Annotated Bibliography for Core EPAs for Entering Residency Pilot Project

(Updated through July 31, 2022)

General/Overarching Implementation Updates/Lessons Learned

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In this article, the authors discuss some of the outcomes of Core entrustable professional activities (EPAs) implementation for seven of the pilot schools, analyzing data from the AAMC Medical School Graduation Questionnaire, the AAMC Early Postgraduate Year 1 Questionnaire, and data collection tools obtaining information on EPA-specific workplace-based assessments, trained entrustment groups, and program director assessment of graduates’ preparedness. The authors organize their findings around the standards of propriety, feasibility, utility, and accuracy. They also reflect on the 13 Core EPAs themselves, discussing which EPAs work well (are relatively easy to teach and assess), which may be missing, and which may be seen as aspirational, as well as what gaps in current curriculum and assessment structures require further attention.

For those interested in implementing EPAs, this article provides outcomes data on many of the essential pieces of EPA implementation. The authors’ findings and
recommendations around assessment of EPAs and the 13 Core EPAs themselves could be particularly helpful in understanding how to implement them in local contexts.


In this article, the authors describe their single-school experience implementing EPAs in the fourth-year acting internship. They developed a specialty-agnostic curriculum addressing specific advanced Core EPAs. The curriculum objectives and assessment are available in the article as Tables 1 and 2, respectively. Implementing EPAs in the acting internship allowed students to practice more complex EPAs—8 (“Give or receive a patient handover to transition care responsibility”), 10 (“Recognize a patient requiring urgent or emergent care and initiate evaluation and management”), and 12 (“Perform general procedures of a physician”)—that they would not have otherwise been able to practice. The article also discusses some of the challenges of implementation.

*For those interested in implementing EPAs,* this article provides guidance on implementing EPAs in the curriculum outside of the usual context of clerkships.

Lomis KD, Ryan MS, Amiel JM, Cocks PM, Uthman MO, Esposito KF. Core Entrustable Professional Activities for Entering Residency Pilot Group update: considerations for medical
In this article, the authors describe the role of medical science educators in the preclerkship and clerkship training phases of medical school in helping students along the path to entrustment. While “entrustment is fundamentally a workplace construct,” medical science educators are essential in teaching and assessing students in the fundamental building blocks that make up each EPA. The authors also discuss the beginnings of the AAMC Core EPAs for Entering Residency pilot, including early progress and next steps around entrustment, curriculum development, assessment, and faculty development.

For those interested in implementing EPAs, this article provides specific information on the role of medical science educators in teaching and assessing EPAs. As medical science educators play an important role in early phases of medical school curricula, their contribution to implementing EPAs and participation in designing integrated curricula are essential.


https://doi.org/10.1097/ACM.0000000000001543
In this article, the authors describe the beginnings of the AAMC Core EPAs for Entering Residency pilot. They briefly highlight the pilot schools, the pilot timeline, and the pilot’s goals, guiding principles, and organizational structure. Additionally, they share early progress and next steps around formal entrustment, assessment, curriculum development, and faculty development.

For those interested in implementing EPAs, this article provides a helpful snapshot of the concepts the pilot found to be most important to focus on early in the project period. It also includes the guiding principles that helped the pilot institutions identify where their efforts should align throughout the project period.


In this article, the authors recommend implementing the Core EPAs using a systems-based approach. They describe following such an approach to implement EPA 11 (“Obtain informed consent for tests and/or procedures”) using their Systems-Based Approach Guide (available in the article as Table 1). This guide highlights detailed steps included in each of five systems-based approach principles: (1) define the system, (2)
create a pathway for goal accomplishment, (3) develop connections, (4) prepare for work activities, and (5) prepare for continuous quality improvement.

For those interested in implementing EPAs, this article provides a tool to help institutions use a systems-based approach to implementation. The article also includes a detailed pilot institution-based example of using the tool to clarify any points, thereby allowing institutions to see how it could be applied in their local contexts.

Learner Perspectives on EPAs


In this article, the authors share the perspectives of medical student leaders at five pilot schools on approaches for engaging students in the Core EPAs, implementation challenges, and recommendations around several decisions in implementing Core EPAs. Specifically, the authors center their discussion around six “key tensions”: (1) how and when the Core EPAs should be introduced; (2) responsibility for driving the assessment process; (3) feedback mechanisms; (4) systems for advising, mentoring, or coaching students; (5) whether EPA performance should contribute to students’ grades; and (6) whether entrustment decisions should be tied to graduation requirements. The article
includes a table that summarizes all the tensions, the range of decision options, and associated recommendations.

*For those interested in implementing EPAs*, this article provides the student perspective, which is an essential piece to understand in implementing EPAs. Additionally, the authors offer specific recommendations around key decisions required for EPA implementation.


In this article, the authors report on first-year residents’ self-assessed preparedness to perform the 13 Core EPAs under indirect supervision in the context of their transition to residency. AAMC Core EPAs pilot medical school graduates completed a questionnaire three months into their first year of residency. “Residents who reported that they had been prepared to perform core EPAs under indirect supervision at the start of training felt that their transition to residency was easier than expected.” Self-assessed preparedness to perform Core EPAs under indirect supervision at the start of residency varied across EPAs; for example, respondents felt more prepared to perform EPAs 1 (“Gather a history and perform a physical examination”), 5 (“Document a clinical encounter in the patient record”), and 6 (“Provide an oral presentation of a clinical encounter”) compared to EPAs
4 ("Enter and discuss orders and prescriptions"), 8 ("Give or receive a patient handover to transition care responsibility"), 10 ("Recognize a patient requiring urgent or emergent care and initiate evaluation and management"), and 11 ("Obtain informed consent for tests and/or procedures"). Specialty was also associated with reported ease of transition to residency.

*For those interested in implementing EPAs,* this article illustrates that readiness to perform many of the Core EPAs under indirect supervision may contribute to an easier transition for graduates regarding the responsibilities they assume at the start of residency.


In this article, the authors report on the perceived readiness of first-year residents at a single hospital system to perform the 13 Core EPAs and what contributed to their reported level of preparedness. Residents completed a questionnaire, and a subgroup participated in focus groups. They reflected on the training experiences they had as medical students and what activities were most helpful for which EPA, the quality of the assessment and feedback they received on their EPA performance, and the EPAs they felt the most/least prepared to perform in residency. The authors found that “residents felt far more prepared” to perform EPAs 1 ("Gather a history and perform a physical
examination”), 5 (“Document a clinical encounter in the patient record”), and 6 (“Provide an oral presentation of a clinical encounter”) compared to 4 (“Enter and discuss orders and prescriptions”), 8 (“Give or receive a patient handover to transition care responsibility”), and 13 (“Identify systems failures and contribute to a culture of safety and improvement”).

*For those interested in implementing EPAs*, this article provides insight from first-year residents on the specific medical school activities that they thought did and did not contribute to their self-assessed readiness to perform EPAs. This feedback could help other institutions identify training activities to support their students’ development.

**Specific EPAs**


In this article, the authors discuss their efforts around operationalizing a developmental framework and curriculum mapping tool for EPA 9 (“Collaborate as a member of an interprofessional team”). They performed an in-depth analysis of the components of EPA 9 and conducted a literature review of existing assessment tools and assessment frameworks. The authors used this information to describe the expectations for development of interprofessional collaborative practice skills for use as a shared mental
model for expectation setting, workplace-based assessment, and entrustment, available in the article as Table 1, and to develop the curriculum mapping Tool for Assessing Interprofessional Collaboration Training, available in the article as Table 2.

For those interested in implementing EPAs, this article provides a comprehensive analysis of the competencies for collaborating as a member of an interprofessional team. EPA 9 is often cited as one of the more difficult EPAs to teach and assess, so the assessment tool provided in the article may be particularly helpful for those interested in teaching and assessing EPA 9 or any component of interprofessional learning.


In this article, the authors discuss their long-standing efforts around teaching motivational interviewing to medical students, assessing their use of it, and providing faculty with the training necessary to teach and assess it. Motivational interviewing is lacking in current competency frameworks, including the 13 Core EPAs, so the authors built upon their existing body of work using the EPA framework. They developed a one-page schematic (available in the article as Figure 1) and workplace-based assessment (available in the article as Table 3) for motivational interviewing. The authors found that implementing the motivational interviewing EPA was feasible and positively impacted student and faculty motivational interviewing skills.
For those interested in implementing EPAs, this article provides a comprehensive analysis of an EPA not included in current competency-based medical education frameworks but essential to patient care: motivational interviewing. The article also includes detailed information on one institution’s faculty development, curricular, and assessment efforts, as well as specific assessment tools other institutions could use.


https://doi.org/10.1007/s40670-022-01578-x

In this article, the authors describe the influence of their curricular efforts around Core EPA 8, “Giving or receiving a patient handover to transition patient care responsibility”. They used graduation questionnaire data to understand differences among schools that implemented the EPA 8 curriculum and those that did not implement the EPA 8 curriculum. They found that for the schools that implemented the EPA 8 curriculum, students reported “greater frequency of handover observation/feedback” and “more strongly agreed that they possessed the skill to perform handovers” compared to students at the school that did not implement the EPA 8 curriculum.

For those interested in implementing EPAs, this article provides evidence for the positive influence of EPA implementation on student outcomes.
Assessment


In this article, the authors report on a single-school, mixed methods study comparing the modified Chen supervisory scale and modified Ottawa co-activity scale (both available in the article as Figure 2) for workplace-based assessment of EPAs 4 (“Enter and discuss orders and prescriptions”), 5 (“Document a clinical encounter in the patient record”), 8 (“Give or receive a patient handover to transition care responsibility”), and 10 (“Recognize a patient requiring urgent or emergent care and initiate evaluation and management”). Medical students were assessed on both scales during acting internships. The authors also interviewed faculty assessors to help understand their use of the assessments. The authors found that ratings were not aligned across scales, indicating that the scales are “measuring different aspects of performance and should be considered complementary rather than interchangeable assessments.”

For those interested in implementing EPAs, this article provides a research-based analysis of the differences between two common EPA workplace-based assessment scales. It highlights that one scale is not better than the other but that they measure different aspects of performance.
In this article, the authors report on single-school outcomes of the Ottawa scale using G (generalizability)-theory and D (decision)-theory. Students were assessed on EPAs 1 (“Gather a history and perform a physical examination”), 2 (“Prioritize a differential diagnosis following a clinical encounter”), 5 (“Document a clinical encounter in the patient record”), and 6 (“Provide an oral presentation of a clinical encounter”) and on whether the activity was complex or routine. The authors found that “9-11 observations translate into an entrustment rating that is reasonably reproducible for a given student.” They also found that residents completed workplace-based assessments more frequently than attending physicians.

For those interested in implementing EPAs, this article provides specific information on the number of workplace-based observations needed for each student. It also discusses their workplace-based assessments tool development and faculty development processes, recommendations, and challenges.

In this article, the authors describe the outcomes for a single-school study of their implementation of EPAs 4 (“Enter and discuss orders and prescriptions”), 6 (“Provide an oral presentation of a clinical encounter”), 8 (“Give or receive a patient handover to transition care responsibility”), 9 (“Collaborate as a member of an interprofessional team”), and 10 (“Recognize a patient requiring urgent or emergent care and initiate evaluation and management”) in the fourth-year acting internship. Based on workplace-based assessment data of these EPAs, they found that “most students achieved a performance level of needing indirect supervision.” Additionally, based on a pre/post acting internship survey, students were significantly more confident in their performance of EPAs 4, 6, 8, 9, and 10.

For those interested in implementing EPAs, this article provides outcomes data regarding the positive effects of implementing EPAs in the acting internship.


In this article, the authors describe developing and implementing a workplace-based assessment process and tool for all 13 EPAs at a single academic health center. This includes how they integrated assessment into their curriculum and the faculty development opportunities they offered. The number of completed workplace-based assessments varied by EPA, as well as by clinical discipline and setting. For example,
“EPA 6 (‘Provide an oral presentation of a clinical encounter’) was most frequently assessed and EPA 10 (‘Recognize a patient requiring urgent or emergent care and initiate evaluation and management’) was least frequently assessed.”

*For those interested in implementing EPAs*, this article provides a summary of implementing a workplace-based assessment process across a wide variety of EPAs, clinical disciplines, and clinical settings. The article could help others develop their own assessment processes and identify where challenges or opportunities may arise.

https://doi.org/10.1016/j.acap.2020.09.016

In this article, the authors report on implementing the Ottawa Clinic Assessment Tool (OCAT) for workplace-based assessment of all medical students in the pediatric clerkship at a single school. They assessed EPAs 1 (“Gather a history and perform a physical examination”), 2 (“Prioritize a differential diagnosis following a clinical encounter”), 3 (“Recommend and interpret common diagnostic and screening tests”), 5 (“Document a clinical encounter in the patient record”), 6 (“Provide an oral presentation of a clinical encounter”), and 9 (“Collaborate as a member of an interprofessional team”). The authors found that OCAT scores increased over the course of the clerkship and that scores were
associated with grades; however, the number of completed workplace-based assessments varied by EPA.

For those interested in implementing EPAs, this article provides a summary of implementing a workplace-based assessment process in a clerkship, as well as some of the resulting successes and ongoing challenges.


In this article, the authors report on the reliability of the Ottawa Surgical Competency Operating Room Evaluation (O-SCORE) scale, determined using G (generalizability)-theory. In this single-institutional study, medical students were assessed across clinical clerkships using a workplace-based assessment. While the O-SCORE “demonstrated modest reliability,” more of the variation was due to the rater/assessor than to the student’s performance. In addition to these findings, the article includes extensive information about piloting EPAs in the authors’ internal medicine clerkship and faculty development efforts across clerkships as supplemental digital appendices.

For those interested in implementing EPAs, this article highlights the challenges of workplace-based assessment and rater/assessor training.
Ryan MS, Khan AR, Park YS, et al; Core Entrustable Professional Activities for Entering Residency Pilot Program. Workplace-based entrustment scales for the Core EPAs: a multisite comparison of validity evidence for two proposed instruments using structured vignettes and trained raters. * Acad Med. 2022;97(4):544-551. [https://doi.org/10.1097/ACM.0000000000004222](https://doi.org/10.1097/ACM.0000000000004222)

In this article, the authors report on the results of their multi-institutional study comparing the validity of the Ottawa and Chen scales. Members of the AAMC Core EPAs pilot teams were grouped and randomized to apply one of the scales to video vignettes of pre-entrustable and entrustable learners. Assessors were also asked to provide feedback on their rating thought process through an open-ended response question at the end of the assessment tool. The authors found that assessment variability was due to the student’s performance, not the rater/assessor, for both scales.

*For those interested in implementing EPAs, this article provides evidence for the validity of these scales “in a highly structured environment.” Additionally, the qualitative responses from assessors offer input on the challenges of using the scales, which could inform institutions’ faculty development efforts.*

In this article, the authors report on the results of their single-school study comparing modified versions of the Ottawa and Chen scales on workplace-based assessment forms. They analyzed the data using G (generalizability)-theory and D (decision)-theory. The authors found that “both scales demonstrated relatively low variance attributed to the learner,” with the Chen scale performing slightly better than the Ottawa scale for five of the seven Core EPAs studied and the Ottawa scale performing slightly better for the remaining two EPAs. The authors also conducted a root cause analysis to understand assessment challenges more deeply.

For those interested in implementing EPAs, workplace-based assessment is a consistent challenge to successful EPA implementation. This article provides a thoughtful stepwise analysis of the workplace-based assessment process to help others anticipate these challenges. It also helps more clearly delineate the differences between the Chen and Ottawa scales for EPA assessment.

**Faculty Development**

This article discusses the faculty development elements necessary for those involved in making entrustment decisions, informed by an extensive literature review. The four skill development elements are (1) “observation skills in authentic work environments,” (2) “feedback and coaching skills,” (3) “self-assessment, role modeling, and reflective practice” skills, and (4) “peer guidance skills.” The article also includes two lists: One list provides specific faculty development recommendations from the Core EPAs Pilot Faculty Development Concept Group based on the aforementioned elements. The other highlights future directions for faculty development research from the Core EPAs Pilot Faculty Development Concept Group that are broad enough to inspire and inform other/additional researchers in this space.

For those interested in implementing EPAs, this article offers a summary of the specific skills areas on which faculty development efforts should focus. It also provides a summary of potential faculty development research questions that could inform a broader constituency exploring these issues.

Lupi CS, Ownby AR, Jokela JA, et al; Association of American Medical Colleges Core Entrustable Professional Activities for Entering Residency Faculty Development Concept Group. Faculty development revisited: a systems-based view of stakeholder development to meet the demands of entrustable professional activity implementation. *Acad Med.* 2018;93(10):1472-1479. [https://doi.org/10.1097/ACM.0000000000002297](https://doi.org/10.1097/ACM.0000000000002297)
This article discusses the training required for the range of stakeholders involved in implementing competency-based medical education—students, didactic faculty, residents and other postgraduate trainees, short-term clinical supervisors, longitudinal clinical supervisors and clinical course directors, portfolio coaches, entrustment committee members, faculty and deans responsible for oversight of professional behaviors, curriculum deans and resource managers, and faculty developers. To organize the needs of these stakeholders, the authors used Steinert’s five domains of faculty development: (1) teacher improvement, (2) leadership and management, (3) research capacity building, (4) academic career building, and (5) organizational change. The article’s Table 1 summarizes the knowledge and skill needs for each stakeholder group along these domains.

For those interested in implementing EPAs, this article provides a summary of many of the stakeholders that institutions may need to engage in doing this work and their knowledge and skill needs. This could inform institutions’ professional development portfolio and stakeholder engagement strategies.

**Entrustment**


https://doi.org/10.1097/ACM.0000000000004242
In this article, the authors report on the results of the first round of theoretical entrustment decision-making at four of the participating pilot schools. Whether determinations about readiness for indirect supervision could be made varied across EPAs, dependent primarily upon data availability. Trained entrustment groups used multiple data sources, including workplace-based assessment data, to make their determinations.

*For those interested in implementing EPAs*, this article discusses the challenges in determining readiness for entrustment and highlights the EPAs for which it may be more or less feasible.


https://doi.org/10.1097/ACM.0000000000001544

In this article, the Core EPAs for Entering Residency Entrustment Concept Group discusses their efforts in operationalizing entrustment decision-making. Based on a literature review and group discussions about decision-making efforts across schools participating in the pilot, the group developed “guiding principles for making formal summative entrustment decisions” as well as a “developmental framework for trustworthiness” based on three dimensions of trustworthiness—discernment, truthfulness, and conscientiousness. Chart 1 in the article outlines the actions of a learner
along developmental stages (from “requires remediation” to “proficient”) for each of these three dimensions. The article also lists many of the challenges faced by pilot schools in making entrustment decisions in its Table 1.

*For those interested in implementing EPAs*, this article provides a helpful summary of the challenges institutions may face in implementing entrustment decision-making. It also offers a concrete way of conceptualizing and measuring/assessing a student’s level of entrustment.


In this article, the authors report the findings from interviews with each of the 10 pilot schools around their processes for making summative EPA entrustment decisions. A table highlights the differences and similarities in how pilot schools approached different elements of the process: approach, committee members, number of students reviewed by the committee, number of EPAs reviewed by the committee, assessment data reviewed, review process, electronic dashboard, and outcomes of entrustment committee meetings. The 10 pilot schools each had a different process model, but all followed the guiding principles discussed by Brown and colleagues (2017) in the entry immediately preceding this one. However, implementing the process was found to be challenging—another table details the challenges schools shared in implementing an entrustment process around
several high-level considerations; for example, interviewees described ethical considerations around limiting committee membership to minimize conflicts of interest (program directors, coaches, etc.).

*For those interested in implementing EPAs,* this article provides an illustrative discussion of the different models of entrustment committees the Core EPAs pilot schools developed, while also emphasizing common principles to consider. The article also highlights the challenges schools may face in implementing an entrustment process.

**Letters to the Editor, Published Abstracts and Columns (Listed Chronologically)**


Brown DR. Narrow phrasing is not always best: in defense of Core EPAs 7, 9, and 13. *Acad Med.* 2021;96(5):614. [https://doi.org/10.1097/ACM.0000000000003992](https://doi.org/10.1097/ACM.0000000000003992)


**AAMC Publications**


This is one of the two foundational publications released prior to the start of the Core EPAs pilot that informed the pilot’s work. This publication is for curriculum developers, including “details about how we [the authors] mapped the EPAs to domains of competence, competencies, and their respective milestones.”

This is one of the two foundational publications released prior to the start of the Core EPAs pilot that informed the pilot’s work. This publication is for faculty and learners, including “a description of the EPA, narrative and bulleted descriptions of learner behaviors, and clinical vignettes describing pre-entrustable and entrustable learners.”


https://www.aamc.org/media/20196/download?attachment

The Core EPAs pilot developed these toolkits to more clearly describe the behaviors associated with each developmental stage for each of the 13 EPAs, displayed as one-page schematics. The toolkits also include the published literature associated with each EPA and the Physician Competency Reference Set competencies associated with each EPA.