

Performance Improvement In Internal Medicine Residency Education: Memorial Hospital of Rhode Island Curriculum

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With the growing emphasis on patient outcomes and quality improvement within the United States healthcare system, medical schools and postgraduate training programs have been developing curricula to educate physicians in these areas.^{1,2} Internists must now demonstrate incorporation of quality improvement into their practices for **American Board of Internal Medicine (ABIM)** recertification. However, most physicians have not had formalized training in this aspect of performance. To address this need, the Internal Medicine Residency Program at **Memorial Hospital of Rhode Island (MHRI)/Warren Alpert School of Medicine of Brown University** developed a quality improvement curriculum.

Our practical, “hands-on” **performance improvement (PI)** curriculum addresses three of the six areas of professional competency defined by the **Accreditation Council for Graduate Medical Education (ACGME)** Outcomes Project: Patient Care, **Systems-Based Practice (SBP)**, and **Practice-Based Learning and Improvement (PBLI)**.³ As of July 2009, the ACGME has mandated that all Internal Medicine residency training programs involve trainees in performance improvement projects and develop formalized curricula.

MHRI INTERNAL MEDICINE PERFORMANCE IMPROVEMENT CURRICULUM

The objectives of the curriculum are clear. Upon completion of training, residents will: 1) demonstrate an understanding of the healthcare quality improvement movement in the context of patient safety and the ACGME competencies, 2) be able to identify the major tenets of quality improvement, 3) utilize an evidence-based approach to determine best practice, 4) understand the application of the “**Plan-Do-Study-Act**” (PDSA) cycle for implementing quality improvement projects, and 5) demonstrate the ability to formulate and implement a PI project as part of an interdisciplinary team.

The curriculum utilizes different teaching approaches. These include didactic lectures as well as interactive small group seminars in which the major principles and concepts of quality improvement are discussed. One of these concepts is the PDSA performance improvement cycle. This cycle emphasizes 1) identification of changes necessary to bring about improvement (Plan), 2) an initial pilot trial of the proposed changes (Do), 3) measurement of results (Study), and 4) implementation of successful changes or additional cycles as needed to achieve the desired results (Act).⁴ In addition, an evidence-based journal club helps residents critically appraise the literature and apply best practices to patient care. Finally, residents are given a syllabus of independent reading material pertaining to quality improvement and the role of PI in postgraduate medical education.

Each of our residents is engaged in at least one of four resident-driven projects. Two are multidisciplinary, involving collaborative efforts between residents, hospital administrators, and nursing staff. This resident-driven approach to institutional quality improvement is largely “bottom-up”, but also incorporates some elements of the “top-down” strategy on the two multidisciplinary teams. Each strategy has strengths and weaknesses. “Bottom-up” approaches offer residents the opportunity to utilize their daily experiences in order to identify institutional or programmatic problems and develop realistic solutions. The potential downside to this approach is that without appropriate mentorship and institutional support, resident-led performance projects may be unsuccessful, or limited in focus. “Top-down” approaches are initiated by the institution, allowing residents to engage in quality improvement collaboratively with institutional leaders. This approach empowers residents by allowing them to develop working relationships with hospital leaders and administrators.²

DESCRIPTION OF PERFORMANCE IMPROVEMENT PROJECTS

The four residency PI projects include 1) inpatient sign-outs, 2) outpatient care of the vulnerable elderly, 3) evidence-based practice literature search for morning report, and 4) resident hand-washing practices on the inpatient wards.

I. Inpatient Sign-Outs

One method of improving communication among residents and ensuring accuracy of transmitted information is to standardize the sign-out process.⁵⁻⁸ A variety of verbal, written, and web-based sign-out systems are currently used by residency training programs. These are not necessarily standardized. Shortened length of patient stays and ACGME duty hour requirements have resulted in multiple handoffs in a 24 hour period. This may contribute to increased frequency of medical error. Thus, the Joint Commission and IOM identified sign-outs as requiring increased attention.⁹⁻¹⁰ Similarly, our residents recognized that the lack of a formalized sign-out tool could result in episodes of uncertainty for overnight, cross-covering residents, resulting in delayed or inappropriate patient care.

A team of eight residents and one faculty mentor piloted a standardized sign-out sheet. Team members first identified what patient information needed to be transmitted. A literature search and telephone survey of other residency programs were performed to identify processes developed by other programs. The team included the following information: 1) name, age, room number, and attending physician caring for patient 2) allergies 3) code status 4) medications 5) brief history of present illness 6) diagnosis and problem list 7) current and pending laboratory studies, and 8) a “to do” list for the covering resident. To close the communication loop, the covering resident is asked to confirm completion of actions on the “to do” list and to document unexpected events.

We piloted the form on the inpatient service for three months. Success will be judged by the results of resident surveys administered pre- and post-intervention. Informal feedback thus far indicates a high level of resident satisfaction with the form. However, adherence to standardization of the information required on the form appears variable and this may be an area to address in the next phase of the project.

II. Establishing a culture of best practice: the "Post-call Question"

The ACGME requires that residents must be engaged in appropriate learning activities that demonstrate an ability to appraise current medical evidence.¹¹ Training residents to seek evidence-based data is a key element of our curriculum. Competency in routine appraisal of the medical literature and its application to patient care is best developed when motivated and reinforced by relevance to daily clinical activity and integrated learning complements journal clubs and didactic sessions.¹² To support the development of habits that will encourage lifelong learning, the "Post-call Question," an educational tool developed at our sister Brown residency program at Lifespan, was introduced into our resident morning report in 2008.

An annual self-evaluation of incoming interns' skills and confidence in performing literature searches has consistently identified wide variability in expertise. Based on these surveys, a series of educational sessions that teach residents how to best utilize library and electronic resources was initiated in 2005. The post-call question requires that residents use these skills to formulate a clear clinical question, and to locate and document an appropriate literature search. Researched information is then interpreted in the approach to a particular patient case presented in morning report.

Initially, residents did not readily incorporate this tool in morning report. Thus, this area was identified for a resident-led performance improvement project. The members of this team are surveying residents to determine barriers to the use of the tool, and documenting frequency of use in morning report. An intervention plan will be made based

upon results of the survey, and post-intervention improvement will be measured.

III. Care of vulnerable elders in the outpatient setting

In 2006, we enrolled as one of 24 participating sites in the ABIM and Josiah Macy Foundation-sponsored study "Improving Quality of Care for Elderly Patients in the Educational Setting."^{13,14} The study was designed to assess the effectiveness of the ABIM practice improvement modules (PIM) in improving residents' knowledge and clinical skill when caring for at-risk elders in continuity practices. The PIM is based upon best practices as defined by the **Assessing Care of Vulnerable Elders (ACOVE)** project and was initially designed for use in the recertification process.^{15,16} However, these modules may be a useful tool in residency education as well.¹⁷ In the initial phase of the study, residents recruited 50 patients, and completed baseline patient and resident surveys, and chart audits. The data were used to target areas for the performance improvement project.

Although all residents were involved in the study, an eight member team led by two third-year residents spearheaded the planning of the actual PI project. In this project, members of the geriatrics faculty and nursing administration have participated. Of the four quality indicators for care of the vulnerable elderly included in the ABIM study, assessment for risk of falls and osteoporosis have been designated as the focus of our initial performance improvement project. The team modified validated screening instruments for the identification of elderly persons at risk for falls and osteoporosis.¹⁵⁻¹⁹ These are being piloted in the resident practice. When a patient screens positive, a checklist based on best practice is followed. Of note, a miscommunication at the initiation of the pilot project resulted in failure to distribute the screening instruments to patients. This event emphasized the importance of on-going interdisciplinary communication. Adherence to the screening tools and checklists will be measured at three months with post-intervention survey and chart audit.

IV. Infection control through handwashing

While it is well-known that hand hygiene is the best method for preventing the spread of pathogens, lack of consistent adherence to appropriate hand washing techniques plagues many hospitals. In 2002, the **Centers for Disease Control and Prevention (CDC)** issued practice guidelines for hand hygiene in hospitals and other healthcare institutions.^{20,21} Hand hygiene is a Joint Commission patient safety goal.

The residents' decision to include infection control through hand-washing as their fourth PI project was partially motivated by a recent hospital-wide initiative regarding handwashing. Direct observations on inpatient units has shown inconsistent compliance with guidelines. Our project, with input from the Infection Control department and quality improvement administrators, has provided an opportunity for residents to collaborate in a multidisciplinary quality improvement team. Residents have been incorporated into the routine surveillance monitoring of hand hygiene practice on the inpatient wards. Their perspective is likely to be a valuable element in achieving increased adherence to guidelines.

CONCLUSION

Medical educators must devise new teaching strategies to address the ACGME competencies of Systems-Based Practice and Practice-Based Learning and Improvement. In addition, we must prepare the next generation of physicians to function in interdisciplinary teams to improve the quality of healthcare delivery. Our Internal Medicine residency PI curriculum utilizes an active, experiential learning process to meet these needs. We have been impressed with resident enthusiasm for these projects and willingness to adopt leadership roles. We believe that the involvement of our residents in the PI process will help prepare them to become leaders in this process.

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The authors have no financial interests to disclose.

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