

The First Clinical Skill: Students Teach Students to Take Vital Signs

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Abstract: Transition from the role of passive student to medical practitioner begins with learning the first clinical skill. This transition can be stressful for those experiencing it and to some extent by those coordinating it. Logistically, it requires demonstration of the techniques to the entire class by a single practitioner or to smaller groups of students by multiple practitioners. The former reduces the opportunity for close observation of technique and is less conducive to questions, while the latter requires multiple practitioners, which can be prohibitive given their already dense schedules. To reduce the stress for all involved and to maximize learning opportunities, an innovative approach to teaching the first skill, vital signs measurement, was developed. Small group instruction and practice were facilitated by senior medical student volunteers in a simulated outpatient clinic using actual equipment. Instruction was provided in a relaxed, but guided format. Students were provided with a lesson plan that detailed both, technique and brief physiology points, as well as check sheets to use during the lab and later as a refresher guide. The lesson plan, instructions for facilitators, and student check sheets were developed by a senior medical student and reviewed by the course faculty. Recruitment and briefing of student facilitators and conduct of the lab were also performed by the senior student. The purpose of this trend article is to describe the development of a new course format and to report our experience with implementation of the new format. It is intended to spark interest in applying similar approaches to other curricular issues.

The transition from passive medical student to medical practitioner begins with learning the first clinical skill, a process that includes a teaching session, an opportunity to practice the skill, and the first visit to a clinical setting. At the University of Arkansas for Medical Sciences (UAMS), hands-on skills development occurs in the Introduction to Clinical Medicine (ICM) course that runs concurrent with the basic science curriculum. At UAMS, ICM is a required two-year course to teach preclinical medical students the skills, knowledge, and attitudes that are fundamental to clinical medicine. The need for hands-on skills development early in the first-year of medical school is emphasized, and students are taught techniques for vital signs measurement within the first month of the first year of their medical education. Although students attend a weekly lecture series, the strength of the first-year course is small group learning directed by clinical faculty.

A clinical skill teaching session requires a demonstration of techniques, either to the entire class by a single practitioner or to smaller groups by multiple prac-

tioners. The former approach reduces opportunities for close observation of technique and is less conducive to student questions. The latter approach requires multiple practitioners, which can be prohibitive given their already dense schedules. The use of small group instruction was viewed as more educationally desirable, but faculty were in short supply. The need for a different approach was identified and a solution sought. A review of the literature indicated that the idea of using senior medical students to augment the faculty appeared to be a viable alternative.¹⁻⁴

Previously, first-year medical students at UAMS had been taught about vital signs sporadically, primarily in a physiology course and without much emphasis on the clinical issues. As a result, students had difficulty integrating the basic science and clinical aspects of vital signs measurement. Student performance on a vital signs station in the spring 1998 clinical examination indicated the need for improvement of basic vital signs measurement skills for first-year medical students. To address this curriculum deficit, a lecture was added to the ICM course in 1999. Also that year, a Clinical Skills

Center orientation was planned and piloted by senior medical students who wanted to help prepare the first-year students to take their first clinical examination.

Following these experiences, a new approach to teaching freshmen medical students about vital signs was conceived. To maximize learning opportunities, a module was designed to provide close supervision and immediate feedback to students on skill attainment in a setting that encouraged hands-on practice. Peer teaching in small groups formed the focus for learning. Peer teaching has been recognized as an important part of the medical education experience. It helps the "teacher" learn the educator role that is an important element of clinical practice and it facilitates deep learning and reflection by the "learners." As an educational tool, peer teaching has been described as conducive to experiential learning and application of learning to practice.⁵ Lincoln and McAllister reported that the use of peer teachers in a clinical setting will foster independence, self-direction, and self-supervision.⁵ Freshmen and sophomore satisfaction with peer teaching has been positive, with underclassmen viewing upperclassmen as valuable in the role of group preceptors, in some cases rating them over faculty members,^{2,4} and valuing them as peer teachers^{6,7,8,9,10,11} and as PBL tutors.³

The use of peers to provide instruction to classmates has the added benefit of providing the opportunity for sharpening and expanding the knowledge and skills of the peer teachers^{1,4,6-9,12,13} and providing them with an opportunity to learn the art of teaching.^{2,4,7-10} Disadvantages to using peers were reported infrequently but included upperclassmen having less clinical experience and peer teachers as taking more time to teach material.^{2, 13}

Methods

The vital signs module was designed and developed by a senior medical student during an elective longitudinal rotation, Clinical Skills Center Attending. Senior students who enroll in this elective are encouraged to tailor the learning experience to their individual career interests. In general, the elective is intended to introduce students to the practice of academic medicine by providing an opportunity to develop skills in teaching, small group facilitation, performance testing, instructional design, and/or educational research. This senior student, who had prior education and experience in teaching, chose to develop, implement, and evaluate the vital signs lab to achieve the learning objectives for the elective. Guidance was provided to the student by an

instructional development specialist, the director of the Clinical Skills Center, and a practicing physician. The student earned one hour of academic credit upon satisfactory completion of the elective.

The vital signs module was designed for senior medical student volunteers to provide instruction, demonstration, evaluation, and feedback to small groups of freshmen in a simulated clinic setting. The ICM course utilizes senior medical students and clinical faculty as co-preceptors of the student small groups. The senior students filling that role are enrolled in a longitudinal elective course, spanning their entire senior year. These persons were solicited to teach the vital signs module, given their expressed interest in teaching medical students and because of their baseline education in providing such instruction in preparation for their roles as ICM preceptors. Because a pool of senior students larger than just the co-preceptor group was needed, the opportunity was opened to the entire senior class as well.

The module was designed to meet ICM course objectives for acquisition of skills required to take and record a patient's vital signs. Content and methods were based on lessons learned during prior iterations of vital signs instruction in the basic science courses. Students had a textbook reading assignment to prepare them for the instruction, and supplemental information was provided in the ICM course syllabus. Both technique and major physiology points were detailed in a comprehensive written lesson plan.

The learning objectives for the session included measuring blood pressure with a manual sphygmomanometer and stethoscope, measuring pulse manually, and recording respirations. The use of actual diagnostic equipment, i.e. stethoscope and sphygmomanometer, added not only to the educational experience, but also provided an orientation to the equipment.

Sessions were held in the UAMS Clinical Skills Center, a state-of-the-art facility designed and equipped for teaching and testing medical skills. The center has ten fully equipped patient examining rooms for student and patient interaction, and each room is equipped with dual cameras and two-way audio response capability. This setting provided an opportunity for group facilitators to incorporate a brief orientation to exam table adjustments, lighting, draping, and otoscope/ophthalmoscope operation concurrent with the vital signs skills instruction.

The groups were facilitated by eleven volunteer senior medical students who were recruited by the module coordinator. They were provided with a lesson plan and guide for conducting the small groups in advance of the

Approximately two weeks after the initial teaching session, freshmen students were given an opportunity to reinforce their learning by using their new skills dur-

Table 1. Summary of Student Journal Responses

Time Well Spent?	Percentage (n=139)	Common Responses
Yes	77%	Was first time in CSC, taking vitals & seeing instruments; Better to learn & practice on peers than patients; Learned helpful info from M-4's; Could have used time more efficiently
Yes & No	14%	Good info, but hurried; Good review for those who already knew how to take vitals; Too little time spent on taking vitals for the student who did not know how
No	9%	Have done it before (previous employment); Too elementary (stool settings, trying on gloves, turning on lights, etc.); Hurried - not enough time to learn much for those without prior experience

instruction day. Immediately before the group sessions, the module coordinator briefed the facilitators on learning objectives and teaching methods. Senior participants were rewarded with a letter of appreciation to their Dean's file and an Outstanding Scholastic Non-Cognitive Performance Award.

The freshman class was split into teams of four to five students for each senior facilitator by prior assignment. To accommodate the entire freshman class, three sessions were scheduled in 45-minute blocks during a three-hour span on one afternoon within the first month of the first semester. Ten group sessions were conducted simultaneously in private clinic rooms of the Clinical Skills Center. The group facilitators provided instruction and demonstrated technique. The students then alternated practicing their new skills on each other.

The module coordinator was present throughout the afternoon to provide immediate feedback to students and facilitators and to be available for questions. The module coordinator oversaw the group sessions from a built-in central observation room with monitors that allowed for simultaneous viewing of all exam rooms and via periodic personal group visits. The module coordinator, ICM course directors, and Clinical Skills Center staff were onsite for troubleshooting.

ing Family Day Weekend. Student volunteers staffed the ten clinic rooms of the Clinical Skills Center on a Saturday morning. As students and their family members were touring the campus, these volunteers took screening blood pressures and described the ways in which the Clinical Skills Center is used in medical education at UAMS.

Results

To date, the vital signs module has been presented three times. After the first year, minor recommended changes were made to the module. These changes included a more condensed form of the student guide sheet and a more detailed and formalized preparatory session for facilitators to ensure consistency of presentation and maximizing the use of limited time.

Although not designed to provide data for a rigorous statistical analysis, a subjective evaluation of the pilot course was conducted. The first-year students were requested to critique the teaching sessions in two ways. First, they answered one question about the lab in their weekly reflective journal: "Was your hour in the Clinical Skills Center today time well spent? Why or why not?" The response rate by the students was 96.5% (139 of 144 students). The majority of responding

students (77%) rated the lab as time well spent (Table 1). Student comments included support for the opportunity to see and use actual equipment. The use of peers was also reported as a positive experience. Although the overall rating was positive, there were significant negative comments as well. Student feedback indicated that the time allotted for the lab was insufficient, especially for those with no previous familiarity with the equipment and techniques. Some students who were scheduled later in the day complained of the wait time.

For the second critique, students were asked to rate the small group facilitators as a whole on organization,

In the second year of this module, 82% of first-year students (122 of 148 students) responded to the evaluation of facilitators. Again, students rated the instruction as above average on all dimensions, and the mean rating for every dimension increased (Table 2). The course director did not collect evaluation data following the third iteration of this module.

Discussion

Although the student ratings are subjective given the methods used to collect and tabulate the students' responses, student feedback was predominantly positive and initial informal review and feedback from facili-

Table 2 Student Evaluation of Teaching Session *

	Pilot Year (2000)		Year 2 (2001)	
	Average Rating (n = 124)	Standard Deviation	Average Rating (n = 122)	Standard Deviation
Organization	3.80	0.94	4.19	0.82
Clarity	3.89	0.88	4.26	0.91
Enthusiasm	3.95	0.88	4.31	0.81
Knowledge	4.12	0.76	4.36	0.68
Rapport	4.12	0.80	4.45	0.83
Instructional skills	3.80	0.94	4.28	0.92
Professional characteristics	4.01	0.81	4.30	0.74
Overall excellence of instruction	3.92	0.86	4.30	0.81
Overall rating for this session	3.95	0.74	4.38	0.71

*Responses on Likert-type scale, with "1" representing poor and "5" representing excellent

clarity, enthusiasm, knowledge, rapport, instructional skills, professional characteristics, and overall excellence using the standard UAMS College of Medicine evaluation form that was designed for assessment of all faculty who lecture in the preclinical curriculum. In the first year of this module, 86% of first-year students (124 of 144 students) responded to the evaluation. The majority (95.1%) gave the facilitators a positive overall rating. The mean rating for every dimension was above average (Table 2). The lowest mean rating was 3.8 and the highest was 4.12, based on a 5-point Likert-type scale anchored by "1" representing "poor" and "5" representing "excellent."

tators and course staff supports the students' assessment that the new approach was a success. The areas with marginal and poor ratings in the pilot year were ones that would seem appropriate given the use of facilitators with probable limited teaching experience, i.e. organization, clarity, and instructional skills. With more attention to preparation of the student facilitators in Year 2, these ratings improved.

As already noted, several limitations of the evaluation methodology must be considered. First, the data was collected via self-report with unknown bias. Secondly, assessment of performance of the actual skills has not been conducted during a clinical exam for these

two groups of students. The quality of the teaching was also not objectively assessed. It is not known if the content and quality of instruction was consistent from group to group, given different facilitators present with each. The facilitators were also self-selected and, although this method was practical at the time, its ultimate value as the means of getting the best instructors was not addressed.

The approach met the goal of providing a more hands-on, closely supervised practical introduction to clinical skills. The literature supports such a use of peers to facilitate instruction. Clearly, a structured objective assessment of the students' skills is needed, but preliminary findings are positive.

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