

Linking Community Hospital Initiatives With Osteopathic Medical Students' Quality Improvement Training: A Pilot Program

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Quality improvement (QI) continues to be a health care challenge, and the literature indicates that osteopathic medical students need more training. To qualify for portions of managed care reimbursement, hospitals are required to meet measures intended to improve quality of care and patient satisfaction, which may be challenging for small community hospitals with limited resources. Because osteopathic medical training is grounded on community hospital experiences, an opportunity exists to align the outcomes needs of hospitals and QI training needs of students. In this pilot program, 3 sponsoring hospitals recruited and mentored 1 osteopathic medical student each through a QI project. A mentor at each hospital identified a project that was important to the hospital's patient care QI goals. This pilot program provided osteopathic medical students with hands-on QI training, created opportunities for inter-professional collaboration, and contributed to hospital initiatives to improve patient outcomes.

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The 2000 landmark report *To Err Is Human* documented the occurrence of preventable medical errors that resulted in many deaths.¹ A second report, *Crossing the Quality Chasm*, provided global recommendations on redesigning the health care system to improve patient care and safety.²

Since then, the public's demand for transparency and the rapidly expanding regulatory requirements have posed a worthy yet formidable challenge to the health care system. In the United States, hospitals are required to meet specific quality standards or risk losing a substantial portion of their potential managed care reimbursement.³ With health care costs on the rise, dedicating sufficient resources to implement quality improvement (QI) surveillance and initiatives poses a notable challenge for community hospitals. Many physicians lack the specific QI education and training necessary to help navigate their patients safely through today's health care gauntlet.

In response, many medical organizations have focused on the importance of QI in training. In 2009, the World Health Organization developed "Patient Safety Curriculum Guide for Medical Schools,"⁴ and in 2011, the World Health Organization endorsed patient safety as a multidisciplinary effort and integration early in the training and education process as key.⁵ One of the core competencies of the Accreditation Council for Graduate Medical Education⁶ and the American Osteopathic Association⁷ is practice-based learning and improvement, which includes QI.

In January 2013, the Association of American Medical Colleges published an expert panel's report that recommended incorporating QI and patient safety in medical school and throughout a physician's career.⁸ We believe that lifelong QI and patient safety training will lead to improved health care outcomes and increased health care collaborations.

Many studies⁹⁻¹² have been published regarding QI training in medical school and residency programs. In one systematic review⁹ of 39 studies, students' QI knowledge was improved through structured curricula, but further studies were recommended to determine whether the courses had clinical value. Some recommendations included opportunities for and access to resources for experiential learning. In 2011, Nie et al¹⁰ conducted a systematic review of patient safety education for undergraduate medical students and reported few curricula that incorporated patient safety education. A survey of medical students by Blasiak et al¹¹ found that QI and patient safety knowledge were generally low among respondents, but those who had previous education in the topics fared substantially better. Medical students can be active participants in QI,¹² but the literature does not substantiate that they engage in QI. To our knowledge, no studies on osteopathic medical students' QI training needs and programs have been published.

To address the challenge of QI training for medical students while providing meaningful QI support to the sponsoring hospital, an adaptive model of actively involving students in QI hospital activities may be part of the answer. In the present article, we report on a pilot summer program that aligned community hospital needs with medical students' needs for QI training and describe the challenges, lessons learned, and recommendations for research and implementation.

Prerequisites and Protocols

In 2013, 3 community hospitals in our osteopathic post-doctoral training institution (OPTI) educational consortium and the Centers of Osteopathic Research and Education (CORE) at the Ohio University Heritage College of Osteopathic Medicine (OU-HCOM) agreed to participate in this pilot program. In developing this program, collaboration among 3 stakeholders was established: OU-HCOM CORE Research Office, each hospital's medical education office, and each hospital's QI department. The CORE Research Office is the Research Education unit at the college and for the OPTI and works with both medical students and residents. Once interested hospitals were identified, the opportunities and application process were posted on the OU-HCOM website and sent to all first-year osteopathic medical students. Participation was on a volunteer basis.

The academic offices at OU-HCOM conducted preliminary screenings of the students who applied. The screening process had 2 levels. First, students had to be in good academic standing (ie, they had passed all their courses and did not have any professionalism issues), they had to submit a curriculum vitae, and they had to confirm that they were available to participate for the duration of the program. Because this program was an independent scholarly activity, students were expected to be self-directed and able to positively represent OU-HCOM. Students who met the initial requirements were advanced to the second level of screening, which involved an interview with the mentors at the hospitals. This step ensured the best possible fit between mentor and student. The mentor discussed with the student the terms of the program at that particular hospital. For example, 1 hospital's program was specifically tailored for students who lived locally and had no need for financial assistance, so no stipend was offered. The mentors made the final selection.

The students accepted into the program were asked to complete institutional and federal scholarly requirements and complete hospital on-boarding procedures and requirements. In cases where projects were deemed as

human participants research, students and mentors secured approval through an institutional review board. To protect the confidentiality of human participants' data, each student was required to complete a hospital-specific online human participants' protection training through the Collaborative Institutional Training Initiative.

Program Description

Opportunities were developed on the basis of the needs of the 3 hospitals. Each hospital's medical education department contributed financial or educational resources; each hospital's QI department provided the project topic, parameters, training, coaching, and mentoring; and the OU-HCOM CORE Research Office offered program inception, coordination, ethics, and overall oversight. Project topics were (1) basic understanding of the interdisciplinary nature of quality and the impact QI can have in the hospital setting at Hospital A, (2) hyperparathyroidism guidelines at Hospital B, and (3) pneumococcal vaccination rates and guidelines at Hospital C. The projects lasted between 4 and 8 weeks. Stipends, housing, and meals were provided at Hospitals A and B.

Hospital A

The program at this hospital provided exposure to QI personnel, processes, patient care, and safety projects. The student completed free foundational online QI certification modules for students, residents, and faculty through the Institute for Healthcare Improvement.¹³ The certification modules took around 15 to 30 minutes. The student completed 7 QI modules, 7 patient safety modules, and 1 module each on patient- and family-centered care, leadership, managing health care operations, population health, and an elective. In addition, the student was required to complete the American College of Physicians High Value Care modules.¹⁴ Each of the modules took 5 to 10 minutes to complete and included interactive patient cases and videos.

During the 6-week experience, the student participated in 26 committee meetings (eg, departmental, case management, patient safety council, morbidity and mortality, QI, safety rounds). Attendance in these committee meetings was necessary for the student to understand the interdisciplinary nature of QI and the impact QI can have in the hospital setting.

The student implemented a pilot observational hand hygiene project to assess adherence to the infectious disease control guidelines of hospital staff, including nurses, physical therapists, food service workers, and others. The student's project identified barriers, and informational sessions were held with hospital staff to prevent future nonadherence to these guidelines.

Hospital B

The student in Hospital B was paired with a physician who was investigating high variability in postoperative parathyroid hormone assay results in patients with hyperparathyroidism. The student conducted an extensive literature review and reviewed patients' medical records. She also reviewed data from a small study involving healthy volunteers to further explain the discrepancy between parathyroid hormone assay results.

At the conclusion of the project, the student recommended a protocol to determine treatment pathways for patients with hyperparathyroidism and strategies to ensure the integrity of assays. For example, she discovered that specimens from a patient were routinely sent to different laboratories for processing and therefore suggested that specimens from the same patient be sent to the same laboratory so results would be more comparable across time and visits.

Hospital C

The student in the third hospital worked with a QI expert to determine barriers to obtaining pneumococcal vaccination among hospitalized patients. As part of their study in Hospital C, the student and the QI expert reviewed and thoroughly analyzed pneumococcal vac-

cination data for a 1-year period. Through this process, they learned that the pneumococcal vaccination guidelines were too vague and thus created confusion, which led to low vaccination rates.

An extensive literature review was conducted to begin the project, followed by close collaboration with nursing leaders and pharmacists to better understand the barriers to success and the clinical context specific to this hospital. The student moved the project forward through active participation in a weekly multi-disciplinary QI workgroup that was tasked with several QI initiatives. Participation in this workgroup exposed the student to several active QI projects at the hospital. At the conclusion of the program, the student prepared a comprehensive summary of the project and presented it to a forum of nursing leaders. The student also created a pamphlet summarizing the evidence-based guidelines to be distributed to physicians and nurses. The hospital leadership funded the guidelines' hospital-wide roll-out, which resulted in improved pneumococcal vaccination rates.

Although the primary goal of the project was to improve pneumococcal vaccination rates among hospitalized patients, the student observed a wide cross-section of QI functions, including a number of committee meetings, workgroups, and interpersonal interactions among the health care team.

Program Deliverables and Debriefing

Each student submitted a scholarly work at the end of the summer program, which included a poster, a final report, or a summative paper discussing his or her project and the learning objectives, challenges, and achievements. Two of the 3 students presented their work at a conference, and 1 created a narrative report. These scholarly works demonstrated evidence of learning and understanding QI principles, practices, and processes.

At the end of the program, the OU-HCOM CORE Research Office debriefed the mentors and the students

separately to determine successes, best practices, challenges, and recommendations. Mentors were contacted via phone, and students were met with individually in person once they were back on campus.

Discussion

Successes

On the basis of feedback obtained during the debriefing session, both mentors and students had a positive experience overall. The students completed projects that contributed to each hospital's QI goals, and they learned about teamwork, communication, crossfunctional and interprofessional collaboration, and how QI initiatives affect patient care, safety, and reimbursement.

The value of mentorship during this experience cannot be understated. The students were exposed to the values and beliefs of several key players on the health care team with diverse skill sets. Further, they had an opportunity to interact with nurses, physicians, and pharmacists by engaging in activities that met a mutual goal of improving care, and they were exposed to decision-making processes, such as those made by committees pertaining to program roll-outs and other initiatives or tasks. The students had a much stronger knowledge of the inner workings of the hospital environment and the extent to which QI requirements and activities affect the day-to-day schedule of a given hospital.

By working on hospital initiatives, students and mentors can strengthen the contributions of osteopathic medicine to communities around the nation. Community hospital-based training is integral to osteopathic medical education during both medical school and residency years. By further linking our students' training to hospital-specific initiatives such as improving patient safety and care, we enhance a teaching model that meets the health care needs of the local community. The interdisciplinary nature of the projects will continue to be emphasized. This pilot program provided exposure to another critical competency—systems-based practice.

Challenges

A challenge was encountered in Hospital B because the student did not have enough face time with the mentor. Although the student successfully completed the project, the experience would have been better if there had been a more defined communication or meeting structure to prevent such a challenge.

Another area of improvement is the subjective and informal nature of the debriefing session. As the program grows in the future, we plan to implement a structured questionnaire to be taken before and after the program with opportunities for comments to standardize the process and obtain data for analysis. We also plan to expand the program to other hospitals within our consortium to obtain a bigger sample size. Again, the goal of the present pilot program was to provide some basic ideas for other institutions to help develop their programs.

Although Hospital C did not offer a stipend, meals, and housing, participation was not deterred. In this case, the student was from the area and did not have financial needs that prevented her from participating in the program. For summer programs, the location of the facility may be of greater interest to students who live in the area.

We also learned that a balance is needed between standardizing parts of the curriculum with allowing flexibility according to each hospital's unique needs. For example, the Institute for Healthcare Improvement Web-based training¹³ can be a requirement for all participants, but each hospital should determine the projects that will benefit their patient outcomes.

Conclusion

The present pilot program was successful in demonstrating the feasibility of providing osteopathic medical students with early opportunities to receive hands-on experiences in practice-based learning and improvement through a collaborative partnership with hospitals. The scholarly works completed by the students at the end of the program provided another im-

portant facet of training in preparation for residency and beyond. The 3 hospitals benefited by fulfilling their QI projects in a timely manner. Moving forward, osteopathic medical educational consortia, such as an OPTI, have the opportunity to provide additional QI training across hospital partners. The opportunity for integrating such programs could be offered during the summer between the first and second year of medical school or as an elective during the third or fourth year. The biggest winners in this collaborative effort are the patients whose care and safety were continuously enhanced through the project outcomes.

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Author Contributions

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