

<b>1. Name your learner assessment activity(ies)</b>
<p>National assessment development: 1) Member of Association of American Medical Colleges (AAMC) Core Entrustable Professional Activities for Entering Residency (CEPAER) drafting panel; 2) National Board of Medical Examiners (NBME) item writing panel for Biochemistry and Pharmacology; 3) collaborator with national colleagues to promote adoption of a metabolic map as a teaching/learning tool and reference on boards exams.</p> <p>Local assessment development: UCSF Competency Director, Medical Knowledge</p>
<b>2. Your role(s)</b>
<p>National roles: 1) The AAMC Core EPAs were designed to guide national development of innovative assessment programs and tools; I was one of two basic scientists on the drafting panel; 2) annually I write 40+ and review and edit hundreds of questions on biochemistry/pharmacology for the United States Medical Licensing Exam with a panel of other experts; 3) I have introduced use of a standardized metabolic map as a learning and assessment tool into my courses at UCSF, have begun to study its impact (see below), and am part of a national collaboration with biochemistry educator colleagues and the NBME to include the map as a reference on licensing exams.</p> <p>Local roles: I oversee reporting of discipline-specific "Essential Core Subject" data (subject scores) to 1st- and 2nd-year students, and liaise with 18 faculty subject representatives that administer discipline-based remediation; I have also developed and piloted a formative medical knowledge exam during the first year using NBME Custom Assessment Services.</p>
<b>3. Learners and amount of contact</b>
<p>I direct a course for 120 School of Pharmacy P1s per year, and another course for 150 Medical students (MS1s) per year. The national assessment development activities described above are far wider-reaching, and I do not have direct contact with the learners.</p>
<b>4. Builds on best practice/evidence</b>
<p>To prepare for my local and national roles I have attended local, regional, and international workshops and courses on assessment tool design, including EPA, blueprinting, standard-setting, and item design workshops. The metabolic map project is building on evidence in the literature related to impact of providing memory aids (graphic organizers, maps, and other visual aids) to learners during assessments; I am in the process of carrying out a systematic review with national collaborators.</p>
<b>5. Goals for assessment</b>
<p>Goals of the national EPA project are described in detail here: <a href="http://tinyurl.com/CEPAERpublication">http://tinyurl.com/CEPAERpublication</a>. The overarching goal of the metabolic map project both locally and nationally is to promote design of assessment focused on problem-solving, application of knowledge, and deeper learning rather than recall. The goal of subject score reporting and remediation is to ensure that students know their relative strengths and weaknesses in longitudinal disciplines in the curriculum that might not be apparent from their overall exam scores, and that they have access to resources for support and improvement.</p>
<b>6. Methods</b>
<p>I would like to highlight a method for development of discipline-specific remediation for low performance in EC Subjects, which is that I have developed spaced education courses as remediation tools for students not at competency in individual disciplines. Spaced education courses using the Qstream platform are easily accessible by students, can be completed with just 5-10 min of time per sitting, and are a flexible way of delivering highly individualized learning, support, assessment, and feedback.</p>

## 7. Results and impact

National results and impact: CEPAER project - a national collaborative of schools is moving forward designing and implementing EPAs based on the AAMC Core EPAs. Metabolic map project - I have been invited to join an NBME task force in Philadelphia this summer to investigate implementation of a metabolic map as a reference on Step 1 of USMLE. Local preparation for this role has included my piloting use of the map as a reference on assessments in my own courses. SOP and SOM students who have used the metabolic map have rated "usefulness of the map for learning" higher than any other component of the course (2015 SOP avg 4.83 out of 5, std dev 0.45; N=70; 2015 SOM avg 4.23 out of 5; std dev 0.76; N=47). Many comments on the overall course evaluation focused on how powerful and useful the map was for student learning.

Local results and impact: Each year I help coordinate remediation for between 5-20 MS1s identified as struggling in individual disciplines; students report satisfaction with this process; studies on local spaced education courses have demonstrated that engagement in some courses increases student performance on a standardized exam, that 55% of users in the cohort examined voluntarily completed at least one course, and that many users requested the opportunity to participate in more of such review courses.

## 8. Dissemination

Dissemination of national work: CEPAERs published at <http://tinyurl.com/CEPAERpublication>, and a 2nd paper is in press in Academic Medicine, presentations at 2014 International Association of Medical Science Educators (IAMSE) and 2013 Association of Biochemistry Course Director (ABCD) conferences. Metabolic map project presentation at 2015 ABCD conference, presentation at 2015 AME Education Showcase.

Dissemination of local work: presentations about subject score reporting, spaced education, and assessment given at national and international conferences (2015, 2013 Association of Biochemistry Course Directors (ABCD), 2014 International Association of Medical Science Educators, 2014 WGEA).

## 9. Reflective critique

All of my work in and around learner assessment has been rewarding to contribute to the domain of learner assessment on the local, national, and international levels. The area in which I will be doing the most work in the transition to the new Bridges curriculum is in subject score reporting. We are in the process of a) changing the set of disciplines that are tracked so they match those reported for USMLE Step 1 exactly and b) completely redesigning our Medical Knowledge assessment system to focus more on short answer/essay summative exams. Both of these will require a re-organization of the methods of assessment and subject score reporting process, which has already begun.