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Feature Editor

Editor's Note: Send submissions to jfreeman3@kumc.edu. Articles should be between 500–1,000 words and clearly and concisely present the goal of the program, the design of the intervention and evaluation plan, the description of the program as implemented, results of evaluation, and conclusion. Each submission should be accompanied by a 100-word abstract. You can also contact me at Department of Family Medicine, KUMC, Room 1130A Delp, 3901 Rainbow Boulevard, Kansas City, KS 61160-7370. 913-588-1944. Fax: 913-588-1910.

Teaching the Quality Improvement Process to Junior Medical Students: The Nebraska Experience

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To teach the continuous quality improvement (CQI) process to junior medical students at the University of Nebraska during their rural family medicine preceptorship, we designed and implemented a population health project in 1998. This project requires students to select a problem affecting a population in their preceptor's practice, analyze that problem, and suggest a solution or remediation using CQI principles. Support for the students during their project includes Web-based examples and readings. Results of this project have included national presentations and changes in several preceptors' practice patterns. This project has been well accepted by preceptors and students.

(Fam Med 2002;34(6):421-2.)

This paper describes the development and evaluation of a project designed to teach junior medical students (120 per class) at the University of Nebraska College of Medicine (UNCOM) about the principles of medical practice quality improvement via a population health project.

Course Description

UNCOM has had a required 8-week rural family medicine preceptorship since 1971. During

this preceptorship, junior medical students work with practicing family physicians and live in rural Nebraska communities with populations ranging from 1,200 to 45,000.

Problem Statement

One of the unique teaching areas that has evolved for medical students participating in the preceptorship has been the business aspect of medical practice. Learning objectives have been developed in this area, and learning tasks (eg, experiential learning with the reception and business staff) have been developed. As department faculty reviewed the educational aspects

of the preceptorship, we found that we had not developed any learning experiences to acquaint our students with population health and practice analysis/improvement or continuous quality improvement (CQI). All these trends are a large part of the current practicing family physician's environment, with many third-party payers examining medical practices for accepted standards in such areas as mammography, immunization rates, and prescribing patterns.

The Project

To acquaint our students with population health and CQI, we designed and implemented the

Family Medicine Community Health Project (CHP) in 1998 as a required part of our preceptorship. The project write-up accounts for 20% of our students' grade for their preceptorship. The goals of this project are to (1) allow the student to gain an understanding of population care, and (2) allow the student to analyze a practice-based population problem.

The students' projects include the following steps: (1) select population problem and the affected population within the preceptor's practice to be studied, (2) perform background literature search about the population problem, (3) define the current state of the problem in the preceptor's practice using either a student-designed survey or by doing a prospective or retrospective chart review (minimum n=50), (4) analyze the data and record it via tables, graphs, or text, (5) propose an action plan to correct or decrease the magnitude of the problem, and (6) present their project to their preceptor prior to completion of the preceptorship.

This project was designed around the concepts promoted by Dr W. Edwards Deming, thought by many to be the "father" of modern quality improvement.^{1,2} Dr Deming's model¹ includes: (1) customer focus (patient population focus), (2) statistical analysis of variation and process focus (chart review or survey), and (3) iterative process of design and redesign (data analysis and action plan).

Since our students are scattered across the state of Nebraska and may be up to 450 miles from the university, background readings, support materials, and example project write-ups for this project are provided for the students via a Web site. Our students participate in a 1-hour project introductory session at their outgoing meeting. Support for the students during the preceptorship for their project is provided from department faculty

via e-mail and telephone. The students complete their project over the 8-week rotation and present their work in written form at the end of the rotation to be graded by department faculty. Topics studied by our students have ranged from delivery of preventive services (immunizations, mammograms, etc) to community water fluoridation, domestic abuse, and improvement of ambulance services in a rural frontier community.

Results

- This project has been well accepted by our students and applauded by our rural preceptors. Our students report that several preceptors now inquire about the students' planned project or suggest a CQI project for their students.

- Students have received an average grade of 92.5% on their projects since the program's inception.

- Process improvements in childhood vaccination delivery have been documented in at least five preceptors' practices as a result of student-initiated CQI projects. These process improvements have included increased rates of vaccine documentation and improvement in records availability and communication among clinic sites.

- One project, titled "An Analysis of Rural Ambulance Runs in Cherry County, Nebraska," won a national award from the American Academy of Family Physicians for student research in 1999.

- Three students presented the results of their projects at the 2001 Society of Teachers of Family Medicine Predoctoral Education Conference in Long Beach, Calif. The titles of their projects were "Community Water Fluoridation in Rural Nebraska," "The Diabetic Care Flow Sheet," and "Domestic Violence in Rural Nebraska."

- Several retail and industrial firms in Nebraska (including meat processing and other manufacturing companies, as well as the world's

largest independent outdoor sporting goods retailer) have requested and received analyses by our students of occupational health problems encountered by those firms.

- More than 80% of our students indicate an interest in applying principles learned in the CHP exercise to their practices during or following residency.

- Department faculty have been pleasantly surprised at the quality of the students' CHP written reports.

- Because of the high-quality work done by our students, our department will sponsor our first annual student community health project poster fair in 2002. Students who have the highest-rated project write-ups will be invited to prepare a poster for display describing their work to compete for cash prizes.

Conclusions

The UNCOM Family Medicine Community Health Project has been well accepted and appears to be meeting our goal of acquainting our students with the principles of population medicine and CQI. Documented changes in patient care delivery and process in our preceptors' practices have occurred as a result of our students' CHP activities. A more formal study of the educational effect of this program needs to be performed to facilitate further refinement and improvement of the CHP and to determine the learning effect of this program.

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REFERENCES

1. Walton M. The Deming management method. New York: Penguin Putnam, 1986.
2. McKeith JJ. Establishing a CQI program. *eMedicine Journal* 2001;2(3).