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The Key Role of a Transition Course in Preparing Medical Students for Internship

Dr. Alan R. Teo, MD,

Robert Wood Johnson Foundation Clinical Scholar, University of Michigan, Ann Arbor, Michigan

Dr. Elizabeth Harleman, MD[Associate clinical professor],

Department of Medicine, University of California, San Francisco, School of Medicine, San Francisco, California

Dr. Patricia S. O'Sullivan, EdD, and

Director for education research and faculty development, Office of Medical Education, and professor of medicine, the University of California, San Francisco, School of Medicine, San Francisco, California

Dr. John Maa, MD[Assistant professor]

Department of Surgery, University of California, San Francisco, School of Medicine, San Francisco, California

Abstract

Among the core transitions in medical education is the one from medical school to residency. Despite this challenging transition, the final year of medical school is known as lacking structure and clarity. The authors examine the preparation of medical students for the professional and personal challenges of internship in the context of transition courses. They first describe the development of a residency transition course, offered since 2001 at the University of California, San Francisco, School of Medicine (UCSF), exploring aspects of a needs assessment, course goals and content, core competencies, and course implementation. They then critically analyze the course, judging it successful based on high subjective satisfaction scores and increased perceived preparedness data. Next, the authors discuss the national context of transition courses, perspectives of various stakeholders, and lessons learned from the UCSF experience. Finally, they consider future directions, suggesting that internship transition courses be a standard part of the medical school curriculum.

Transitions in medical education are stressful periods.[1] In particular, the internship transition —when students shift their identity to that of physician and face new, commensurate responsibilities and requirements—can lead to stress and burnout,[2] mental health problems,[3,4] and poor patient care.[5] Residency training program directors have identified common struggles for interns, such as lack of self-reflection and improvement, poor organizational skills, underdeveloped professionalism, and lack of medical knowledge.[6]

The fourth year of medical school is a natural time to address these challenges, but that year is often underutilized, unstructured, and unclear in purpose. Fourth-year courses, clerkships, and other curricular activities rarely address the needs common to all medical students,

Correspondence should be addressed to Dr. Alan Teo, Robert Wood Johnson Clinical Scholars Program, 6312 Med Sci Bldg I, 1150 W. Medical Center Drive, Ann Arbor, MI 48109-5604; telephone: (734) 674-4844; fax: (734) 647-3301; alan.teo@ucsf.edu.

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focusing instead on discipline-specific content (e.g., subinternships).[7] In light of these issues, educators have called for curricular interventions in the final year of medical school to assist with the transition from medical student to resident.[8] A recent review of the final year of medical education specifically called for fourth-year curricula to "complete the medical school experience and facilitate the transition to residency."[7] Educational leaders have called for a "more sophisticated understanding of the role of the senior year in a budding physician's development."[8]

At the University of California, San Francisco, School of Medicine (UCSF), we sought to provide a more sophisticated and purposeful preparation for both the professional and personal challenges of internship. As part of a newly designed medical school curriculum, we offered a multidisciplinary, integrated, closing course, which we called "Coda." In this article, we describe our course in the context of a scholarly discussion of the educational issue of transition to internship. We begin with a description of how our innovation was designed and implemented, continue with a critical analysis of the course, and conclude with an examination of implications for the future of the field of transition periods in medical education.

Designing a Course for the Transition to Internship

Background and needs assessment

Before Coda was introduced, the fourth year of medical school at UCSF concluded with a course titled "Mechanisms of Disease," which consolidated core knowledge of disease pathophysiology by reviewing students' clinical experiences during medical school and by preparing them for common emergent situations during internship. In 2001, UCSF launched a redesigned undergraduate curriculum, replacing the traditional structure of two years of basic science plus two years of clinical rotations with a model divided into three stages spanning four years: the "Essential Core," the "Clinical Core," and "Advanced Studies." A course interspersed across the third year, "Intersessions," comprised three week-long components that focused on evidence-based medicine, ethics, health policy, basic science, and professional development.[9] As the concluding course in the Advanced Studies section of the curriculum, Coda was designed as a sister course to Intersessions with a similar structure but different focus.

Early Coda course directors informally asked stakeholders (residency program directors, educators, and residents) to name the knowledge, skills, and focus they hoped to see in incoming interns. Based on this feedback, their own experiences working with residents, and the six ACGME core competencies (see Table 1), the course directors created a comprehensive list of competencies necessary for the successful transition to internship. Transition course curricula shared by Duke University and the University of Washington generated additional ideas. As with all curricular innovations at UCSF, student feedback was essential to the design of the concluding course, and the course benefited in its early years from the input provided by several recently graduated medical students with a particular interest in medical education.

Course goals and design

Once they had agreed on a core set of competencies for all first-year residents, the course directors designed the curriculum around three principles: (1) appropriateness for all graduating students, regardless of specialty choice; (2) an integrated preparatory experience; and (3) early exposure in a relaxed atmosphere to allay anxieties about the beginning of residency. Additionally, the course directors defined several general goals for the course: (1) to provide a broad review of essential clinical information and opportunities to practice both

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clinical and technical skills to "fill in the gaps" of medical knowledge and "connect the dots" among content areas; (2) to prepare students to succeed on a personal level; (3) to discuss, at a more sophisticated level, serious personal and professional topics (e.g., interns' fears of harming a patient); and (4) to assemble the best instructors from across the university to teach in the course. The curriculum contains five domains: management of common clinical conditions, management of medical emergencies, communication, procedures, and life skills (Table 2).

Lecture time for the course is mostly devoted to the domains of management of common clinical topics and medical emergencies. Skills sessions focus on exercises in casting, splinting, central line placement, and management of tubes, lines, and drains. Small-group sessions seek to expand medical students' experiences and explore their anxieties about their new roles, working with consultants and housestaff, and anticipating "Top 10 Calls" at night. Large-group sessions focus on the politics of being an intern, the challenges of working in a hierarchy, planning and managing finances, minimizing risks of litigation, ways to meet teaching responsibilities, and other topics not traditionally included in a four-year medical school curriculum. The course also encourages students to ask for help and to achieve personal enrichment and development, especially by hearing from student panelists who have preceded them about how to succeed in internship. Such strategies can promote reflection and professional development among medical students.[9]

Building on the work of its predecessor course, Coda offers opportunities for focused content review and skills training relevant to each student's specialty choice. It balances medicine and surgery perspectives by having one co-director from each discipline, and balances "hard" content with more reflective experiences. The variety of teaching approaches—lectures, small groups, and hands-on skills sessions—keeps the appeal of the course broad and facilitates engagement of students with different learning styles. The transition course serves as a moving conclusion to the medical school experience for students.

Course implementation

As a mandatory course, Coda requires significant institutional investments of energy, capital, and faculty time. Curricular oversight is provided by the School of Medicine's Clinical Studies Steering Committee, which oversees all clinical courses. The two course directors are each allocated 10% protected time/salary support, and their clinical responsibilities are minimized while the course is in session. Administrative responsibilities, such as course announcements, coordination, room reservations, student assignments, and scheduling, are handled by a course administrator at 20% effort. A comprehensive cost per student is difficult to estimate; the primary financial cost is for training in advanced cardiac life support, at $110 per student. The majority of those costs were first borne by the School of Medicine and later by the Department of Surgery and UCSF School of Medicine Alumni Association. Specialists are involved from a variety of disciplines, including pediatrics, internal medicine, surgery, and psychiatry.

When the course was introduced in 2003, in the context of ongoing comprehensive medical school curricular reform,[10] it was conceptualized as an integrative, preparatory course, but it has gradually evolved to focus more on the transition to residency. Course content has evolved each year based on input from the Clinical Studies Steering Committee and on feedback from participants on content, structure, and teaching. The instructors also receive constructive feedback. Over seven years, we have increased the number of small-group offerings and hands-on skills sessions to maximize active learning. Specialty-specific immersion experiences (e.g., in internal medicine, surgery, obstetrics/gynecology, pediatrics, and intensive care medicine) have been developed and offered as part of a panel of options

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that allow students to customize their learning. Also, by experimenting with curricular offerings, we have identified increasingly effective ways to teach about both core medical content and the critical ethical, professional, and communication skills an intern needs to possess.

Critical Analysis of the Coda Course

In formal evaluations, students have consistently rated the course highly. From 2005 to 2010, the average rating for overall course quality fell between 4.3 to 4.7 on a five-point Likert scale (where one is “poor” and five is “excellent”), making it UCSF School of Medicine’s course with the highest overall rating in 2008, 2009, and 2010. Qualitative feedback from students has focused on a number of recurring themes. Students appreciate the emphasis on practical, “high-yield” clinical material, the review of essential material for internship that they may not yet have been exposed to, and the breadth of topics covered. Participants praise the course’s role-modeling, appreciate the confidence it instills prior to internship, and consider it a “great note to end medical school on.” They have also identified areas of improvement: more emphasis on primary care and the outpatient setting, and more availability of small-group sessions that conflicted with other sessions they wished to attend.

In quantifiable ways too, the course has demonstrated utility. Based on 60 matched (67% match for all students) pre/post surveys in 2009, students reported significant improvement for 75% of the twelve items with an average effect size of .53 (medium effect size). Students felt that the course improved preparation in: : (1) recognizing sick and unstable patients; (2) identifying help and backup; (3) communicating effectively within their chosen specialty; (4) communicating effectively outside their chosen specialty; (5) communicating effectively with ancillary staff; (6) teaching others; (7) maintaining their own well-being; (8) understanding what resources are available to help manage mistakes; and (9) carrying out daily patient care responsibilities. Moreover, students’ significantly improved in all areas they feel least prepared prior to taking the course. Feeling unprepared for internship is a common refrain among medical graduates the world over,[11] and perception of making errors and stressful life events are associated with intern depression,[4] making these findings particularly noteworthy.

The course has several important limitations. First, the excitement and emotional significance of the period between the match and graduation–the very period the course occupies—can conflict with the difficult content, such as medical error, death and dying, and the rigors of what lies ahead in the students’ professional development. Events related to graduation and logistics of completing medical school are also distractions. Setting aside these contextual factors, when the course does promote self-reflection, it is likely to engender personal growth.[12] Second, the short length of the course and its placement just before graduation means that it does not provide a mechanism to address deficiencies identified for individual students. Nonetheless, the course seeks to continue developing themes, skills, and domains from the clinical core, intersession courses, and fourth-year subinternships. Finally, in a large graduating class with diverse postgraduate career plans in different specialties, having all course material feel relevant to all students is a Sisyphean endeavor. In terms of participant bias in the survey, there may have been self-selection of those students who were more interested and distortion from the Hawthorne effect.

Discussion

The broader context of transition courses

Transition, or capstone, courses[2] are commonly used in diverse disciplines, from nursing[13,14] and public health[15] to engineering,[16] and even poultry science.[17] In medicine,

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though, the vast majority of studies of transition courses have focused narrowly on specialty-specific clinical competencies, such as surgical or other procedural skills.[18–24] In these limited skill domains, medical students have been shown to become significantly more confident,[22] knowledgeable,[18] and perform nearly as well as junior residents.[19] We believe, however, that such piecemeal approaches overlook the larger context of less tangible struggles. Clearly, the challenge of the transition to internship involves much more than, say, increasing the fund of knowledge about the differential for postoperative fever or honing central line placement skills. A perception gap between student and faculty persists: clerkship directors underestimated interns' struggles with self-confidence and professional identity,[25] whereas interns cite issues of confidence, life balance, connections, emotional responses, managing expectations, and facilitating teamwork as the most critical incidents in developing professional identity.[26]

UCSF is not alone in having implemented a curriculum to comprehensively address the transition from student to resident physician. The courses we identified (Table 3) vary in length, whether they are required, and attention to competencies besides patient care and medical knowledge.[27] Models include Duke University's four-week capstone course, which grapples with difficult topics such as ethical issues, medico-legal issues, professionalism, health systems, and doctor-patient communication, and Baylor College of Medicine's three-week "Integrative Clinical Experience," which includes domains and modules on coping with stressors and communication skills for team-building and breaking bad news.[28]

The foundation for the Coda's themes lies in earlier medical school courses. In particular, UCSF's introduction to doctoring course ("Foundations of Patient Care") and the intersession courses taken during the core clinical clerkship year have similar course qualities, including teaching professional development, gathering together as an entire class, and targeting known knowledge gaps.[29] In other words, Coda does not introduce these issues *de novo*; rather, it is the culmination of a progressively more sophisticated examination that takes place over the course of medical school.

Stakeholder perspectives

The need for improved preparedness for internship is relevant to medical school administration and faculty, residency programs and educators, students, and patients. Administrators may find it challenging—even risky—to carve time out of the existing fourth-year curriculum to introduce a multi-week mandatory transition course. The best instructors—often faculty the students recognize and respect from their earlier medical school courses—typically regard the opportunity to teach and mentor graduating students as a privilege, but those on busy clinical rotations (compared to research rotations) may have unexpected emergencies that preclude their full participation. Residency program directors may appreciate their new interns' enhanced readiness, but they bear none of the costs of the transition course from which they benefit. Medical students may resist a mandatory course given at a time they otherwise regard as a well-deserved break.

In some ways, the ultimate stakeholder in the successful and smooth transition from student to resident is the patient. The "July phenomenon" has been well described in the literature, and many have wondered whether better efforts to instill competence in new medical school graduates could enhance quality of care.[30] A transition course aims to do just that.

Lessons learned from the UCSF course

While implementing the Coda course, we have learned several important and unanticipated lessons that may offer insights for other medical schools considering the introduction of similar courses. We can summarize these lessons as three principles.

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First, because the course requires lengthy and complex preparation, protected time for the course directors is indispensable. The availability of a skilled and experienced administrator to assist with course logistics and organization is also key. The course also depends upon donated faculty time and substantial resident participation.

Second, the directors and faculty should be prepared for continuous revision. The course's appealing location and access to the entire graduating class makes it a natural magnet for many suggestions and ideas by varying stakeholders. In addition, these transition courses are still quite innovative and will certainly encounter unforeseen challenges.

Third, course leadership should be attuned to the less-than-overt curriculum around communication and professionalism that exists in the clinical learning environment. Teaching professional development has been one of our biggest curricular challenges, as students very near to internship often prioritize medical knowledge review over other course content. We found that using case-based examples, recruiting and training well-known and respected resident and fellow teachers, and integrating our teaching about professional development in the real-world realities of the daily life of an intern all helped us achieve some success with this goal.

Future directions

At UCSF, the vision and mission of the Coda course have been recognized as consistent with the overall intent of the fourth year of medical school—to facilitate the transition in medical school training from student to resident, and to develop skills in maturation, reflection, professional development, and communication. The success of the course has made it a landmark in discussions regarding further curricular reform at our institution and the concept of a longitudinally integrated curriculum that reserves the fourth year of medical school for a individualized, in-depth course of study.[31] Students and educators have suggested offering Coda at the start of the fourth year or late in the third year, and this has been a major reason for the expansion of the Intersession course that occurs after completion of the third-year core clerkships. Other proposals include increasing the length of the course, increasing the number of mandatory sessions, introducing a required skills assessment, and offering remediation to students with documented deficiencies.

The most important area for further course development is to expand course approaches to learning. Learning methodologies used for medical knowledge and skills are not as effective for more abstract areas of cognitive development. Thus, incorporating the expertise of developmental and cognitive psychologists in a transition course for residency would offer major insights.[8] Given that key themes in the UCSF curriculum include professional reflection, consolidation of knowledge, and social, emotional, and ethical growth, this expertise is exceptionally important to the continued development of a complete transition course.

Research on the long-term durability of the impact of residency transition courses is wanting, as are studies that go beyond pre- and post-course testing of satisfaction, sense of preparation, and mastery of medical knowledge. Answers to the following questions would be useful for stakeholders, advance understanding of "transitioning" skills, and provide further support for implementing medical school transition courses. Are there sustained changes in confidence and sense of preparedness that the transition course may have instilled? Are mental health co-morbidities such as depression and anxiety reduced by courses that target the stressors of internship? Is there an impact upon attrition from residency programs or burnout in a medical career? Can a transition course improve patient care outcomes in early internship? Answering these questions would require longitudinal

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study, direct observation and assessment of trainees, and measurement of patient care outcomes.

Making a Transition Course Standard in the Medical School Curriculum

The long path to becoming an independently practicing physician is lined with transitions. Our innovative, three-week internship transition course at UCSF, thoughtfully designed around issues that are most salient at this time of transition, has increased fourth-year medical students' sense of preparation for internship and has been well-received by students and faculty. It addresses a key need in medical student education and allays anxieties common to medical students transitioning to internship. By propelling students forward in their training and revisiting skill development in sensitive subjects like medical errors, it likely has implications for patients' safety. Limited in time, it cannot *comprehensively* help students transition to residents, but it feasibly and concretely moves the senior medical student curriculum in that direction.

We believe a transition course for internship should be strongly considered by medical educators and policymakers as a graduation requirement. Integrative and cross-cutting in nature, a transition course fits well within the Liaison Committee on Medical Education's existing requirement for educational opportunities in multidisciplinary content areas.[32] We further believe that UCSF's Coda course offers a template, though certainly not a rigid prescription, for a residency transition course. Given that UCSF is not alone in implementing such a course, in-depth examination of the issue is sorely needed. The time has come for an explicit discussion and scholarly analysis of the place of internship transition courses in improving learning for students and residents, teaching for medical educators, and quality of care for patients.

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Table 1

ACGME Core Physician Competencies Addressed in the Internship Transition Course, Offered Since 2001 at the University of California, San Francisco, School of Medicine

Competency	Example from curriculum
Patient care	Reading electrocardiograms and chest x-rays
Medical knowledge	Reviewing “don’t miss” diagnoses
Practice-based learning and improvement	Using informational resources for evidence-based medicine
Interpersonal and communication skills	Calling a consult
Professionalism	Managing a mistake/medical error
Systems-based practice	Conducting safe handoffs (“sign out”)

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Table 2

Sample Content, Hours, and Activity Format from the Internship Transition Course, Offered Since 2001 at the University of California, San Francisco, School of Medicine

Topic	Hours	Format
Management of common clinical situations		
Electrocardiogram “boot camp”	2.0	Workshop
Approach to acid-base disorders	1.0	Lecture
Acute renal failure	1.0	Lecture
Intravenous fluid management	1.0	Lecture
Basics of chest radiology	1.0	Workshop
Acute pain management in the hospitalized patient	1.0	Small group
Insulin management in the hospitalized diabetic	1.0	Small group
Overview of pressors	1.0	Lecture
Management of the mechanically ventilated patient	1.5	Lecture
Emergency medicine for the intern	1.5	Lecture
Top ten intern night calls in internal medicine, surgery, obstetrics/gynecology and pediatrics	1.5	Small group
Management of chest tubes, nasogastric tubes, and urinary catheters	1.5	Small group
Management of deep vein thrombosis/pulmonary embolism	1.5	Small group
Inpatient human immunodeficiency virus	1.5	Small group
Management of medical emergencies		
Obstetric and gynecologic emergencies	1.0	Lecture
Psychiatry and behavioral emergencies	1.0	Lecture
Advanced cardiac life support	6.0	Lecture
Neurologic emergencies	2.0	Lecture
Approach to shortness of breath	2.0	Lecture
Approach to chest pain	1.5	Lecture
Management of sepsis	1.5	Lecture
Management of a gastrointestinal bleed	1.5	Lecture
Overdose and toxicology	1.5	Small group
Communication		
Sign out and cross cover	1.5	Lecture

Topic	Hours	Format
Running a family meeting and discussing code status	1.0	Small group
Teaching as an intern	1.0	Lecture
Pre-rounding and presenting in the intensive care unit	1.5	Workshop
How to be a good consultant	1.5	Small group
How to communicate across specialty	1.5	Small group
Procedures/skills labs		
Advanced cardiac life support	6.0	Practicum
Basic surgical procedures	3.0	Workshop
Airway management	2.0	Workshop
Splinting	2.0	Workshop
Life skills		
Managing finances	1.0	Lecture
Coping with the stressors of internship	3.0	Small group, panel discussion
Professional liability	1.0	Lecture
Dealing with mistakes as an intern	1.5	Workshop

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Table 3

Medical Schools in the U.S. and Canada with Transition or Capstone Courses for Residency as of 2010, Identified by Electronic Database Search* and Manual Search[31]

Institution	Course Name	Length (weeks)
Baylor College of Medicine	Capstone	2
Brody School of Medicine at East Carolina University	Transition to Residency	2
Drexel University	Intersession II (Transition to Residency)	4
Duke University	Capstone course	4
Indiana University	Preparation for Surgical Residency	4
Johns Hopkins University	Capstone	2
Oregon Health Sciences University	Transition to Residency	1
Temple University	Capstone Course	2
Uniformed Services University of the Health Sciences	Transition to Residency Symposium	1
University of California San Francisco	Coda	3
University of Central Florida	M4: Capstone Experience: Leadership, Teaching, Prep for Internship	3
University of Colorado	Integrated Clinicians' Course	4
University of North Carolina-Chapel Hill	Capstone course, MS4	4
University of South Carolina	Capstone Rotation	2
University of Washington	Capstone II: Transition to Residency	1
University of Western Ontario	Transition Period	12

*Available at http://www.aamc.org/meded/curric/start.htm.