1. Name your teaching activity(ies):

Brain, Mind and Behavior Visual System Didactics, Foundations of Patient Care Scopes Course, clinical preceptor for third and fourth year students, ophthalmology residents and clinical fellows; Retinal Degenerations/Medical Retina clinic attending; Continuing Medical Education lecturer; Ophthalmology and Academic Ophthalmology career advisor.

2. Your role(s):

* Teaching visual system small group and direct ophthalmoscopy sessions
* Skills session for pre-clerkship students in 160.01 elective and 4th year students before they start sub-internships in Ophthalmology
* Attending physician for medical students, residents and fellows in medical retina clinic
* Instructor for fluorescein conference and Retina cases at Ophthalmology Grand Rounds Lecturer at UCSF Ophthalmology CME course every year since 2000

3. Learners and amount of contact:

* 1st year medical students: 97-100 in Scopes course; 114 students in Brain, Mind and Behavior lecture and small group sessions lasting 2 hours; 20-30 in Ophthalmology elective 160.01
* 3rd year medical students: 3-11 in ophthalmology clerkship offered 6-8 times a year, 1 each year in longitudinal clinical elective once a week for 22 sessions a year
* 1st and 2nd year ophthalmology residents and retina fellows: 4-8 hours of clinic each week; course instructor for 1 hour fluorescein conference each week, 3 months a year

Ophthalmology community: 60-150 academic and community ophthalmologists attend Grand Rounds each week; I organize case presentations in Retina 4-5 times a year and sponsor 4-5 case presentations at Grand Rounds, and lecture at the UCSF Ophthalmology CME course attended by 100- 150 community ophthalmologists each year.

4. Builds on best practice/evidence:

Working with a group of curricular ambassadors, we identified 18 gaps between the pre-clerkship UCSF medical student curriculum and the American University Professors of Ophthalmology (AUPO) recommendations and the UCSF Essential Core and Foundations of Patient Care (FPC) curriculum. We created new resources including additions to the Scopes course and FPC syllabus, independent learning modules (ILMs) and a clinical ophthalmology website with interactive modules, and a pharmacology assignment in the Prologue course to address 11 of those gaps. We are working to continue to address the remaining 7 gaps.

5. Goals and learning objectives:

The goal of the undergraduate medical education program in Ophthalmology is that all graduates of UCSF School of Medicine are prepared to evaluate patients' visual system complaints, and to either treat or refer those patients as appropriate. Some examples of learning objectives for our program:
Visual System didactics for Brain, Mind and Behavior:
* The Retina: explain how rods and cones differ; understand how retinal disorders cause vision loss
* Visual Fields: test confrontation visual fields on classmates; identify the physiological blind spot on one or more classmates; explain the principles underlying the localization value of visual field testing
* Pupil Response: test pupillary responses on classmates; understand how abnormalities of pupil responses enable localization of the source of vision loss; understand how pupil abnormalities can result from neurological disease

The Extraocular Muscles: understand which nerves innervate the extraocular muscles; explain the consequences of cranial nerve palsies on ocular motility; understand how cranial nerve palsies may result from neurological disease

6. Methods:

* To integrate the visual system lectures into the Brain, Mind and Behavior course we designed a comprehensive syllabus, 2 hour online lecture, and a student-led small group course, and provide assistance in the orbital anatomy lab. The student-led small group session involves a series of clinical cases that students work through in small groups of 3-4, using online resources including the syllabus to achieve the learning objectives listed above. The student-led nature of the experience increases the engagement and ownership of the learning process by the students, and the interactive nature of the experience integrates elements of patient care, medical knowledge, practice-based learning, and interpersonal and communication skills. This work addresses gaps in Medical Knowledge, Core Clinical Skills and Recognition of Red Flag Physical Findings in the UCSF medical school curriculum as defined by the Association of University Professors in Ophthalmology.

In the Scopes course, I created an introductory lecture and implemented small canisters and a worksheet to introduce the students to the techniques of direct ophthalmoscopy.This program addresses gaps in Core Clinical Skills in the UCSF medical school curriculum as defined by the Association of University Professors in Ophthalmology.

7. Results and impact:

* The evaluations for the visual system lectures in Brain, Mind and Behavior increased in response to the new curriculum from 3.26 to 4.06, with current scores higher than those received by a senior faculty member in 2012.
* The students report increasing comfort performing direct ophthalmoscopy on a patient in their preceptorships each year the Scopes course has been evaluated (from 48% reporting somewhat or very comfortable in 2013 to 50% in 2014)
* Retina didactic sessions including fluorescein conference, grand rounds and clinic have resulted in sustained improvement in UCSF ophthalmology resident scores on national Ophthalmic Knowledge Assessment Program results. The average overall percentile scores compared to Ophthalmology residents nationwide have increased as follows: 2010: 55.3%, 2011: 66.7%; 2012: 77.1%, 2013: 81.7%, and the subscores in the Retina section were the highest among 10 subspecialties.
* UCSF Ophthalmology Update 2013 CME course lecture average score was 4.62, higher than all speaker average of 4.36 (n=99 respondents).

8. Dissemination:

* The Association for Research in Vision and Ophthalmology conducts the largest annual international vision research meeting. I have been invited to teach learners seeking careers in ophthalmology from around the nation and around the world at the “Pizza with an Expert” event since 2009.

I maintain the Vision and Ophthalmology Interest Group website which provides on-demand educational resources to students, including individual learning modules on the eye exam, visual system and common ophthalmology problems created with Curriculum Ambassador medical students.

9. Reflective critique:

I was gratified to learn that the renovated BMB curriculum was well-received by students and the course directors, and worked with the course directors to modify the experience slightly this year. In coming years I have the following specific goals:
1. Critically assess how the student-led small group sessions integrate with the lecture, syllabus, orbital anatomy and FPC Scopes sessions to ensure the different components of the visual system didactics are integrated.
2. Work with Essential Core and Core Clerkship leadership to address the remaining 7 gaps between the UCSF curriculum and AUPO recommendations
3. Engage students to focus on clinical skills that will be relevant and useful for all graduates of UCSF medical school, including assessment of pupillary responses, visual fields, and direct ophthalmoscopy.