

BRIEF REPORTS

Development of a Hospitalist-Led-and-Directed Physical Examination Curriculum

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BACKGROUND: Deficiencies in physical examination skills among medical students, housestaff, and even faculty have been reported for decades, though specifics on how to address this deficit are lacking.

METHODS: Our institution has made a commitment to improving key physical examination competencies across our general medicine faculty. Development of the Merrin Bedside Teaching Program was guided by a comprehensive needs assessment and based on a learner-centered educational model. First, selected faculty fellows achieve expertise through mentorship with a master clinician. They then develop a bedside teaching curriculum in the selected domain and conclude by delivering the curriculum to peer faculty.

RESULTS: We have developed curricula in examination of the heart, shoulder, knee, and skin. Currently, curricula are

being developed in the examination of the lungs, critical care bedside rounds, and motivational interviewing. Curricula are integrated with educational activities of the internal medicine residency and medical school whenever possible.

CONCLUSIONS: A hospitalist-led physical examination curriculum is an innovative way to address deficits in physical exam skills at all levels of training, engenders enthusiasm for skills development from faculty and learners, offers scholarship opportunities to general medicine faculty, encourages collaboration within and between institutions, and augments the education of residents and medical students. *Journal of Hospital Medicine* 2012;7:640–643. © 2012 Society of Hospital Medicine.

Deficiencies in physical examination skills among medical students, housestaff, and even faculty have been reported for decades. For example, cardiac examination skills have been shown to improve during the early years of medical school and then plateau by the third year, with no measurable improvement through residency or beyond without fellowship training.^{1–3}

Despite efforts by residency programs to promote bedside teaching, many general medicine faculty shy away due to lack of confidence and comfort in teaching physical diagnosis.⁴ The presence of hospitalists increases satisfaction among trainees with inpatient teaching,⁵ and medical faculty's ability has been shown to positively impact medical students' test scores.⁶ This lack of bedside teaching is a missed opportunity, as general medicine faculty are assuming more teaching responsibility.

The Merrin Bedside Teaching Program was founded in 2004 at New York University (NYU) School of

Medicine to improve the quality of bedside teaching in the Department of Medicine/Division of General Internal Medicine. In this article, we describe the development process and early outcomes of this program.

METHODS

The principal teaching institution of NYU is Bellevue Hospital, an 800-bed tertiary care safety-net facility located in New York City. Approximately 30 general medicine faculty members at Bellevue Hospital attend on the inpatient teaching service 12 weeks per year each, with the remaining time spent in the hospital-based clinics and other inpatient services.

Prior to the initiation of this program, our faculty did not receive formal instruction in bedside teaching, in general, or in teaching physical diagnosis, in particular. Housestaff and students were reporting that bedside rounds were not being conducted consistently and were of variable educational quality. Among a number of our residency and fellowship programs, there were concerns about meeting Accreditation Council for Graduate Medical Education (ACGME) requirements for quantity and quality of bedside rounds and faculty development.

To inform program development, we conducted a literature review, a series of focus groups with residents and faculty, and a survey of 39 general medicine hospital and ambulatory-based clinician teachers to determine the perceived bedside teaching faculty development needs of our department. Then, over the next 2 years, we recruited 32 hospitalists and

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fellowship faculty to participate in a videotaped bedside teaching simulation. Each attending reviewed the videotape one-on-one with an experienced facilitator (A.K.), who elicited the attending's goals and instructional models and methods used for clinical teaching. To address the wide variety in teaching approaches identified in the assessment, 4 to 6 attendings met weekly for 1 month to observe each other conducting rounds with their teams. The facilitator of these groups used materials derived from relevant medical education theory⁷⁻⁹ and related conceptual models to frame the debriefing. Participants enthusiastically supported the educational value of this learner-centered, experiential teaching approach.

We integrated this needs assessment with an individualized approach, incorporating learner goal-setting with interactive and highly experiential teaching strategies,^{7,9,10} to create the Merrin Bedside Teaching Program in 2004. This program recruits faculty, with reputations as excellent teachers, to design a program to develop their own bedside teaching skills and disseminate what they learn to their peers. Faculty fellows are recruited through an open call for applications, which includes a letter of support from a supervisor and a detailed independent learning plan, including an identified mentor. Fellows are selected by the program's executive committee based on the likelihood of the success of their proposed program. A stipend equivalent of between 5% and 10% of base salary is provided to each fellow for a period of 2 years. Selected faculty fellows are encouraged to focus on an aspect of the physical examination, work in groups of 2 or 3, and to identify and recruit a mentor who is considered a master clinician in the target specialty. Master clinicians are given an honorarium to acknowledge their selection and incentivize them to spend time with the faculty fellows. This is funded with philanthropic support from the Merrin Family Foundation.

Fellows are guided by program leadership in their independent study, development of clinical teaching skills, and curriculum development using the same theory-driven, systematic approach that framed program inception.⁹⁻¹¹ Bedside rounds are the core instructional method used by each group of fellows and are supplemented by lectures, interactive small-group seminars, and Web-based modules in certain cases. Bedside sessions are run by the master-clinician mentor until the faculty fellows are deemed competent by the mentor and feel confident enough to lead independently.

Since 2004, there have been 14 fellows who have developed programs focused on the examination of the heart, skin, knee, and shoulder. Program development is underway in motivational interviewing, the pulmonary examination, and the examination of the critically ill patient. We describe the work of the first 4 fellows as an example of how this fellowship creates

value for the individual fellows, our departmental teaching programs, and the medical school.

Our first cohort of fellows chose, out of personal interest, to concentrate on the cardiac examination. They spent the first year working with highly respected cardiologists to hone their own clinical skills, reviewing the literature on the evidence-based cardiac physical examination and effective teaching methods,^{12,13} researching the use of electronic stethoscopes and related technology for teaching at the bedside, and piloting a variety of approaches to teaching their busy colleagues these skills.

Bedside rounds focus on pertinent physical findings with an emphasis on an evidence-based approach. We find we are most effective when the patient's diagnosis is unknown by the group leader to avoid bias when formulating the differential diagnosis. Sessions include a discussion of how the exam correlates with the diagnosis, relevant pathophysiology, imaging, and treatment options.

Two, 1-hour-long lectures in cardiac examination are delivered: the first reviews basics of heart sounds, both normal and abnormal, and the second reviews the most common systolic and diastolic murmurs. These lectures, scheduled into routine faculty conference time, utilize a PowerPoint format, with an overview of basic physiology and pathophysiology, aided by phonocardiograms, frequency spectrographs, and audio recordings delivered via a loudspeaker. Interactive cases offered by Blaufuss Multimedia (Rolling Hills Estates, CA) are an excellent teaching tool that incorporate case presentations, videos of key physical findings, auscultatory recordings, and relevant pathophysiology. We initially used this resource because of its high quality and ease of use; we now use our own interactive case presentations, which allow for flexibility with content and style, and which reinforce the prevalence of interesting cases at our institution to the audience members.

Technology has proven to be an invaluable tool in teaching cardiac physical diagnosis, both at the bedside and in the classroom. Electronic stethoscopes provide the ability to record heart sounds for use in teaching venues on short notice, such as morning report, and for use in creating the interactive case presentations described above. The electronic stethoscopes we use can be wired to peripheral devices, such as camcorders, iPods, and speaker pads. Speaker pads are devices, approximately the size of a stethoscope head, that can be connected by wires in series, each attached to a stethoscope, allowing a group of people to listen to the same sounds simultaneously with excellent sound reproduction. This technology allows each person standing around the bedside to listen to a patient while the group leader auscultates and explains the findings in real time. There are distinct advantages of simultaneous auscultation both for describing auditory findings and minimizing discomfort to the patient.

Applications are available for the iPod (Stethoscope App, Thinklabs Technology, LLC, Centennial, CO) which can record and display real-time phonocardiography when attached to an electronic stethoscope, even at the terminus of a speaker pad chain. This application also allows recorded sounds to be played directly through a speaker, or transferred to a computer with the corresponding phonocardiographic and spectrographic images, that can all be incorporated into an interactive case presentation. Frequency spectrographs allow visualization of differences between low- and high-frequency sounds, which, in conjunction with the timing and amplitude displayed by phonocardiography, can aid in teaching subtle findings, such as shapes of murmurs, patterns of splitting, gallops, etc.¹⁴ Playback of heart sounds in a conference room setting can be challenging, given the often subtle and low-frequency findings typical of cardiac pathology, and is effectively achieved by using a musician-quality loudspeaker. We have found that speaker pads offer the best sound quality at the bedside, although they are inconvenient for larger groups.

DISCUSSION

A new framework has been proposed for considering faculty development programs that focuses on the participants, program, content, facilitator, and the context in which the program occurs.¹⁵ We have effectively addressed and synthesized these components in a rich, high impact, learner-centered faculty development program that also responds to challenges raised by changes in the health delivery system, concerns about accreditation requirements, and targeted local needs assessment.

We have been fortunate to recruit specialty faculty who are outstanding teachers, have welcomed the fellows into their clinics, and have dedicated countless hours to supervision and education. An unintended, but important, outcome of the program is that we are able to highlight the exceptional skills of our senior, experienced clinicians. These are colleagues who all too often do not receive adequate recognition in the modern-day academic medical center environment, but who are undoubtedly invaluable to the education mission of these centers.

The existence of the program has resulted in our general medicine faculty showing great enthusiasm, both to develop an area of expertise and to participate as learners in the programs developed by peers. The faculty fellows in each specialty have become a valuable resource to peer faculty, residents, and medical students alike, who are now less dependent on consultants to identify and explain physical findings. The faculty teaching the knee and shoulder exams started a Sports Medicine Clinic within primary care, and assist with joint injections throughout the clinic. In addition to providing clinical support, their educational curriculum is included in both the attending

and housestaff conference schedules. The cardiac lectures, both didactic and interactive case presentations, are included in the attending conference schedule, intern and resident core curricula, and the third-year medicine clerkship lecture series. The dermatology group has created a series of comprehensive online modules that provide content tailored to general medicine. All this durable material is available broadly to trainees of all professions in our medical center.

Given the ever-growing burden of patient care and extra-clinical responsibilities, the principal factor limiting the effectiveness of bedside rounds is faculty availability. Despite this, all of our hospitalists have attended at least 1 bedside cardiac session, and the majority have attended multiple times. Varying the time and day of the sessions, offering to join attending rounds, and being available for impromptu diagnostic consultations have maximized the fellows' contact with faculty, residents, and students.

Although funding for evaluation of the program has been limited, a research agenda is emerging. Both the pulmonary physical exam and critical care groups are in the process of evaluating the effectiveness of their programs on the quality of bedside rounds, student and resident learning, and, to the extent possible, on patient care.

CONCLUSION

We believe wholeheartedly that bedside instruction both in physical diagnosis and interview skills must not become a lost art. General medicine faculty are ideally situated to take on this challenge. An educational program targeting hospitalists and general medicine faculty energizes faculty and leverages local resources to fill in gaps in skills for faculty and then for trainees. Generalist faculty relish the opportunity to champion a particular element of the doctor-patient encounter, which has contributed to our ultimate goal of strengthening the core diagnostic skills of our faculty who are at the forefront of clinical care and medical education.

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