FINAL REPORT

University of Washington School of Medicine Curriculum Renewal

Assessment Committee

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EXECUTIVE SUMMARY

- The curriculum committee will develop and assign general objectives and competencies to multiple components of the curriculum. The committee recommends that the AAMC Physician Competencies Reference Set and the USMLE Unified Content Outline be adopted as frameworks for objectives and competencies.

- An assessment and evaluation committee will be established to develop policy, assist curriculum leaders in development of assessment techniques, and provide evaluations of curricular units as well as the curriculum as a whole.

- Developmental milestones for each competency will be developed for each phase of the curriculum that lead to the achievement and documentation of the knowledge, skills, behaviors, and attitudes expected of our graduates as they complete the MD degree.

- The results of all assessments will be recorded in a student longitudinal portfolio with a dashboard interface to allow review of progress in achieving objectives and competencies.

- Performance within a unit will determine if a student passes the unit and will contribute to assessment of performance in the phase.

- Each element in an assessment will be related to one or more competency, objective, theme, or milestone and will be recorded and available to determine success on those units within and across phases.

- **Phase 1** - Traditional assessment methods will be utilized with increasing reliance on simulations, structured observations, reflections, and other written methods.
  a. Frequent summative assessments with feedback will be needed in block courses to allow students with marginal or poor performance to remediate performance gaps during the block.
  b. An extensive summative OSCE will be conducted at the end of phase, focusing on the appropriate milestones.

- **Phase 2** - Phase leaders will determine the methods for assessment of objectives, milestones, and competencies within the phase. Specific assessment within clerkships will determine successful completion of that unit. Review of performance across all measures in the phase will determine success for the phase.
  a. All milestones and objectives assigned to this phase will be assessed in block clerkships and Longitudinal Integrated Clerkships (LICs). A predetermined number of assessments in LICs will be conducted by educators external to the site.
  b. An extensive summative OSCE will be conducted at end of the phase, focusing on the advanced milestones assigned to the phase.

- **Phase 3** – Assessment will be based on the specific objectives and competencies assigned to the phase.
  a. Decisions for Entrustable Professional Activities will be made on observation of performance across a number of patient encounters once appropriate milestones have been achieved.

- Post Graduate assessment and Program evaluation must continue to support continuous improvement of the curriculum and meet the needs of our regional partners.

- The UWSOM assessment vision includes upon the following 4 factors:
  a. Robust educator development
  b. Implementation of regional education and assessment centers
  c. Adoption of an overall residency readiness goals such as the entrustable professional activities
  d. Design, implementation and ongoing support of a dashboard and portfolio system for performance tracking, monitoring and reporting
Beginning with the End in Mind – Entrustable Professional Activities (EPAs): A major goal of the School of Medicine curriculum is to enable students to perform those day-to-day professional tasks expected of graduates entering residency training. With these professional activities, currently known as EPAs, in mind, the Curriculum committee will develop and assign general objectives and competencies to multiple components of the curriculum. Developmental milestones for each competency will also be developed through the cooperative work of educators in each phase of the curriculum that lead to the achievement and documentation of the knowledge, skills, behaviors, and attitudes expected of our graduates as they complete the MD degree. Figure 1 illustrates the overall vision of the framework.

Block and clerkship leaders will be charged with the development and implementation of experiences for students necessary to achieve the course objectives and competency milestones. These leaders may also develop session objectives for specific blocks of instruction clearly related to block and clerkship level objectives. Curricular theme leaders will work with block and clerkship leaders to assure the inclusion of theme related objectives and milestones.

All assessment tools must reflect the highest quality possible and assist in preparing the students for assessments in the next phase of their training. All assessment tools will be developed before the beginning of each academic unit. These tools will be kept secure. An equivalent form of the final assessment will also be available in advance for use in the event of
a student failure and needed for reassessment. Whenever possible, assessment will be completed or recorded on computer. All teaching sites will use the same assessments.

The results of all evaluations will be recorded in a student portfolio arranged to reflect progress in achieving objectives and competencies. This information will be available to students, their teachers and for use in program evaluation to chart the paths of individual students toward expected competencies and the success of the curriculum in helping our students to be ready for the next stage of their training.

**General Assessment in Phase 1:** Block and theme leaders will be charged with the responsibility of developing assessment methods within the first phase of the curriculum, with the assistance of the Assessment and Evaluation committee. Each element in an assessment will be related to one or more course and / or theme objective or milestone. While overall performance within a unit will determine if a student passes the unit, assessments for specific objectives, course and themes, will be recorded and available for further analysis.

Commonly used assessment methods will include multiple choice test items, short answer test items, brief essays, problem sets, and reflective pieces. Frequent summative assessments with feedback will be needed in block courses, perhaps every two weeks, to allow students with marginal or poor performance to remediate performance gaps during the block. Standardized patients, simulations using manikins, review of audio and or video interviews, review of patient encounters, and other methods may be used in the assessment of the intensive longitudinal clinical experience and specific milestones. The method chosen will be determined both by the nature of the objective or milestone to be measured and the resources available.

This phase will conclude with the administration of an OSCE focusing on the clinical skills and milestones appropriate for entering the second phase of the curriculum.

**General Assessment in Phase 2:** Phase leaders will be charged with the responsibility of developing methods within the second phase of the curriculum to assess student progress in obtaining phase-related objectives, milestones, and competencies. Records of all assessment will be collected in an electronic performance portfolio. While assessment will occur within the context of a clerkship and will determine successful completion of that unit, the review of performance across all measures in the phase will determine success within the phase.

At least one assessment of the applied medical knowledge unit, preferably NBME Subject Examinations or similar assessments supplied from other national organizations, will be administered for each block clerkship. Focused assessment of clinical skills will include simulations, standardized patients, and well-designed Mini-Clinical Examinations. Assessment of other skills and milestones, including clinical reasoning and communication skills, will be assessed by other observational or written methods. The quality of all assessments will require extensive educator development and / or the identification of a limited number of trained educators charged with these tasks. Review of student-written medical notes, reflective essays, and other written materials may also be developed for student assessment. Students may be required to complete skills assessments in regional assessment centers several times during the phase. All assessments conducted in blocked clerkships will be also conducted in longitudinal integrated clerkships (LIC). A pre-determined number of observational assessments of LIC students will be conducted by visiting educators. Similarly, a specified number of written assessments for LIC students will be evaluated by educators external to the teaching site.
An important component of this phase is the identification of the types of patients and medical conditions a student needs to encounter to effectively master the curriculum’s objectives and milestones. Clerkship educators must be aware of student progress towards meeting these experiences, provide alternative experiences if patients are not available, and assure that students receive similar patient experiences across all teaching sites.

This phase will conclude with the administration of an OSCE focusing on the clinical skills and competencies needed for entering the next phase of their education. This assessment will focus on the general competences needed by all graduates to enter an undifferentiated post graduate program. In effect, this assessment will be the critical summative assessment for our students.

**General Assessment in Phase 3:** Student educational experiences in this phase of the curriculum are by design unique to the individual student’s interests. Consequently, the assessment of the student’s progress in this phase will be primarily in the hands of the educators responsible for the clerkships and courses in which a student enrolls. Reports of observational assessment of clerks used in all required clerkships will be collected for clerkships during this phase. Depending on the final design of the phase, students may be asked to delineate goals and objectives for their experiences, and provide structured self-assessments of their own progress.

**General Assessment in Phase 4 – Post Graduation:** The WWAMI program was developed, in part, to provide access to medical education for residents of Pacific Northwest states without medical schools. Return of students to those states has been a consistent concern of our legislative partners. Historically, assessment of student outcomes has extended to how well our graduates were prepared for residency and their final careers, both type of medical practice and location. The contribution of factors within our curriculum on career outcomes has been a major focus of evaluative work. It is critical that these efforts continue to produce the basic and detailed information needed by our state partners to evaluate their participation in the WWAMI program. The new curriculum, particularly with the possibility of almost all of the initial phase occurring at regional sites, offer new possibilities and requirements for investigating the relationships of educational experiences with career outcomes.

**General Approaches to Program Evaluation:** The School of Medicine currently supports extensive program evaluation activities, utilizing data collected from current student assessment, comparisons of our student characteristics and outcomes with national data, student evaluation of courses, clerkships, educators, and the general program. While these activities have provided essential information for the improvement of our programs, little detailed information has been collected about the ability of our programs in meeting specific curricular objectives. The addition of detailed student assessment information to a centralized portfolio system will allow a much closer and finer grained evaluation of the educational programs of the school.

**Assessment and Evaluation Committee:** A standing committee will be developed whose members will include faculty and evaluation professionals, appointed by the Dean of Curriculum, reporting to the Curriculum Committee. The responsibilities of this committee will be to: 1) develop policies regarding student assessment, grading standards, and program evaluation needed to meet accreditation standards, and ensure appropriate and high quality assessment tools used throughout the undergraduate medical curriculum; 2) assist curriculum leaders in the choice, development, and implementation of appropriate assessment tools; 3) provide evaluative information and reports for the review of each block, clerkship and theme component of the curriculum; and 4) assist in periodic review of student performance and other evaluations.
to determine the ability of the curriculum in helping students to achieve objectives and competencies.

**Entrustable Professional Activities:** This framework began with a reference to a final goal of enabling our students to perform professional activities essential for entry into residency. While entrustment is preceded by the student’s accomplishment of all the appropriate milestones, this decision is more than a simple checking off of components. An entrustment is achieved if the student is observed completing the activity with real patients consistently over a period of time. A number of the assessment tools previously mentioned, such as Mini-CEX and educator observation forms, particularly if collected from multiple sources, may provide evidence in support of an entrustment decision. This evidence, and other assessments collected in the student’s portfolio may lead to a mentor or supervisor’s decision for entrustment. The specific mechanisms by which these decisions are to be made will depend, in part, on the final design of the curriculum and the opportunity of educators to observe students in the environment of the clinic and hospitals.

**Next Sections:** The following sections of the report highlight four major components of assessment considerations: proposed Educator Development of Assessment, Regional Educational and Assessment Centers, Entrustable Professional Activities, and Assessment Portfolio and Dashboard.

**KEY COMPONENTS**

**Component 1: Educator Development**
A successful assessment initiative hinges upon capacity building in people, namely UWSOM educators including faculty, residents, and other health care professionals, who perform critical functions as evaluators of student performance. Below are sets of target skills organized by curriculum phase that the committee considers to be priority areas of training to build and sustain educator capacity at UWSOM.

**Phase 1:** Educator Development is needed to prepare faculty to:
- Match assessment methods to learning objectives
- Write integrated and multi-dimensional multiple choice test items
- Write short answer essays to test students’ ability to apply concepts to human biology and behavior
- Assess learner portfolios and provide feedback
- Develop standardized scoring rubrics for written narrative, including essays, learning portfolios

**Phase 2:** Educator Development is needed to prepare a diverse group of educators to:
- Write integrated and multi-dimensional multiple choice test items
- Develop standardized scoring rubrics for written narratives, including formal patient work-ups, patient notes, etc. in which students may demonstrate and apply previously learned basic science concepts and medical skills in the care of patients
- Provide effective feedback on brief research papers (using published guidelines for research papers) and other written documents that require the student to identify additional content resources beyond those available in course materials as applied to patient care
• Provide feedback on/debrief simulations pertaining to physical examination skills, selected procedures, communication and counseling, team performance and leadership.
• Conduct one-on-one portfolio review and provide feedback based on scoring rubric.
• Evaluate clinical-workplace performance (with multiple direct observations from a variety of trained evaluators to ensure reliability and validity).
  • Develop and/or use validated behavioral checklists
  • Behavioral observation training to improve the detection, perception and recall of actual performance
  • Performance dimension training to familiarize faculty with the definitions and criteria describing each performance expectation
  • Train all health professionals who teach our students, including residents, in the use of clinical-workplace assessments (direct observations of performance)

**Phase 3:** All the faculty development activities identified in Phase 2 are required in Phase 3 to support higher stakes assessments of students’ knowledge base and clinical performance.

**Implementation Strategies:** Potential strategies for educator development include:
  • Deliver large group interactive workshops
  • Deliver trainings using “flipped classroom” techniques
  • Provide access to online training materials
  • Select a cadre of faculty and build time into their schedules for educator development activities. (Similar to the “Colleges model”).
• Develop Train-the-Trainer (TTT) sessions for faculty in the skills of teaching residents how to conduct direct observation assessment of medical students.
• Develop short (20-minute) faculty/instructor development sessions that can be conducted during standing department/division meetings.

**Component 2: Regional Education and Assessment Centers**
The UWSOM Curriculum Renewal Assessment Committee recommends that Regional Education & Assessment Centers be developed in response to curriculum and class expansion plans (Figure 3). The Committee considered four fundamental questions in coming to this recommendation.

**Definition of a Regional Education & Assessment Center**
A Regional Education & Assessment Center is a physical facility with adequate on-site staff and testing personnel to conduct year-round (a) formative learning and faculty development activities as well as (b) formative and summative testing of students' knowledge and clinical skills. Regional Education and Assessment Centers need to be located at the main Seattle Campus and near selected UWSOM affiliated campuses in the five-state region. Each Center should be capable of conducting a high-stakes OSCE or OSCE-like examination, and should provide a location for practice with standardized patients, group learning activities, simulation activities, and a place for students to take computerized standardized tests. In addition, the Centers can serve as a facility to meet regional faculty development needs in improving teaching skills. Therefore, the Centers can play a critical role in strengthening and expanding faculty capacity for sustaining educational excellence of UWSOM throughout the region.

![Figure 3. Overview of Regional Educational and Assessment Centers](image-url)
Rationale Regional Education & Assessment Centers
Regional expansion is expected to increase the class size to 280 or more by the year 2017. Current curriculum plans call for a three-phase curriculum that will require large portions of the curriculum to be taught at regional sites. One regional site (Spokane) has already developed a pilot to train students in all four years. An important principle is that the educational experience be comparable at all sites. This includes access to testing services. It is not practical to transport all students to a central location for their year-round educational and testing needs. The disruption to students’ schedules and the expense of transporting and housing large numbers of students for testing purposes becomes prohibitive. The main Seattle campus is approaching its limit for conducting a large observed clinical examination due to (a) the number of trained clinician observers that are available at any given time; (b) limitations in physical facilities; and (c) numbers of available standardized patients and staff. In the new curriculum, students will need ready access to testing services and training facilities at multiple times throughout the year.

Effect of Regional Centers on the standardization of testing and education
Clinical skills testing in a large medical school with multiple regional sites requires central control of the testing program to insure standardization and efficiency. It is proposed that the Seattle campus serve as the hub of operations to devise case blueprints, oversee the development of cases, train and supervise standardized patients, analyze test results and disseminate test results. Regional sites would be utilized primarily to conduct examinations, observe and record student performances, give students feedback, and provide faculty/staff training. Methods of quality control such as videotaping and data analysis by personnel overseeing the program will help to assure an acceptable level standardization. Adequate access to Regional Education & Assessment Centers may actually help assure a comparable educational process for all students regardless of which region they are training.

Resources needed to create and maintain Regional Education & Assessment Centers
A number of regional facilities, such as schools of nursing, already exist that are specifically designed for the observation of clinical skills and may be able to be shared with other disciples. A full inventory of existing testing facilities within the five-state region will be required. At the present time, the Seattle SOM campus is limited by inadequate testing facilities of its own. At a minimum, an adequate testing facility for an institution the size and caliber of the UW includes 1) at least 12 mock examination rooms equipped with sound and video-monitoring capabilities, 2) a central control and observation room, 3) space for orienting and debriefing students, 3) office space for staff and testing personnel, 4) space and equipment for students to complete computer assessments and write-ups or take a standardized test, and 5) storage space for computers, mannequins and other equipment. Regional centers may be smaller depending on the number of students in the region.

Each regional center will require adequate staff to schedule and conduct OSCE or OSCE-like assessments, proctor examinations, and provide other testing services. It is anticipated that staff from the Seattle hub would work with regional sites in the development of standardized patients and trained observers.

Component 3: Implications of Entrustable Professional Activities for Assessment
Background on Entrustable Professional Activities (EPAs).
The American Association of Medical Colleges (AAMC) has recently developed core consensus competencies that are expected of all MD graduates (Englander R, et al. Toward a common
taxonomy of competency domains for the health professions and competencies for physicians. Acad Med 2013;88: 1088-1094). These EPAs represent a short list of integrated, complex behaviors common to all specialties, reflecting introduction in early stages of training, development and mentoring of core skills, and mastery of the integrated behaviors at the end of medical school. These learning objectives would allow a student to be “entrusted” with a patient at the end of their formal training, working independently to complete these activities. AAMC had adopted 13 EPAs and it was the consensus of our committee that all 13 would be appropriate for adoption at the USWOM. The Assessment Committee developed assessment strategies for EPA 3 and EPA 7 (Appendix). This was done to illustrate how EPAs could function as a unifying framework for medical student assessment in the UWSOM curriculum. Each EPA has origins in the Foundations phase, development in the Clinical phase and features unique to the Career Exploration phase.

Recurrent Themes in Assessment of Progress Using EPAs as Outcomes.
In examining EPA-3 (“Recommend and interpret common diagnostic and screening tests”) and EPA-7 (“Form clinical questions and retrieve evidence to advance patient care”), there were recurrent strategies for assessment that offered opportunities for overlapping feedback, assessment information available to stakeholders (learners, instructors, and overseers) through information technology and a developmental progression aligned with both the new UWSOM curriculum and evolving professional assessment. In the Foundations phase, content knowledge can be assessed using vetted NBME multiple-choice examinations and scored TBL cases. Developing integrated clinical skills can be assessed by mentored observation, structured reflection on video-captured interactions and low stakes OSCEs. During the Clinical phase assessment of live patient interactions, continued evaluation of video-captured patient interactions, additional OSCEs and structured evaluation of documentation provide critical feedback as skills merge and develop to the entrustable level. In the Career Exploration phase, assessment includes structured reflection about career development, further skill development and consolidation with attaining the 7 EPAs. In this phase, emerging directions will provide assessable insights for the practicing physician.

Component 4: Dashboard / Longitudinal Portfolio Design and Implementation
Currently, student assessment data live in multiple UW systems because no single software solution meets all of our needs to administer complex assessment processes across all phases of the curriculum. Current systems include E*Value (clinical evaluations), ExamSoft / QuestionMark (computer-based exams), Catalyst / Canvas (quizzes), the Colleges Portfolio, and the UW Student Database. The Academic Affairs Database (AADB) serves as a small data warehouse that pulls certain data from E*Value and the UW Student Database on a nightly basis, normalizes the data to conform to rational data structures, and provides role-appropriate reports to Academic Affairs/Medical Education deans, faculty and staff, College mentors, Regional Affairs deans, and students themselves. The system also provides ad hoc querying on underlying data views to a limited number of individuals.

In addition to this data warehouse, the Colleges Portfolio tool provides a mechanism for students to submit reflections on their College activities and receive feedback from their mentor. In the new curriculum, we envision an expansion of both the warehouse and the portfolio in which all elements reside in a data warehouse with a dashboard interface to allow students and appropriate educators and administrators to view at a glance the progress of individual students or cohorts. The School of Medicine will need to invest in underlying technologies as well as a more robust data integration infrastructure. Elements of this investment include the following:
Develop or adopt a longitudinal portfolio tool. As this type of reflection will be required assessment activity in other portions of the curriculum, an expanded portfolio tool will be needed to accommodate additional curricular components. It will also accommodate those developed by students and mentors to achieve and document individualized student goals, particularly in Phase 3.

Develop a mechanism and process to tag assessment items. In order to track progress toward competencies, themes and threads, each assessment item (e.g., MCQ, essay question, OSCE station, etc.) will need to be tagged consistently. Some assessment systems permit this type of tagging, but others do not. A method of applying these tags will need to be developed, and appropriate staff/faculty time needs to be allocated to ensure quality control.

Create and expand data integrations. Data transfers between AADB and several new systems will need to be established. In some cases the process will be automated, but in other cases it may require manual export of data from the source system and import into AADB. In addition, only a limited set of data from clerkship evaluations is currently pulled into AADB. Additional data (e.g. ratings on clinical skills, professionalism concerns, and comments from all evaluations) will need to be pulled into the expanded data warehouse. The figure below illustrates the flow of data from source systems to AADB and then to the end user through static reports or a dashboard.

Create a dashboard view. Because of the integrated nature of the new curriculum, it will be difficult to track student progress toward an individual competency across courses/clerkships, blocks and phases. Individual students will need an interface that shows their progress to date on the level of competencies and sub-competencies. As each assessment occurs, this view should be updated dynamically to allow the student to see their progress on multiple dimensions. The figure below illustrates how an individual student view might appear. Four competency domains are represented here, with progress bars for each sub-competency based on assessment data that has flowed into AADB from source systems.
Develop an early warning system. As more real-time assessment data becomes available in AADB, it should become possible for the Associate Dean for Student Affairs (and others, as appropriate) to identify students who are struggling with academic or professionalism issues. This early warning system could identify not only students in serious difficulty, but also students who consistently receive marginal but passing grades on a given competency.

The dashboard and portfolio development outlined here will allow students, educators and administrators to act on relevant data in a timely manner to ensure student success in achieving curriculum competencies.

Figure 5. A Mock Dashboard View
EPA 3: Recommend and Interpret Common Diagnostic And Screening Tests

Summary: The matrix below illustrates assessment strategies tied to EPA 3: Recommend and interpret common diagnostic and screening tests. Columns coincide with UW phases. Rows coincide with domains of competence, as laid out in the 2013 AAMC publication on “Core Entrustable Professional Activities for Entering Residency”.

On reviewing the matrix below, one can spot recurring methods of assessment as follows:

**Foundations phase** – The inclusion of repeated formative assessments with feedback and a focus on assessing learners’ increasing knowledge base and ability to apply that knowledge to patients with fixed findings and in case scenarios and instructional, low stakes OSCEs with feedback.
1. Short answer and MCQ tests to test developing knowledge base – perhaps in the context of TBL/PBL type formats.
2. Assessment/guided review of audio or videotaped interactions (either simulated or real patient encounters).
3. Identifying conditions in patients with fixed findings,
4. Instructional and low-stakes OSCEs

**Clinical & Career exploration phases** – The inclusion of direct observation of what the learner actually “does” in the clinical setting. The focus in these phases is on assessing learners’ ability to gather and review relevant patient information from multiple sources; weigh information, present recommendations, and engage in discussion with patients.
1. Direct observation of patient encounters using checklists and global ratings
2. Observation of performance in simulated encounters with Standardized Patients (OSCE or OSCE-like methods)
3. Review of student reflections on clinical encounters – in support of reinforcing evidence base for prioritized skills and conceptual frameworks.
4. Assessment of oral presentations (drawing out thinking through One-minute preceptor, Ask-Tell-Ask – and in situ teaching and evaluation) and written documentation (through developed rubrics).

<table>
<thead>
<tr>
<th>Interpret lab data, imaging studies, and other tests required for the area of practice.</th>
<th><strong>Foundations Assessment</strong></th>
<th><strong>Clinical Assessment</strong></th>
<th><strong>Career Exploration Assessment</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Assessing learners’ ability to distinguish normal/abnormal using written exams – including case based scenarios/vignettes.</td>
<td>Testing for learners’ ability to distinguish normal/abnormal using written exams.</td>
<td>Supervision of direct patient encounters in which the learner interprets lab data, imaging studies and other appropriate tests.</td>
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<tr>
<td>Clinical cases in PBL/TBL format where students determine lab data, imaging studies and other tests that evaluate organ system function and pathology associated with that organ system.</td>
<td>Clinical cases that exemplify lab data, imaging studies and other tests that evaluate organ system function.</td>
<td>Direct observation of patient encounters using checklists and global ratings.</td>
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<tr>
<td>Self-study modules of clinical cases that allow students to determine what testing is needed</td>
<td>Supervision of direct patient encounters in which the learner interprets lab data, imaging studies and other appropriate tests.</td>
<td>High stakes OSCE’s to evaluate students’ ability to interpret lab data, imaging studies and other studies pertinent to the OSCE content.</td>
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<tr>
<td>Foundations Assessment</td>
<td>Clinical Assessment</td>
<td>Career Exploration Assessment</td>
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<td>and how to interpret the results.</td>
<td>Tests to order, with feedback.</td>
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<tr>
<td>Patients with “fixed findings – including patient images – presented to students – to provide opportunities for practice interpretation with feedback.</td>
<td>Socratic questioning in clinical context.</td>
<td>Low stakes OSCEs</td>
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<tr>
<td><strong>Incorporate considerations of cost awareness and risk-benefit analysis in patient and/or population-based care.</strong></td>
<td><strong>PBL/TBL cases where students investigate costs and the risk-benefits of tests.</strong></td>
<td><strong>In clinical settings observation of direct patient encounters evaluating students’ consideration of the cost/benefit and risk/benefit analysis in determining testing to order for patients. (Use of Socratic questioning, “think aloud protocols.”)</strong></td>
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<tr>
<td><strong>Demonstrate an investigatory and analytic approach to clinical situations.</strong></td>
<td>Assessing learners’ ability to apply knowledge of testing to clinical cases through written examinations.</td>
<td><strong>In clinical settings the student considers the clinical presentation in determining what testing is appropriate.</strong></td>
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<td></td>
<td>Standardized patients.</td>
<td>Examination of students’ analytic approach to diagnostic testing through on-line cases, examinations, oral presentations and written documentation.</td>
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<td>“Think aloud” protocols; asking for justifications.</td>
<td>Use of one-minute preceptor; Ask-tell-ask to elicit thinking and provide feedback.</td>
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<td><strong>Apply principles of epidemiological sciences to the identification of health problems, risk factors, treatment strategies, resources, and disease prevention/health promotion efforts for patients and populations.</strong></td>
<td><strong>PBL-based cases where students investigate and apply principles of epidemiological sciences to the identification of health problems, risk factors, treatment strategies, resources, and disease prevention/health promotion efforts for patients and populations.</strong></td>
<td><strong>Actual patient encounters in which the student determines what testing is needed taking into account the identification of health problems, risk factors, treatment strategies, resources, and disease prevention/health promotion efforts for patients and populations.</strong></td>
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<td>Actual patient encounters in which the student determines what testing is needed taking into account the identification of health problems, risk factors, treatment strategies, resources, and disease prevention/health promotion efforts for patients and populations.</td>
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<td>Foundations Assessment</td>
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<tr>
<td>Written examinations evaluating application of epidemiology to clinical cases.</td>
<td>populations. (Assessment through questioning – OMP, Ask-Tell-Ask). Examinations assessing application of these principles. (Especially oral examination – Socratic questioning).</td>
<td>populations. Direct observation of patient encounters using checklists and global ratings.</td>
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<tr>
<td>Make informed decisions about diagnostic and therapeutic interventions based on patient information and preferences, up-to-date scientific evidence, and clinical judgment.</td>
<td>Practice cases PBL of clinical cases where patients preferences and history, evaluation of the literature to inform what diagnostic testing is needed. Standardized patients.</td>
<td>Direct observation of students’ solicitation of patients’ preferences and history, evaluation of the literature to inform what diagnostic testing is needed. Assessment of write ups where student weights history, testing and scientific evidence to determine therapeutic interventions needed. Direct observation of patient encounters using checklists and global ratings OSCEs.</td>
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<td>Counsel and educate patients and their families to empower them to participate in their care and enable shared decision-making.</td>
<td>Small group activity practicing counseling patient and families on. Early practice with patients in nursing homes or in the context of longitudinal experiences with assigned patients. Feedback from the patients. Web-based modules-trigger tapes with “select a best answer”.</td>
<td>Direct observation in the clinical setting evaluating student communications with patients/patient supports regarding test results, further testing needed and the rational for such testing. Patient survey – with feedback to student about how they are perceived. Instructional OSCE’s – with feedback from SPs. Direct observation of patient encounters using checklists and global ratings OSCE’s evaluating students skills in shared decision making with patient.</td>
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<td>Provide health care services to patients, families, and communities aimed at preventing health problems or maintaining health.</td>
<td>Early experiences in student-run clinics? Portfolios, “critical incident” reports. Written reflections on preventative health care provided to patients of different demographics</td>
<td>Direct observation) in the clinical setting evaluating students’ identification of appropriate tests, studies and interventions for preventative health care. (Aided by Direct observation in the clinical setting evaluating students’ identification of appropriate tests, studies and interventions for preventative health care.</td>
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<td>Foundations Assessment</td>
<td>Clinical Assessment</td>
<td>Career Exploration Assessment</td>
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<td>from longitudinal clinic. Clinical online cases or PBL/TBL cases that students work through that illustrate an understanding of preventative health practices.</td>
<td>checklists and rubrics)</td>
<td>Direct observation of patient encounters using checklists and global ratings. OSCE’s to evaluate students’ ability to communicate with patients about preventative health care.</td>
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APPENDIX 2: PROPOSED ASSESSMENT FRAMEWORK FOR ENTRUSTABLE PROFESSIONAL ACTIVITIES (EPA) 7

EPA 7: Form Clinical Questions And Retrieve Evidence To Advance Patient Care

Summary: Columns coincide with UW phases. Rows coincide with domains of competence, as laid out in the 2013 AAMC publication on “Core Entrustable Professional Activities for Entering Residency”.

**Foundations phase** – The inclusion of repeated formative assessments with feedback and a focus on assessing learners’ increasing knowledge base and ability to apply that knowledge to patients with fixed findings and in case scenarios and instructional, low stakes OSCEs with feedback.
1. Short answer and MCQ tests to test developing knowledge base – perhaps in the context of TBL/PBL type formats.
2. Assessment/guided review of audio or videotaped interactions (either simulated or real patient encounters).
3. Identifying conditions in patients with fixed findings,
4. Instructional and low-stakes OSCEs

**Clinical & Career exploration phases** – The inclusion of direct observation of what the learner actually “does” in the clinical setting. The focus in these phases is on assessing learners’ ability to gather and review relevant patient information from multiple sources; weigh information, present recommendations, and engage in discussion with patients.
1. Direct observation of patient encounters using checklists and global ratings
2. Observation of performance in simulated encounters with Standardized Patients (OSCE or OSCE-like methods)
3. Review of student reflections on clinical encounters – in support of reinforcing evidence base for prioritized skills and conceptual frameworks.
4. Assessment of oral presentations (drawing out thinking through One minute preceptor, Ask-Tell-Ask – and in situ teaching and evaluation) and written documentation (through developed rubrics).

<table>
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<tr>
<th>Identify strengths, deficiencies, and limits in one’s knowledge and expertise</th>
<th>Foundations Assessment</th>
<th>Clinical Assessment</th>
<th>Career Exploration Assessment</th>
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<tr>
<td>Performance data from Foundations (conceptual MCQ, TBL, Case Studies Self-reflection regarding performance; goals set during independent development plan (IDP)) Application to clinical problems during clinical immersion (foundation phase)</td>
<td>Reports from clinical mentors identifying areas of strength, challenge and emerging skills. Clinical presentation skills to colleagues, perhaps reflecting understanding coupled with communication</td>
<td>OSCE data regarding clinical cases Mentor comments regarding strengths and challenges Self-reflection regarding career preferences among areas of strength</td>
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<p>| Identify and perform learning activities that address one’s gaps in knowledge, skills or attitudes | Professionalism basics assessed by MC/TBL/Case Use of collaborative-consultation during case studies/group | Helical learning during clinical assessment | USMLE score data Assessment of behavior during any remediation activity regarding attitude and professionalism |</p>
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<tr>
<th>Locate, appraise, and assimilate evidence from scientific studies related to patients' health problems</th>
<th>MIDM-type integrated activities, teaching information competencies during foundations, assessed by projects and presentations. Cases during clinical immersion focus on integrated problems solving, related to care options.</th>
<th>Mentored observation regarding dissection of clinical problems coupled with appropriate information gathering. Structured case-study assessment.</th>
<th>High stakes summative case presentation involving challenging decision-making options; up-to-date clinical challenges. OSCE. Standardized patient exercises. Self-reflection on skill development.</th>
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<tr>
<td>Use information technology to optimize learning and clinical care</td>
<td>MIDM-type integrated activities during Foundations, teaching information competencies.</td>
<td>Specific assessment of information literacy and competency using current problems (such as changes to DTP/DTaP vaccination).</td>
<td>Portion of high stakes clinical case assessment requires information literacy skills.</td>
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<td>Obtain and utilize information about individual patients, populations of patients or communities from which patients are drawn to improve care</td>
<td>MIDM-type integrated activities during Foundations, teaching information competencies. Comparisons or reflection of varied settings for observation involving differing patient populations and regional concerns.</td>
<td>Observation and mentored experiences gathering histories from diverse populations. Self-reflection on skills and/or improvement in this area? Assessment of experiences and any deficiency in these experiences.</td>
<td>High stakes assessment with actors/standardized patients representing diverse populations.</td>
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<td>Apply established and emerging principles of clinical sciences to diagnostic and therapeutic decision-making, clinical problem-solving, and other aspects of evidence-based health care</td>
<td>Demonstrate understanding of principles using MC/TBL/Case-based foundational courses. Identification of NEW issues during foundational training.</td>
<td>Mentored casework demonstrating diagnostic forks in cases involving new issues; low stakes assessments. USMLE step data.</td>
<td>USMLE data. High stakes assessment including current issue, requiring information gathering. OSCE.</td>
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<td>Apply principles of epidemiological sciences to the identification of health problems, risk factors, treatment strategies, resources, and disease prevention/health promotion efforts for patients and populations</td>
<td>Assessment of foundational knowledge in case-based or TBL using common clinical problems, such as aging, unhealthy behaviors or patient consent issues.</td>
<td>Mentored cases during clinical rotations, assessment by mentors. Low stakes. OSCE/standardized patients.</td>
<td>High stakes summative cases. High stakes presentations of cases. USMLE data.</td>
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<td>Communicate effectively with colleagues within one’s profession or specialty, other health professionals, and health related agencies</td>
<td>Active learning modes involving watching effective communication, discussing effective communication and a case-based taped discussion of learner using techniques</td>
<td>Mentors trained in communication as well as clinical skills assess learner for professional discussions with colleagues</td>
<td>High stakes assessment of case requiring consultation with multiple colleagues</td>
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<td>Peer assessment in small groups of effective communication, using constructive inquiry</td>
<td>OSCE/simulation-based clinical consult</td>
<td>Teaching effective communication to new student learners under supervision of learner</td>
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### Additional Options:

| Communicate effectively with patients, families, and the public, as appropriate, across a broad range of socioeconomic and cultural backgrounds | Principles assessed by MC/TBL/case-based scenario | Mentored interaction at varied locations | Self-reflection on skill development | High stakes |