Behavioral and Social Science Consortium for Medical Education

Overview of a United Effort: 2005-2011

In 2004, the Institute of Medicine released a report (1) summarizing how undergraduate medical school curriculum should be enhanced to address critical health issues faced in the United States (U.S.) today. One major finding was that approximately half of all causes of mortality in the U.S. are linked to social and behavioral factors such as smoking, diet, alcohol, sedentary lifestyle and accidents (2). It is generally recognized that biomedical research alone cannot adequately address these issues. Less than 5% of the more than two trillion dollars spent on healthcare annually in the U.S. is devoted to reducing behavioral and social risk factors (3, 4). The IOM also found that the curriculum in most U.S. medical schools does not provide sufficient teaching about these behavioral and social risk factors, despite the fact that significant mortality and morbidity are associated with them (1).

In response to the IOM report, the National Institutes of Health (NIH) awarded grants to nine medical schools (Table 1) to develop, pilot, and disseminate behavioral and social sciences modified curricula across the six Domains identified by the IOM (of note is that the IOM suggested revised curriculum integration rather than the development of new courses): 1) Mind-Body Interactions in Health and Disease, 2) Patient Behavior, 3) Physician Role and Behavior, 4) Physician-Patient Interactions, 5) Social and Cultural Issues in Health Care, and 6) Health Policy and Economics. The collaborations and the curricular innovations are described in detail elsewhere (5).

Table 1. Participating Medical Schools

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<th>Medical School</th>
<th>Principal Investigator</th>
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| Albert Einstein College of Medicine | Paul R. Marantz, MD, MPH  
Professor of Clinical Epidemiology and Social Medicine  
Associate Dean for Clinical Research Education |
| Baylor College of Medicine, John Rogers, MD, MPH  
Associate Professor of Medicine |
| Columbia University College of Physicians and Surgeons | Rita Charon, MD, PhD  
Professor of Clinical Medicine |
| David Geffen School of Medicine at the University of California, Los Angeles | Margaret Stuber, M.D.  
Jane and Marc Nathanson Professor of Psychiatry |
| Indiana University School of Medicine | Debra K. Litzelman, M.D., M.A.  
Associate Dean for Research in Medical Education  
Professor of Medicine |
| Oregon Health and Science University | William L. Toffler, M.D.  
Professor and Director, Predoctoral Education |
| University of California School of Medicine | Jason M. Satterfield, Ph.D.  
Director, Behavioral Medicine  
Professor of Clinical Medicine |
| University of North Carolina School of Medicine | Alan W. Cross, M.D.  
Professor, Social Medicine |
| University of Wisconsin School of Medicine and Public Health | Patrick McBride, M.D., M.P.H.  
Professor, Departments of Medicine and Family Medicine  
Associate Dean for Students |
Briefly, the projects varied with respect to the focus of the interventions, but all nine medical schools addressed how to incorporate behavioral and social sciences content throughout all four years of medical school in both the preclinical and clinical curricula. Examples of the curricular changes implemented include incorporation of bio-psychosocial approaches that stress holistic, culturally sensitive, and interactive approaches to patient care, development of student empathy, communication, and teamwork skills with a particular focus on patient safety (6-8), and promotion of lifelong habits of self-directed learning and self-care.

Approximately 6,100 medical students were affected by curricular innovations over the five-year collaborative (5). Individual institutions in the collaborative used a variety of evaluative methods and tools (e.g., curricular mapping, qualitative and quantitative assessments) to evaluate the effectiveness of these curricular innovations, and we believe that the results from these evaluations will help promote the dissemination of effective components and ideas to other medical schools.

To optimize evaluative interactions within the collaborative, one school (OHSU) submitted an administrative supplement to create an Evaluation Core. This Core, overseen by author (Carney), established a database of various outcomes from the nine schools, increased sample size from one school to nine, and allowed for a more robust analysis. This document represents final K07 highlights for each school during all project years. Each of the following sections describes the activities of the Evaluation Core and work completed at each school. Importantly, mechanisms to disseminate what we have accomplished are impressive (Figure 1), including 127 dissemination activities, well over half of which are presentations (oral or poster) at national medical education meetings, and a growing number of publications (n=19 to-date).

Clearly, this effort has been a successful model of NIH funding to support educational initiatives in medical school. Consequently, NIH invited all nine K07 schools to apply for an additional 5 years of funding using an R25 mechanism to continue the work of the K07 collaborative and to “take it to the next level.” All renewing schools were required to work with a new partner school to facilitate dissemination and innovation. 8 of the original K07 schools were funded along with 8 new partner schools with project periods beginning in 2011 or 2012. These new projects will include a greater focus on interprofessional education, public health, resident training, and other curricular innovations. Project details should be forthcoming.

References
I. Progress Report
During the first period of K07 funding (2005-2010), Einstein has achieved the major goals of this 5-year grant award. We will report our progress keyed to the various Specific Aims of that earlier application in this section; Section II will begin by highlighting the lessons learned from the K07 that will inform the approach proposed in this R25 application.

**K07 AIM 1: To develop enhanced courses, curricula and education designed to increase medical students’ knowledge and skills in the behavioral and social sciences related to health.**

**HIGHLIGHTS:**

**a. We established an infrastructure to promote curriculum development.** Through the K07 grant, we identified 12 faculty leaders to serve as “Domain Leaders” and “Domain Co-Leaders” for each of the 6 IOM Domains. These faculty developed domain-specific “Logic Models” to focus their curriculum development efforts. We created both an Internal Advisory Committee and an External Advisory Board, as outlined in our proposal. Through several day-long meetings over these years, we received valuable assessment and input from these experts. We created an Evaluation Committee at Einstein that kept our faculty focused on outcomes and worked extensively in collaboration with the national Evaluation Consortium that grew out of the K07.

**b. We created a new, cross-cutting course in the clinical curriculum, “Patients, Doctors, and Communities” (PDC).** This new curriculum was presented as a cornerstone of our initial grant proposal, described therein as an “inter-clerkship curriculum.” Based on a conceptual model presented in our K07 grant, a commitment was made to establish this new program for the 2006-7 academic year, with the PI (Dr. Paul Marantz) as the founding Course Director for PDC. It was agreed that this would be a required course for all third year students, excluding only MD/PhD students, whose unusual schedules logistically precluded participation. Students were assigned to small groups of about 8. They would return from their various clerkship sites to the medical school approximately one afternoon per month. The PDC program actually began during the final month of the second year of medical school, with four of the “Introduction to Clinical Medicine” (ICM) course sessions assigned to PDC as a series of “Introduction to the Clerkships” seminars.

The importance of this accomplishment cannot be overstated. It represented the first major revision to the clinical curriculum at Einstein since the school’s inception in 1955. It also reflects the nationally-recognized challenge of revising the specialty-specific, inpatient-based clerkship model that has been in place in most schools for the 100 years since the Flexner Report. With the imprimatur and funding provided by the OBSSR K07, we were able to work through the various curriculum committees and engage the high-level support needed to implement this major change, which created for the first time a non-specialty-specific educational program that cut across the required clinical clerkships. This was accomplished by assigning one half day per month of clerkship time to this cross-clerkship program.

A course planning committee was formed. It comprised 5 faculty members with a range of expertise germane to the BSS “domains” outlined in the IOM report: communication skills, ethics/professionalism, and preventive medicine/population health. This committee met every two weeks to plan the initial course. The course planning committee has continued to meet biweekly in order to revise and update the course. Senior, experienced faculty were recruited to serve as group leaders/facilitators. At each session of PDC, specific topics are addressed following a common structure. Session planning subcommittees were formed, usually led by the appropriate K07 Domain Leader, which submitted proposals to the course planning committee for revision and approval. Pre-session assignments include background readings and required submission of a narrative description of a clerkship clinical encounter to the student’s group leader. The faculty use the students’ experiences to illustrate core didactic principles, supplemented by readings, simulated patients, video triggers, etc. For example, for a session on behavior change, students are asked to interview a patient regarding the pros and cons of continuing and stopping an unhealthy behavior, and to submit a written description of this encounter in advance of class. During the classroom session, students review the core principles of motivational interviewing with their faculty preceptor. The students then use this information in a role play in which they represent their patient as a
classmate, in the physician role, uses the core principles of motivational interviewing to help promote behavior change, and receive feedback designed to help improve their skills.

While PDC addressed curriculum topics across the range of BSS Domains identified in the IOM report, its greatest success lay in its ability to use students’ bedside patient-care experiences as the underpinning of its pedagogical approach. In PDC, every “case” discussed is a real patient rather than a “paper case,” providing meaning and relevance for the learners. While this approach works seamlessly with topics that relate to clinical skills (especially communication skills) and ethics and professionalism, which have logically became the central focus of the PDC course, efforts to link individual patients to population health concepts were tried and were sometimes effective, but tended to be somewhat contrived.

Over the past 4 years PDC has undergone substantial growth and development. Dr. Marantz served as course leader for the first year, absorbing the substantial push-back this revolutionary change provoked among students and faculty alike. He was succeeded by Dr. Eric Green, who led PDC from 2007-2010 and served as a co-investigator on the K07. The course structure and sessions were refined and adjusted based on both student feedback and input from K07 domain leaders. Faculty consistently voiced satisfaction at their ability to influence aspects of the “hidden curriculum” never before part of formal Einstein instruction. Student feedback has shifted dramatically from strong resistance to this new requirement to high student ratings and recognition by many of the important contributions PDC makes to their education. The 2010 evaluation data were received as this proposal was being written; scores went up in every category, with the course receiving an overall rating of 4.4 out of 5, and faculty rating on average 4.7 out of 5.

Within the Einstein education structure, PDC has rapidly become an integral part of the third year curriculum, and has spawned new initiatives (like site-based training within specific clerkships, and a new full-day program prior to the first clerkship).

c. We revised and enhanced the “communication skills” curriculum at Einstein. Under the leadership of Domain Leader and co-PI, Dr. Felise Milan, Einstein has experienced remarkable growth and development in this domain, highlighted by the opening of the Ruth Gottesman Clinical Skills Center, a state-of-the-art clinical skills facility where students have opportunities to develop interviewing, examination, and clinical reasoning skills on standardized patients, and where formative and summative assessments are performed.

d. Growth and evolution of the “ethics and professionalism” curriculum at Einstein. With the leadership of Domain Leader and co-PI, Dr. Deborah Swiderski, the theme of Ethics, Humanism, and Professionalism has undergone considerable positive change at Einstein. The new Montefiore-Einstein Center for Bioethics and Master’s Program in Bioethics have added to the creative development in these areas.

K07 AIM 2: To provide curriculum and other products for dissemination to other medical schools.

A major success of the first phase of funding was the establishment of a highly effective consortium among the K07-funded schools. Einstein has been extremely active in this consortium, contributing to more than 20 presentations at national meetings and at least 5 peer-reviewed papers. Dr. Marantz, the PI, is also a member of the AAMC’s Behavioral and Social Sciences Curriculum Task Force (chaired by Dr. Rita Charon, Columbia’s PI), which will be issuing its report within the next year. These activities will only grow and improve during the R25 phase, building upon our success to date with an expanded consortium and a new coordinating center.

K07 AIM 3: To foster health-related research and careers in behavioral and social science within medical school settings.

While this has been a secondary goal of the national K07 program, this has been a priority at Einstein, where several important advances have occurred. Most important was the creation of the Center for Public Health Sciences (CPHS) at Einstein (with Paul Marantz as Director), with co-sponsorship from the Ferkauf Graduate School of Psychology of Yeshiva University (with Sonia Suchday, PhD, as Associate Director). Its primary focus is on public health research, through community-based and action-oriented studies on behavioral and social
factors in chronic disease. The CPHS offers a Certificate Program and an MPH program, whose faculty and course offerings will advance the work proposed in this application.

Einstein received a CTSA grant from the NIH in 2007, which has spurred its efforts in community-engaged behavioral and social sciences research and led to several key faculty recruitments in this area. One of these, Dr. Bruce Rapkin, served as a mentor for a medical student who was in the first cohort enrolled in the Certificate in Public Health program. The student completed an original study entitled “A Post-Treatment Assessment of Bronx Prostate Cancer Patient’s Comprehension of Illness, Service Needs, and Quality of Life.” His participation in this program was made possible through his receipt of a Research Fellowship from Einstein (providing stipend support for an extra year of medical school) and a full-tuition scholarship via a supplement to our CTSA grant.

Dr. Paul Marantz, PI of this grant and co-PI of Einstein’s CTSA, has been appointed as the first “CTSA Liaison” from the NIH’s Office for Behavioral and Social Science Research (OBSSR), beginning in late 2009. In that role, Dr. Marantz has been working through the Community Engagement Key Function Committee of the CTSA. In collaboration with leaders at OBSSR, he organized and chaired (in partnership with Dr. Lynn Bosco of OBSSR) a half-day workshop on Educating and Training BSS Researchers in CTSAs in Rockville, MD on May 11, 2010. He continues to work closely with OBSSR to advance BSS research within CTSAs. Dr. Marantz has also received 3 ARRA-funded Supplement grants to the CTSA; two for workforce development (one of which is focused on “comparative effectiveness research”) and one to provide pilot funding to promote community-based research; all include BSSR as a major component.
Baylor College of Medicine
Principal Investigator: John Rogers

Item 1.A Original Proposal Progress

Our initial proposal included 4 Aims designed to fill gaps in the behavioral and social sciences aspects of our curriculum. We proposed educational interventions (shown in Table 1 below) that corresponded to our Aims and that addressed the six content domains in the Institute of Medicine Report, Improving Medical Education. The Aims, and associated interventions, were framed as relationship-centered, considering not only behavioral content, but content and process that could maximize key relationships that directly influence learning outcomes—whether in the classroom, laboratory, or clinical setting. Our focus was to transform both the formal and hidden curriculum by leveraging existing content, adding new content, and transforming key relationships, specifically student-teacher relationships. Our Aims were to:

1) Strategically reshape the formal curriculum by transforming core student-teacher relationships;
2) Implement innovative educator development programs that positively transform student-teacher relationships in the “hidden” curriculum;
3) Provide new learning opportunities that positively transform other relationships;
4) Promoting an institutional environment that recognizes and values the mediating influence of relationships and the importance of the behavioral and social sciences in medical student education.

Item 1.A.i Overview:

Much of our original proposal was focused on curriculum development and implementation, so early years of the funded grant period were critical for bringing team members together, coalition building, creating curricular elements, collaborating with key institutional players for buy-in and implementation, and gaining momentum in addressing the behavioral and social sciences gaps in our (at the time) more biologically-oriented medical school curriculum. We faced some significant challenges, and achieved successes, in carrying out these Aims. Challenges include the loss of the original Principle Investigator in the 2nd year of the funded proposal, as well as losses of other team members (to job relocation, death, etc.) in subsequent years. Despite these challenges, we have been successful in implementing all our original proposed activities as well as fostering additional activities in harmony with our aims. Table 1 (with legend) succinctly captures our successes in carrying out the Aims, implementing proposed interventions, and making progress in curricular transformation. All achievements are currently embedded and sustainable in curriculum. Appendices embedded within table include manuscripts, abstracts and materials relevant to the activity.

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<th>Original HIGH PRIORITY Activities</th>
<th>Achievements in High Priority Areas</th>
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<td></td>
<td>Key players</td>
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<td><strong>Aim 1: Strategically reshaping the formal medical school curriculum by transforming core student-teacher relationships;</strong></td>
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<tr>
<td>Establish a competency-oriented curriculum</td>
<td>![List of achievements](Appendix A)</td>
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<tr>
<td>Curriculum Committee</td>
<td>![List of achievements](Appendix A)</td>
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<td>Course Directors</td>
<td>![List of achievements](Appendix A)</td>
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<td>Clerkship Directors</td>
<td>![List of achievements](Appendix A)</td>
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<td>Senior Associate Dean, Undergraduate Medical Education (UME)</td>
<td>![List of achievements](Appendix A)</td>
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<td>![List of achievements](Appendix C &amp; D)</td>
<td>![List of achievements](Appendix E)</td>
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<td>CCGGs established Y1 &amp;2</td>
<td>![List of achievements](Appendix F)</td>
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<td>Clerkship evaluations revised to map onto the CCGGs Y3&amp;4 and implemented Y5; CCGG student self-assessment implemented Y2</td>
<td>![List of achievements](Appendix G)</td>
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<td>LACE- Cultural Competency with IAT- Workshop created utilizing IAT as trigger for small group discussions re: implicit physician bias about patients; implemented Y2-Y5</td>
<td>![List of achievements](Appendix G)</td>
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<td>4-year Relationship-Centered Care (RCC) curriculum map that outlines RCC elements, IOM priority topics, and courses where this material is taught in all four years of the BCM curriculum.</td>
<td>![List of achievements](Appendix G)</td>
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<td>Establish Learning Communities</td>
<td>![List of achievements](Appendix G)</td>
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<tr>
<td>Sr Associate Dean, UME</td>
<td>![List of achievements](Appendix G)</td>
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<td>![List of achievements](Appendix G)</td>
<td>![List of achievements](Appendix G)</td>
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<td>Established Learning Communities (now called Mentoring Program) of student groups with assigned mentor in Y3. Recruited 21 mentors Y3-Y5 for 3 years of incoming students w/ mentors; Designed mentors guide</td>
<td>![List of achievements](Appendix G)</td>
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| Establish Transition Experiences | • Director, Mentoring Program  
• Mentoring Faculty  
• Students | and schedule; *(Appendix H)*  
• Evaluations ongoing with manuscripts in development. |
| Establish Healer’s Art Course | • Key Teaching Faculty | Trained 8 faculty in Y3-Y5; Implemented Healer’s Art as elective for 1st Year students in Y3; approximately 66 enrolled in Y3-Y5. *(Appendix I)* |

**Aim 2: Implement innovative educator development programs that positively transform student-teacher relationships in the “hidden” curriculum**

| Educator Development | • Director of Faculty Development  
• Academy of Distinguished Educators | RATL modules developed Y1, implemented Y2, regularly implemented at Vanderbilt. *(Appendix J)*  
• Designed Faculty Development Workshop re: Techniques for Teaching Communication Skills Y3; implemented Y4&5  
• Professionalism workshop offered annually to faculty re: techniques for early identification of and feedback to students who exhibit unprofessional behavior  
• Developed Relationship-Centered Care “disc” pocket card as Communication Aid; Disseminate regularly *(Appendix K)* |

**Aim 3: Provide new learning opportunities that positively transform other relationships (e.g., student-student and student-patient)**

| Utilize learning communities for peer-to-peer activities | • Mentoring Faculty  
• Students | Group events offered by each mentor to promote student interactions  
• Established Professionalism Appraisal and Competency Evaluation Committee Y3 *(Appendix L)*; PACE developed (Y4) and implemented (Y5) peer-to-peer professionalism feedback and debriefing, facilitated by mentors *(Appendix M)* |
| Learning portfolios | • Sr Associate Dean, UME  
• Director of Educational Evaluation & UME staff  
• Mentors | Adopted E*Value (web-based customizable system for evaluation, clinical experience tracking, electronic student portfolio and curriculum mapping) Y2; Adapted paper portfolio to electronic format *(Appendix W)*; Designed and implemented mentor-guided individualized learning plans and Appreciative Inquiry-type reflection activities Y3; All incoming students Y3-Y5 utilizing. Modifying portfolio use annually. |
| Small Group Experiences and Team Learning | • Course Directors | Adopted more widespread use of team and small group learning in IPS, PPS, LACE, CABS in Y1-3; Ongoing  
• Implemented Palliative Care *(Appendix V)* in LACE in Y3-Y5 for students to interact with dying patients and their families; and reflect on reactions.  
• Implemented 4th year student Capstone Course (aka APEX) Y3-Y5 with considerable small group learning. *(Appendix N)* |

**Aim 4: Promote an institutional environment that recognizes and values the mediating influence of relationships and the importance of the behavioral and social sciences in medical student education.**

| Establish award programs for students who exemplify a relationship-centered physician | • Academy of Distinguished Educators | Established Gold Humanism Award *(Appendix O)* for 4th year student; ceremony attended by 1st year students to promote this as possible goal.  
• LOVE award *(Appendix P)* presented to faculty at White Coat Ceremony to model physician humanism and relationship-centered care. |
| Establish central system for logging and tracking patient experiences | • Director of Educational Evaluation & UME staff  
• Core Clerkship Dirs | PXDX adoption in 5th year in clerkships (Customized component of E*Value that permits students to log patient encounters, procedures and diagnoses, & customized fields such as interprofessional communication); 3 clerkships phasing in Y5; Additional planned |
| Outside experts | • Howard Stein  
• McGovern Series | IOM Author; Consulted on mapping BCM curriculum *(Appendix G)* to identify gaps; Worked with BCM in Y1 to offer implementation guidance.  
• Through collaboration with Academy, the speakers for this series have been chosen to highlight grant issues *(Appendix Q)* |
Appreciative Inquiry activities
- Course Directors
  - Joan Engelhardt
- Implemented AI activities in Compassion & Art of Medicine & LACE Y1-2
- Ms. Engelhardt consulted with BCM in Y5 to explore the “best of BCM” (i.e., the extent to which relationship-centered values permeated student and educational leaders) (Appendix R)

Legend: Y=Grant Year; IPS = Individualized Problem Solving Course; LACE = Longitudinal Ambulatory Care Experience; CCGG = Core Competency Graduation Goals; RATL = Residents As Teachers and Leaders; PPS = Patient, Population & Society Course; CABS = Clinical Application of Basic Sciences Course

Item 1.B Highlights:

Aim 1 (beginning, p. X) includes a more detailed description of key activities that we plan to continue. We highlight three key innovations – our mentoring program, which is an ongoing activity, and two activities being adopted by our partner TAMHSC (Best Intentions and Appreciative Inquiry).

- **Our Mentoring Program** (MP, formerly Learning Communities) is designed to transform student-teacher relationships, by partnering students with senior faculty members whom they can trust and seek guidance from, and who will follow the students throughout medical school. After a year to set-up and design the program and another to recruit mentors, we have now implemented two cohorts of first-year students, with our third to start in August for a total of about 550 students. We’ve recruited 21 mentors in that time, some of whom have chosen to work with multiple cohorts of students, and have developed more clarity about desired mentor characteristics. Though we have limited data so far, we recently collected mentoring experiences data from 3rd and 4th year students (who have not participated in the mentoring program) to serve as a comparison cohort for our students who have had the benefit of the mentoring program. As noted in this proposal, we are expanding our program to provide more mentoring during the first 12 months of clinical training to help with this transition.

- **The Best Intentions Workshop**, a 3rd year LACE session we’ve implemented with more than 400 students over 3 years, uses the Implicit Associations Test (IAT) as a trigger for small group-based reflection about physician implicit bias about patients in clinical settings, as well as strategies for managing potential biases. In all years, we’ve observed that students with lower self-awareness about bias prior to the session showed significant increases in self-awareness of personal bias after the session (p < .001). Students also showed significant (p<.01) increases in agreement that the IAT was effective for increasing student reflection about and awareness of personal bias and for generating small group discussion about personal bias (Item 7). 67% of students identified alternate strategies for managing bias toward patients at post-session, and distribution of the strategies changed significantly from pre-session to post-session as well (p < 0.01). The IAT effectively triggers reflection, with the caveat that users must pay considerable attention to activity structure and facilitation skill.2-4

- **We are currently using Appreciative Inquiry interviews** to assess the effect of grant initiatives on the institutional environment. Appreciative Inquiry questions are designed to elicit the values of those interviewed through the stories told about positive events. Qualitative analysis will reveal information about the impact of the grant on the views of faculty, residents and students about relationships and the behavior and social sciences in medical student education. We plan to repeat this analysis in Year 5 of the current proposal to continue our longitudinal analysis of BCM culture change.

Item 1.C Additional IPE Activities that Set the Stage for Current Proposal:

We are carrying out activities currently that serve as foundational for the current proposal, including some baseline data collection regarding home visits in LACE and an interprofessional education (IPE) simulation activity that forms the basis of Aim 2.

- **Home Visits in LACE**: Prior to the activities proposed in this grant, the LACE course for 3rd year students has included some home visits. However, these were without an IPE component. In the hope that our renewal is funded, we are currently collecting attitudes toward other professionals at the beginning of LACE and again at the end, to serve as comparison data for students who receive the IPE components in future years.

We are currently conducting a small research project, funded by the Macy Foundation, to explore the use of communication didactics, simulation, and debriefing to provide some exposure to interprofessional case management and to increase 4th medical students communication skills when working with other professionals (in this case nurses). We have embedded an intervention to test if some networking that
introduces the medical and nursing students to one another improves communication outcomes. Through that grant, we have selected and refined a case (Appendix S) for the simulation, which serves as the basis for our proposed Simulation in the Sub-Internship of Aim 2. Further, we are using principles from the debriefing to shape our debriefing in the proposed activity. Though we have a small sample to date, preliminary data analyses suggest that students report increases in knowledge about communicating with other professionals (p<.001) and that students who have an opportunity to network with one another communicate more effectively, collaborate more easily, and are more cooperative with one another (p<.05).

Item 1.D. Summary

With changes in our team and structure, we have had some setbacks and delays. However, our efforts to date have been very successful, primarily at creating curricular activities and implementing them within our schedule regularly. We are now well-positioned to expand our efforts beyond only student-teacher relationship, into the arena of relationships between medical students and other professionals.
This proposal describes an on-going project at the College of Physicians and Surgeons of Columbia University (P&S) to strengthen the teaching and modeling of social and behavioral sciences to medical students. In our work on the preceding 5-year K07 award, detailed in the progress report below, we have reconceptualized and restructured our teaching of these areas in the basic sciences parts of the curriculum. (We adopted the Institute of Medicine-defined domains of social science and behavioral science in this work: Physician Role and Behavior, Physician-Patient Interactions, Social and Cultural Issues in Health Care, Mind-Body Interactions in Health and Disease, Patient Behavior, and Health Policy and Economics [IOM].) In the process, we have achieved a committed, educated cohort of clinician/educators in a supportive and innovative learning community. We adopted conceptual frameworks, methods, and metrics from three broad theoretical fields: narrative medicine, reflective practice, and relationship-centered care. Our work has been instrumental in transforming not only the teaching of social sciences but the integrated educational program of our school. By taking leadership in a major curriculum reform initiative coinciding with our work, this committed cohort of faculty incorporated social and behavioral sciences front and center in how P&S teaches about illness, doctoring, and the sciences of medicine. In the R25 project, we hope to build on our successes to strengthen the clinical parts of our students’ education in social and behavioral sciences and to continue to build faculty expertise. With the partnership of Weill Cornell Medical College, with whom we share our major teaching hospital NewYork-Presbyterian Hospital, we will fortify the clinical teaching of social and behavioral sciences to medical students in the hospital and clinics through both focused clinical teaching and innovative exposure to collaborative aspects of the institutional culture of the hospital.

**KO7 Project:** “Human Behavior and Experience in Health and Illness” is a five-year project awarded to the College of Physicians and Surgeons of Columbia University (P&S) funded by NHLBI in March 2005 as one of the K07 grants in answer to RFA-OD-05-001, “Strengthening Behavioral and Social Science in Medical Schools.” The Specific Aims of the parent grant outlined the following goals:

1. To equip medical students with specific clinical competencies and reflective competencies to address behavioral, social, personal, and cultural aspects of health and illness.
2. To integrate behavioral and social sciences into the four year P&S curriculum.
3. To offer intensive faculty development to selected clinical faculty who teach this material to P&S students.
4. To stimulate the recruitment of behavioral and social scientists to the P&S faculty.
5. To evaluate the effectiveness of the curricular enhancement.
6. To disseminate the curricular design and approach to other medical schools.

The project at Columbia adopted an intensive teach-the-teachers approach targeted at the clinical faculty recruited as preceptors in the Clinical Practice 1 (CP1) and Clinical Practice 2 (CP2) courses. These are required courses of lectures and small group seminars for first-year and second-year P&S students that teach students about all IOM domains of social and behavioral sciences. The ten clinical faculty recruited to teach the CP1 course in 2006-07 were required to enroll in the “KO7 Seminar,” a one to two hour weekly faculty seminar, supported by the grant, that was held immediately after the CP small groups met. This seminar was pivotal; it provided early accomplishments that shaped the focus of our work. The preceptors received a modest stipend to participate in the seminar. KO7 sessions were devoted to learning about each of the Institute of Medicine domains of social science and behavioral science. The grant supported the time of six P&S faculty named “Domain Directors” for each of these topic areas, either social scientists, behavioral scientists, or clinicians with research and publication in these areas of clinical practice. This support lasted the life of the grant. Under the PI’s guidance, participants took turns chairing sessions to introduce readings, guest lecturers, role-playing exercises, bias awareness workshops, health literacy exercises, dyadic exercises in interviewing, close reading of fiction or poetry, or writing about patients in the preceptors’ own clinical practice as well as presentations from experts in the field. Pedagogic, scholarly, and clinical concerns were integrated into the discussions so that preceptors derived guidance for their actual teaching of the social and behavioral science content to medical students while inspecting their use of these concepts in their clinical practices and scholarly lives.
**Conceptual Frameworks:** The grant’s activities were guided by concepts in three related fields: narrative medicine, reflective practice, and relationship-centered care. Narrative medicine is the practice of medicine fortified with the narrative competence to recognize, absorb, interpret, metabolize, and act on the stories and plights of others. Through attention toward the story, representation of what is heard, and the affiliation that results from the narrative relationship, narrative medicine methods spiral toward effective partnerships in clinical and collegial work (Charon 2006 & 2001, Engel). Reflective practice is a process of carefully, critically, and internally examining and exploring one’s actions as a means to continually improve and enrich practice (Parker, Schön). Relationship-centered care emphasizes the underlying importance of relational trust in all aspects of clinical work, extending not only between clinicians and patients but among colleagues and the entire work force of clinical institutions (Safran, Beach, Pololi). To teach the type of reflective practice that values the social and behavioral sciences, we proposed that faculty need explicit knowledge of their own practice, a knowledge that requires narrative competence, and a learning community marked by relational trust. Social learning and adult learning theories informed the project’s pedagogic methods (Dewey, Mezirow, Southern). The project aimed to weave the social and behavioral sciences into the culture of P&S, not restricting it to classroom hours but letting it inform the culture of the medical school and its teaching hospitals.

**Methods:** The K07 seminar evolved through the lifetime of the grant. Initially enrolled preceptors continued their participation beyond the duration of their allotted monetary stipend. The seminar became an intense community of practice in which participants learned content, theory, pedagogy, and practice. Personal relationships marked by recognition, supportiveness, and relational trust flourished among the participants and extended far beyond its boundaries, enabling initiatives and collaborations outside of the CP courses. By adopting narrative methods of teaching and learning—close reading of literary or sociological texts, writing about patients and practice, doing reflective or creative writing exercises, and reading to one another what had been written—the seminar process itself educated its participants in the conceptual frameworks of the grant. Learning and teaching methods emerged gradually from the group itself as its work proceeded. Shared intellectual leadership, peer evaluation, inbuilt reflection, critical reading and writing, and a focus on individual lived experience became signature methods of learning and teaching that permeated the learning climate of the entire school. Participants quickly adopted what they experienced in seminar as their teaching methods with first- or second-year P&S students, initiating what they called the “K07 viral spread” throughout the institution. Soon, the K07 methods spread to committee meetings, attending rounds, clerkship seminars, presentations at professional meetings, and individual doctor-patient encounters. As detailed in the “K07 Evaluation Report: Funding Period 2006-2010” submitted by the grant’s evaluators Drs. Balmer and Richards (Appendices A & B), the K07 participants have emerged as institutional leaders, taking major roles in the curriculum reform that coincided with this project and many aspects of education and research of P&S and its academic medical center.

**Evaluation:** The evaluative strategy adopted by the project mirrored its conceptual frameworks and aims. To cite the evaluators’ report:

> Our report framework was informed by Southern (2007) and Bennet and Rockwell (1995) who use an input-process-output model to describe an upward spiraling effect. Starting at the base of the spiral, program activities (in this case, the K07 seminar) aim to build and maintain participation in a targeted group of faculty. Participants’ reactions to the activities affect their own learning and, as teachers, the learning they activate and impart to students, peers and others. . . . Our evaluation approach is also informed by the developmental model put forth by Patton (1994). A developmental evaluation is useful when evaluating innovative programs where goals are clarified as the project progresses (versus established in advance) and the purpose is to capture innovation and change (versus document the accomplishment of prescribed goals).

Data sources for the evaluation included 1) Typed transcripts of all K07 seminar meetings that were linguistically and thematically analyzed; 2) Open-ended semi-structured ethnographic interviews with K07 participants over the grant period; 3) Focus groups convened by evaluators and visiting consultants during the first two years of the project; 4) A comparison faculty group was chosen—the Advisory Deans of P&S—as a
means of highlighting, by triangulation, the unique features of the K07 participants; 5) Tabulations were generated of participation, attendance, coverage of IOM domains, illustrative quotes from participants, listings of teaching texts, educational strategies introduced and developed in the project, accomplishments of K07 faculty and their roles in curricular governance; 6) Student evaluations of the Clinical Practice course and individual preceptors starting prior to the introduction of K07 were collected and analyzed. On the basis of examining the above data sources, the evaluators propose that the following assertions were supported by specific parts of the data sources. The Evaluation Report and its tables, included as Appendix A and B, detail the specific supports for each assertion:

1. K07 provides a mechanism for individuals in different departments to come together and to actively participate in social enterprises.
2. K07 faculty value the “transformation” that K07 engenders.
3. K07 participants appreciate that the elements of story—namely, context, plot, stance, and rhetoric—evoke learning.
4. In their relationship between peers, K07 faculty undergo a process of self-scrutiny that enables them to become more critically reflective teachers.
5. Learning within K07 has had a ripple effect, infiltrating the P&S curriculum at a critical period of major curricular reform.

The outcomes of this project are visible at multiple levels of the medical school—the pre-clinical curriculum for medical students, the performance of the medical school faculty in teaching social and behavioral sciences, the development of the curriculum as a whole during the grant period that includes a major curriculum reform, the emergence of faculty leaders at the institution, and the institutional culture among health sciences schools of the university. (Appendix C contains comparisons of baseline evaluations of Clinical Practice course in 2005 and repeat administration of many of the same evaluative questions in year 3 of the project with an increase in average rating by students from 3.0 to 3.5 on Likert scale of 1-4.)

To cite from the conclusion of the Evaluators’ Report:

The five assertions, with their supportive evidence, strongly suggest that Dr Charon’s K07 seminars have transformed the lives of individual faculty, who in turn are having a positive impact on students, other faculty, and the P&S curriculum. We believe that these transformations are creating a culture more supportive of the behavioral and social sciences in medical education. We assert that the use of narrative has allowed K07 faculty to know one another in deeper ways, and to support one another’s efforts to make competence in the social and behavioral sciences a cultural norm at P&S. . . . As a community of practice, K07 engenders deep engagement and social capital that leads to change in community members, thereby impacting their students, their patients, and the institution. Using this framework of community of practice also helps reveal an area of growth opportunity for the K07 seminars: Wenger posits that meaningful participation must be complemented by reification (i.e. the process of giving form to our experience by producing objects that congeal this experience into “thingness”). K07 faculty value their participation, recognize the group’s positive achievements, but also desire for something more.
In 2005, the Indiana University School of Medicine (IUSM) proposed to create an innovative, integrated curriculum in the behavioral and social sciences (BSS) with support from the NIH BASSIC grant. The new, comprehensive curriculum would unite IUSM's formal and informal curricula and enhance BSS learning opportunities through the development of BSS-focused educational modules, active learning experiences, and assessment tools.

Guided by the IOM report, *Improving Medical Education: Enhancing the Behavioral and Social Science Content of Medical School Curricula*, IUSM set a goal of creating two educational interventions per each of the 26 key BSS topics (Appendix 1). During the project period (9/30/05-8/31/10), the BASSIC Initiative will have achieved this goal through the development and implementation of numerous BSS curricular advancements, highlights of which include: 48 team based and problem based learning experiences, 18 standardized patient experiences, and additional learning and assessment activities that layer BSS concepts onto basic science and clinical content throughout the curriculum; opportunities for student journaling and small group narrative reflection that integrate elements of the informal curriculum into the formal curriculum; faculty development opportunities in BASSIC principles and activities including 4 state-wide workshop and retreats hosting over 200 faculty and periodic training sessions in small group facilitation and teaching strategies for active learning; the integration of BSS innovations into a second intervention campus; and BASSIC educational materials being made available for dissemination to the broader medical education community. More specifically, IUSM achieved these and many other successes by pursuing the following four specific aims.

**Specific Aim #1:** We will develop and implement a behavioral and social science integrated curriculum (BASSIC) that encompasses and interconnects the formal and informal curricula. BASSIC will include 48 sets of behavioral and social science educational materials that will be made nationally available.

**Curricular Development and Implementation Process**

IUSM has established a BASSIC Learning Community (BLC) comprised of sixteen members of the IUSM community, including PI and co-PI (Drs. Litzelman and Inui), clinicians, basic science course directors and faculty, student representatives, and professional staff from the Dean’s Office for Medical Education and Curricular Affairs (MECA) to oversee the BASSIC Initiative. In addition to meeting twice monthly as a large group, members divide into working groups and meet frequently to develop, implement, and review specific curricular components. BASSIC curricular developments generated by the working groups include 28 Team Based Learning (TBL) and 20 Problem Based Learning (PBL) cases, 2 web-based modules, 6 mini-lectures on topics like smoking cessation and child abuse, a Health Policy and Economics capstone experience, and new NBME reflective narratives on patient safety, as well as initiatives aimed at filling BSS gap areas such as disaster preparedness, physician well-being, and Gay, Lesbian, Bisexual, and Transgender studies.

Widespread faculty interest in TBL prompted IUSM to hold school-wide faculty TBL workshops in October 2005 and May 2007, facilitated by national experts in TBL and its applications for medical education. The combined workshops were attended by over 100 statewide faculty members who shared their enthusiasm for TBL methodologies and encouraged the adoption of BASSIC-infused teaching strategies. Curricular experts from MECA and the BLC developed a training program for IUSM faculty in small group learning facilitation, including TBL and PBL, and co-facilitated each of the implemented TBL sessions. New course directors have embraced these training opportunities and are energetically incorporating BSS material and active learning methodologies into their courses. The BLC envisions continued coaching as new faculty join the process with the ultimate goal of encouraging interdepartmental collaboration and inter-professional teaching, ensuring the availability of BSS content expertise and use of small group learning methodologies.
During 2007-08, two BLC faculty were certified by the Stanford Faculty Development Center (SFDC) to teach their "Basic Scientists as Medical Educators" course, a course developed to meet the needs of and address the challenges faced by basic science faculty in medical schools. A faculty retreat focusing on the subject was held in May 2008, led by six Stanford trained facilitators and attended by over 50 IUSM basic science faculty from all nine campuses. The retreat emphasized ways basic scientists can integrate BSS content into their courses. In May 2009, the two SFDC-certified faculty organized a second retreat entitled “Collaboratively Building an IUSM Integrated Competency Curriculum.” Over 50 basic science and clinical educators worked to build effective teaching skills and discussed ways to collaboratively design course content and learning experiences that would meaningfully interweave the basic, clinical, behavioral, and social sciences.

Teaching and Learning Methods
Team Based Learning was envisioned as the primary teaching and learning methodology for BASSIC. Lessons were designed to draw connections between basic science course content and assigned BSS readings. The BLC created novel applications for many TBLs, giving students in small groups the opportunity to respond to short-answer questions, role-play patient-physician interactions, and construct concept maps to apply pre-reading material. During TBL sessions students were actively engaged, interacted with BSS content at a higher level of learning than simple recall, and demonstrated mastery of the material through consistently improved group readiness assessment test (RAT) scores compared with individual RAT scores. They applied content that they read to difficult real-life situations and made and defended tough decisions between multiple choice answers that have elements of “rightness,” but one answer that was “superior.” PBL and other learning methodologies were added to broaden the scope of courses engaged in BSS integration while many of the original TBL/PBL cases were extensively modified to allow for more group discussion and knowledge sharing. A central bank was created to house all TBL and PBL cases for future use.

The further development of Standardized Patient (SP) encounters was promoted as another important BSS learning and assessment methodology. First and second year students are introduced to SPs through Objective Structured Teaching Experiences (OSTEs) focusing on history taking and head-to-toe physical examinations. BSS content has been incorporated into the OSTEs with material and situations relating to abuse and sexual preference. Third and fourth year students participate in Objective Structured Clinical Examinations (OSCEs) that utilize SPs and integrate BSS content. IUSM students can now anticipate a minimum of 18 SP and simulated patient encounters during their undergraduate medical education.

Structural Changes to Promote BASSIC Initiatives at the Indianapolis Campus
As projected in the BASSIC proposal, major renovations to the IUSM Ruth Lilly Medical Library were undertaken to create an educational space for the learning and assessment of BSS material. The second and third floors were transformed into a multi-purpose educational environment which includes a TBL classroom for up to 145 students, four computer labs with 160 computers for learning and evaluation use, and 10 small group study rooms. New study carrels and enhanced wireless access have been added throughout the building and a new 24-hour study area recently opened for IUSM students.

Specific Aim #2: We will work with the AAMC to modify their national curriculum database (CurrMIT) for ease of entering and tracking BSS integrated curricular content.
Work on behavioral entries for CurrMIT began with an examination of the 26 BSS topics identified in the IOM report. Specific behavioral terms included in pilot TBL readings were extracted and logged into CurrMIT, as were TBL and PBL case topics (tagged as BSS curricular elements), to facilitate the future development of new CurrMIT fields. Originally, IUSM planned to identify key terms that fall within the IOM domains and discuss a draft product with the AAMC and schools participating on the NIH grant. Following the AAMC’s announcement that CurrMIT will be discontinued in 2014, BASSIC leadership decided to team with other medical schools using internally developed curriculum databases to develop useful BSS key terms and nomenclature.
**Specific Aim #3:** We will capitalize on our nine-campus system, using them as intervention and control campuses, to iteratively implement, study the effectiveness, and improve the new BASSIC curriculum. IUSM’s South Bend campus, the second planned intervention site, engaged in the grant process earlier than anticipated and eagerly incorporated BSS elements into their curriculum. The first four years of the grant period saw the integration of more than 75 hours of BSS-infused TBLs into first and second year courses, with an additional 25 hours anticipated for Year 5 implementation. Content included health risk behavior, ethical guidelines for professional behavior, use of community resources to enhance patient care, complex communication skills, psychological, biological and management issues in somatization, physician well being, work in health care teams and organizations, and cultural competency.

**Specific Aim #4:** We will assess the effectiveness of BASSIC using multiple innovative evaluation methods that spring from theories and methods of behavioral and social science applied to medical education and professional formation and will nationally disseminate BASSIC educational materials.

**Student Evaluation**
BSS-focused multiple choice questions were created for problem solving and application of BSS material in five basic science courses and in all TBL sessions. The BLC initiated a periodic review and revision process to ensure that questions meet an appropriate level of difficulty.

BASSIC-infused learning experiences, especially TBL and PBL, were designed to include Peer and Self Assessment (PSA) and tied into a more comprehensive curricular program already in place to assess self-awareness and personal growth. Students assess themselves and are assessed by their peers in team-work, preparedness, problem-solving skills, and professionalism. Emphasis is placed on writing constructive, action oriented comments. Students meet annually with a self-selected faculty advisor to review PSA reports and develop a plan for personal growth.

OSCE and OSTE experiences provide students the opportunity to be assessed by Standardized Patients in their history taking and counseling skills and receive performance feedback. Existing OSCE cases and SP checklists were modified to use as an assessment tool in the clinical years.

Student journaling exercises continue to be a rich repository for self-assessment and reflection. Student reflections on their educational experiences are shared with their peers in small group activities during the third year, effectively mining elements of the informal curriculum for use in the formal curriculum. Student narratives provide an opportunity for students to integrate BSS with biomedical knowledge in the context of health care. Narratives from professionalism seminars, dietary history activities, and patient safety exercises are analyzed by BLC members for evidence of an improved understanding of BASSIC concepts and ability to integrate BSS and biomedical principles. Narrative analysis also helps identify areas of improvement for TBLs, PBLs, and other learning experiences.

**Program Evaluation**
Course evaluations and student feedback for the BSS-infused TBL and PBL experiences show increases in course quality and relevance. Based on the collected information during Years 1 and 2, the BLC conducted a review process and refined the BSS learning experiences developed to date. Student and faculty feedback on the learning environment for these activities led to the development of new physical space, ultimately influencing the redesigned Ruth Lilly Medical Library.

Prior to the BASSIC initiative, IUSM students continually scored below the national average on the behavioral science portion of the USMLE Step 1 exam. Immediately following the integration of BSS material, students at the two BASSIC intervention sites (Indianapolis and South Bend) showed significant improvement, scoring at or above the national average since the inception of the new BSS educational interventions.

Preliminary internal data also indicates significant improvements in student BSS knowledge following the BASSIC intervention. A family violence intersession was designed to fill a curricular gap area and
had a marked and immediate impact on MS IV OSCE performance – pre-intervention students averaged 32% on their domestic violence-specific checklist scores and 55% overall while post-intervention students averaged 70% and 72% respectively the following year.

The first IUSM class to complete their undergraduate medical education under the new BSS integrated curriculum graduated in May 2010. During the coming year, the AAMC Graduate Questionnaire will give these students the opportunity to share feedback on their BSS training. Additionally, a Residency Program Director’s survey will be disseminated to assess these students’ interpersonal, professional, and teamwork skills.

Dissemination of IUSM Educational Materials
IUSM’s newly designed Health Policy and Economics (HPE) course was selected for a presentation on active learning as a pre-course at the 2008 AAMC Annual Meeting. The proposed 48 BSS-infused TBLs and PBLs have been refined and made available to other medical schools. A web-based module for the OB/GYN Clerkship focusing on counseling patients about hormone replacement therapy and complementary and alternative medicine was made available in the fall of 2008. Material from the BSS-focused Family Violence Intersession has been accepted by MedEdPortal as a featured submission. A new TBL case entitled “Precocious Pubic Hair Development: A Team Based Learning Review of the Hypothalamic-Pituitary-Adrenal Axis and Puberty”, a “Care Management” game designed by HPE collaborators, and a chest pain PBL case which includes a life-style journaling exercise emphasizing the challenges of medical adherence are currently under review at MedEd Portal. Additionally, the BASSIC Initiative at IUSM has generated publications including chapters on behavioral medicine and professionalism and journal articles outlining curricular developments such as the Council of Elders activity (see Section 5.5.5 for full publication list).
Principal Investigator: Bill Toffler

**Aim 1 – Develop, implement, and evaluate a four-year curriculum designed to increase medical students’ knowledge and skills in the Behavioral and Social Sciences (BSS) related to health.** Domain chairs with specific expertise in each of the six IOM domains worked with leadership in both pre-clinical and clinical courses to develop and implement new curriculum, train faculty, and develop ongoing evaluation procedures. Outcomes summary:

- BSS curriculum was implemented throughout the first and second years in the longitudinal Principles of Clinical Medicine (PCM) course. New and revised BSS topics include: medical interviewing, stress management, child abuse, physician social responsibility, health literacy, patient advocacy, the BATHE technique, truth-telling and confidentiality, breaking bad news, motivational interviewing, healthcare disparities, cross-cultural communication, patients with personality disorders, evaluation of medically unexplained symptoms, life-threatening illness, and a full-quarter sequence on health policy and economics.
- Clinical year requirements such as the Clinical Performance Exam (CPX) and Transition to Residency have introduced or revised BSS content. BSS additions to required clerkships include: Family Medicine—behavioral change, end-of-life/palliative care, and principles of primary care; Pediatrics—communication management issues in child abuse, pediatric chronic illness, and common child-rearing challenges; Psychiatry—psychodynamics of patient-physician interactions and substance abuse treatment methods; Rural Community Health Care—distance learning on mental health issues, reflective pieces, and BSS community projects; Surgery— informed consent and bad news communication skills.

**Aim 2 – Increase the knowledge and skills of faculty, residents, other researchers, and practicing physicians in the BSS related to health.** A direct interface between BSS grant faculty, PCM course leadership and the clerkships facilitated the implementation of proposed curricular changes, the ongoing recruitment of new BSS faculty, and the adaption of faculty development for new BSS teaching skills. Outcomes summary:

- The weekly two-hour sessions of the two-year PCM course expose a large number of faculty to the BSS curriculum: over 100 faculty experts give lectures, and 270 faculty from multiple specialities attend BSS lectures with students prior to leading small groups.
- When first- and second-year students work in clinic (four hours a week) they discuss BSS-related assignments, which heightens community physicians’ exposure to BSS issues.
- BSS material is taught in required clerkships in the context of students’ clinical experiences with attendings and housestaff.
- Data from student evaluations of professionalism by faculty in all core clerkships were shared which prompted faculty development that significantly improved subsequent evaluations.

**Aim 3 – Disseminate BSS curriculum and accompanying teaching materials to other medical schools as well as other health care professional schools.** Dissemination occurred at institutional, national and international levels (see citations in section 5.5). Outcomes summary:

- The PI attended all national meetings of the nine-school NIH BSS consortium to collaborate and involve AAMC leadership to advance BSS education in U.S. medical schools.
- Interdisciplinary dissemination was enhanced by the recruitment of the medical director of the OHSU Physician Assistant program to the grant effort. PA and medical students are now enrolled together in the PCM course covering shared BSS topics.
- National meeting presentations were made at American Association of Medical Colleges (AAMC), Society of Teachers of Family Medicine (STFM), the International Learning Institute on Health Literacy and STFM Behavioral Sciences Forum.
• OHSU faculty [submitted and] published articles on BSS curricular innovations and evaluation specific to OSHU as well as contributing to the collaborative publications of the nine-school consortium.

• OHSU BSS innovations are now available on the Family Medicine Digital Resource Library.

Aim 4 – Evaluate the impact of the new curriculum on medical students' knowledge and skills in the BSS related to health by means of valid evaluation measures and procedures. Evaluation of students' BSS knowledge and skills utilized new and existing tools over the course of the grant project. Outcomes summary:

• Systematic evaluation methods included: surveys at designated times in the curriculum, written exams, Objective Structured Clinical Exams (OSCEs), focus groups, qualitative analysis of essays, and formal course evaluation processes. BSS evaluation instruments and research projects continue to be developed and refined.

• A qualitative study of student attitudes and values regarding health care financing and access was initiated in 2010, and will be analyzed and written up by the end of the grant period.

• New tools developed (and being validated) include: BSS OSCEs, a clerkship professionalism survey, and the Preclinical C^3^ survey (based on the validated C^3^ survey).

• Data from the clerkship professionalism survey found a significant difference between student perceptions of specialties, and a manuscript was submitted for publication.

• BSS evaluations of attitudes of graduation year cohorts continue: C^3^ survey, the Preclinical C^3^ survey, and the MAAS survey (measuring student mindfulness). Only the first cohort experiencing the full BSS curriculum will graduate by the end of the grant period; additional years proposed in this renewal application would strengthen data and conclusions.

• Focus groups with fourth-year medical students were held for a more in-depth analysis of graduating students' impressions of their preparation in the BSS domains.

Aim 5 – Foster health-related BSS research and careers within OHSU and catalyze further development of BSS training for health care professionals with the ultimate goal of advancing the health of the nation. The focus on behavioral and social science issues in the curriculum has not only brought about major curriculum change, but a cultural change at OHSU. In addition, this grant project also provided more faculty the opportunity to participate in BSS teaching, educational research, and leadership. Outcomes summary:

• Multidisciplinary faculty collaborated on BSS curriculum development and evaluation: In addition to key personnel, 10 Domain leaders, 5 PCM leaders, and 6 Clerkship Directors previously not involved in BSS in medical education participated in BSS course development, teaching, and evaluation. This substantially increased the numbers of OHSU professionals participating in BSS education and research.

• Faculty development sessions were aimed at giving faculty new skills in facilitating groups and teaching BSS content (approx. 80 per year, volunteer small group leaders from over 20 specialties).

• Over 20 faculty members recruited as expert lecturers have been given the opportunity to present on areas of special interest and to role model BSS knowledge, skills and attitudes for future physicians. Several went on to present material presented to medical students at national meetings (see bibliography for list of presentations and publications).

• BSS Faculty mentored junior faculty in active BSS roles, spreading BSS culture as well as providing career advancement through leadership and academic presentations.
The initial K07 proposal was a response to a call for strengthening the teaching of behavioral and social sciences in medical schools across the United States. The six areas of need identified by the Institute of Medicine in its 2004 report were:

- Mind-Body interactions in health and disease
- Patient Behavior
- Physician role and behavior
- Physician-patient interactions
- Social and cultural issues in health care
- Health policy and economics

The original five-year plan submitted by UCLA identified the following Specific Aims:

1. Develop a set of evidence-based graduation competencies in the six areas of behavioral and social sciences for UCLA medical students, and determine how these might be taught and evaluated so as to be integrated within all four years of the medical school curriculum.
2. Review and revise the Doctoring curriculum as a primary means of teaching and evaluating these competencies.
3. Develop materials to be used within other aspects of the curriculum for the teaching of these competencies, including the third year clerkships and the fourth year colleges as well as the first two years.
4. Develop and implement systematic faculty development for faculty and residents involved in medical student teaching.
5. Design and evaluate tools to assess the effectiveness of the new curriculum modules at the medical school at UCLA.
6. Disseminate the curricular modules in collaboration with other medical schools.
7. Encourage medical students to do research studies in behavioral and social sciences by providing funds for students to attend and present at professional meetings.

Over the past six years the David Geffen School of Medicine at UCLA (DGSOM) has been successful in accomplishing these Aims, as detailed below. The resulting improvements in the teaching of BSS have significantly impacted both the formal and informal curriculum at the DGSOM, resulting in a cultural shift affecting medical students, residents, and faculty. Moreover, the K07 award allowed the DGSOM to be a member of the consortium of nine medical schools across the United States. Working together with major organizations including the Association of American Medical Colleges, the National Board of Medical Examiners, and the American Medical Association, the consortium has advanced the teaching and assessment of the behavioral and social sciences at a national level, as detailed in the Appendix.

1. Develop a set of evidence-based graduation competencies in the six areas of behavioral and social sciences for UCLA medical students, and determine how these might be taught and evaluated so as to be integrated within all four years of the medical school curriculum.
2. Review and revise the Doctoring curriculum as a primary means of teaching and evaluating these competencies.

The majority of the BSS curriculum is contained in the three years of the Doctoring program at the DGSOM. As a result of the previous grant, Dr. Stuber was asked to oversee and coordinate the overall Doctoring curriculum. She was also asked to take over and revise the third year component of Doctoring. The UCLA team refocused Doctoring, so that the first two years were primarily addressed the behavioral and social science areas of patient behavior, physician role and behavior, and physician-patient interactions, with components of social and cultural issues in health care and health policy and economics. Mind-body and
health was addressed with exercises such as a half-day for each student rounding with a hospital-based chaplain, and a visit to an AA meeting. The third year of Doctoring then reduced the focus on patient behavior, and physician-patient interactions (which are a focus on the wards and with the clinical coaches) and put more focus on physician role and on social and cultural issues in health care and health policy and economics. Topics include teamwork, ethics, systems of care, medical error, and clinical decision-making.

3. **Develop materials to be used within other aspects of the curriculum for the teaching of these competencies, including the third year clerkships and the fourth year colleges as well as the first two years.**

BSS is part of the required curriculum of all years at DGSOM. Cultural and economic aspects of care are included in Problem-based learning (PBL) cases in the first two years, and are a part of clinical care in all of the clerkships. Information on use of integrative medicine for treatment of pain is included in the Musculo-skeletal Block of the first year and there is a week in the Medical Neurosciences Block in the second year, which focuses on stress and disease. This week includes an interactive lab on cognitive behavioral therapy as well as lectures from leading scientists working with stress and the immune system and stress and the gastrointestinal system. An interactive computer-based course which is currently being developed for use in 2012 includes use of biofeedback, acupuncture, relaxation, mindfulness meditation, as well as use of herbs and supplements for headache. All third year students are given an introduction and experience of yoga and mindfulness meditation, with discussion about use of diet, exercise, and social support to maintain personal health.

4. **Develop and implement systematic faculty development for faculty and residents involved in medical student teaching.**

The team at DGSOM created specific three-hour workshops for the Doctoring faculty for all three years of this curriculum. In addition, one hour faculty development sessions are required before each session with the students. Faculty members are also given specific readings and an opportunity to discuss these with one another and with Dr. Stuber or Zackson. A similar approach is used with the tutors in the second year Medical Neurosciences Block. Faculty members in the Doctoring courses were able to earn continuing education credits for these sessions, providing an added incentive to attend.

Rita Charon, M.D., Ph.D. from Columbia (another school in the BSS consortium), was invited to have multiple discussions on the use of narrative writing, including meetings with the Medical Education Committee regarding the types of writing which should be taught in medical school, and Grand Rounds presentations for Internal Medicine and for Psychiatry in April 2007 (which can be viewed at [www.PsychiatryGrandRounds.com](http://www.PsychiatryGrandRounds.com)).

The group at DGSOM has also been invited to work with faculty in many departments. Specific interactive sessions on ethics in the workplace have been presented by Drs. Bursch, Cook and Stuber with the faculty and trainees in psychology and psychiatry in the division of Child and Adolescent Psychiatry. Drs. Zackson and Baillie have held interactive workshops on teaching professionalism with residents and faculty from over 25 training programs at DGSOM.

5. **Design and evaluate tools to assess the effectiveness of the new curriculum modules at the medical school at UCLA.**

The DGSOM has used a variety of tools to evaluate the success of these interventions. The first level is through required student on-line evaluations of all teachers and courses. These evaluations are read carefully by the course directors, who are expected to respond to them. Changes in courses made in response to student feedback are discussed within the monthly meetings of the course chairs. DGSOM students commonly make extensive narrative comments about the courses and instructors, in addition to indicating numerical ratings.

Qualitative feedback is also gathered using student representatives in some courses and for all of the Doctoring courses. For example, Dr. Stuber or Zackson meets with student representatives of the small groups in Doctoring 3/ System-based Healthcare three times a year. This provides an opportunity for brainstorming
about future topics as well as providing specific feedback about group dynamics, tutors, assigned readings, and past topics.

Additional measures were used to assess possible changes in attitudes over the years of intervention. In 2008 and 2009, the Jefferson Empathy Scale and the Patient-Practitioner Orientation Scale (PPOS) and the C3 (Communication, Curriculum and Culture) instruments were given to students at the start and end of the third year. These data are currently being compared with data collected by other schools within the K07 consortium.

6. **Disseminate the curricular modules in collaboration with other medical schools.**
Drs. Stuber, Baillie, Wimmers, Cook, Zackson, and Bursch have presented our findings at national annual meetings of the Association for Directors of Medical Student Education in Psychiatry, the Society for Family Medicine, the Association of American Medical Colleges, the American Association of Cancer Educators, the Ottawa Conference, and the Association for the Behavioral Sciences and Medical Education, and regional meeting of the Western Group on Medical Education for the AAMC. We have also presented posters and papers on the behavioral and social science curriculum at the Association of Medical Education of Europe (AMEE) and at other international medical education meetings in Italy, Norway, Australia, Istanbul, and the Czech Republic. We have created a website, to disseminate the evaluation materials described above as well as other curricular materials developed by the team. [www.medicalprofessionalism.org](http://www.medicalprofessionalism.org)

Dr. Stuber is a UCLA representative on conference calls and meetings of the national Consortium of Academic Health Centers for Integrative Medicine. A group from UCLA is working with the University of Nevada to transform their curriculum, with Dr. Stuber addressing the behavioral and social science components. Dr. Stuber was also a part of a group from UCLA invited to present at an international conference on Evidence Based Education at Sumandeep Vidyapeeth University in India in March 2011, where she spoke about teaching professionalism and on how to integrate behavioral and social science materials with the clinical and basic sciences in medical education.

7. **Encourage medical students to do research studies in behavioral and social sciences by providing funds for students to attend and present at professional meetings.**

During the first few years of funding Dawn Desylvia, one of the UCLA DGSOM students worked with our team to conduct a survey of the medical students’ experience with, knowledge of, and attitudes toward complementary and alternative medical practices, resulting in a publication. The team has had two to five medical students work with them each summer, many from other medical schools across the United States. Two of these have resulted in papers now in press. In addition, one or two fourth year UCLA medical students have chosen to spend a six-week research elective with the team each year. Two of these resulted in senior scholarship projects in 2011. We have also sponsored medical students from UCLA and other schools to present research at national and international conferences. An example of a poster presented at the American Pediatric Society meeting by Leila Hojat is included in the appendix.
Our five year K-07 project, “Integrating Social and Behavioral Science in Medical Education,” achieved its primary goals and outcomes through 4 Specific Aims. Curricular innovations were primarily delivered in years 1-3 of medical school in the outpatient and/or classroom setting. Pilot studies of clerkship innovations identified key areas for future educational scholarship primarily in the inpatient setting. Our new R25 project, “Collaborative Advances in Clinical Health Education” (CACHE) continues this work but expands the scope of learners to include medical residents, faculty attendings, and hospitalists at both UCSF and Stanford hospitals.

I. Specific Aims and Relevant Studies/Results

Specific Aim 1: Building Blocks: Expand the UCSF undergraduate medical student curriculum (MS1-4) to ensure adequate coverage of the 6 IOM content domains... Substantial new, required content has been developed in medical student years 1-3 and advanced content has been added to year 4 as part of the Health & Society Pathway. An extensive local mapping project identified significant overlap with an existing course in provider-patient interaction and professionalism, thus only 4 of the IOM categories were emphasized in this K07 project - Mind-Body, Patient Behavior, Social-Cultural Factors, and Health Policy/Economics. For the remaining 2 content areas (Provider-Pt Interaction and Physician Role), focused materials were developed to supplement the pre-existing course (e.g. see Telephone Follow-up project below under Specific Aim 3). Specific high priority topics where selected by a multimodal process including a review of all leading SBS textbooks, local expert consensus, and a national survey of n = 204 medical school faculty. Convergent results allowed our group to confidently select highest priority topics for development and implementation (Satterfield, et al., 2010). To objectively measure quantitative growth (percentage of hours), and the areas of growth, we performed pre-post curriculum mapping of the larger SOM curricula in 4 of the 6 IOM domains in 2005-2006 and 2009-2010 using electronic keyword searches and interviews of course and clerkship directors. Results indicate a 16% increase in SBS sessions in the overall curricula and a 24% increase in SBS content in the syllabi. The change in both the number of teaching sessions containing SBS content and the amount of SBS content in the course syllabi for each IOM domain was as follows: 54.3% increase in session number and 50.0% increase in syllabi content for Mind-Body, 4.2% increase in sessions and 4.5% decrease in syllabi for Patient Behavior, 7% decrease in sessions for Social-Cultural Issues in Medicine but a 12% increase in syllabi content, and 11.8% increase in sessions and 100% increase in syllabi content for Health Policy.

To promote the integration of SBS concepts into non-SBS sessions, basic science faculty joined the SBS curriculum team and co-developed “integrated science teaching modules” – Pharmacology, Genetics, Endocrinology, Health Policy, and Integrative Medicine/CAM. As mentioned above, 3 of the 4 IOM areas had substantial increases in SBS syllabus content. To further measure integration and the possible uptake of SBS concepts by non-SBS faculty, a measure of “institutional penetrance” was created. Institutional penetrance was assessed using electronic key word searches of the entire medical school syllabus for each IOM area to determine when constructs emerged and who was responsible for the use of the term. Key words were taken from the IOM report (2004), SBS textbooks, and an index of MeSH terms with the assistance of a research librarian. Searches were completed for the 2005-2006 (pre) and 2009-2010 (post) school years and controlled for overall syllabus length. Preliminary results suggest that non-SBS faculty who worked with our K-07 team were more likely to incorporate SBS topics into their teaching sessions as hoped. For example, our pharmacologists now routinely discuss medication adherence and our geneticists are more likely to discuss ethical and cultural considerations of genetic screening and counseling.

SBS clerkship liaisons were assigned to each MS3 clerkship to collect data on current clerkship practices and begin the process of developing buy-in. Clerkship directors and SBS liaisons identified best practices, “low-hanging fruit,” and created a wish-list for SBS innovations. Each clerkship developed at least one SBS session or teaching tool – e.g. inclusion of SBS faculty in neurology case conferences, requiring students to write a biopsychosocial formulation for psychiatry, or materials for smoking cessation with pregnant women in Ob/Gyn. Both clerkship faculty and students appreciated the curricular innovations although the number of sessions was low and SBS tended to be overwhelmed by clinical care duties outside of protected seminar or conference time. Clerkship faculty expressed the wish for greater faculty development and demonstrations of the utility of SBS in clinical care.
To measure quality, inform change and drive improvement, we completed in-depth evaluations of the overall curricular design, organization, implementation, and outcomes of 3 of the SBS IOM domains: Patient Behavior, Social-Cultural Issues in Medicine, and Health Policy. This evaluation consisted of student reflections on the curriculum and comparison of faculty teaching scores for the aforementioned 3 IOM domains for one graduating class. Key themes from the student reflection were as follows: (1) Social-Cultural Issues in Medicine: students were satisfied with the content covered during the first three years and put much of what they learned into practice during the third-year. Student would have liked additional coverage of these issues as it related to patient care in the third year. (2) Health Policy: Students were satisfied with the Health Policy content received and cited specific areas which they felt they learned best. Students however, also reported that they would have liked to have more instruction in Health Policy over the course of the first two years. (3) Patient Behavior: Students acknowledged the importance of the behavior curriculum to practice and noted how relevant the information was when they entered the clinical years. Students cited learning the most about behavior change and health-related behaviors. Results of the faculty teaching evaluation data during the first two years of the curriculum for small group leaders remained stable from 2005 through 2009. In 2009 faculty teaching scores for SBS small group facilitators across all blocks were high (above 4 on a scale of 1-5) and similar to other small groups in the first two years of the curriculum. Near the end of our project period, SBS didactic lectures and SBS faculty were regularly nominated for medical student teaching awards.

In addition, we examined change in student perceptions of the SBS-related curricula using data from the Association of American Medical Colleges Graduation Questionnaire (GQ). The GQ data were compared between 2005 and 2009. Results showed that significantly more students participated in field experiences in community health and experiences related to cultural awareness in 2009 than 2005. Significantly more 2009 students felt their education in ethical decision-making and behavioral sciences was appropriate.

Specific Aim 2: Pipeline: Identify and develop “pipeline” students with promise to become SBS leaders in research, education, and patient care and promote SBS research and education. We supported students in the SBS Area of Concentration (AoC) and the new Health and Society (H&S) Pathway to Discovery Program by providing mentorship, research training, and funds for student projects in SBS-related areas. Elective SBS research sessions were created for MS1/2 and an in depth research training course was developed for MS4 students interested in SBS. An SBS mentor directory was developed and basic mentorship training was provided before students were paired with mentors. Between 2005 and 2010, 19 students participated in the SBS AoC/H&S Pathway and received SBS project funding. Nearly all projects resulted in at least one poster/abstract presentation and, in some cases, presentations at national meetings including an invited plenary address for the Association for Behavioral Science and Medical Education (2008). A full listing of all student projects and presentations is included in the SBS Dissemination Registry in Appendix 2. To assess the impact of the SBS pipeline on student careers, we are currently interviewing these students about their status post-program participation, program impact on career choice, and overall perception of the program in relation to professional development. Students who received funding reported that it helped then carry out and complete their projects. Students interested in SBS research reported that the grants educated them about avenues for conducting such research and provided them with mentors to draw on. Students gained research, curriculum development and grant writing skills, learned how to coordinate a team for research purposes, and created collegial networks that helped them with and during residency.

Specific Aim 3: Assessment: Develop, implement, and evaluate SBS skill-based competencies and assessments by year of learner. Evaluate developed curricular materials and overall project impact. After an extensive curricular mapping project to identify local SBS content and coverage (Satterfield, et al., 2010), 9 core SBS competencies (and 19 sub-competencies) were selected as “high priority” and used to drive curricular innovations for MS1-3 including work in the clinical clerkships. Clinical assessments of students were achieved through faculty and/or resident ratings of student performance and clinical performance exams using standardized patients (SP’s) in the UCSF clinical skills center. We evaluated the impact of the overall SBS curriculum on students’ skills by examining the change in student performance on SBS-related items on the annual mini-Clinical Performance Examination (Mini-CPX) administered at mid-third year and the high stakes Clinical Performance Exam (CPX) administered at the end of the third year of medical school. Students’ individual checklist items were compared for 2007, 2008, and 2009. On the Mini-CPX, there was a consistent upward trend in student performance in the health behavior and risk-factor assessment related skills. On the CPX, results indicated that the students in 2009 performed significantly better than students in 2007 on addressing pain control and readiness to stop smoking. At present, this SBS composite does not have
sufficient items to score competence for each IOM domain. Further development of SP cases and checklists will be essential to create psychometrically valid and educationally useful measures.

In 2008-2009, we piloted a telephone follow-up curriculum for 3rd year students to reinforce communication competencies around patient education and adherence. 70.6% of students reported improvement in their patient education skills and 41% changed their approach to patient education. The performance of intervention students as compared with non-intervention students on communication items on an SP format clinical performance exam trended toward greater use of effective patient education techniques. Debriefing sessions with students and faculty suggest that students would have benefited from more direct observations of the skills and greater opportunities to practice.

In addition to the measure of institutional penetrance discussed under AIM 1, we evaluated overall impact of the SBS curriculum by looking at changes in student attitudes over time using the ATSIM and HBAS surveys (Crosson et al., 2004; Parlow & Rothman, 1974). Students in their second year were significantly more likely than first years to agree with the importance of knowing the patients’ perspective in order to provide good health care (p=.001). We also looked for changes over time in students’ conceptual approaches to patient care problems (using a concept mapping exercise of a written case scenario). Results from the comparison of concept maps between first and second years indicated that first years had less robust maps with fewer nodes (12.4 vs 15.7 total nodes) and were significantly less likely to include social history-taking items, health behaviors, or consider SBS-related treatments (2.3 vs 3.4, p=.03).

Finally we sought to understand faculty attitudes toward SBS in medicine and whether curricular improvements would lead to attitudinal changes as measured by the HBAS and ATSIM (Crosson et al., 2004; Parlow & Rothman, 1974). We administered surveys to faculty members with three or more teaching evaluations in 2006-2007 and again in 2009-2010. Overall aggregated faculty attitudes similar between both years except that faculty in 2010 were less likely to value the importance of social factors as determinants of health and illness (p=.02). Ongoing analyses will determine if these attitudes were more likely to be held by clinical faculty who were not the central targets of the K07 but will be targeted by this proposed R25. This negative finding is consistent with third year student perceptions of their learning environment with clinical faculty as measured by the C3 questionnaire (Haidet et al, 2005). Results from the C3 survey in 2007 and 2010 showed a more negative view of the hidden curriculum in 2010 particularly around the issues of treating patients as objects and delivery of bad news. Anecdotally, students have suggested that the SBS curriculum taught them to look for unprofessional behaviors but hasn’t altered the behavior of residents and faculty.

Specific Aim 4: Dissemination: Disseminate educational products—including an SBS case book and teaching guide—to other medical and health professional schools. Our SBS Dissemination Registry lists all professional presentations, projects, publications, and grant applications supported by our 5 year project. To date, our group has produced 20 peer reviewed publications, 6 book chapters, 2 online publications, 3 books, and 2 published abstracts. We have presented over 40 professional talks, symposia, workshops, and posters. Of the total publications, 17 are in educational journals, text books, or websites with the remainder in professional journals addressing core SBS knowledge and/or foundational research to move our efforts into other populations of learners (e.g. residency education). Given the declining use of textbooks and the mismatch between how rapidly this field is advancing and how slowly books come to press, our group decided not to produce an “SBS case book.” Instead, we created an electronic “toolbox” of SBS “clinical pearls” that translate core SBS constructs into clinical care (Saba et al., 2010). This toolbox was peer-reviewed and published on MedEdPortal (including an attached teaching guide) making these tools available to everyone. A paper detailing teaching methods, processes, and “tips” is currently under preparation. As a further contribution to the broader field of medical education, our group recently published a systematic review of curricula for behavior change counseling skills (Hauer et al, 2012). Our group will continue to submit and share developed curricular tools including SBS standardized patient and teaching cases using MedEdPortal and in a recently contracted medical education book by Springer due out in 2014.

II. Significance. Over 1000 UCSF and UC Berkeley medical students (in our joint medical program) have experienced at least a portion of the new SBS-related curricula and we have trained a total of 95 faculty and post-doctoral fellows to specifically teach SBS content to medical students. In addition, a subset of students have been identified as potential future leaders in SBS and supported in this specific area of career and skills development. Further impact is demonstrated by two new funded grants that have grown from this project – an
interprofessional, integrative medicine leadership grant (PI: S. Adler, NIH K07) and a residency training grant for substance abuse in primary care (PI: J. Satterfield, SAMHSA/CSAT). Our extensive dissemination registry (with over 30 publications and 40 presentations) demonstrates impact beyond UCSF including collaborations with other KO7 consortium schools and national organizations. Although patient satisfaction and clinical outcomes were not measured in this study, we hope improved learner competencies translate into better patient care. Our future R25 project will work to integrate SBS more closely into patient care and clinical teaching through providing support to residents and faculty who teach students.

III. Plans. Our new project, “Collaborative Advances in Clinical Health Education” (CACHE) begins Spring 2011. This project will focus on faculty and resident training as a means to improve patient care and medical student teaching. In the interim, project faculty and staff are currently in the process of revising and “cleaning” all curricular products, finishing final data analyses, and writing up materials for dissemination. Papers in preparation include “Teaching Provider-Patient Interaction Skills with Telephone Follow-up Calls,” “12 Tips for Teaching the Social and Behavioral Sciences,” and “Concept Mapping for the Social and Behavioral Sciences.” We have recently joined with the American Psychosomatic Society and Springer publishing to create a consortium wide collection of “SBS best teaching practices” to be included in a forthcoming medical education textbook.
University of North Carolina
Principal Investigator: Alan Cross

UNC School of Medicine’s K07 BSS project (2006-2011) addressed all 26 topics defined in the 2004 IOM report, plus one more. UNC sought to make changes sustainable by working within the existing structure of curriculum management. Grant resources supported key faculty members in instigating changes, as well as in evaluation. The curriculum management system was reshaped to support ongoing innovation. A key accomplishment has been the development of Core Competencies for all students that highlight behavioral and social science. UNC SOM is initiating major reforms based on these new competencies. UNC’s Aims for the K07 program were:

**Aim 1:** Engage a multi-disciplinary faculty in teaching BSS and develop institutional support to sustain improvements.

**Aim 2:** Establish measurable learning objectives for BSS topics.

**Aim 3:** Incorporate new BSS curricular components into all four years of the curriculum.

**Aim 4:** Conduct faculty development modules to enhance capacity of faculty and preceptors to teach BSS.

**Aim 5:** In collaboration with other funded institutions, disseminate faculty development programs and evaluation strategies.

**Managing Institutional Change:**

In the first years of the K07 grant, UNC’s PI acted as co-chair of the 1st year curriculum, member of the Curriculum Management and Policy Committee, and co-director of the newly-formed, grant-supported Academy of Educators (AOE). Grant-affiliated faculty members helped develop a 4-year sequence to teach clinical and communication skills. In grant year 2, the new Executive Associate Dean for Medical Education revamped the curriculum management structure and embarked on major learning environment changes that give greater prominence to BSS. Several coinvestigators participated in monthly course committees, annual day-long curriculum reviews, and the AOE, fostering integration of project goals within the new curriculum administration. The K07 grant substantially affected development of new Competencies for students that will drive the curriculum for the next several years.

**Specific Curricular Innovations Supported by K07 Funded Investigators**

**4th Year:**

**Advanced Practice Selective:** This required 4th year course addresses systems-based practice—including how practice organization and financing affect care and outcomes. Grant-supported faculty members have contributed social medicine sessions to this course, given each month through the year for a group of 10-16 students. One month is dedicated to studying the underserved in depth.

**Integration Selective:** This required 4th year course was designed to reintegrate basic science into the clinical experience. Grant-supported faculty members consulted extensively with its director to include BSS among “basic” sciences. K07-supported faculty members provided several social medicine sessions for this selective, including clinical ethics. This selective for 10-16 students runs monthly throughout the year.

**LGBTQ and Clinical Ethics in Capstone:** A one-week Capstone course for all 4th year students addresses topics critical to internship performance. Three hours of this course are now dedicated to concerns of gay, lesbian and transgendered persons— led by gay and lesbian medical students with faculty backup. This approach was presented at the 2010 AAMC meeting. Another new three-hour session on clinical ethics— comparing different moral theoretical approaches to specific cases—was conducted in small groups by Medicine and Society faculty, reprising as much as possible the structure of 1st-year Medicine & Society sections.
Literature and Medicine in Capstone: 13-15 students participate in group discussion of selected literary works during the 4th year Capstone course. This experience mobilizes discussion of fiction, poetry, and other forms of literature to facilitate reflection on social dimensions of medical care.

3rd Year:

Cultural Sensitivity in the Pediatric Clerkship: Each 3rd year student writes a reflective essay on how cultural difference affected care of a particular patient. Essays are reviewed in group discussion. This exercise includes students at Area Health Education Centers (AHEC) sites as well as in Chapel Hill.

Advocacy in the Pediatric Clerkship: A discussion of the physician's role as advocate was added to the pediatrics clerkship.

Critical Incident Reports in Medicine Clerkship: A critical incident essay and discussion sessions component was introduced in the Internal Medicine Inpatient Clerkship. Topics range from professional roles to teamwork to organizational change.

Family Medicine OSCE: The family medicine clerkship now includes an Objective Structured Clinical Exam (OSCE) in its student assessment. This case includes behavioral and social dimensions of care.

Transition Course: A week-long course including project personnel was created to ease the students' transition from classroom basic science to hospital and clinic-based learning. This includes redefining students' roles and considering ethical issues that complicate patient care.

2nd Year:

Brain and Behavior: In 2009 the 2nd year neurosciences course was redesigned with the assistance of student evaluations, and coordinated with 1st year neuroanatomy and physiology and with the 3rd year clerkship in neurology. The course, renamed 'Brain and Behavior', provides considerably more behavioral science, and represents a key area for future faculty and course development.

1st Year:

Clinical Applications Course: In the '05-'06 academic year, a newly formed Clinical Applications Course (CAC) was directed by the project PI, based on three evolving clinical cases spanning the first year. Each case highlighted specific social forces as well as bioscience problems.

Clinical Cases: Emulating the CAC, 1st year course directors agreed to build into the block curricula other clinical cases that reflect common health problems, such as diabetes and hypertension, affecting citizens of North Carolina. They also agreed to weave the three CAC patients into block curricula.

Multi-Year Core Learning Sequences

Communication: In year one of the K07 award, a faculty group created a coherent 4-year curriculum in doctor-patient communication. The leader of this effort now co-directs a revised Introduction to Clinical Medicine course—Clinical Skills Development (MS1) and Clinical Skills Integration (MS2).

Professionalism: This topic received sustained attention in the K07 curriculum grant. We adopted a multidimensional framework building on conceptual foundations laid in 1st year Medicine and Society on skills taught in Introduction to Clinical Medicine. A committee including project leaders created definitions and assessment tools. The student advisory system was revamped: Advisory Colleges are now convened by carefully-selected faculty receiving 20% salary support to advise and monitor professional development of 16 students from each class. A curriculum of noon meetings addresses professionalism throughout the 4-year student experience, including opportunities for senior students to inform students more junior. A Faculty Development Grand Rounds led to official adoption of a robustly social/historical definition of professionalism. The AOE hosted workshops on teaching and evaluation of professionalism.
Ethics: The 1st-year Medicine and Society course has long devoted considerable attention to ethics, but continuation of ethics teaching in clinical years is needed. The K07 grant supported a range of improvements. Key faculty, included several K07 OSCs, who led incorporation of ethics topics into clerkships, the former Integration Selective, and the 4th year Capstone Course (above).

Faculty Development: UNCSOM has a strong faculty in BSS, particularly in the Department of Social Medicine. Faculty members in other departments have expertise in this area, but the number is not sufficient to bring BSS education to all clinical settings. Faculty development has been a major goal of our project. We launched invited clinical faculty to “lunch and learn” discussions of social topics. With the formation of the AOE, improved communication and incentives (including CME credit) have markedly improved attendance at faculty development workshops. The Academy regularly supports faculty development sessions in BSS topics and associated teaching practices—including sponsorship of outside speakers and workshop leaders. UNC’s K07 PI and many collaborators are AOE members.

Nine-School Collaboration: An active consortium developed among the K07 institutions, chaired for 2 years by UNC’s K07 PI. In monthly conference calls, K07 PIs—the NIH BSS Curriculum Consortium—compared pedagogical innovations, discussed presentations at the AAMC and the AMA, and collaborated on evaluations and publications. UNC’s K07 evaluator collaborated with other project evaluators and helped coauthor two papers (Hollar et al. 2007; Carney et al. 2010). A UNC K07 collaborator represented UNC in Consortium discussions of the AMA (ISTEP) study of learning environments in 2011.

Evaluation: Data supporting program evaluation are not included in this abbreviated summary. Overall, UNC was reasonably successful at accomplishing its original goals and evaluating most of them. UNC laid groundwork for more systematic coverage of BSS topics across the 4-year curriculum over the next 4 years, and for more robust efforts at training faculty to teach those topics.
During the previous K07 grant period, the UWSMPH initiated a comprehensive curriculum transformation process across all four years of medical education which aligned with the school’s overall transformation to a school of Medicine and Public Health. Implementation began in fall 2008 with preclinical curricula, and planning is ongoing for curricular change in the clinical years. The goal of the curriculum transformation is to integrate the core principles of public health and population medicine with the teaching of traditionally focused medical education. Understanding the behavioral and social science determinants of health is critical to transforming the way graduates of our new curriculum integrate public health content and practice into new strategies to address the full spectrum of health and disease.

At the beginning of the last grant period, UWSMPH defined competency outcomes for medical students in the six curricular domains of the IOM 2004 report *Improving Medical Education: Enhancing the Behavioral and Social Science Content of Medical School Curricula* for each year of medical education. Over the course of several years, new BASIC (Behavioral and Social Science Integrated Curriculum) courses and initiatives were developed for the three domains defined as focused topics for curricular enhancement: Cultural competence, professionalism and health care system/economics/public health. Key accomplishments in these three areas are outlined below.

**Cultural Competency:** Under the direction of Shobhina Chheda, MD, new content on cultural competency has been added to core courses across the continuum of medical school training. An assessment of the content of this curriculum was done using the AAMC TACCT (Teaching and Assessing Cultural Competency Training) instrument. Missing content was identified and modifications to assessments were piloted.

Elements of the new BASIC cultural competency curriculum include:

- A required four semester Cultural Perspectives Curriculum with approximately 8 hrs large group / 4 hours small group instruction across four semesters of the first and second year “Patient, Doctor and Society (PDS)” course. Topics include health and illness perspectives of patients and physicians, culture of medicine, and health literacy. Assignments also engage students in the process of self-reflection to further understand their own health and illness perspectives and biases.

- An electronic portfolio to document learning in the domain of cultural competence was piloted in 2008 to determine if this assessment method could be adapted to medical student education. Students completed a portfolio-based reflective writing exercise around an artifact of cultural competence. A two-phase evaluation of the portfolio project with first year students and mentors in the Patient Doctor and Society 1 course was completed. Phase I utilized mentors’ pre-portfolio and post-portfolio ratings of students’ cultural competence and post-exercise surveys of students and mentors to determine the drawbacks and benefits of using portfolios. Phase II used similar ratings and survey responses by multiple faculty members unfamiliar with the students to calculate inter-rater reliability and determine the feasibility of using students’ portfolios as a measure of their cultural competence.

Despite initial positive evaluation of the pilot project, electronic portfolios have not been more widely adopted for learning and assessment within our curriculum. This grant application proposes their further development using a new technology platform and an expanded focus to include professionalism, career development, and measurement of other competencies.

- Efforts to integrate cultural competency curricula into clinical education have resulted in the integration of new cultural competency/health disparities content into clerkship curricula as well as adaptation of existing curricula. This occurred through collaboration with individual clerkship directors and promoted sustainability of the implemented changes. This work was presented in collaboration with two other Behavioral and
Social Science Consortium institutions at the 2008 AAMC meeting. A manuscript describing this work is currently being revised for re-submission. A required third year Core Day “Skills to Impact Health Disparities” has been developed and is now offered annually. This has been modified each year through an extensive student survey and review cycle which assesses student self-perceived comfort on skills related to cultural competence; review and revision of existing learning objectives of trigger cases based on student responses; development and/or modification of trigger cases to meet objectives; pilot of new trigger cases prior to Core Day; and repeat survey of students regarding self-perceived comfort on skills related to cultural competence. Currently, dissemination of trigger cases via Med Ed Portal is underway.

- The Transitional Clerkship for rising third year students was revised to include sessions on BASIC topics of professionalism, communication, and teamwork.

- Pilot of a new interdisciplinary experiential course was offered: Intercultural Communication in Health Care, which included extensive discussion with patients and health care teams and drew student enrollees from medicine, nursing, social work, physician assistant and physical therapy programs. This will not be continued due to a position change of the instructor.

The assessment of cultural competency via a standardized clinical skills exam is being piloted to measure student achievement of these skills. Previously, the primary assessment of these skills was at end of second year through testing via a PDS 4 OSCE looking specifically at skills regarding health literacy. In our pilot, the third year “Year End Professional Skills Assessment” (YEPSA) was revised to look at communication across stations as one way to assess students’ success at providing culturally competent care. Items were developed using the Kalamazoo Consensus Statement, which defines seven key areas of patient-physician communication. In addition, we developed a YEPSA station to focus on student assessment of negotiating differences in health beliefs. Outcomes of student performance are pending.

In the new grant period, the focus of our efforts in this area will shift from curriculum development to dissemination activities, with our partner institution and other schools in the consortium.

**Professionalism:** Under the direction of grant PI and Associate Dean for Students Patrick McBride, UWSMPH has made significant progress to develop a comprehensive plan to foster the expression of professional values and behaviors by medical students across all years of education. Attributes of professionalism were defined and strategies to incorporate teaching, role modeling, and peer support were identified in the traditional curriculum as well as for the “hidden curriculum”.

Dr. McBride and other key faculty and staff attended the University of Indiana School of Medicine Immersion Conference for faculty development on professionalism education, resulting in the development of a UWSMPH professionalism program which includes:

- Utilizing professionalism measures in admissions interviews
- Restructuring the first-year orientation to incorporate patient interaction and student-written oath of professionalism and code of conduct
- Revising the third-year transitional clerkship to include sessions on BASIC topics of professionalism, communication, and teamwork
- Evaluating student professionalism in courses and clerkships
- Implementing an academic and career advising program, utilizing 20 faculty mentors to engage with students individually and through Learning Communities
- Working with hospitals, faculty and staff to create an optimal learning environment
- Developing faculty and student honors for professionalism and service
- Establishing a Gold Humanism Honor Society, a national honor society for medical students that recognizes leadership, humanistic behavior, and community services. Our student chapter has led numerous efforts to incorporate the teaching of humanism into our curriculum and student experiences.
In addition, working through their Learning Communities, all entering classes write an oath of professionalism incorporated into the white coat ceremony for the first year of medical school. Students are evaluated on selected attributes of professionalism in most courses and all clerkships. Faculty education on professionalism includes grand rounds and sessions at Medical Education Day. A career advising and mentoring program (ACAP) was established that matches faculty to students within small group Learning Communities. All orientation, transitional clerkship and third year core curriculum events include content on professionalism.

Public Health: New content in this domain was added into the first, second and fourth year medical student curriculum within existing courses: “Patient, Doctor and Society 1-4” in the first two years and the fourth year required preceptorship clerkship. A new three credit required course, “Epidemiology and Population Health”, was added to the first year of training to allow in-depth teaching of the basic science of population health (epidemiology, biostatistics, study design, and introductory level information on population health and health systems).

Under the direction of Associate Dean for Medical Education Christine Seibert, curriculum restructuring in years one and two allowed for the introduction of monthly two-day Integrating Case discussions which bring biomedical, behavioral and social science content together with public health and societal implications. Cases include topics such as prematurity and infant mortality, organ transplantation, obesity, diabetes, substance abuse, chronic pain management, and other discipline-spanning conditions or concerns. Reflective writing has been

Expanded Summer Research Opportunities in Behavioral and Social Sciences: UWSMPH sponsors a mentored summer research program for more than 70 medical students between first and second years. Institution and grant support has expanded opportunities for students to work with faculty engaged in behavioral and social science research. The number of projects in behavioral and social sciences content domains (patient behavior, physician role and behavior, physician-patient interactions, social and cultural issues in health care, and health policy and economics) has grown each year. In 2010, ten such projects were undertaken.

Institutional impact: UWSMPH provided matching funds from the Wisconsin Partnership Program endowment to support education innovations developed from the BASIC award. A comprehensive curriculum transformation plan – a product of two years of planning (and still ongoing) – was implemented for our entering first year medical students in 2008. The complete redesign of the UWSMPH medical student curriculum – with the overarching goal of integrating public health and traditional medical education – has opened the architecture of the curricular structure to allow for significant change across all years of medical student education. Student assessment and curricular evaluation methods have been designed to measure the impact of these innovative changes and are ongoing.

The outcomes and key findings of the work completed on the BASIC grant include 7 presentations at regional and national professional meetings, 11 abstracts, and 5 publications in peer-reviewed journals. These products resulted in significant interest in the work accomplished.