Guiding Medical Students through Practical Experiences in Population Health

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ABSTRACT:
To promote competencies in population health, we developed a required 4-week clerkship which provides students with practical experiences in practice-based learning and improvement (PBLI). In this clerkship, student teams are matched with a clinician with a relevant PBLI project and assigned to a ‘methods advisor’ from the Department of Preventive Medicine and Public Health. Students receive ‘just-in-time’ training in the classroom on issues related to project development and implementation. Week 1: Identify need/issue for a defined patient population; investigate current literature and project methods. Week 2: Design project plan, develop data collection tools, and select statistical tests for evaluation. Week 3: Collect and analyze data. Week 4: Present findings. Student teams demonstrate progress on their PBLI project by meeting weekly with their methods advisor to review project benchmarks. Within the past decade student teams have engaged in over 500 projects. Categories include: 1) Community Aspects of Practice and Public Health (56%); 2) Outpatient Clinical Practice Improvement (20%); 3) Inpatient Clinical Practice Improvement (18%); 4) Medical Education (4%); and 5) Health Policy (2%). Students demonstrated competency by successfully applying quality improvement methods to these focused population health issues. Our progress to-date demonstrates that a 4-week PBLI clerkship is feasible and can provide practical quality improvement experiences in which students can achieve population health competencies.

EDUCATIONAL METHODS OR APPROACHES USED:
The Health of the Public course incorporates team-based leaning workshops; lectures, and student team presentations. The PBLI projects require literature reviews; the development of data collection tools; data collection and analysis; and the preparation of oral and poster presentations.

PROJECT DESCRIPTION:
Health of the Public (HOP) is a required fourth-year medical school clerkship offered three times in the academic year: October, February and April. During this 4-week clerkship students participate in interactive team-based learning sessions, attend seminars, and work in teams on a population-based health care project called their “capstone project.” The framework for this required team-oriented clerkship grew out of the RMPHEC population health competencies and the ACGME practice-based learning and improvement (PBLI) competencies. The course links students with practicing clinicians or members of the community who are interested in studying or improving clinical practice or addressing a health concern. A coordinator on the KUMC campus oversees the HOP classroom activities and PBLI projects, and acts as a liaison to community clinicians. The course is a critical component of the teaching obligations of the Department of Preventive Medicine and Public Health and has been sustained for the past 12 years.

HOP classroom activities provide students with team building, critical appraisal, and presentation skills that they apply to their PBLI projects:

A) Six team-based learning workshops complement reading assignments: Health Behavior Theory and Conceptual Models, Quality Improvement (Medical Errors), Practice Redesign and the Medical Home, Evidence-Based Medicine, Introduction to Health Insurance, and Medicare and Medicaid.
B) Content experts from the medical center lecture on the following topics: Logic Models, Risk Management, Health Insurance Reform, Evidence-based Medicine and Clinical Decision Making, Physician Payment Systems, and Applying Statistics to PBLI.

C) Student Team Presentations on Current Medical Topics cover ten to twelve topics per cohort. Topic examples include: Accountable Care Organizations, Innovations in Informed Patient Decision Making in the Medical Encounter, and Pharmacy-based 'Minute Clinics'.

The HOP capstone project is a PBLI project grounded in a clinical environment. The coordinator contacts HOP students 6 weeks prior to class regarding their residency interests, in order to identify HOP capstone projects that may lay the foundation for future PBLI initiatives. The coordinator also confirms potential site mentors and in consultation with them, creates a list of promising projects. Four weeks before class, students attend a capstone project information session where the course structure is explained, and where students begin to consider projects on the preliminary list developed by faculty; students may also decide to initiate their own project. Over the ensuing weeks the coordinator and faculty match student groups of 3-4 with new or existing projects, an appropriate mentor, and a "methods advisor" from the Department of Preventive Medicine and Public Health. To complete the course didactics and project in 4-weeks, at least an outline of a project idea and a mentor are required prior to the start of the rotation.

Student teams meet weekly with their methods advisor to review deliverables and demonstrate PBLI project progress. The PBLI projects follow this 4-week schedule:

Week 1: Identify need/health concern to be addressed for the defined patient population and develop a focused study question; investigate current literature; create a logic or conceptual model that illustrates the proposed improvement process; prepare a quality improvement/quality assurance human subjects protocol. (On the 1st day of HOP, mentors meet with the HOP faculty "methods" advisor and the student team. At this meeting students are briefed on their project’s population health issue, all parties come to a consensus regarding the project objective, and students develop a focused study question.)

Week 2: Present preliminary literature review; design and plan implementation timeline for project; develop data collection tools (data entry or survey).

Week 3: Collect data, identify appropriate statistical tests and analyze data; draft presentation powerpoint.

Week 4: Complete data analysis and present findings. Student teams prepare oral and poster presentations.

HOP is a very tightly organized course. Site mentors are warned that they must respond to student e-mail questions within 24 hours. Human subjects committee meeting arrangements are made before the clerkship begins so that all the project protocols are reviewed (and amended, if necessary) and approved in week 2.

A poster exhibit is held at the end of each HOP session. All university medical center faculty and medical students are invited to attend this event. HOP students discuss their research and field questions from colleagues and instructors. On occasion, students have presented their posters at the University of Kansas Student Research Forum and the Kansas Public Health Association Annual Conference. Site mentors and students have successfully submitted abstracts or posters derived from HOP student projects at professional meetings (e.g., Annual Meeting of the North American Primary Care Research Group, North American Association for the Study of Obesity Scientific Meeting, Annual Meeting of American Society of Anesthesiologists, International Liver Transplant Society Annual Meeting, and the
Many hospital departments and community providers collaborate on the PBLI projects. Project mentors are recruited primarily from clinical departments (internal medicine, family medicine, radiology, anesthesia, and pediatrics), but are also from community agencies and health departments (e.g., Rose Brooks Domestic Violence Agency, Kansas City, MO; Silver City Health Center, Kansas City, KS; Wyandotte County Health Department, Kansas City, KS.) The HOP faculty and course coordinator have developed relationships with department chairs, residency directors, and the quality improvement and performance improvement teams in the hospital. The Department of Preventive Medicine and Public Health also has close ties with providers in the community that deliver health care to uninsured and underserved patients.

Within the past decade, student teams have engaged in over 500 projects. These projects have addressed a wide range of topics, including colon cancer screening, diabetes management, childhood obesity, smoking cessation, mammography, management of acute coronary syndromes, surgical wound prevention, and transitions of care after discharge.

**HEALTHY PEOPLE OBJECTIVE ADDRESSED:**

HOP addresses the Healthy People 2020 objective ECBP-12s: Increase the inclusion of core clinical prevention and population health content in M.D.-granting medical schools. (by providing content in required courses)

ECBP–12.1 : Counseling for health promotion and disease prevention.
ECBP–12.2: Cultural diversity
ECBP–12.3: Evaluation of health sciences literature
ECBP–12.4: Environmental health
ECBP–12.5: Public health systems
ECBP–12.6: Global health

Many PBLI projects have addressed Healthy People 2020 objectives, including Chronic Disease Care, Violence Prevention, Tobacco Use, Obesity, Community-based programs; Health policy; and Disparities. Other aspects of HOP, such as the Health Insurance Reform lecture ("Instituting new programs, policies, and practice"); the Practice Redesign and the Medical Home team-based learning workshop, ("Changing aspects of the physical or organizational infrastructure"); and the Insurance, Medicare and Medicaid team-based learning workshop ("Understanding Access to Health Services") also inform students on topics related to the Healthy People 2020 objectives.

**PROGRAM OR COURSE GOALS:**

**Number of students enrolled/participating in 2010-2011 school year:** 115

Fourth year medical students in a 4-week required clerkship.

After completing the HOP derkship, medical students should be able to apply the scientific method to a population-health care issue and demonstrate competency in practice-based learning and improvement.

In order for students to meet PBLI project goals, they must: 1-Describe problem in a defined patient population; 2-Develop a focused study question; 3 -Identify relevant literature needed to answer question; 4- Critically review articles for study design, methods, major strengths and weaknesses in studies; 5-Understand the basic concepts related to statistics and data presented in a study; 6-
Healthy People 2020 and Education For Health
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Determine methods you will use to analyze a study question; 7-Evaluate an intervention to address a quality of care problem; 8-Collect and analyze data; and 9-Assess impact of intervention

Did you conduct a needs assessment as part of your planning process? ☑ Yes ☐ No

We identified strong support in the literature and professional organizations for teaching PBLI and population health, but few examples of successful programs and few tested curricular materials.

Prior to the implementation of this course, students have little exposure to Practice-based learning and Improvement or Systems-based Practice. Quality improvement activities are incorporated into two sessions in years 1-2. Medical students do receive some instruction in population-health topics during the first 2 years of their education: Epidemiology and Biostatistics, Determinants of Health, Health Policy, Evidence-based Medicine, Cultural Competency, and Access to Insurance. These topics, however, are not integrated in a meaningful way with their clinical experiences until they take the HOP course.

PROFESSIONS INVOLVED:

Three core faculty (1 M.D., 2 Ph.D.) from the Department of Preventive Medicine and Public Health serve as primary instructors and 'methods' advisors for projects. Faculty from other departments (pediatrics, anesthesia, radiology, internal medicine, family medicine) and community organizations serve as 'clinical mentors/content experts' and provide the topics for the practical projects. Forty to fifty mentors volunteer on student capstone projects each year.

LESSONS LEARNED/EVALUATION RESULTS:

Several components have led to the success of this program: 1) Students have 4 weeks of dedicated time to study population health without the distractions of other clinical duties 2) Students have classroom time to learn fundamentals of population health and health systems and can immediately apply some of these concepts in a practice-based learning and improvement project 3) Students work in teams both in the classroom and on their project. Classroom activities apply novel concepts of 'team-based learning', while on their project students learn to work together to coordinate activities on a practice-based learning and improvement project that must be completed within 4 weeks.

Initially, finding clinician mentors with interests in quality measurement and improvement was difficult, and only a small number of projects had led to actual institutional changes. During the first years of the course, this lack of enthusiasm from practicing clinicians led some students to think that skill sets in population health were irrelevant to their future practice. This was particularly problematic for some students planning to go into subspecialties. The environment however is changing rapidly, spurred by strong leadership in quality improvement at our main teaching hospital. Participation from physicians and nurses in radiology, anesthesia, and critical care have helped students recognize that the principles of patient safety, quality improvement, and population health apply to all disciplines - not just primary care, and that all physicians have responsibilities related to PBLI and population health. Potential clinicians and community providers for capstone projects are now recruited whenever possible (e.g., chance meetings in the hallways, grand rounds, seminars, committee meetings) and a list of projects is kept "on-tap."

Students need to find value in the work they've done on their project and the poster exhibit allows them to present their results to faculty in a low-key forum. Faculty are very supportive and by engaging students in discussion reinforce the value and usefulness of the PBLI project. We are particularly pleased that former HOP students, now on the hospital staff, have embraced quality improvement efforts in their own departments and have become mentors and role models for current HOP students.

Student feedback gathered from the HOP internal course evaluation and the KU School of Medicine 4th year curriculum evaluation reveal an increase in students’ self-assessments regarding their PBLI and
population health-related skills and a positive overall assessment of the course. Students have valued the PBLI projects, some wishing that more time had been available for the projects, and others are curious to learn whether their project was "ultimately useful" at their sites.

**CONCLUSION:**
Students can develop and implement PBLI projects during a four-week clerkship. These rapid cycle improvement projects can provide the students with practical experiences in the principles of population health care. Although only a few of these projects go on to publication or presentation at national meetings, the rapid implementation and completion of these projects may help students feel less intimidated about initiating PBLI projects in the future.

**COMPANION MATERIALS:** *(Course syllabi, resource lists, tests, website, etc.)*
- April 2011 HOP Syllabus/Handbook: Grading requirements, Assignments, Team-based learning instructions, Evidence-based learning resources, Faculty contact information, course objectives. HOP Website is password protected and only available to enrolled students.
- April 2011 HOP Course Calendar
- Example: Team-based Learning Workshop on Quality Improvement presented in small group setting: (Learning objectives, readings, small group discussion questions)
- Example: Team-based Learning Workshop on Evidence-based Medicine presented in large group setting: (Learning objectives, readings, team exercises)
- Abstracts from April 2011 Student Projects

**PUBLICATIONS:**
None

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