

Undergraduate Medical Education for the 21st Century: Leadership and Teamwork

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Background: *The health care delivery system is experiencing enormous flux. The knowledge and skills sets required of today's physicians include expertise in competency areas that have not been included in the traditional medical curricula. The Undergraduate Medical Education for the 21st Century (UME-21) project was designed to develop innovative curricula that addressed the training necessary for medical students to gain skills required to provide high-quality, accessible, and affordable care in the modern health care environment. One of the nine UME-21 content areas, leadership and teamwork, has historically received relatively little attention in medical education.* **Methods:** *Each school participating in the UME-21 project submitted a final report that provided information for this descriptive summary of curricular innovations for teaching the concepts of leadership and teamwork to medical students. A classification lexicon for the curricular content and experiences in this content area was derived from these UME-21 project reports. Each school evaluated its curricular innovations independently using a variety of methods, largely descriptive and qualitative in nature.* **Results:** *Eight UME-21 schools developed curricula addressing the content area of leadership and teamwork. The majority of these curricula used the clinical care teams in the clinical rotations to demonstrate the principles and importance of leadership and teamwork. Three of the schools implemented didactic sessions and workshops to explicitly address leadership and teamwork. One school used the gross anatomy dissection teams as the "laboratory" for demonstrating this content material. The evaluations of these curricular efforts showed them to be positively regarded by the medical students. Outcomes of measurable changes in competency in this area of expertise were not evaluated.* **Conclusions:** *There is little past experience in teaching leadership and teamwork in medical school. The UME-21 project supported the design and implementation of several curricular innovations in this content area, which were well received by learners. These eight leadership and teamwork curricula are described, a lexicon outlining the specific content that was addressed in this content area is presented, and lessons learned are included in this report. Further efforts to demonstrate the mastery of new skills in this important content area, based on curricula such as these, are needed.*

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The modern health care delivery system is complex and rapidly changing. The role and responsibilities of physicians are evolving with these changes, requiring new knowledge and skills for today's and tomorrow's physicians. To optimally manage the care of individuals and groups of patients, physicians must understand how systems of care function and how to effectively use those systems. Managing the care of individuals and populations often requires physician participation in team-based efforts. High-quality and effective clinical practice in this environment requires a physician to be a

member, and often a leader, of many teams that must work together to deliver health care in the United States.

The forces that are changing the role and responsibilities of today's physicians come from many sources, including biomedical and clinical research, biotechnology, information management sciences, medical informatics, economics, politics, and, of course, our patients. To deal with the forces, well-educated and well-trained physicians should be grounded in newly articulated competencies such as systems-based care, evidence-based medical practice, outcomes-based standards of care, population medicine, quality management, and information access and management. Coincident with these new competencies, physicians practicing in the 21st century health care system must be knowledgeable and skillful in team and leadership dy-

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namics, including the function and culture of organizations. A physician's professional education should include basic concepts of team structure and function and the concepts of effective leadership. The six competencies now used by the Accreditation Council for Graduate Medical Education for residency education include "working within a team" under the content area related to patient care.¹ Further, the Institute of Medicine's report, *Crossing the Quality Chasm: A New Health System for the 21st Century*, recommends that the health care system be financed and organized to promote coordinated and collaborative care of patients through the use of effective teams.²

There is little published in the medical education literature regarding leadership and teamwork in medical school curricula. In fact, a search of MEDLINE citations since 1966 using the MeSH headings, "leadership" and "education-medical-undergraduate" yielded only 15 relevant citations, and most of these articles addressed leadership in changing undergraduate medical education. Only a few articles actually described curricular projects to teach leadership and teamwork to medical students or nursing students.³⁻⁸ A search of the Association of American Medical Colleges (AAMC) CurMIT curriculum database for the term "leadership" in course names or course objectives shows one school with an entry in the database. Searching CurMIT for the term "teamwork" returned no entries.

This report describes some of the UME-21 curricular projects in the content area of leadership and teamwork, specifically focusing specificity of curricular efforts in undergraduate medical education (UME).

Methods

Each UME-21 partner institution took its own approach to curriculum development in the nine content areas, with each school emphasizing different aspects of the content areas. At the end of the 3-year UME-21 project, each school submitted a final report describing its curricular innovations. To write this paper, we reviewed these reports and identified curricular projects that specifically addressed the content area of leadership and teamwork.

Results

Seven partner schools and one associate partner school developed new educational programs in the area of leadership and teamwork as part of their UME-21 projects. There were three main areas of emphasis in these eight leadership and teamwork curricular projects: (1) the psychology of teams and leadership, (2) team-focused experiences with clinical care teams, and (3) leadership and management in health care organizations. A generic description of the topic areas and experiences from the UME-21 educational projects in the content area of leadership and teamwork is shown in

Table 1. The most commonly identified curricular approach to teaching leadership and teamwork was using clinical care rounds to specifically demonstrate the roles, responsibilities, and interactions among physicians and the other members of multidisciplinary teams.

Description of Curricular Content in UME-21 Projects

The UME-21 projects, with particular attention to those components addressing leadership and teamwork, are described below for each of the eight UME-21 schools that developed and evaluated new curriculum modules in this content area.

Dartmouth Medical School

Dartmouth Medical School's UME-21 project involves continuum of learning that includes new educational experiences in the integrated primary care clerkship (IPCC) in the third year, class-wide grand rounds in the third year, and the fourth-year required course "Health, Society, and Physician."

The IPCC consists of three block experiences (4 weeks of ambulatory pediatrics, 4 weeks of ambula-

Table 1

Topic Areas and Experiences in Eight UME-21 Schools: Leadership and Teamwork Content Area

Topic Area	Schools*Addressing Content Area
I The psychology of teams and leadership	
A Effective teams	1,3,4,5,7,8
B Conflict resolution and negotiation	3,4,5,7,8
C Consensus building	3,4,7,8
D Effective leadership	3,4,7,8
E Team learning by students	3,5,7
II Clinical experiences with health care teams	
A Working on ward teams	5,7
B Primary care as team care	1,3,5,6,8
C Discharge planning	7
D Multidisciplinary rounds	1,3,4,5,7,8
E Working with pharmacists, physician assistants, nurse practitioners	1,3,4,5,7,8
F Caring for the community as team care	3,5
III Leadership and management in organizations	
A Familiarity with organizational culture	3,5
B Leadership: promoting organizational change	5
C Strategies for effecting change	4,5
D Practical experiences: working with medical directors in HMOs	2,3,8

*1-Dartmouth Medical School, 2-Jefferson Medical College, 3-University of Miami, 4-University of Nebraska, 5-University of Pennsylvania, 6-University of Pittsburgh, 7-University of Wisconsin, 8-University of California, San Francisco

tory medicine, and 8 weeks of family medicine). One day each week, students return from practice sites for didactic sessions. These didactic sessions include a community health assessment module (3 contact hours), a prevention module (1 contact hour), and a chronic illness module (3 contact hours). These modules consist of lectures, small-group discussions, student topic presentations, and written assignments.

Students evaluated these sessions using Likert-scale surveys and interactive feedback sessions. These student evaluations were mixed, with steady improvement noted over the project's 3 years. The project director at Dartmouth Medical School stated that the IPCC, its multiple modules, and the task-based assigned projects have caused the following successes to be achieved in teaching this content area. Students recognize and appreciate their own as well as other team members' roles in providing for the needs of their patients. They reported increased communication and shared ideas generated by a variety of learning methodologies and assignments. They reported that the modules resulted in reduced redundancy within primary care clerkships.

Jefferson Medical College

Jefferson Medical College's UME-21 project sponsors a week-long mini-course for senior medical students, the "managed care mini-clerkship." The goals of this course are to expand the students' knowledge of the principles of managed care and to provide students opportunities to work within an organization that manages the care of a well-defined population. The managed care mini-clerkship takes place during the required fourth-year ambulatory sub-internship. It integrates a seminar series on the "business of the managed care team" (provider relations, ethical issues in managed care, finance, and contract issues) and clinical management activities (home visits, concurrent case review). Students also spend one half day at a managed care organization's headquarters working with medical directors and others in the organization. In addition, there is a panel discussion with care team coordinators, visiting nurse team leaders, and discharge planners.

The medical students evaluated the managed care mini-clerkship positively. The project director at Jefferson Medical College stated that the UME-21 project and the managed care mini-clerkship have fostered collaboration between the managed care partner, JeffCARE, and department faculty. The fourth-year managed care mini-clerkship has been very well received by the students, in the context of a curriculum already perceived by many students to have too many fourth-year requirements. The success of the fourth-year managed care mini-clerkship has resulted in the introduction of a similar curriculum module for house staff, with external funding for this effort.

As a result of the success of the fourth-year mini-clerkship, managed care materials addressing the issues of leadership and teamwork have also been incorporated into the required reading for all third-year students at all clerkship sites in family medicine and pediatrics. These readings are posted on the clerkship Intranet. Test questions based on these readings have been added to end-of-clerkship examinations with satisfactory student performance.

University of Miami

The University of Miami's UME-21 curriculum innovation spans the 4-year undergraduate continuum. It is integrated into the existing interdisciplinary Generalist Education in Medicine Program.

A first-year UME-21 module, "First Team on the Path to Professionalism," is designed specifically to address issues of effective teamwork and leadership. This module is integrated into the Gross Anatomy course and the Clinical Skills course and includes didactic sessions, small-group sessions, and assigned exercises addressing the topics of leadership and teamwork, with examples and assignments directly related to the dissection teams in gross anatomy. After introductory sessions on basic concepts of teamwork, the anatomy dissection teams (four students) establish team goals, discuss potential pitfalls, discuss strategies for success, and define member roles and responsibilities. Twice during the anatomy course, students meet in groups of 12 to discuss the progress and status of their dissection teams. Examples to illustrate success and frustrations within a team are brought up for discussion. No students from the same dissection team are in the same larger discussion group.

During the 12-week, third-year primary care block, all students spend 1 day at a managed care insurance company's headquarters in seminars given by executive physician and nonphysician managers of the administrative units within the health plan. Students also tour the various departments and observe daily operations. A fourth-year elective, "Externship Working With a Medical Director of a Health Plan," is available but rarely taken by senior students.

The principles of leadership and teamwork were effectively demonstrated through the anatomy dissection teams. Students rated the effectiveness of their four-member teams twice during the anatomy course. The team members' grades in the anatomy course were directly correlated with the team's rating of its effectiveness in functioning as a team.

The students also completed an attitude survey toward managed care before and after the visit to the managed care partner's administrative headquarters. The opportunity to explore and experience the workings of a managed care plan improved their opinions of managed care and the potential benefits it may bring

to the care system. The project director at the University of Miami states that the "First Team on the Path to Professionalism" experience early in the first-year curriculum and the opportunity to visit and meet the directors of a managed care health plan have caused the following successes to be achieved in teaching this content area. First, gross anatomy dissection teams can be effectively used to illustrate concepts of teamwork and leadership. Second, visiting a health plan's administrative headquarters and seeing the roles and responsibilities of the medical directors, managers, and workers of the company has a positive effect on students' knowledge and attitudes toward managing care and is valued by clinical medical students.

University of Nebraska

The University of Nebraska's UME-21 curriculum, "Managing Care in the 21st Century," spans 18 months of the third and fourth years of medical school. Leadership and teamwork are addressed in a 3-hour workshop on leadership and negotiation skills in the third-year "Managing Care Curriculum" (MCC). During the primary care clinical experiences, students visit skilled nursing homes, rehabilitation facilities, and made home health care visits. All of these visits provide opportunities to learn about the care, and the caregivers' roles, at these various facilities. Students also spend 3 hours in a health plan working firsthand with members of the plan's various departments.

The medical students evaluated the leadership workshop positively. More than 75% of the students felt the "Building Blocks of Negotiation" and the "Developing Leadership" sessions were very good or excellent. The role-playing sessions were less favorably evaluated. The project director at the University of Nebraska states that their UME-21 curriculum, and specifically the 3-hour workshop on leadership and negotiation skills in the third-year "Managing Care Curriculum," has resulted in students having exposure to the ideas of Steven Covey (*The Seven Habits of Highly Effective People*) and to the six-step negotiation process model that has been developed to achieve "win-win" solutions to problems. The workshop received positive evaluation from the students.

University of Pennsylvania

The University of Pennsylvania's UME-21 project integrates managed care concepts and practices into and across the entire 4-year student experience. The UME-21 curriculum is integrated into the Health Care Systems course, the Clinical Evaluative Science course, and the Introduction to Clinical Medicine course in the first year.

In the Health Care Systems course, 7.5 hours of lectures and expert panels are devoted to issues of leadership and teamwork with presentations by interdiscipli-

nary groups of physicians and allied health professionals. During the third-year Doctoring II course, a 3-hour session is devoted to teamwork, conflict resolution, and working with other allied health providers. During the Introduction to Clinical Medicine course, the internal medicine clerkship, and the family medicine clerkship, all students make home visits with a multidisciplinary team that includes physicians, nurses, social workers, and health technicians. An expanded financial interview is introduced during the Introduction to Clinical Medicine course and expanded during the clinical clerkships to include utilization and clinical pathway/disease management information. The latter activities require interaction with a variety of nonphysician health care professionals, including nurse managers, utilization review specialists, and social workers. Finally, during the primary care clerkship, students spend time in physician offices and are expected to spend time with the office staff and understand their roles in the office practice and procedures.

The project director at the University of Pennsylvania states that the UME-21 curriculum, and specifically its integration into the existing Introduction to Clinical Medicine course, the primary care clerkships, and the new Health Care Systems course have caused the following successes to be achieved in teaching this content area. In the office environment, students have an opportunity for close interactions with nurse managers, nurses, billing personnel, and other health care professionals. Modular syllabi have been developed to address this new content, including the effective role of teams in providing and managing clinical care.

University of Pittsburgh

The University of Pittsburgh's UME-21 project is integrated into the 12-week, required, multidisciplinary ambulatory experience, the community/ambulatory medicine clerkship (CAMC), and expands existing community-health care delivery-medical school partnerships. Much of the leadership and teamwork content is folded into the students' clinical responsibilities. They work directly with primary care physicians to learn about the primary physician's role in coordinating care with other providers. The students also choose a selective experience in a specialty discipline, where they have opportunities to work with patients referred by primary care physicians. These selectives include team-based services such as geriatrics, women's health, disabilities medicine, sports medicine, and emergency medicine.

Course evaluations by students were conducted using a combination of Likert scale questions and specially developed instruments based on the critical incident technique.⁹ In this technique, paired questions are used to probe for recollections of positive and negative experiences. A particular strength of this technique over

typical open-ended questioning is its ability to draw specific comments from subjects, from which themes and conclusions may be surmised and quantified. From the critical incident questions, it was found that 67% of the students had observed an incident in which team-based care had a positive influence in the care of a patient. In these same clinical settings, 23% observed an incident in which team-based care had a negative effect. The detailed answers behind these statistics revealed that the positive or negative experiences primarily related to successful or failed communications and interactions between the primary physician and other physicians and health care team members. The finding that the majority of students are exposed to the synergistic effects of team-based patient care supports the idea that team functioning and leadership care be taught in the primary office setting. Alternatively, one quarter encountered the significant negative effect of poor communication between physicians involved in a patient's care.

Course evaluation also showed that 69% of the students strongly agreed or agreed that they learned about the coordination of care among multiple providers, and 84% felt similarly that they learned about effective working relationships among health care providers. The project director at the University of Pittsburgh states that the UME-21 curriculum integrated into the CAMC has caused the following successes to be achieved in teaching this content area. First, selective clinical experiences (emergency medicine, geriatrics, women's health, substance abuse, disabilities medicine, rehabilitation medicine) were effective for introducing students to practice settings that are complementary to the primary care office. In these settings, they observed the importance of "teams" in providing comprehensive care, modeled by primary care preceptors in their role as team leaders who directed care and coordinating efforts with other health care providers. Primary care preceptors also modeled an attitude of teamwork and respect toward members of the health care team, as manifested by courtesy, reliability, responsibility, honesty, helpfulness, selflessness, and initiative. Second, the use of chronic diseases permitted demonstration of the importance of having a particular provider serve as the patient's care coordinator, working with specialists and other health professionals to manage the patient's chronic illness.

University of Wisconsin

The UME-21 project at the University of Wisconsin is called the "Patient, Doctor, and Society: Patient Care Management" curriculum. The Patient Care Management curriculum builds on a solid basic foundation in years 1 and 2 to provide a continuous 4-year undergraduate medical education curriculum in the principles of managing health care.

During the internal medicine clerkship, students complete an exercise in ordering an effective clinical consultation. Students also make daily interdisciplinary rounds working with pharmacists, social workers, discharge planners, and nurses. During the psychiatry clerkship, students work with an interdisciplinary team from a hospice in a day-long, "Communication Skills and End of Life" seminar. These sessions include the fundamentals of team function and conflict resolution.

The project director at the University of Wisconsin states that the UME-21 Patient Care Management curriculum integrated across the 4 years, especially into several of the third-year core clerkships, has caused the following successes to be achieved in teaching this content area. First, students learn to work with formularies and discharge planning. Second, through a "consult exercise" on the medicine clerkship, students learn how to use a specialist consultant. Similar skills are acquired during inpatient rounds with pharmacists on the medicine clerkship and during interdisciplinary clinical case conferences. Third, managed care modules for all clinical clerkships permit integrated teaching across disciplines.

University of California, San Francisco

The UME-21 project at the University of California, San Francisco (UCSF) is called the "Partnerships for Longitudinal Ambulatory Care Education" (PLACE) curriculum. This UME-21 innovation provides major curriculum development for the clinical core of the third year of medical training.

The UME-21 project and the addition of PLACE to the curriculum required reorganization of the third-year clinical clerkships into two blocks of approximately 22 weeks each—one inpatient block and one outpatient/longitudinal block. Leadership is addressed in two of the weekly small-group didactic sessions, one titled "Building Interdisciplinary Teams" and the other "Conflict Management and Conflict Resolution." Students complete the Thomas-Kilmer Conflict Mode Instrument to help them identify how their personal dispositions interact with the requirements of a situation and can lead to certain outcomes.

Using a pre- and post-exercise self-assessment, the students' confidence in their leadership skills increased after the small-group sessions. However, based on the survey results, they did not fully grasp or appreciate the true value of these skills in their education.

The project director at UCSF states that the UME-21-sponsored PLACE curriculum integrated across the ambulatory block of the third-year core clerkships has caused the following successes to be achieved in teaching this content area. First, it provided students with a didactic workshop series focusing on topics such as health care systems delivery operations, building and working within multidisciplinary teams, conflict man-

agement and resolution, information management, and prevention and population-based medicine. Second, it established a "Longitudinal Interdisciplinary Ambulatory Care" experience at a managed care organization partner's site providing the experiential framework for UME-21 curricular learning objectives. Third, the UME-21 effort established an "Interdisciplinary Didactic Series" taught in parallel with the "Ambulatory Care Placements" and focusing on ambulatory topics such as prevention, managed care, population-based medicine, and the role of the physician. These experiences helped students acquire and/or reinforce essential skills for practice in managed care systems such as working in multidisciplinary teams, accessing outcome data from the medical literature to choose appropriate therapy for patients, providing population-based preventive care, and applying clinical practice guidelines to provide cost-effective patient care. Fourth, the UME-21 effort improved students' attitudes toward managed care in general and also their ability to work effectively within that system to provide quality patient care. Students valued the working relationship they developed with their mentoring preceptor and gained insight into how physicians operate successfully within various practice settings.

Conclusions

After reviewing those UME-21 curricular projects that specifically addressed the content area of leadership and teamwork, two general observations and conclusions can be made. First, this content area can be successfully introduced into the undergraduate medical curriculum. While subgroups of students at all sites did not appreciate the value of training in this area, in general, student evaluations of these curricular components were positive, and at times, excellent. Each UME-21 school took its own unique approach to designing a leadership and teamwork curriculum, and these curricula are customized to fit into the school's overall educational program. In their entirety, they are not easily transportable and would not likely "plug-and-

play" into another school's curriculum. However, there are many similarities among these projects, and many are comprised of discreet modular exercises that may be adapted by other medical schools.

Second, curricular exercises that are intended to address leadership and teamwork are frequently clinical activities where this content area is more implicit than explicit. Students are expected to implicitly acknowledge and assimilate the issues of team-based care, roles and interactions among team members, and, specifically, the physician's place in these various health care teams, yet leadership and teamwork is rarely the primary focus of these exercises. Only three schools had workshops where the issues of leadership and teamwork were explicitly addressed.

Overall, however, the schools participating in the UME-21 project are committed to providing descriptions of their curricula, learning resources, and any evaluations of those educational innovations that they developed as part of this exciting and timely project.

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