including ADEA (American Dental Education Association) CCI (Commission on Change & Innovation) attendees.

Materials provided to Delphi participants: Participants in all three phases were provided all or some of these training materials including a video defining the EPA framework in dental education [26] an example of the EPA diagrammatic framework based on Englander et al., [27] Ten Cate's "Nuts and Bolts of EPAs" journal article, [9] and a list of core competencies defined for pre-doctoral dental education.

RESULTS

For phase 1, 2 and 3 drafts of the EPAs please refer to Tables 2, 3 and 4 respectively.

Phase 1. ADEA 2017 Fall Session for the Academic Deans: The first draft of the EPAs (Table 2) was presented at a in person workshop for dental school academic deans and other interested attendees at the ADEA Fall 2017 meeting. Since most participants may not have been familiar with the concepts of EPAs, an 85-minute workshop presented the basic concepts of the EPA framework that included 30 minutes of discussion. A co-presenter was one of the co-authors of the "AAMC Core EPA's for Entering Medical Residency", which were developed using a Delphi process. [27]

The attendees were invited to respond to the first draft of EPAs and for each one of the EPAs evaluate if the EPA was acceptable "as is" or not acceptable (Table 2). Approximately 35 people attended the workshop and 24 attendees responded to the survey (response rate, 69%). Responses were captured on paper copies and transferred to an excel file.

The EPAs "*Diagnose and manage dental emergencies and dental trauma*" and "*Manage medical emergencies in the dental setting*" were judged to be "acceptable as is" by most participants (n= 23 & n=22 respectively). Similarly, the EPA "*Provide care that speeds recovery from illness and improves function*" was judged "not acceptable" by 11 of the 24 participants. Eight participants judged the EPA "*Care for patients and families in multiple settings*" "not acceptable".

Phase 2. Academic Deans & ADEA Representatives Reactor Panel.

Based on feedback received in Phase 1 and continuous review by the CAG, the Phase 2 EPA list (Table 3) was changed in 3 ways. First, parts of EPAs 2, 3 5, 11, 12, & 13 in Phase

1 were incorporated into the other EPAs. A new EPA 6 was added. Second, a new EPA 13 was added that focused on pain and anxiety. Third, the language of many EPAs was changed to be more specific.

In Phase 2, feedback was obtained from a reactor panel that included the associate deans for academic affairs from 10 dental schools (University of Illinois-Chicago, Indiana University, University of Iowa, The Ohio State University, University of Michigan, University of Maryland, University of Minnesota, University of Nebraska, and Rutgers University), ADEA representatives and specific faculty experts in dental education (including two from Germany and Saudi Arabia). The EPAs-and associated evaluation questions were distributed via email, with a link to the electronic Qualtrics™ survey. A total of 31 persons were contacted and the number who responded was 21 (68%).

The survey asked respondents to evaluate each EPA statement and its associated brief description. The CAG decided on the three criteria for each EPA to be rated by participants, as indicated by their level of agreement with the two criteria: ("I would include this EPA in the general dentistry curriculum at my school"; "This EPA matches well with clinical practice") Respondents' ratings of agreement were evaluated using a 5-point Likert scale, with responses ranging from Strongly Disagree (SD-1) to Strongly Agree (SA-5) for the first 2 criteria. Ratings across all EPAs ranged between 4.10-4.81 for the statement "I would include this EPA in the general dentistry curriculum at my school" and between 4.29-4.86 for the statement "This EPA matches well with clinical practice". Participants also rated the clarity (the 3rd criteria) of the EPA scale using a 10-point Likert scale, with values ranging from 1 (low) to 10 (high). Ratings for clarity ranged from 6.15 ("*Provide a primary care dental home for comprehensive longitudinal oral care for individuals of all ages and their families, including people with special healthcare needs*") to 9.37 ("*Manage medical emergencies in the dental setting*").

The EPA "*Provide for control of pain and anxiety during provision of care, including local anesthesia and behavioral techniques, with consideration of the impact of prescribing practices and substance use disorder*" was rated highly for all three criteria: inclusion in the curriculum, match with clinical practice and clarity. Participants answered yes (n=14, 74%) or no (n=5, 26%) to the question: "Do you think this list of 15 EPAs cover the scope of a general dentist in practice."

Phase 3 ADEA CCI Participants: In Phase 3 (table 4), the only changes made were to categorize Phase 2 EPAs **9 to 12** into one category (9 a to 9 f) under the statement: "*Perform common procedures in multiple settings*" with some EPAs split further- for e.g., "*Perform dento-alveolar surgery*" in Phase 2 was split into "*Management of soft tissue diseases/disorders*" and "*Hard and soft tissue surgery*" in Phase 3.

Following the workshop, ADEA CCI participants (n=91, representing 40 schools) were invited to evaluate the list of EPAs using the EQUAL rubric via a Qualtrics survey. [28] The EQUAL rubric is an established, reliable tool to evaluate EPAs in respect to three areas or domains: Discrete activity (six items); Entrustable, Essential, and Important Task of the Profession (four items); and EPAs as an educational tool (four items). Each domain is scored on a five-point scale with different defining criteria for the scale points. In this study, only one domain "Entrustable, Essential, and Important Task of the Profession" was used in the survey with the rationale that this was the most important assessment at this point of time of development of the EPAs.

The response rate was low, with about 12-18 (response rate of 13% to 20%) of the 91 respondents answering the survey across all questions possibly because this was still a new concept and participants may have found it overwhelming to evaluate the entire set of EPAs.

Qualitative Feedback Themes Across the Three Phases

An example of an open-ended comment is provided for each EPA in each of the Phases in tables 2 to 4. The main points that emerged were as follows. In Phase 1 (table 2), there were a lot of suggestions to combine EPAs as reflected by comments for EPAs 3, 4, 5, 12, 15. There was concern about language and terminology. For instance, the use of the words such as "advocate" (Phase 1 EPA 13), "primary care dental home" (Phase 2, EPA 1)," communities (Phase 2, EPA 2 "culture" (Phase 2, EPA 3), cultural competence (Phase 3, EPA 3) seemed to cause concern. There were also concerns about the word "manage" (Phase 2, EPA 11). Measurability of some of the EPAs also emerged as a theme (e.g., Phase 1, EPAs 9 & 10; Phase 3, EPAs 1, 2,10, &12). Comments on EPA 14 (Phase 1), EPA (Phase 2) and EPA 7 (Phase 2) suggest that inter professional education and care is still underdeveloped in dental education. Participants also provided positive feedback about many of the EPAs, complimenting them for clarity (e.g., Phase 2, EPAs 6 7 13) and for capturing essential tasks of dentistry (e.g., Phase 2 EPAs 9, 10,13 & 15 and Phase 3, EPA 12.).

DISCUSSION

The primary purpose of this study was to create an initial draft set of EPAs that identified core activities for dentistry. Identifying these activities and assessing graduating dentists' ability to perform these activities with complete independence has tremendous value for patient care and safety (Figure 1). In order to develop the list of EPAs, the process we used was designed to cover development, expansion and validation. In our study, for the development of EPAs, the CAG members engaged in a scoping review and evaluation of the literature on EPAs, as well exploring the value of consensus approaches such as the Delphi method to develop an initial set of EPAs. [29] For expansion and validation of these EPAs,

feedback was obtained using the Delphi method and through the use of surveys involving stakeholders such as academic deans, faculty and staff from multiple, geographically distributed dental schools over three iterative Delphi phases. The EPA workshops also served as an opportunity for stakeholders to discuss and provide feedback. Thus, we followed a systematic process in developing this initial set of EPAs.

In Phase 2, 74% of participants agreed that the EPA framework covered the scope of work/practice for a general dentist. In Phase 3, EPAs 8, 9a, 9b & 9c were rated high overall on the four criteria of the EQUAL rubric in the domain "Entrustable, Essential, and Important Task of the Profession".

Four issues were identified in the analysis of data. One, open-ended comments from participants suggested that in defining EPAs, language and terminology is important. For instance, terminology such as "advocacy"; "multiple settings", "provide first contact", "illness", "inpatient", "manage", "primary care home" were indicated as confusing by our Delphi participants. As Ten Cate has suggested, it's critical that we have common definitions and a shared understanding of terminology.[30] This transparency will enable the dental field to collaborate on a national and international scale not limited to local contexts.

Second, in creating a set of EPAs that define what a graduating dentist needs to be able to perform with independence, it is important criteria are clearly defined, for the learner and the assessor.[16] Some criteria for a good EPA statement are that it should be specific and focused, have a clearly defined scope, and a clear beginning and an end. Thus, the EPA "*Provide for control of pain and anxiety during provision of care, including local anesthesia and behavioral techniques, with consideration of the impact of prescribing practices and substance use disorder*" was rated highly (table 2). The EPA "*Preserve, restore and replace teeth*" was described by participants as "beautifully summarizing the bread-and-butter skills

in dentistry" in Phase 2. The EPA "*Perform patient assessment, diagnosis, and comprehensive treatment planning, determine prognosis and obtain informed consent*" was seen as "very clear". In contrast, the EPA: "*Provide care that speeds recovery from illness and improves function*" and the EPA "*Care for patients and families in multiple settings*" were not judged well in Phase 1. In phase 3 (table 4), the ratings for EPAs 9a to 9f suggest that these were seen as core tasks of the dental profession and were clearly written as such. Based on participant feedback, we also combined and split EPAs to address scope and specificity.

A third issue that emerged was concern about how one would measure an EPA in practice. For instance, in Phase 3 for EPA 1 "*Provide a primary care dental home for comprehensive longitudinal oral care for individuals of all ages and their families*", there was concern about the ability to measure this. There were similar concerns about EPA 2 "*Develop trusting relationships and sustained partnerships with individuals, families, communities and other professionals to deliver person-centered care*". Assessment of entrustability and the act of entrustment by the individual faculty or the institution requires contexts that consistently pair the trainees with faculty that allow for multiple, longitudinal observations and multi-source feedback. [6,9,16,31] Assessments of work and work products such as product evaluations (health record entries; self-reported activity logbooks, reflective essays) and *post hoc* checks such as evaluations of work quality, patient satisfaction data, and knowledge and skills tests, together provide multi- source feedback about how close the trainee is to exhibiting independence in the actual work environment. [31] The assessment of entrustability should also include an evaluation of the trainee's integrity (honesty; benevolence), reliability (conscientiousness) and humility (discernment of one's own limitations). [32] Finally, the literature supports the use of clinical competence committees to facilitate a holistic review of trainee progress. [33,34] It is also important to acknowledge the

need for faculty development and calibration to build skills for observation, assessment of non-cognitive traits such as integrity, and to conduct holistic assessments. [35]

A fourth issue emerged. This set of EPAS brought into focus an expanded vision of the role of the dentist, beyond a primary focus on technical procedures, to a role as a primary care provider: the "Oral Physician". For instance, the lack of comfort with EPAs that focused activities on interprofessional education and interprofessional care (EPA 1, 2, 3,7 in Phase 2 and EPAS 1, 2, 3, 4 in Phase 3) suggests there is still hesitancy in seeing this as essential to the practice of dentistry. There were concerns raised about dental schools not having enough examples of team-based collaborative care settings in which to provide longitudinal and immersive opportunities to teach IPE/IPC skills. Similarly, Phase 2 (EPA 7) focuses on the need for dentists to work with not only interdisciplinary teams but also interprofessional teams. The IPE/IPC focused EPAs warrant further discussion in terms of these EPAs being seen as core activities of the graduating dentist.

Where do we go next? This project was an initial effort to draft a set of EPAs for pre-doctoral dental education that define the outcomes of the educational program to prepare trainees for general dental practice. This draft EPA framework needs to be validated and further revised by a broader and more diverse stakeholder group, including representatives from more dental schools, patients, preceptors in the community, dental accrediting bodies and dental licensing boards. As next steps, clear alignment with CODA accreditation standards will be essential for the EPAs to be accepted and adopted by dental educators. It is not surprising that those EPAs that closely resembled corresponding CODA standards statements (for e.g., Phase 2/EPA 6 & Phase 3/EPA 9) were highly rated for this reason. [36] Stakeholders need to understand the EPA framework if they are to accurately evaluate its relevance to dental education; therefore, faculty development and clear communication about the EPA framework and the reasons for change are essential. [12] Finally, if we do adopt this

framework, future research on implementation of EPAs in the curriculum is the logical next step. [19]

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Table 1. Delphi Process Participant Details.					
Phase	**Participants**	**When?**	**Survey mode**	**Number who responded (range)***	**Total number of participants**
1	Academic Deans who attended EPA workshop at the ADEA Fall Meeting Academic Deans Session	Fall, 2017	Paper copies	20-24	35
2	Reactor Panel: Ten dental school academic deans, interested faculty and administrators of different schools & ADEA staff representatives	July- Aug 2019	Qualtrics	20-21	31
3	ADEA CCI participants	June 2019	Qualtrics	12-18	91

*there were missing responses across items, and we report a range of responses.

Table 2. Phase 1 evaluation of acceptability of EPA statements.	Acceptable	Not Acceptable	One example qualitative comment
1. Provide a dental home for comprehensive longitudinal dental care for people of all ages, including patients with special healthcare needs.	17	6	Tough to assess/ measure care for special needs. Definition/limitation of 'special needs.
2. Care for patients and families in multiple settings.	13	8	Multiple setting? Retirement/ nursing homes? Family homes?
3. Provide first contact access to care for oral health issues and dental problems.	18	2	Combine 1.2.3
4. Provide preventive care that improves wellness, modifies risk factors for illness and injury, and detects illness in early treatable stages.	21	3	Probably could merge with EPA #5
5. Provide care that speeds recovery from illness and improves function.	12	11	Combine with EPA#4
6. Diagnose and manage chronic dental conditions and multiple comorbidities.	18	4	Should be able to recognize what co-morbidities should be referred
7. Diagnose and manage dental emergencies and dental trauma.	23	1	Question of triage in dental and medical specialties
8. Perform common procedures in the outpatient or inpatient setting including (Could be individual EPAs)	18	6	Change to one title; like 'Perform Operative procedure
9. Manage medical emergencies in the dental setting.	22	2	Limited observational opportunities
10. Develop trusting relationships and sustained partnerships with patients and families and communities.	16	6	Aspirational. Hard to measure (e.g.: …. Relationships)
11. Use data to optimize the care of individuals, families and populations.	20	1	Data, literature, best evidence?

12. In the context of culture and health beliefs of patients and families, use the best science to set mutual health goals and provide services most likely to benefit health.	20	2	Could 10 and 12 be combined around cultural competency in some way?
13. Advocate for patients, families and communities to optimize health care equity and minimize health outcome disparities.	16	6	What does advocate mean? Too broad
14. Provide leadership within interprofessional care teams.	16	6	Yes, but we don't have those teams yet
15. Coordinate care and evaluate specialty consultation as the condition of the patient requires.	18	3	Could be part of #14

*The total number of attendees who were invited to respond to the survey is unavailable. This is an estimate.

Phase 1 draft set of EPAs & number of respondents who evaluated each EPA as "acceptable as written" or "not acceptable as written". Total n=35*; range of responses: 20-24; response rate 57% to 69%

Table 3. Phase 2 evaluation of EPA statements using 3 criteria	Include in curriculum (1 SD- 5 SA) Mean (SD)	Matches practice (1 SD- 5 SA) Mean (SD)	Clarity (1 unclear - 10 very clear) Mean (SD)	One example qualitative comment
EPA 1: Provide a primary care dental home for comprehensive longitudinal oral care for individuals of all ages and their families, including people with special healthcare needs	4.10 (.92)	4.40 (.75)	6.15 (2.08)	I think that "primary care dental home" may need to be further operationalized so that the assumption is not that "primary care dental home" is referring to traditional private dental practice exclusively.
EPA 2: Develop trusting relationships and sustained partnerships with individuals, families, communities and other professionals to deliver person-centered care.	4.14 (.97)	4.29 (.85)	7.52 (2.04)	I agree with the EPA as described in the description. The use of the word "communities" in the EPA is unclear to me.
EPA 3: In the context of culture and health beliefs of individuals and families, use the best scientific evidence to set mutual health goals and provide recommendations most likely to benefit health.	4.24 (.99)	4.52 (.60)	7.20 (1.82)	I struggle with the word "culture" here-are there databases like "Up to Date" that can take best evidence (medical/dental) and place this into the context of "culture"-if not again how do we define/meet expectations?
EPA 4: Using motivational communication and other	4.33 (.98)	4.67 (.58)	7.62 (1.85)	From my point of view these are two different EPAs in one. I

health promotion techniques, provide preventive care recommendations that optimize wellness and function, modify risk factors for disease and injury, detect disease in early manageable stages, and expedite healing and recovery.				would separate the part "detect disease in early manageable stages, and expedite healing and recovery" from the rest, as these activities are very different ones. Furthermore, the status of trust could also be very different for these two parts of the EPA.
EPA 5: Provide leadership within the oral healthcare team and work collaboratively across disciplines and professions as a member of interprofessional care teams.	4.48 (.99)	4.52 (.88)	8.45 (2.21)	IPE is not well enough developed for this to succeed. In many of our training environments, the opportunities to really engage do not exist. And again, more of a competency that is needed for overall successful treatment, rather than an entrustable treatment itself.
EPA 6: Perform patient assessment, diagnosis, and comprehensive treatment planning, determine prognosis and obtain informed consent.	4.76 (.44)	4.81 (.52)	9.10 (1.38)	Good and clear.
EPA 7: Diagnose and manage acute and chronic oral conditions and comorbidities, including oral manifestations of systemic diseases.	4.62 (.75)	4.57 (.60)	8.33 (1.88)	Very much agree with this - again a good emphasis on the need for IP collaborative care for the patient. My only concern is that I believe there is good coordination and communication with the interdisciplinary team (other dental specialists) BUT I feel this is very lacking with the interprofessional team, even from my own experience - with other healthcare providers) i.e., physicians.
EPA 8: Diagnose and manage oral emergencies, trauma and infection.	4.67 (.87)	4.81 (.52)	8.95 (1.86)	I'm not sure that schools can provide students with enough experiences to be more that competent for this EPA. While students usually see enough patients in pain and know how to treat that condition, trauma and true cases of infection are more rare.
EPA 9: Preserve, restore and replace teeth.	4.81 (.52)	4.81 (.69)	9.00 (1.88)	Very important EPA, beautifully summarizing the bread-and-butter skills in

				dentistry. It is very important to determine the breadth and depth of this EPA as it overlaps most dental specialties. This can be only evaluated once the complete picture is known and shared. On a side note, some schools consider endodontics as part of operative dentistry... is this the case here?
EPA 10: Perform periodontal therapy	4.65 (.95)	4.60 (.69)	8.80 (2.06)	The EPA is critical - but some changes would be need in the description for this to match well with clinical practice. Sometimes the dentist will collaborate with the dental hygienist to provide this care. Periodontal therapy is probably more often provided by a dental hygienist than a general dentist.......perhaps a better choice of words would be - Collaboration with a dental hygienist is one strategy used for providing periodontal therapy.
EPA 11: Perform dento-alveolar surgery.	4.65 (.68)	4.60 (.76)	8.95 (1.52)	Does the word manage need to be included?
EPA 12: Manage space and treat/manage occlusion.	4.55 (.83)	4.65 (.83)	8.65 (2.06)	Agreed, very straight forward, self- explanatory
EPA 13: Provide for control of pain and anxiety during provision of care, including local anesthesia and behavioral techniques, with consideration of the impact of prescribing practices and substance use disorder.	4.81 (.61)	4.86 (.67)	9.35 (.94)	This is excellent with the emphasis on impact on prescribing practices and substance abuse
EPA 14: Manage medical emergencies in the dental setting.	4.29 (1.06)	4.43 (.93)	9.37 (1.36)	Manage medical emergencies ..."in the dental setting"; is there a better phrase to describe the situation/setting or the EPA should simply focus on manage medical emergencies.
EPA 15: Coordinate care and evaluate specialty consultation and referral as the condition of the individual requires and execute appropriate handoffs to other members of the healthcare team.	4.38 (.93)	4.52 (.68)	8.75 (1.68)	Excellent and important EPA. In my humble opinion, the most important part of consultation is how are the outcomes of that consultation handled and how are patients helped to make decisions afterwards. That and other important aspects of consultations and referrals could

				be only evaluated after the mapping process is clear.

	Criteria for assessing the EPA				One example qualitative comment
Table 4. Phase 3 evaluation of EPA statements and ratings.	Very important to essential practice	A clear and defined outcome consistently produced from the work	Exclusively performed by trained and qualified individuals within the profession	Clearly expected of a physician as part of delivering competent clinical care	
1. Provide a primary care dental home for comprehensive longitudinal oral care for individuals of all ages and their families.	10 (56%)	4 (22%)	7 (39%)	8 (44%)	My concern is the ability to measure and predictably expect all students to achieve this.
2. Develop trusting relationships and sustained partnerships with individuals, families, communities and other professionals to deliver person-centered care.	9 (56%)	3 (19%)	5 (31%)	7 (44%)	This encompasses inter professional care as well as patient-centered care. Less clear on how measurable this would be. Patient satisfaction? How are entrustable partners instructed prior to measuring?
3. In the context of culture and health beliefs of individuals and families, use the best scientific evidence to set mutual health goals and provide recommendations most likely to benefit health.	10 (67%)	5 (33%)	8 (53%)	9 (60%)	Cultural competence and social determinants of health care practice are definitely important, but definitions and execution vary widely in response to the individual. I do not feel this aspect of care lends itself to universally answering the question, "Can this student be trusted to perform this activity with minimal or no supervision?" in all cases.
4. Using motivational communication and other health promotion techniques, provide preventive care recommendations that optimize wellness and function, modify risk factors for disease and injury, detect disease in early manageable stages, and expedite	8 (57%)	5 (36%)	7 (50%)	8 (57%)	I think this is another area where we don't focus enough. Especially since there isn't always the easiest way to bill this time, which in practice is the measurable variable. This is where our profession should head but unsure if these question-and-answer possibilities state this enough. Is important to clinical care, is important to

healing and recovery.					the profession, but unfortunately (and clearly) a dental practice could succeed without encompassing this.
5. Provide leadership within the oral healthcare team and work collaboratively across disciplines and professions as a member of interprofessional care teams.	6 (46%)	4 (31%)	5 (38%)	6 (46%)	While it seems likely that there is bound to be overlap, there seems to be a lot of overlap between this and #2. I suppose #2 is more about relationships with patients rather than team members and other health care professionals. That wasn't as clear to me when reading #2.
6. Perform patient assessment, diagnosis, and comprehensive treatment planning, determine prognosis and obtain informed consent.	12 (92%)	10 (77%)	9 (69%)	11 (85%)	These items seem more traditionally measurable/quantifiable. They also seem more in line with current competencies/CODA standards, which probably makes it easier to acknowledge as an integral piece of the picture.
7. Diagnose and manage chronic oral conditions and comorbidities, including oral manifestations of systemic diseases.	8 (62%)	8 (62%)	10 (77%)	9 (75%)	The diagnosis and initial management I really see, but in a longitudinal aspect how do you measure if the students are actually able to manage some of these conditions long term.
8. Diagnose and manage oral emergencies, trauma and infection.	10 (77%)	10 (77%)	10 (77%)	11 (85%)	No comment available
9a. Perform common procedures in multiple settings: Preservation and restoration of teeth.	9 (75%)	10 (83%)	10 (83%)	11 (92%)	Unclear on multiple settings. Are we talking electricity goes out, or on special care patient population? Not sure what the variable output is. Either something is clinically acceptable or it's not
9b. Perform common procedures in multiple settings: Replacement of teeth.	10 (83%)	10 (83%)	10 (83%)	11 (92%)	No comment available
9c. Perform common procedures in multiple settings: Periodontal therapy.	10 (83%)	10 (83%)	10 (83%)	10 (83%)	Based on the clinical severity, this is often also difficult to measure. Huge failing in our profession to better define management, especially knowing the limitation with care as disease severity increases.

9d. Perform common procedures in multiple settings: Management of soft tissue diseases/disorders.	8 (67%)	9 (75%)	9 (75%)	9 (75%)	No comment available
9e. Perform common procedures in multiple settings: Hard and soft tissue surgery.	8 (67%)	10 (83%)	11 (92%)	10 (83%)	Are you considering endodontic therapy to be a hard/soft tissue surgery? Just curious as to where it fit in.
9f. Perform common procedures in multiple settings: Management of space and treatment/management of occlusion.	8 (67%)	9 (75%)	10 (83%)	10 (83%)	I don't agree with the last statement in that it is crucially important to the management of the patient but not necessarily clearly expected.
10. Provide for control of pain and anxiety during provision of care, including local anesthesia and behavioral techniques, with consideration of the impact of prescribing practices and substance use disorder.	10 (83%)	8 (67%)	8 (67%)	10 (83%)	Unsure of standardization for measurability
11. Manage medical emergencies in the dental setting.	9 (75%)	10 (83%)	8 (67%)	11 (92%)	Again, very underrepresented. And absolutely crucial especially moving our profession forward.
12. Coordinate care and evaluate specialty consultation and referral as the condition of the individual requires and execute appropriate handoffs to other members of the healthcare team.	8 (67%)	6 (50%)	7 (58%)	6 (50%)	Definitely crucial part to management of a patient but difficult to standardize how measurable this is

Phase 3 draft set of EPAs and corresponding number of respondents (%) **that rated each EPA as 5 on a 5 point scale (1-5)** for each of the criteria for the domain of "entrustable, essential, and important task of the profession, and clarity" from the EQuaL rubric. [24]

Total no of respondents (n=91); total responses ranged from 12 to 18 across items, response rates 13% to 20%).

Table 5. EQuaL rubric statements with scale points 1 and 5 defined		
EQuaL rubric statements	Definition of scale point 1	Definition of scale point 5
This EPA describes work that is essential and important to the profession.	very low importance to professional practice	very important and essential to professional practice
This EPA describes work that is essential and important to the profession	very low importance to professional practice	very important and essential to professional practice
The performance of this EPA in clinical practice is restricted to qualified professional:	is routinely done by untrained persons	Exclusively performed by trained and qualified individuals within professions

Figure 1. EPA framework linked to patient outcomes. Adapted from Englander R, Frank JR, Carraccio C, et al. Toward a shared language for competency-based medical education. *Med Teach.* 017;39(6):582-587. **KSA: Knowledge, Skills, Attitudes**