

## Developing Entrustable Professional Activities (EPAS) for House Officer to Practice Safely and Independently in Dentistry; A Qualitative Study Using Interpretive Paradigm

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### ABSTRACT

**Objective:** To develop entrustable professional activities for a one-year house job in dentistry.

**Study Design:** Qualitative study (Interpretive Paradigm).

**Place and Duration of Study:** Khyber College of Dentistry and Sardar Begum Dental College, Peshawar Pakistan, from Sep 2017 to May 2018.

**Methodology:** A five-step approach was used to develop four EPAs for a one-year house job. Using maximum variation sampling, faculty members from eleven disciplines of dentistry working in public and private dental colleges of Khyber Pakhtunkhwa and charge of training dental interns participated in the study. Three focus group interviews and three in-depth interviews were conducted. Data was transcribed and thematic analysis was done.

**Results:** The EPAs were developed for a one-year house job using the five-step approach. This process resulted in developing the content of four EPAs in detail, analysing the results into competencies aligned with Pakistan medical and dental council, assessment methods such as multisource feedback, direct observation, mini CEX assessment with peer coaching and role modelling teaching strategies for each activity. Participants agreed on trusting the house officer to perform independently with a gradual shift of supervision scale from direct action to indirect and finally enacting the EPAs unsupervised.

**Conclusion:** This study presents the foundation for using specific EPAs in dentistry, a step towards a competency-based approach. The content of EPAs for a transition period of a one-year house job in dentistry was developed using the 5-stage approach. These EPAs can provide explicit guidance for the engagement of dental house officers in clinical workplace activities.

**Keywords:** Dental graduate, Dental intern, Entrust able professional activities, House officer.

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### INTRODUCTION

Entrustable professional activity (EPA) is a newly emerging concept of translating competencies into practice and is defined as 'tasks or responsibilities that can be entrusted to a trainee once sufficient, specific competence is reached to allow for unsupervised execution.<sup>1,2</sup>

The EPAs have been developed for a residency program in various disciplines and subspecialties of medicine.<sup>(3-7)</sup> EPAs are now being increasingly developed and implemented in undergraduate medical education.<sup>6,8</sup> The EPAs bridge the gap between theory and practice by articulating competencies acquired during medical or dental school to ensure independent practice.<sup>9</sup> The EPA framework for undergraduate medical education is being implemented in medical universities around the globe.<sup>10</sup>

The dental graduates must complete one year of clinical practice as an intern (house job), spread over

two months of rotations in six wards under close supervision prior to receiving a registration certificate from the Pakistan Medical & Dental Council. There are no competencies, outcomes, or EPAs developed so far in dentistry for a one-year house job. The need of the hour is to state, "What professional activities a dental graduate be entrusted to do safely and independently?" and "how is the content of those activities developed?" The EPA can serve this purpose by bridging the gap between theory and practice and by designing the workplace structure to prepare the graduate to learn to assume their responsibility as an intern.

This study aims to develop the EPA content with its respective competencies (knowledge, skills and attitudes), teaching strategies, assessment methods and entrustment decision/supervision level required from the dental graduates during their rotations in different wards of one-year house job.

### METHODOLOGY

This qualitative research using an interpretive paradigm was conducted from September 2017 to May 2018 at Khyber College of Dentistry and Sardar Begum

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Dental College, Peshawar. Ethical approval was obtained from Khyber Medical University Research and Ethics Board (No. DIR/KMU-EB/DE/000420). Permission was granted from the in-charge/director of constituent institutes.

**Inclusion Criteria:** Experts in all the eleven disciplines of dentistry with more than two years of experience working in either public or private sectors having at least a certificate in medical education were included in the study.

**Exclusion Criteria:** Participants who were not specialized or other than a specialist in dentistry were excluded from the study.

Informed consent was obtained from all participants and ensured the confidentiality of responses. Views and opinions of respondents were used to develop detailed content for four EPAs in dentistry for one year of house job. The purposive sampling technique was used with the maximum variation technique.

A five-step approach by Ole Ten Cate *et al*,<sup>2</sup> was used for developing EPAs. Step 1: Select the EPA topic and map of competencies with PMDC. Step 2: Develop the EPA content by collecting qualitative focus groups and individual interview data from participants. Step 3: Seek feedback on the transcript from participants. Step 4: Draft the EPAs based on thematic analysis of collected data to populate domains in accepted EPA format. Step 5: Refine and finalise the EPAs.<sup>6</sup>

All the transcripts were reviewed and coded. Using an open coding technique, text analysis was done (word repetitions, key-indigenous terms, and keywords-in contexts). Data collection and analysis were done at the same time.

## RESULTS

This section presents the process of developing the content of five EPAs. We discussed the findings by dividing this section into four with statements respondents used, enhancing the presentation of the results. The tabulated format for EPAs and their content is given below from Table- I & IV.

### Theme-I: Knowledge, Skill and Attitude to Enact Entrust Able Professional Activities

The key elements identified in developing the content were the basic knowledge of gathering and interpreting information, patient care skills, problem-solving, and professionally managing the common disease in a clinical setting. Interestingly participants highlighted when they should learner refer as in case of emergency and avoid any complication. "Most of the

systemic problems have oral implications of manifestations by taking appropriate history & also presume chance of an emergency. "Oral surgeon should be a "safe surgeon" He should address all his apprehensions and answer all his questions before carrying out a procedure. Document the findings. Control cross-infection, the most important thing is to know when you not to operate. Ask for opinion wherever needed."

An interesting finding also presents participants' consensus on reporting medico-legal cases and writing referral letters. With this, the participants also stressed the limitation of learners.

A Dentist should be a doctor" He should know the disease consequences. He should understand what limitation is..when not to put his hand when to pull the breaks, and when to refer to."

### Theme II: Assessment Methodology and Tools

Participants agreed that the assessment should be ongoing, and the house officer's performance should be assessed against each EPA. However, respondents suggested using assessment tools in accordance with the setting and resources available, e.g., direct observation, mini CEX, case-based discussion and Multisource feedback. Very few suggested to have created portfolios and reflected upon their practices.

"You should check their time and again and observe them doing the task get multisource feedback. There should be a checklist measuring attitudes as well. I would suggest that the student make their portfolios in which they can write the cases they have encountered, their experiences and reflections."

### Theme-III: Teaching Strategy

Two themes emerged labelled under the heading of how to "do it yourself."

"*Watch how I do it*" assigning this responsibility to the resident or senior house officer to observe, help and report."

The finding in this study identified two ways of teaching either by role modelling and appointing junior staff. Interestingly the participants presented an idea of a "*Learners toolbox*" comprising learning materials, books, verbal guidance, tasks/presentations, penalties, courses, workshops and skill-share boot camps. "High dependency patients, patients with psychological diseases, handicapped, they need more care. Alternatively, the house officer is less confident"and a situation like"..any accidental happening in surgery/ increased bleeding, tissue damage, excessively bone cutting, unfavourable fractures. Then you should take

over, taking the patient in confidence and at the same time teaching and supervising the house officer."

**Theme-IV: Developing Trust and Entrustment Decision**

There was a consensus that the assessor should keep track of learner performance reports. "Supervision is a teamwork"and"Responsibility always lies on

complex procedures (dental emergencies, e.g. syncope, excessive bleeding, allergy, complicated extractions, restorative and endodontic procedures)". Secondly ", Procedure should be divided into chunks so that it could be learned and practised easily". It was agreed that in the end, all house officers attain a similar level of proficiency by their second or third week with continuous practice.

**Table-I: EPA1 Gather History and perform (extra and intra) oral examination of patient.**

<b>Description</b>	Use the chief complaint, gather history and perform a complete head and neck exam appropriate to the context within a reasonable time frame in the following circumstances: <ul style="list-style-type: none"> <li>• Common chief complaint (e.g., toothache, fever, tooth or mucosal discoloration, trauma, swelling, crooked teeth)</li> <li>• The patient may have underlying medical problems (e.g., chronic conditions such as hypertension, COPD/asthma, or diabetes).</li> </ul>
<b>Limitation</b>	Follow Protocols and Guidelines of History Taking and Clinical Examination. The encounter with the patient should be conducted with respect, in a manner sensitive to the patient's circumstances, including sexual/gender orientation, cultural/religious beliefs respecting privacy. Supervise Him Closely (SPC) in case the patient is Handicapped or has Systemic Illnesses or Lack of Knowledge, Low Self Esteem of learner.
<b>Competencies</b>	I.II.V PMDC I. Clinical, Cognitive and Patient Care Skills (Skilful) II. Scientific Knowledge for Good Medical Practice (Knowledgeable) V. Competencies related to Professional Attributes (Behavioural Sciences and Professionalism)
<b>Competencies</b>	1. Apply principles and Guidelines of History Taking and Clinical Examination within ethical boundaries 2. Identify Oral Manifestations of Dental Emergencies and Systemic Illnesses 3. Examine Patients with Orofacial pain, Limited Mouth Opening (TMJ Examination) and Oral Lesion 4. Differentiate between the normal and abnormal Morphology of Teeth and Anatomy of the Oral Cavity. 5. Identify Diseases and Malocclusions Related to Teeth and Oral Cavity Respectively. 6. Relate Anatomy, Morphology and Pathology of Oral Cavity with Clinical Findings). 7. Advise counsel, Educate and demonstrate to the Patient Hygiene Maintenance.
<b>Assessment Tool</b>	Direct Observation and Demonstration followed by Indirect Supervision and Feedback Suggested tools: Mini CEX, OSCE
<b>Observations for Formal Entrustment</b>	Attaching Senior (ATS), Assign Responsibility to Train or Demonstrating Staff (ARS), Junior Faculty Members Supervise (JFS) <ul style="list-style-type: none"> <li>• Direct/ Chair Side Observation and Cross Checking with Question (CCQ)</li> <li>• Provide Feedback,</li> <li>• Provide Learning Assistance, e.g. Reading Material, Verbal Guidance, Suggest Task/ Assistance</li> <li>• Performing the activity multiple times independently</li> </ul>
<b>Entrustment Decisions</b>	The activity will be entrusted at level 4 when the ward in charge or consultant or supervisor is confident that the intern has the knowledge, skills, and attitude to enact this EPA by the end of 2 months of clinical rotation. The Head of the Department should document a final judgment after observing the intern/ house officer on multiple observations, allowing them to practice independently.

top, yet a morbidity committee be established to track learner or house officers progress throughout internship program and document." Entrustment is a step-wise process based on multiple sources and multiple times, ensuring patient satisfaction.

Many participants have identified barriers in readiness to practice either because the intern is unaware of his limitations and abilities. Participants pointed out that training on simulators was essential to maintain patient safety in the early years. "They must go through a series of patients mostly ranging from simple procedures and at least observe or Manage

**DISCUSSION**

This study provides insights into all dental specialists/experts in developing content for EPAs. Themes encompass interns' activities, responsibility, knowledge, skills and attitude required to enact those EPAs. It also sheds light on assessment methods and tools used to operationalize competencies recognized by PMDC, focusing on managing general common diseases, ensuring health and safety measures, and emphasizing patient education and communication with the health care team. A concept introduced by ten Cate, EPAs are descriptors of work aligned to

competencies, providing a clear, meaningful interpretation of competency-based medical education implementing an outcome-based model.<sup>11-14</sup>

This study aimed to understand how EPAs are developed by interpreting the views and opinions of

table was made with five competencies proposed by PMDC mapped and aligned with EPAs. Competencies included "I. Skillful, II. Knowledgeable, III. Community Health Promoter, IV. Problem-solver and V. Behavioral Sciences and Professionalism".

**Table-II: EPA 2 Integrate information gathered about a patient to construct and prioritize differential diagnosis as well as propose a plan for common chief complaints.**

<b>Description</b>	The graduate formulates a list of possible diagnoses across clinical settings of seven disciplines (prosthodontics, oral and maxillofacial surgery, operative dentistry and orthodontics, pedodontics, periodontology, and oral medicine). The plan includes integrating history, oral examination and common clinical presentations using a systematic approach, formulating a differential diagnosis and then arriving at a possible diagnosis, including records and suggestions for next steps as appropriate (e.g., commonly ordered diagnostic tests/imaging and initial treatment, medications etc.)
<b>Limitation</b>	The house officer identifies patient demographics and other related factors (history of medical illness and socioeconomic status) that may influence the diagnosis and prioritise. The house officer should refer the patient with TMJ problem to oral medicine or any other concerned dept. Careful supervision is required in the case of a high-risk patient. Complex Procedures or emergencies recognised, for example, hemangioma or vascular tumour, are mistaken for epulis.
<b>Competencies</b>	I, II and IV PMDC I. Clinical, Cognitive and Patient Care Skills (Skillful) II. Scientific Knowledge for Good Medical Practice (Knowledgeable): IV. Critical Thinking, Problem Solving and Reflective Practice (Problem-solver):
<b>Sub Competencies</b>	1. Collect and record clues from the patient and relate history Oral and Systemic Condition and Medical/ Dental Emergencies) with the current situation 2. Select and Interpret Specific and General Investigations to Arrive at Definite Diagnosis (e.g. Radiographs, Biopsy, Blood Tests.) 3. Identify Common Diseases and recognise Its Consequences Common Diseases, Dysfunction, and Infections Of oral hard and soft structures (teeth Periodontium, Pulp, Bone, TMJ) and oral mucosa 4. Differentiate between Normal and Abnormal Features of Oral Hard and Soft Tissues. 5. Construct a management plan and select treatment options, and prescribe medication.
<b>Assessment</b>	This EPA should be assessed by direct observation of the house officer during ward rounds, a patient encounter review, and a Checklist for grading Case-Based Discussion or Question and answer sessions in OSPE/OSCE.
<b>Observations for Formal Entrustment</b>	1. Direct Observation/ Supervision 2. Assigning responsibility to junior faculty members, training medical officers or senior house officers to supervise (Indirect Supervision/ Observation ARS) 3. Provide Learning Assistance, verbal guidance (Vg), Time, Reading material, Basic Science Lectures, practical Guidelines, Case presentations, tasks or assignments 4. Feedback 5. Construct ten simple management plans and two complex cases for every rotation in OPD.
<b>Entrustment Decision</b>	The activity will be entrusted at level 4 when the ward in charge or consultant or supervisor is confident that the intern has the knowledge, skills, and attitude to enact this EPA by the end of 2 months of clinical placement in OPD. Department in charge should document a final judgment after multiple observations.

respondents or subject experts to develop detailed content and an entrustment scale for EPAs in dentistry for the year of House job. In contrast, this previous study used Delphi or the nominal group technique to identify EPAs rather than simply propose actual content for EPAs.<sup>(3)</sup> Four EPA Titles were selected and modified according to our setting following discussions with continuous feedback from the subject specialist. It was finalized after several discussions with the research team and with experts. A two-grid

House officers must practice cross-infection, and contamination control measures, follow established guidelines and apply those principles in daily practice. According to our study, core competency (procedures) operational items for dental graduates were similar to a study in Taiwan but with additional procedures related to orthodontics and pedodontology.<sup>16</sup> Dental referral was an unexpected finding and an essential aspect of our study. Participants believed that referring patients to a consultant for immediate and appropriate

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management is an intern's limitation. A similar study explained referral to concerned departments and its importance.<sup>18</sup>

discussion, are widespread and best-investigated methods to assess interviewing and other communication skills.<sup>18,19,16</sup> In our study, most participants

**Table-III: EPA3 Communicate information relevant to patients care with the patients and other health care team.**

<b>Description</b>	Findings following a patient encounter (e.g., patient interview, physical exam, recommending and interpreting test results) are organised and prioritised. The supervising clinician discussed and vetted findings via oral presentation and then communicated with the health care team and the patients. The information to be shared with the patient is clearly explained. Information includes diagnosis, management plan, next steps, patient education, referral and procedures.
<b>Limitation</b>	Written documentation is a 'MUST.' Call or referral may include the clinical setting other than where the house officer is currently working (with other Departments). The encounter may include adult patients, child or family members, and the health care team within and outside the Department. Observe when encountering a High Dependency Patient, Patient with Psychological Diseases, Mental Depression, Anxiety. Handicapped, Medically Compromised Patients Should Be Carefully monitored. Close supervision will be required to manage complicated Patients (Angry or Impatient) and Medico-Legal, Emergency, Head Injury/ Road Traffic Accident Case cases.
<b>Competencies</b>	<b>I, III, IV, V PMDC</b> I. Clinical, Cognitive and Patient Care Skills (Skillful) III. Knowledge of Population Health and Health Systems (Community Health Promoter) IV. Critical Thinking, Problem Solving and Reflective Practice (Problem-solver) V Competencies related to Professional Attributes (Behavioral Sciences and Professionalism)
<b>Sub Competencies</b>	<ol style="list-style-type: none"> <li>1. Discuss the management plan with the supervisor/ senior faculty member</li> <li>2. Communicate clearly</li> <li>3. Write a referral note</li> <li>4. Maintain patient records and handover to the other house officers in a proper manner conveying clear information about the severity of the illness, patient demographics and wishes regarding care, a concise medical history, current problems and issues, pertinent and pending laboratory, radiological and other diagnostic information and follow up</li> <li>5. Explain clearly and discuss the procedure and other treatment options with the patient using layman's term</li> <li>6. Write a prescription</li> <li>7. Counsel the patient</li> <li>8. Demonstrate empathy towards patients.</li> <li>9. Write and communicate to the community about any disease creating awareness among the general population via different means</li> <li>10. Report medico-legal cases, if any.</li> </ol>
<b>Assessment</b>	This EPA can be assessed by <ol style="list-style-type: none"> <li>1. Direct Observation using a graded Checklist.</li> <li>2. Multisource feedback</li> <li>3. Written assessments and role plays can also be used.</li> <li>1. 4. Case-based discussion</li> </ol>
<b>Observations and Formal Entrustment</b>	<ol style="list-style-type: none"> <li>1. Perform three times under observation (Communicate Information to The Patient, To the Health Care Team Member or Consultant and Referring Him to Another Department)</li> <li>2. Feedback and counselling</li> <li>3. Practice and Aid with role-playing on simulated patients (angry, sad etc.) until mid of clinical placement</li> <li>4. Suggest any Reading material. For example, he should go back and read the protocols, and your toolbox should include presentations, workshops on communication</li> <li>5. Write five referral letters.</li> </ol>
<b>Entrustment Decision</b>	The activity will be entrusted at level 4 when the ward in charge or consultant is confident that the intern has the knowledge, skills, and attitude to enact this EPA by the end of 2 months of clinical placement after multiple observations. Morbidity Committee/ Board established comprising experts with authority to permit house officers to practice safely.

Feedback, mini CEX, DOPS, OSCE, and small group workshops, including role-play and interviews with actual patients, followed by feedback and

recommended direct observation dividing the procedure into small chunks like history, examination, and chair side performances. Another study also reported

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that breaking down elements of a procedure into smaller components could be directly observed with different OSCE stations.<sup>20</sup>

house officer. Other studies have also recommended non-threatening peer coaching to facilitate cooperative learning and cognitive growth.<sup>21</sup>

**Table-IV: EPA 4 Follow protocols for general dental procedures.**

<b>Description</b>	The graduate follows protocols and applies the principles of best practices in various dental settings with patients of various age groups, including children and their parents, adults and elderly individuals. The procedures include Scaling, complex and straightforward Restoration of the tooth (fillings and Root canal treatment), Administration of local anaesthesia, Non-Surgical tooth extraction, removable and fixed appliances/prosthesis, orthodontic procedures, prescribing and dispensing drugs. The graduate recognises his/her limitations and knows not to perform a procedure beyond their abilities.
<b>Limitation</b>	Follow Departmental SOPs and Control cross-infection. Using instruments injudiciously should be avoided. If the learner encounters any complication he cannot manage, refer the patient to the consultant for time management. Close supervision is needed While Performing in the patient's mouth, mainly if the procedure is Complicated or Complex for Patients that need special care, elderly with medical illness or systemic disease, epileptic patients, patients on anticoagulants or any other medication that can affect the treatment.
<b>Competencies</b>	<b>I, II, III and V PMDC</b> <ul style="list-style-type: none"> <li>• Clinical, Cognitive and Patient Care Skills (Skilful)</li> <li>• Scientific Knowledge for Good Medical Practice (Knowledgeable):</li> <li>• Knowledge of Population Health and Health Systems (Community Health Promoter):</li> <li>• V. Competencies related to Professional Attributes (Behavioral Sciences and Professionalism)</li> </ul>
<b>Sub Competencies</b>	<ol style="list-style-type: none"> <li>1. Follow required Departmental strategies and standard operating procedures for all the dental procedures</li> <li>2. Explain indications and contraindications of the drugs used</li> <li>3. Communicate the benefits of the procedure</li> <li>4. Explain post-treatment care and the precautions to the patient (adults and children)</li> <li>5. Follow and implement best practices</li> <li>6. Practice sterilisation and disinfection and control Cross Infection</li> <li>7. Follow and practice the principles of sterilisation and disinfection</li> <li>8. Control cross infection and practice health and safety measures, for example, wearing appropriate gloves and masks etc.</li> <li>9. Document the findings</li> <li>10. Educate the patient about the disease and its consequences addressing all apprehensions before carrying out a procedure.</li> <li>11. Counselling and Record-Keeping</li> <li>12. Recognise limitations, when not to operate and when to refer</li> </ol>
<b>Assessment</b>	This EPA should be assessed by <ol style="list-style-type: none"> <li>1. Direct observation (DOPS) using checklists</li> <li>2. Multisource feedback and track student progress via Portfolios</li> <li>3. Case-based discussion</li> </ol>
<b>Observation for Formal Entrustment</b>	<ol style="list-style-type: none"> <li>1. Feedback</li> <li>2. Assign Responsibility to Supervise (ARS) Assistance given by either the senior house officer, senior registrar, or any senior faculty member, Peer Assisted learning PAL and demonstrations.</li> <li>3. Provide learning assistance. The toolbox should have journals, books, tasks and courses for house officers</li> <li>4. Perform multiple times under direct observation before performing independently</li> </ol>
<b>Decisions/ Judgements</b>	The activity will be entrusted at level 4 when the ward in charge or consultant or supervisor is confident that the intern has the knowledge, skills, and attitude to enact this EPA after multiple observations by the end of 2 months of clinical placement. Morbidity Meeting will give the final judgement by tracking students' overall performance.

This study found that the teaching strategy was broadly categorized in two ways. Chair side teaching or role modelling and peer coaching were used along with a few other methods. Study participants suggested a teaching strategy where pairing involves a senior house officer or junior faculty member with a new

In our study, the respondents have highlighted the learner's limitations and anticipated situations with examples where they would need close supervision. Ole ten Cates *et al*,<sup>2</sup> in their research, also stated that supervisors observe how the learner has achieved the task and judge how they could entrust the learner to



do EPA with a certain degree of supervision required in future. Observation of a learner conducting an EPA could permit a supervisor to decide the learner's capacity to perform that activity, lowering supervision and increasing autonomy.<sup>15,21</sup> Participants suggested that if the learner has difficulty developing the desired skill, he should be pulled back to step and try again at a beginner's level. Practicing a couple of times should help him achieve competency.

EPAs should be developed for undergraduate clerkships in dentistry where students are exposed to patients for the first time and mapped along the continuum of an education program to graduation and then entering residency. The current dental curriculum needs to be revised in case of adopting EPAs, for it needs to be linked with graduate expectations and program objectives to produce safe junior dental practitioners.

#### LIMITATIONS OF STUDY

The findings in this study were limited to two dental colleges (public and private sector) in Peshawar, Khyber Pakhtunkhwa. Another limiting factor was that only the expert's perspective was considered; opinions of other stakeholders like students, administrators and patients may explore another dimension of the study. For triangulation, different research approaches can be used, like ethnography. A nominal group or Delphi round can further validate the findings.

#### CONCLUSION

A comprehensive five-step approach to developing EPAs for dental graduates highlights the limitations of the undergraduate dental curriculum. This study presents the foundation for using specific EPAs, a step towards a competency-based approach and milestones assessment of house officers. EPAs designed for one-year house job can be transferred and applied in different settings.

**Conflict of Interest:** None.

#### Authors' Contribution

WUN: Conception and design, acquisition of data, analysis and interpretation of data, GSO: Drafting the article, revising it critically for important intellectual content, BJ: Proof reading.

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