The University of Texas Southwestern Medical Center at Dallas

**Southern Association of Colleges and Schools:
Quality Enhancement Plan**

CONVERGENCE

Establishing learning communities across health professions

**Prepared by the Quality Enhancement Plan Committee
for the SACS On-Site Visit
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Abbreviations Used in This Document

Abbreviation	Definition	Abbreviation	Definition
AAMC	Association of American Medical Colleges	MS1, MS2	Medical Students in Year 1, 2
ACGME	Accreditation Council for Graduate Medical Education	MSTP	Medical Scientist Training Program
COC	Commission on Colleges	OME	Office of Medical Education
DIT2	Defining Issues Test 2	QEP	Quality Enhancement Plan
GIR	Group on Information Resources (AAMC)	SACS	Southern Association of Colleges and Schools
GSBS	Graduate School of Biomedical Sciences	SHP (SSHP)	(Southwestern) School of Health Professions
IDEAL	Interprofessional Development, Education & Active Learning	SMIGs	Science of Medicine Interest Groups
IPE	Interprofessional Education	STARS	Science Teachers Access to Resources at Southwestern
JSPE	Jefferson Scale of Physician Empathy	SURF	Summer Undergraduate Research Fellowship Program
LC	Learning Communities	SWAT	Southwestern Academy of Teachers
LCD	Learning Community Days	UT	University of Texas
LCME	Liaison Committee on Medical Education		

I. Executive Summary

The University of Texas Southwestern Medical Center is a leading academic medical center offering students the opportunity to learn from medical science's best and brightest. Today's Center includes three degree-granting institutions: UT Southwestern Medical School, UT Southwestern Graduate School of Biomedical Sciences and UT Southwestern School of Health Professions. We train the physicians, medical scientists and allied health care professionals of the future. Medical students learn to become highly skilled practitioners. Researchers are trained to lead their fields in developing the latest innovations in biomedical science. Students from our health professions programs go on to become integral members of our nation's health care team.

For nearly two years, the Quality Enhancement Plan has evolved through an iterative process of inquiry, investigation, communication and cooperation involving a broad and diverse representation across the three schools. Our QEP is the educational **CONVERGENCE** of two missions of the medical center – patient care and biomedical science. **CONVERGENCE** involves students from multiple professions interactively learning together in a protected and nurturing community for the explicit purpose of improving interprofessional communication, collaboration and the health/well-being of our region, our state and our nation. The QEP is also the **CONVERGENCE** of these communities in a campus-wide interprofessional event called Learning Community Days.

CONVERGENCE will enhance students' learning by improving a) their knowledge and understanding of common diseases and b) their ability to communicate this knowledge to peers, professionals, patients and the public. The plan creates or makes use of existing learning communities within each of the three schools: Interprofessional Development, Education & Active Learning teams (IDEAL), for the health professions school; Science of Medicine Interest Groups (SMIGs), for the graduate school; and the Academic Colleges, for the medical school. Each learning community will participate in longitudinal activities focused on a specific science of medicine topic over the course of a year or two. Once a year, all of the learning communities will come together or converge to participate in Learning Community Days, concentrating on the specific topic covered in the previous year. **CONVERGENCE** will bridge the educational silos through these interprofessional learning communities, resulting in greater communication within the institution and with the public. **CONVERGENCE** is further enhanced by concentration on the science of medicine, thereby linking our strengths in patient care and research with our educational mission.

CONVERGENCE will create an academic and institutional culture that not only appreciates and values the need for interprofessional training, but also provides opportunities for effective integration of knowledge and skill into health care research or delivery prior to graduation. From an educational perspective, **CONVERGENCE** offers a continuum of knowledge and teambuilding experiences from acquisition, to application, to demonstration. Thus, it represents a dynamic process of student engagement in increasingly more complicated and expansive opportunities.

Learning communities and interprofessional education will become *a way of life* at UT Southwestern and an integral part of our culture. Our faculty, staff and students recognize **CONVERGENCE** as the critical pathway to enhance education and link the provision of health care and community outreach with all professions working together. **CONVERGENCE** began because of a SACS QEP requirement; however, we have found the process to be gratifying and look forward to improving our students' education through these efforts.

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II. Process Used to Develop the Quality Enhancement Plan

The University of Texas Southwestern Medical Center ranks among the top academic medical centers in the world. Our faculty members are responsible for a broad array of groundbreaking biomedical research advances and are highly respected for their dedication to teaching. Our physicians provide patients with the highest quality of care throughout the medical center's outpatient clinics and affiliated hospitals.

The medical center has three degree-granting institutions: UT Southwestern Medical School, UT Southwestern Graduate School of Biomedical Sciences and UT Southwestern School of Health Professions.

- The schools train nearly 4,200 medical, graduate and health profession students, residents and postdoctoral scholars each year.
- Ongoing support from federal agencies such as the National Institutes of Health, along with foundations, individuals and corporations provide more than $360 million per year to fund about 3,500 research projects.
- Faculty and residents provide care to nearly 100,000 hospitalized patients and oversee 1.7 million outpatient visits a year.
- UT Southwestern has approximately 10,000 employees and a 2007-08 operating budget of $1.423 billion.

UT Southwestern Medical Center Mission

- To improve the health care in our community, Texas, our nation, and the world through innovation and education.
- To educate the next generation of leaders in patient care, biomedical science and disease prevention.
- To conduct high-impact, internationally recognized research.
- To deliver patient care that brings UT Southwestern's scientific advances to the bedside — focusing on quality, safety and service.

Accomplishing the mission of UT Southwestern demands a continuous process of quality assessment and improvement. The SACS accreditation preparation and the development of the Quality Enhancement Plan (QEP) was, is and will continue to be a vital part of UT Southwestern's ongoing process of quality assessment and improvement.

Two main goals were initially established in the process used to develop the QEP. The first goal was to involve all of the educational constituencies of the institution. The second goal was to develop a plan that produced strategic educational outcomes for learners. The Faculty Senate of the medical school took the initial step in the process. Students, trainees, teachers and education administrators from all schools met with the senate members to discuss their views about our educational programs (Fig. 2.1). The senate members identified opportunities to transform the teaching and learning experiences at UT Southwestern. Their report (see appendix A) emphasized the importance of interprofessional interactions among the various components of the campus.
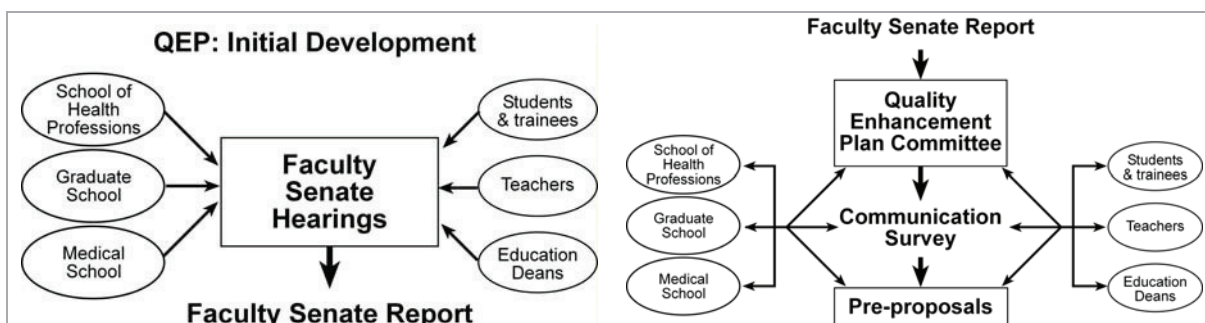
Figure 2.1 Schematic illustration of the process and constituencies involved in the identification of potential QEP topics

A QEP committee with broad and diverse membership from the three schools was convened to take the QEP project forward. The members of the committee are:

Name	Position	Administrative Title
James E. Griffin, M.D. (Chair)	Professor, Internal Medicine	Assoc. Dean for Acad. Planning, UT Southwestern Medical Center
John Abrams, Ph.D.	Professor, Cell Biology	
Patti Blau, Ph.D.	Assoc. Professor, Physical Therapy	
Beth Brickner, M.D.	Assoc. Professor, Internal Medicine	
Raul Caetano, M.D., Ph.D.	Professor, Health Care Sciences	Dean, School of Health Professions
Melanie Cobb, Ph.D.	Professor, Pharmacology	Dean, Graduate School of Biomedical Sciences
Susan Cox, M.D.	Professor, OB/GYN	Assoc. Dean for Medical Education, Southwestern Medical School
Michelle Crank, M.D.	2nd Year Resident, Internal Medicine, Medical School Alumnus	
Jennifer Cuthbert, M.D.	Professor, Internal Medicine	
Juanita Garces	Medical Student	
Alfred Gilman, M.D., Ph.D.	Professor, Pharmacology	Provost, EVP for Acad. Affairs, Dean, Southwestern Medical School
Clarice Grimes, M.D.	Asst. Professor, OB/GYN	
Kim Hoggatt, M.A.	Assoc. Professor, Biomed. Communications	
Kristine Kamm, Ph.D.	Professor, Physiology	
Lynne Kirk, M.D.	Professor, Internal Medicine	Assoc. Dean for Undergraduate Medical Education, Clinical Sciences, Southwestern Medical School
Mark Lehrman, Ph.D.	Professor, Pharmacology	
Rathi Martinez	Medical Student	
Charles McConnel, Ph.D.	Professor, Health Care Sciences	
Dennis McKearin, Ph.D.	Professor, Molecular Biology	Assoc. Dean, Medical Scientist Training Program

Name	**Position**	**Administrative Title**
Angela Mihalic, M.D.	Assoc. Professor, Pediatrics	Assoc. Dean for Student Affairs, Southwestern Medical School
Karen Mulitalo, MPAS	Asst. Professor, Physician Assistant Studies	
Susanne Mumby, Ph.D.	Assoc. Professor, Pharmacology	Asst. Dean, Graduate School of Biomedical Sciences
Venetia Orcutt, Ph.D.	Assoc. Professor, Physician Assistant. Studies	
Octavio Ramilo, M.D.	Professor, Pediatrics	
Michael Roth, Ph.D.	Professor, Biochemistry	Assoc. Dean, Graduate School of Biomedical Sciences
Elizabeth Scott	Physical Therapy. Student	
Jon Self, J.D.	Graduate Student	
Clinton Sheffield	Medical Student	
Nancy Street, Ph.D.	Asst. Professor, Microbiology	Assoc. Dean, Graduate School of Biomedical Sciences
Brenda Timmons, Ph.D.	Postdoctoral Scholar	
Jamie Walker	MSTP Student	
Jon Williamson, Ph.D.	Professor, Health Care Sciences	Assoc. Dean, School of Health Professions
James Drake	*ex officio* member	Director, Planning & Institutional Studies

To begin the process, brainstorming sessions elicited important topics from key stakeholders in the UT Southwestern educational community. Discussions started with an explanation of the QEP and its importance to re-affirmation of our accreditation and to the institution. Each school focused on the QEP process as an opportunity for educational innovation.

The importance of communication within each school, among the schools, and with the community at large, emerged as a common theme after being initially proposed by the graduate student members and echoed by numerous teachers. For example, a diverse group of health professions students were asked what things could be done to improve the quality of their educational experience on campus. Two recurring ideas emerged from these discussions; 1) a need for more interdisciplinary team experiences (e.g., interactions with other health professionals) and 2) a need for more patient-related scenarios (e.g., role playing, mock patients, case studies). In a series of formal meetings and informal dialogues with other students, trainees and teachers, the committee reached a consensus on the need to administer a survey as the next step (Fig. 2.1).

The responses to the survey (n = 1,961) were analyzed and reviewed by the committee members. The survey findings clearly established that communication is important and that additional skills in communication are sought by respondents. The majority of students and postdoctoral scholars indicated that they would like additional educational opportunities to enhance their communication skills. Communication with the public was the area with lowest perceived competence that many of the respondents wanted to improve.

Potential QEP topics and proposals were solicited from the entire community of learners and teachers. The proposed topics included interprofessional education and healthcare, using new educational technology, enhancing teaching facilities, integrating teaching across the

campus, improving learning climates, translating basic science findings to clinical outcomes and efficiency and quality of learning. The committee's next task was to choose a focus that met the goals of involving all our constituents, identifying needs and improving learning outcomes.

III.   Identification of the QEP theme

As a free-standing medical center, UT Southwestern reaches across a broad spectrum of the biomedical enterprise. Training and practice in patient care are as important as basic and clinical research. The institution has long recognized the synergistic benefits that are derived from collaborative efforts. Predictably, however, there remains separation between clinical, research, and allied health careers in their professional cultures, training and practice.

The QEP provides an opportunity to close the gap by involving all our constituents. To achieve the goals of improving learning outcomes, planners sought an appropriate QEP theme that addressed an identified need. An iterative process of discussion and refinement was used in selection of the theme. Our scholars, from novice to expert, were the critical core of the selection process (Fig. 3.1).
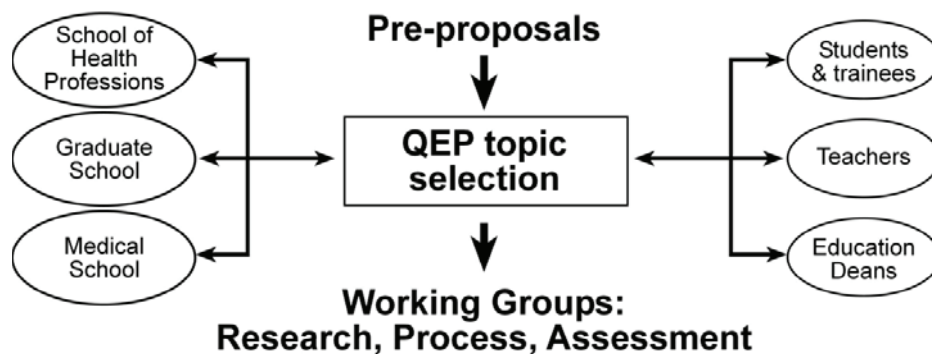
Figure 3.1 Schematic illustration of the process and constituencies involved in the QEP topic selection and development

Proposals:

Initially, all faculty and students were given the opportunity to submit a proposal for consideration in the QEP topic selection process. Altogether, a total of 27 separate proposals were submitted campus-wide. After extensive discussion, criteria for the review and selection of proposals suitable for further development were established, including:

1. Communication aspects of the project
2. Improved learning outcome(s)
3. Measurement of effectiveness
4. Time-frame for implementation
5. Scope of resources
6. Numbers of potential learners involved
7. Ability to serve as a model for other schools, departments and programs
8. Overall importance and significance

Selection Processes:

Every submitted proposal was carefully reviewed by one or more subcommittees representing each of the schools of the institution. Each subcommittee selected proposals for further assessment by the entire group. A number of proposals, while individually worthy, were considered too narrow in either content or target audience. Others were thought to be broadly important topics - for example, cross-cultural communication - and incorporation of these into the final project was to be attempted if at all possible.

The following proposals were selected for further development:

- Health professions school subcommittee: Interprofessional Development, Education & Active Learning teams (IDEAL)
- Graduate school subcommittee: Science of Medicine Interest Groups (SMIGs)
- Medical school subcommittee: IDEAL; Science of Medicine Interest Groups; Expansion of Academic Colleges

The medical school subcommittee envisioned that IDEAL and the Science of Medicine Interest Groups would fit into a theme involving interprofessional communication and translating new knowledge into patient care. Furthermore, these two learning communities could be woven into and throughout the Academic Colleges (described below in section VI).

Every proposal chosen for continued development was then discussed in depth by the entire committee. The inter-relationship of each proposal with all three schools and with the broad communication subject was addressed. The concept of learning communities that enhanced education was introduced as the discussion evolved.

Learning Communities:

UT Southwestern recognizes that each of the three schools contains a variety of intrinsic learning communities for students and trainees. These include the formal and informal curriculum venues for didactic and interactive teaching. The interactions between these current communities vary but campus-wide there is little to no integration. Every learning community involves at least two of the three schools when one considers both the teachers and the learners as a single group. With the implementation of **CONVERGENCE** there will be medical center wide interactions amongst and between the learning communities.

The QEP committee members determined that bringing together learning communities around the common principles of understanding and treating human disease will produce deep and long-lasting benefits by graduating M.D. physicians capable of evaluating and carrying out cutting-edge medical research in addition to primary care of patients, Ph.D. scientists able to translate their findings more readily to patient care and health professionals able to participate more fully in clinical trial research and patient care. Many of the most common modern-day health disorders are the focus of both patient care and research at UT Southwestern. By promoting communication among the researchers, the clinicians and the learners, i.e. students and trainees, the QEP can provide venues for active dissemination of cutting edge, translational research and clinical trials.

Themes:

A tri-school QEP subcommittee met to define the core principles of the proposals that are combined into our single, inclusive QEP. Two central issues, common diseases and interprofessional education, were related to the individual proposals. The subcommittee members from each school discussed their own longitudinal proposal, concentrating on needs, resources and interests of their constituents.

During the ensuing meetings of the tri-school subcommittee and the parent QEP committee, the plan emerged as a connected longitudinal program. Each school identified a learning community and defined that community's interrelationships within the school and between other campus entities. All the schools incorporated a cross-sectional component called Learning Community Days, an event at which communication, cooperation and collaboration will flourish.

Summary:

The goal was to develop an appropriate QEP theme that addressed an identified need. To achieve our goal, an iterative process of discussion and refinement in selection of the theme was used. The identified need is that of interprofessional education and it will center on common diseases. The narrow student learning outcomes will concentrate on the acquisition of knowledge in relation to the common diseases. The broader outcomes will address behaviors and attitudes to colleagues in other professions as well as successful communication with peers and members of the community.

The aim is to promote clinical translational advances by bringing together the science and the practice of medicine. Learning communities are at the center of our QEP theme. Current learning community scholars, from novice to expert, were the critical core of the selection process and will continue to be critical in the implementation. The QEP includes individual components from each school and combined components from two or all three of the schools.

The individual longitudinal components are Interprofessional Development, Education & Active Learning teams (IDEAL) from the health professions school; Science of Medicine Interest Groups (SMIGs), from the graduate school; and the Academic Colleges, from the medical school. Each of these individual components can be isolated "silos" in the health care continuum. The QEP will break down the walls and join the components together, so that the whole becomes much more powerful than the sum of the individual parts. The QEP is further enhanced by concentrating on the science of medicine, thereby linking our strengths in patient care and research with our educational mission.

The overall responsibility of UT Southwestern is to educate the next generation of leaders in patient care and biomedical science. To accomplish this mission requires a continuous process of quality assessment and improvement. The QEP is the educational CONVERGENCE of two missions of the medical center – patient care and biomedical science – and will become an integral element of learning and assessment throughout our campus.

IV. Desired Student Learning Outcomes

The Quality Enhancement Plan (QEP) of UT Southwestern Medical Center will transform the student learning environment by creating learning communities and enhancing interprofessional education. The plan has been named **CONVERGENCE,** which Webster's Ninth New Collegiate Dictionary defines as "tending to move to one point or approach each other." The outlined plan is motivated by the overall goal of UT Southwestern Medical Center to educate a diverse group of healthcare workers and prepare students to serve the needs of Texas and beyond. **CONVERGENCE** includes multiple components that are linked by the campus-wide Learning Community Days event. These components or learning communities include the medical school's Academic Colleges, the health profession school's Interprofessional Development, Education & Active Learning Teams (IDEAL), and the graduate school's Science of Medicine Interest Groups (SMIGs).

Over the past twenty years, institutions of higher education, particularly at the undergraduate level, report success in improving student learning outcomes through the creation of curricular structures called learning communities. Students from different disciplines enter a learning community in which they participate in courses and seminars together. These interest-based learning communities link together several existing courses, and may create new teaching activities, "so that students have opportunities for deeper understanding and integration of the material they are learning, and more interaction with one another and their teachers as fellow participants in the learning enterprise." [1] Learning communities offer extended benefits. "The benefits of learning communities to students are numerous but extend beyond students to faculty and the entire institution. Students involved in learning communities show an increase in academic achievement, retention, motivation, intellectual development, learning, and involvement in the community. Moreover, learning communities also reinforce positive views of the institution."[2]

Learning communities become more advanced as students accumulate experience in their area of specialization. UT Southwestern interest groups will include experts from multiple disciplines of the university who are collaboratively and continually working together for the advancement of the topic area. A major principle of learning communities is that people learn more together than if they were on their own. [3] The group, not the individual, is viewed as the main learning unit. Thus the UT Southwestern vision is that each interest group will promote a collaborative culture engaging students, postdoctoral scholars, academic clinicians and basic science researchers in communication and learning. The learning communities will thus promote institutional goals and public welfare.

A parallel goal of **CONVERGENCE** is to enhance interprofessional education. The Cochrane Collaboration defines interprofessional education as an opportunity in which members of more than one health or social care profession learn interactively together, for the explicit purpose of improving interprofessional collaboration and/or the health and well-being of patients or clients. Interactive learning requires active learner participation and active exchange between learners from different professions [4]. Simply put, interprofessional education is two or more professions learning with, from, and about each other to improve collaboration and quality of patient care (see section V).

Learning communities and interprofessional education are significant investments in the future of the university's education, clinical, and research missions. There is close alignment

of **CONVERGENCE** goals with UT Southwestern Medical Center's mission and goals (Table 4.1).

Table 4.1: CONVERGENCE Goals are closely aligned with Institutional Goals and Priorities

CONVERGENCE Goals	Institutional Goals
1. CONVERGENCE activities will educate students about basic biomedical sciences, translational and clinical research, foster communication and collaboration between researchers and clinicians and improve students' ability to communicate discoveries to peers and the public.	Facilitate the translation of research discoveries to appropriate applications for the health of all people, including the development of and commercialization of new products, devices, clinical practices, and the continuing education of health professionals.
2. CONVERGENCE activities will educate an institution-wide diverse group of high-quality healthcare providers and biomedical scientists to develop deeper knowledge, better understanding of translational research, and improved communication skills through inter- and intra-disciplinary Learning Communities.	Educate a diverse group of high-quality health professionals including biomedical researchers to adequately serve the needs of Texas and the international science community.
3. CONVERGENCE will utilize the expertise of the Southwestern Academy of Teachers (SWAT) to facilitate lectures on excellence in teaching and develop and implement the faculty development workshops related to **CONVERGENCE**.	Educate, train, recruit, and develop outstanding faculty members who increase knowledge and provide excellent teaching instruction.
4. CONVERGENCE -inspired Learning Communities will offer outreach programs in disease prevention and service learning opportunities for our trainees.	Offer outreach programs in disease prevention and service learning opportunities for our trainees.

Learning outcomes specific to **CONVERGENCE** have been linked to specific school activities or to the overarching campus-wide Learning Community Days event (Table4.2).

Table 4.2: Matching Learning Outcomes and Activities to CONVERGENCE Goals and Objectives

CONVERGENCE Goals	CONVERGENCE Objectives	Activities	Learning Outcomes
Goal 1	Students will demonstrate increased knowledge and skills in translating biomedical research into clinical practice	Learning Community Days (LCDs) Science of Medicine Interest Groups (SMIGs)	Students will be able to demonstrate basic concepts related to clinical and translational research including how research is conducted, evaluated, explained to patients, and applied to patient care.
Goal 1	Students will effectively communicate clinical translational research to peers, faculty, patients and the public.	SMIGs LCDs Interprofessional Development, Education and Active Learning Teams (IDEAL)	Students will become competent in verbal communication skills to communicate through oral presentation to peers the objectives, background, experimental design and methods, results, interpretation and critique of research.
Goal 2	Students, faculty, and patients will develop a better understanding of mechanisms of homeostasis and disease as well as improved confidence in interactions through enhanced communication skills.	SMS Academic Colleges IDEALs SMIGs	Students will demonstrate increased knowledge about their fundamental understanding of the topic of interest and how this understanding is translated into clinical practice, competency, and enhanced cross-disciplinary and inter-professional communication with patients and other healthcare professionals.
Goal 2	Same as above	LCDs	Students will display an attitude of cooperation, collaboration and respect for professional roles in interactions with scientists, members of the health care team, patients and the public.
Goal 3	Faculty will incorporate faculty development initiatives into their teaching techniques/styles that promote enhanced student learning in communication.	Faculty Development via Effective Teacher Series	Faculty will utilize teaching styles that reflect diversity of teaching methods such as more experiential learning activities and constructive feedback.
Goal 4	Students/graduates will increase knowledge of basic science, diagnosis, treatment, and prevention of disease through multi-disciplinary and inter-school small group learning activities.	SMS Academic Colleges SMIGs IDEALs Learning Community Days (LCDs)	Students will demonstrate increased knowledge of the latest scientific and clinical research and the ability to lead community outreach activities on preventive health.

In addition the QEP CONVERGENCE objectives are linked with Medical School Educational Objectives as shown in Appendix B. The Medical School Educational Objectives are shown in relationship to the appropriate UT Southwestern course(s) and current evaluation methods. Additionally, each Educational Objective is linked to the appropriate ACGME Core Competency and LCME Standard. The Science of Medicine Interest Groups and Learning Community Days will also serve to enhance the curriculum that supports the learning outcomes of the graduate school as shown in Appendix C.

Student learning outcomes are statements of the knowledge, skills, attitudes, and beliefs that the individual student possesses and can demonstrate upon completion of a learning experience or sequence of learning experiences. In this case, student learning outcomes refer to changes in student performance goals, and/or perceptions as a result of the educational experiences offered by UT Southwestern Medical Center in the CONVERGENCE initiative. The desired learning outcomes for each component of the QEP are listed below. Recall there are four components or learning communities included in the QEP: medical school's Academic Colleges, the graduate school's Science of Medicine Interest Groups (SMIGs), the health profession school's Interprofessional Development, Education & Active Learning Teams (IDEAL), and the campus-wide Learning Community Days events.

As a result of participating in the **UT Southwestern Academic Colleges** during the MS1 and MS2 years, medical students will:

- Demonstrate an understanding of the moral aspects of ordinary medical practice, the common presentations of ethical conflict in medical practice, and the ethical roles and responsibilities of the physician to society.
- Learn to communicate effectively, both orally and in writing, with patients, patients' families, colleagues, nurses and other staff with whom physicians must exchange information in carrying out their responsibilities.
- Apply principles of evidence-based medicine through review and presentation of basic and clinical science articles.
- Demonstrate basic concepts related to clinical and translational research including how research is conducted, evaluated, explained to patients, and applied to care.
- Recognize the complementary roles in patient care across disciplines.

As a result of participating in a **Science of Medicine Interest Group (SMIG)**, UT Southwestern graduate students and postdoctoral scholars will:

- Demonstrate increased knowledge about both basic understanding of the topic of interest and how this understanding is translated into clinical practice.
- Develop an ability to communicate through oral presentation to peers the objectives, background, experimental design and methods, results, interpretation and critique of research in the topic of interest.
- Develop writing skills that reflect an ability to integrate basic knowledge with a clinical question in the area of interest.
- Foster collaboration between researchers and clinicians
- Report an increased awareness of how health care professionals and scientists contribute to research and patient care.
- Demonstrate an ability to communicate discoveries to a lay audience.
- Report increased comfort with evaluation of various aspects of homeostasis and disease beyond their primary discipline.

- Be introduced to the description of a population, its demography, cultural and socioeconomic constitution, circumstances of living, and health status; and understand how to gather health information about this population.
- Express the impact of the SMIG on career goals.

As a result of participating in **Interprofessional Development, Education and Active Learning Teams (IDEAL)** during their course of study, health profession students will:

- Acquire a set of defined communication skill competencies to include but not be limited to giving and receiving feedback, negotiation, and cross-cultural interactions.
- Demonstrate communication skills through awareness of patient-centered interventions by respecting patients'/clients' beliefs and values in self-determination.
- Develop improved confidence in behavioral interactions through enhanced communication skills.
- Demonstrate increased knowledge of basic science, diagnosis, treatment, and prevention of disease related to current topic through multi-disciplinary and inter-school small group learning activities.
- Recognize the complementary roles in patient care across disciplines.

As a result of participating in the **Learning Community Days (LCDs)**, UT Southwestern Medical Center graduates from all schools will be able to:

- Report increased **interaction** among students in the graduate school, medical school and school of health professions.
- Demonstrate improved **communication** among students in the graduate school, medical school and school of health professions.
- Describe enhanced **cross-disciplinary and interprofessional communication**
- Reflect a **spirit of cooperation and respect** in working with members of the health care team including patients and the public.
- Report increased opportunities for students to participate in **service-learning activities**
- Demonstrate **increased knowledge** of the latest scientific and clinical research in a specific topic area
- Be able to analyze problems, formulate research questions, critically review the literature, progress toward answers to questions within their fields, and modify answers as **new knowledge** becomes available.
- Report an understanding of, and respect for, the roles of other health care professionals, and of the **need to collaborate** with others in caring for individual patients and in promoting the health of defined populations
- **Integrate topics** from oral presentations with published literature in the form of a written review.

V. Literature Review and Best Practices

In a review of educational innovations and trends in academic medicine, Irby and Wilkerson highlighted the use of two approaches which are consistent with UT Southwestern's needs.[5] The first is the use of multidisciplinary perspectives and the integration of multiple disciplines to represent more fully optimal ways of thinking about human health and disease.[6] This supports the concept termed interprofessional education (IPE) [7, 8], upon which the UT Southwestern **CONVERGENCE** project will focus as it brings together students, trainees, and faculty from the health professions, graduate, and medical schools.

The second is a trend in the use of the instructional innovation of learning communities (LC), a form of case-based learning. Learning communities build upon the concept of learning as an active, constructive, social and reflective process. [9] Learning communities strengthen longitudinal relationships between students and faculty working across multiple years of the curriculum. A review of the unique aspects regarding IPE and Learning Communities important to the development of **CONVERGENCE** is provided in the next sections.

Background - Interprofessional Education (IPE):

For over three decades, the Institute of Medicine has recognized the importance of interprofessional or interdisciplinary teamwork in medical education. In 1978 the Institute of Medicine recommended that medical students learn to deliver health care through a team approach as a part of their professional training. IPE connotes communication and collaboration among multiple disciplines/professions, each contributing to the learning of the others [10].   This approach is ideal to facilitate interaction across schools at UT Southwestern. Interprofessional education in health professions and biomedical science builds upon the fact that health care and research in the biomedical sciences require collaboration and teamwork.   Joint education among these professions fosters teamwork [11] [12] [13]. The Institute of Medicine has identified the need for clinicians in health care disciplines to "actively collaborate and communicate" to achieve health care that is "safe, effective, patient-centered, timely, efficient and equitable" [14]. Interprofessional education facilitates the ability of professionals to actively collaborate and communicate from the beginning of their professional education.

Clark noted that this type of collaboration results in thought and action that is synergistic and more powerful than that produced by learning within one discipline [14] [15]. In an early description of interdisciplinary teams, Luszki pointed out the strengths of IPE by noting that interdisciplinary teams are composed of a group of people who are trained in the use of different tools and concepts [16]. They come together around a common problem (disease in our case) with members of each discipline bringing their own tools. They constantly communicate and re-examine the problem jointly using these tools, to come up with a final solution/product that is the responsibility of the entire group.

Interprofessional education has many advantages [17] [18]. It is a more efficient use of human resources on the part of the teachers and the learners.   The work of the interprofessional group is more effective in solving problems and it is a more satisfying learning environment.

Best Practices – Interprofessional Education:

The best practice of IPE identifies commonalities of content across disciplines and combines them to enhance learning. D'Amour and Oandasan [15] address the IPE concept as one of interdisciplinarity or the "development of integrated knowledge in response to fragmented disciplinary knowledge." Reeves and colleagues [19] have outlined key factors in planning and implementing IPE in health care settings. Learner-focused factors include using several types of learning methods, have a mix of professions, use stable groups, and have a clear focus for learning activities. For faculty, it is important that they have small group teaching skills and are regarded as good quality (high status) facilitators. Faculty need to be prepared by faculty development and other ongoing support activities. The institution needs to assure adequate resources and attract enthusiastic faculty to teach in IPE groups.

Brown, Behringer, and their colleagues [20] employed this concept in half-day seminars for graduate learners from multiple disciplines. Their learners interacted with faculty, staff, and community members around a topic of common interest. The format was a keynote speaker followed by small-group multidisciplinary sessions discussing and examining the topic in depth. This was followed by a concluding plenary summary session presenting the output of the small groups. Our Learning Community Days are similar in design to the project of Brown et al.

Ho and colleagues recently outlined the strategic roles of the institution in implementing IPE [21]. They described five successful Canadian IPE programs in the health disciplines. Through interviews of key faculty involved in these programs, they summarized several requirements for starting IPE programs. These included faculty champions for IPE, links with senior levels of administration, organizational structure to facilitate and coordinate interprofessional interaction among faculty, funding for faculty, and coordination of student schedules. Factors identified that facilitated IPE include faculty development, governance, ongoing involvement of champions, and ongoing support of senior administrators. Many of these recommendations are incorporated into UT Southwestern's CONVERGENCE.

Background - Learning Communities:

Learning communities are an instructional method that links two or more courses within a discipline or between disciplines. [22] Davies [23] further specifies that learning communities are comprised of a subgroup of learners from a larger cohort who work together with a common goal. The members of the learning community provide support and expectations for group commitment and collaboration in learning. The learning community brings together the learning and skills of two or more disciplines into a unified mixture of educational objectives and blended instruction [24]. Students within a learning community develop cohesive social bonds that enhance learning.

UT Southwestern's CONVERGENCE utilizes learning communities to facilitate learning among and between students in medicine, health professions, and biomedical sciences. These learning communities will be linked by a common theme focusing on common diseases. This organization of learning communities promotes involvement in academic and social activities that extend beyond the classroom. Learning communities encourage students to connect ideas from different disciplines and help develop identity with a group focused on academic content.

Other important benefits of learning communities include fostering: 1) active learning over passive learning; 2) cooperation over competition; and 3) community over isolation. Dialogue and exposure to different points of view can help students attain higher levels of intellectual development [25].

Three lines of research support the use of learning communities to enhance adult learning: developmental theory, cognitive science and educational research [25].

- **Developmental theory** supports the design of a learning environment that both challenges and supports students to move to higher levels of intellectual and psychological development [26] [27]. The interdisciplinary and interactive nature of learning communities introduces students to complex, diverse perspectives, which promote critical thinking and contextual learning.

  Key student outcomes are enhanced by participating in learning communities. The students discover how concepts in one subject area can be applied to projects in other subject areas. They become more effective in working together to solve problems. They reinforce their own skills by teaching and mentoring fellow students in various subject areas. They learn how experts in different fields coordinate activities across disciplines. They learn to adapt to different faculty perspectives and learning environments. From a social perspective, they make more friends across the institution and within their community which increases their chances for success in personal, academic and professional arenas [24].

- **Cognitive science** notes the importance of learning context to enhance new learning by making connections with previous knowledge, e.g. applying basic science in a clinical context. Learning communities foster more complex ways of thinking so that students learn at a deeper level [28].

- **Educational research** has shown that students participating in learning communities have higher grades and more engagement with the learning process [29] [30]. Zhao and Kuh reported that in a general academic setting, students in learning communities made higher grades, were more persistent (lower drop-out rates), and evinced greater intellectual and social development [31]. Additionally, students participating in learning communities have been assessed in areas of personal/social growth, general education and practical competence. While outcomes were positive, authors noted that there could be large variations in the effectiveness of learning communities and that the effects of learning communities might be more related to their role in "increasing student involvement" (as an indirect effect) than to the learning community itself. Overall, empirical data support the use of learning communities as an effective educational practice.

Best Practices – Learning Communities:

Successful learning community proposals have clearly defined faculty responsibilities and institutional support. Additionally, it has been suggested to offer faculty stipends to encourage participation and to use learning community advisors with expertise to assist in curriculum and faculty development prior to initiation of learning communities [22]. At UT Southwestern these latter two have contributed to the success of our College learning communities with College co-directors, headmaster, and masters serving as the advisors to the mentors of the College groups.

One group [23] identified a foundation of good practice in the development and delivery of innovative learning and teaching methods within a physical therapy program. Having students lead workshops, team projects and student-to-student partnerships added value to the learning experience. In this project, different learning communities focused on different neurological diseases using a case scenario.   Basic topics of pathology, therapy management, medical management and psychosocial implications were considered. Authors reported that learning communities enhanced communication skills with peers and increased knowledge specific to a neurological condition. However, students commented that a test or other assessment would serve to better motivate them to learn the content.

Several representatives of medical schools using learning communities meet on a regular basis at the annual meeting of the Association of American Medical Colleges (AAMC) [32] . This group also has a discussion list that was developed from the Learning Communities Institute held at the University of Iowa in 2005. The AAMC meeting and the discussion group are forums where faculty from multiple institutions can exchange ideas and experiences with learning communities at their own medical schools. Drs. Susan Cox and James Wagner, co-directors of our Colleges, regularly attend these meetings.

Authentic Assessment:

Beyond the important knowledge acquired from the contextual learning environment, authentic assessments by students, faculty, and peers of the learning activity enhance clinical competence, which ensures quality patient care. Authentic assessment provides opportunities for learning to be meaningful, applied consistently to all students and linked to desired learning outcomes [33] [34]. The culmination of such activities will foster discourse and mutual learning by all parties.

Boissonnault [35]   compared the effectiveness of two patient case-based instructional strategies designed to develop medical screening and patient referral abilities in fifty-one physical therapy students, comparing traditional lecture and student/faculty role-playing sessions. Case-based active learning activities were assessed by written examination, self-ratings of confidence in acquired skill set, and overall satisfaction with educational experience. Compared to the traditional group, the active learning group scored higher on the written examinations, and reported higher self-confidence and more satisfaction with their experience.

Authentic assessment requires faculty development workshops that will train faculty and outside clinical preceptors who often lack teaching skills to effectively provide educational supervision [36]. Such workshops have focused on providing feedback to students, teaching in the context of case studies, and asking effective questions [37]. Faculty development is critical to enhancing student/graduate outcomes, particularly in communication and professionalism. A review of randomized controlled trials of teaching communication skills reported that the most effective strategies for medical students involved giving structured feedback about performance following an audio or video recorded encounter and small group discussions [38] . The Teaching Toolbox collaboration effort described by Rider and Keefer [39],   expanded the ACGME core communication competencies by connecting competencies to teaching strategies at each level of medical education. Strategies most commonly used to improve clinical teaching skills were direct observation by peers and preceptors and self-assessment. Ultimately, faculty members who provide reliable,

consistent and meaningful assessment/feedback enhance student learning [40], patient outcomes and satisfaction, and self-satisfaction in practice [39].

Summary:

These two approaches – IPE and learning communities – form the basis upon which the UT Southwestern's **CONVERGENCE** will focus its efforts. Each school developed projects unique to their environment, but tied to the overall UT Southwestern **CONVERGENCE** theme. Each group has researched best practices specific to their activities and has included these within their descriptions. **CONVERGENCE** utilizes sound research and best practices as it brings together students, trainees and faculty from the health profession, graduate and medical schools to enhance student education, promote better communication, and drive achievement of the mission of the university.

VI.   Actions to be Implemented

UT Southwestern will develop learning communities within each school and create an institution-wide menu of learning community activities that are offered to students throughout the medical center. The plan creates or expands existing learning communities within each of the three schools: Science of Medicine Interest Groups (SMIGs), for the graduate school; the Interprofessional Development, Education & Active Learning Teams (IDEAL), for the health professions school; and the Academic Colleges, for the medical school. All students will be encouraged to participate in a learning community and in the campus-wide Learning Community Days. At least once a year, all of the learning communities will converge to participate in the institution-wide Learning Community Days. The extent to which students participate and pursue activities offered by the QEP will vary depending on their individual professional goals, the potential educational value of their participation, their own interest and motivation, as well as scheduling considerations.

Learning Communities will augment student education, promote better communication, and drive achievement of the mission of the medical center by bringing together students, trainees and faculty from the health professions, graduate and medical schools. Learning communities encourage students to connect ideas from different disciplines and help develop identity with a group focused on academic content. Dialogue, exchange of ideas, and exposure to different points of view will help students attain higher levels of intellectual development. This organization of learning communities further promotes involvement in academic and social activities that extend beyond our classrooms and clinical settings.
Thus the following will be implemented as part of **CONVERGENCE –**   Learning Communities, Learning Community Days, and Community Service Projects.

Learning Communities

Science of Medicine Interest Groups (SMIGs):

Science of Medicine Interest Groups related to common health issues and diseases will be formed under the direction of the Graduate School of Biomedical Sciences. Each interest group will promote a collaborative culture engaging students, postdoctoral scholars, academic clinicians and basic science faculty simultaneously in communication and learning. The cancer interest group will be the first SMIG developed in the 2009/2010 academic year and shall serve as a prototype for the development of additional SMIGs. Two

new SMIGs will be developed each year until approximately ten are active. Examples of interest groups representing areas of strength or emphasis at UT Southwestern are cancer, neuroscience, metabolism/obesity, immunology/infectious disease, cardiovascular science, surgery/imaging, reproductive biology, genomics/genetic diseases, and aging.

The Graduate School of Biomedical Sciences will administer interest group activities under the guidance of a faculty director. Offerings will qualify participants for a one-year, five-credit hour completion certificate for graduate and other students and a two-year 15-hour academic certificate for postdoctoral scholars and other trainees who are not enrolled in degree programs. The certificate program represents a focused collection of activities that, when completed, affords the student a record of academic accomplishment in the selected area of interest. For example, medical students with strong interest and motivation may enroll in a graduate school SMIG program of their choice, as an optional element of their third or fourth year medical training. The programs are designed to provide students with access to specialized knowledge that is less extensive than, but a complement to, that obtained during a regular degree program. The goals of the certificate program are: a) to enhance the knowledge base of students and postdoctoral scholars that is necessary for translating biomedical research into clinical practice by observing the efforts of world leaders in those activities; b) to increase the exchange of ideas for student and postdoctoral scholars' research by oral communications of research progress and by discussions with peers, faculty and less expert audiences; and c) to produce researchers and clinicians who can critically read, evaluate, present and discuss the primary research literature in order to use it wisely in their professions. On one hand the emphasis will be on exposing graduate students and postdoctoral scholars to more clinical and translational concepts of research and on the other hand to introduce medical and health professions students to basic science research.

Completion of a certificate requires documented accomplishment of each of the three activities described below.

1. Members of each SMIG will attend a series of basic research-oriented seminars and a series of clinically oriented seminars (Grand Rounds) on the topic of interest. These series will present state-of-the-art current research discoveries and will include invited experts from outside UT Southwestern. The purposes of these seminar series are to increase a) basic understanding of the topic of interest and b) knowledge of how this understanding is translated into clinical practice.

Each SMIG will conduct a local annual retreat during which presentations of local and/or invited faculty research on the topic of interest will be discussed from the point of view of how it might be translated to clinical practice. Discussion will also focus on the major clinical problems needing to be solved in the area of interest. The goals of the annual retreat are to increase the knowledge of students and postdoctoral scholars about faculty research programs and how they may translate to clinical medicine, and how research on the topic of interest is conducted. On years when the topic of a particular SMIG is chosen for one of the campus wide Learning Community Days, participation in this activity may replace a SMIG Retreat. Students and postdoctoral scholars will be expected to write a review that addresses a specific aspect of translational medicine in the SMIG topic area.

2. Each SMIG will run a weekly workshop (Journal Club and/or Works-in-Progress meeting). Participants in the Journal Club will present and discuss current literature with emphasis on

topics relevant to those presented in the research and clinical seminar series. Under the direction of faculty leaders, research currently conducted at UT Southwestern relevant to the interest topic will be presented by students and postdoctoral scholars and discussed. Those actively researching in the subject area will be the speakers at the Works-in-Progress meetings. The format of these presentations will include presenting the clinical relevance and background for the research. The purposes of the Journal Club/Works-in-Progress workshops are to a) increase the communication skills of students and postdoctoral scholars, b) increase the knowledge of how research on the topic of interest is conducted, c) reinforce the learning in the seminar series by increasing knowledge of the topic of interest, and d) increase the ability of students and postdoctoral scholars to read primary research literature critically.

3. The third activity required for certificate completion is a presentation to a less expert audience. Examples include the Summer Undergraduate Research Fellows (SURFs)*, the participants in the Science Teachers Access to Resources at UT Southwestern (STARS) programs**, Health Professions School's IDEAL teams (described in the next section) and the lay audience invited to the second event of the Learning Community Days (described further below). The goal of these presentations is to produce professionals able to communicate scientific information to a lay audience that explains the reasons for pursuing a line of research and the opportunities possible through scientific discovery. After these presentations, faculty and the inexpert audience will provide feedback on the effectiveness of communication with a less expert audience.

* The SURF program at UT Southwestern is an intensive summer research training experience designed for college students who are preparing for careers in biological research. Fellows spend ten weeks pursuing individual research projects in the laboratories of graduate school faculty members. Fellows gain experience in modern research techniques, and have a chance to plan and execute an experimental strategy to answer a scientific question. The program introduces students to the sorts of projects encountered during postgraduate research training and leads to an understanding of the planning, discipline, and teamwork involved in the pursuit of basic answers to current questions in the biological sciences. At the end of the summer, fellows present their research in a poster session.

** The STARS program was developed in 1991 to improve the quality of science education in north central Texas. At that time, a partnership was formed to make available to middle and high school science teachers some of the vast educational resources of UT Southwestern Medical Center. Since its inception, STARS has grown to serve over 5,000 teachers and 30,000 students in 2,000 schools in the Dallas/Fort Worth area. The scope of STARS has steadily expanded to include over 20 separate programs and projects.

Interprofessional Development, Education & Active Learning Teams (IDEAL):

The School of Health Professions is developing a program in which students from each discipline will be assigned to small interdisciplinary teams, termed Interprofessional Development, Education & Active Learning teams (IDEAL). IDEAL will serve as learning communities within the School of Health Professions for its own students and with other students across the medical center.

The School of Health Professions offers a variety of asynchronous health professions programs of varying lengths (most are approximately two years). First year health profession

students will be assigned to one of the IDEAL teams. Each team will be comprised of a small group of 12-16 students from various disciplines and led by a faculty advisor. Students will be provided training on topics such as ethics, the importance of good patient communication, body language, listening skills, providing understandable answers, cultural competency, motivational counseling and case studies relating translation of basic science research to clinical medicine. Specific learning objectives will be developed for each topic area and will be assessed periodically. As the majority of health professions students are involved in clinical rotations in their 2nd year, the IDEAL teams will meet over a nine month period (September to May) to allow interaction with Academic Colleges and SMIGs, culminating with participation in the Learning Community Day activities. Members of IDEAL teams will develop evidence-based medicine presentations for the LCD to share with university and public participants.

In addition to the weekly IDEAL meetings, there will be monthly "School of Health Professions Grand Rounds" with required attendance by enrolled students and faculty during the fall and spring semesters. This venue will serve as the IDEAL Learning Community Seminar Series and provide mechanisms for the delivery of disease-based science of medicine lectures (e.g. normal structure and function, transition to abnormal, disease state, basis of therapeutics). The series will be revised periodically to focus each lecture on one of the available science of medicine interest areas (cancer, neuroscience, metabolism/obesity, immunology/infectious disease, cardiovascular science, surgery/imaging, reproductive biology, genomics/genetic diseases, and aging). Faculty from the medical school and graduate school will be invited to share their expertise as related to the interest areas; post-doctoral scholars will also be invited to share their research and its clinical relevance. Students will have the opportunity to discuss the grand rounds presentation within their IDEAL teams. They will also discuss the translation of research discoveries and the related application to patient populations served by each discipline.

The IDEAL teams will enhance the learning environment within the School of Health Professions and promote **CONVERGENCE** across the medical school, graduate school and health professions school. The IDEAL program will take advantage of the small group learning community approach to foster a deeper understanding of relevant topics and further promote interaction with content experts from the medical and graduate schools. The IDEAL team will also directly meet the needs expressed by health professions students to improve interdisciplinary interaction across programs within the School of Health Professions.

Academic Colleges:

In 2007, Academic Colleges were established at UT Southwestern Medical School to create an informal environment where mentors and MS1 students could share the experience of being a physician. A College at UT Southwestern is a **learning community** that brings together gifted clinical teaching faculty as mentors for small groups of students. Each of the six Academic Colleges has a master, 6 or 7 mentors, and 40 first year medical students. Each mentor is assigned 5 or 6 students. The mentors instruct students on clinical topics, such as how to take a history, how to perform a physical examination, render a diagnosis, ethics and professionalism. Subjects assigned for the weekly mentor meetings are coordinated with the material discussed in the medical school basic science curriculum.

The Academic Colleges will serve as building blocks for developing and sustaining additional learning communities in the medical center. During the implementation of the UT Southwestern QEP the College system will be enhanced in several ways. Teaching of

evidence-based medicine and critical appraisal of the literature will be added. There will be College sessions devoted to critically appraising published articles by evaluating portions of the articles through focused questions. Students will be introduced to the terminology and concepts in didactic sessions, but will put these into practice through evaluation of articles during the College session. One article will be from the basic sciences and the other focus will be clinical. (Example - if a student participates in the Cancer SMIG, then the paper might be related to a new chemotherapy or angiogenesis factors.) In these sessions, the articles will be selected by the mentor and course directors to assure appropriateness for discussion and meeting curricular goals. In addition, ethics case studies elated to the SMIG themes will be discussed: cancer, neuroscience, metabolism/obesity, immunology/infectious disease, cardiovascular science, reproductive biology, surgery/imaging, genomics/genetic diseases, and aging. Finally and most importantly, Academic Colleges will be expanding to include the second year class of medical students. A pilot curriculum for the MS2 Academic Colleges is currently in progress. The second year curriculum focuses on professionalism and patient-centered care, vital lessons not learned from a textbook alone, and emphasizes proficiency in the basic clinical skills of physical examination, diagnosis, clinical reasoning and interpretation, as well as communication. College sessions will be developed that focus on teaching the principles of basic sciences, clinical sciences and translational research. Based on their interest group, students will select and prepare for discussion a high quality article published in the past two years. This will help the students prepare for participation in the Learning Community Days (LCD).

Until now, the emphasis in the Academic Colleges has been to provide mentorship and share experiences about being a physician, ultimately leading to better interpersonal skills and communications with patients. An ongoing challenge will be to identify ways to incorporate translational medicine into the College sessions. There is an appreciation by planners that the combination of science of medicine and interprofessional teams will be a valuable "side effect" of the Colleges.

There are many opportunities for overlapping and layering of the learning communities both within each community and amongst communities as shown in Table 6.1. These include but are not limited to:

Medical Students during their first year will learn about SMIGs from their Academic College mentors. After exploring their personal interests and future career goals, students may select a specific SMIG that will become their scientific learning community. The medical students will be provided a listing of SMIG activities and will be encouraged to participate as scheduling permits. It is anticipated that those students interested in research will participate during the summer between their first and second year and continue until graduation. In order to earn a certificate of completion, students will participate regularly in the required activities (for at least one year, as outlined in the section above on SMIGs).

A subset of medical students will choose to participate in summer research projects guided by SMIG faculty mentors. Pairing of students and mentors will be facilitated by Dr. Michael McPhaul, Associate Dean for Medical Student Research. These students could present their research formally via poster or oral presentation at the Learning Community Day and thus qualify for a completion certificate.

Graduate Students and Postdoctoral Scholars will have the opportunity to participate in Academic Colleges by selecting a mentor with a keen interest or clinical background in their chosen research field. Participating students will join the mentor for selected College

Sessions, in particular those covering evidence-based medicine, critical appraisal of the literature, as well as participation on hospital visits. This will allow exchange of ideas between the medical students and the graduate students, such as understanding of the principles of the biomedical sciences, concepts underlying evidence-based medicine, and the importance of basic and clinical research to the practice of medicine. Medical students will gain an understanding and appreciation for how new basic science knowledge is developed, and be capable of thinking critically about how new scientific knowledge applies to clinical medicine. All students will also learn to communicate effectively with an interdisciplinary clinical team.

Health professions students will be provided a schedule of College and SMIG activities and will be encouraged to participate. It is anticipated that both first and second year health professions students could select specific SMIG and College functions to attend. These may include topics involving the importance of basic and clinical research to the practice in the health professions or participation on hospital visits with medical students. As noted previously, the students would also learn how better to communicate effectively with an interdisciplinary clinical team and more clearly understand their role as a health professional.

School	Learning Community	Participants
Medical	Academic Colleges	Medical students Graduate students / Postdoctoral Scholars Health professions students
Graduate	SMIGs	Graduate students / Postdoctoral Scholars Medical students
Health Professions	IDEAL teams	Health professions students Postdoctoral Scholars Medical students
Campus-wide	Learning Community Days	Medical students Graduate students / Postdoctoral Scholars Health professions students

Table 6.1 Illustration of the participants' interactions among schools and learning communities.

Learning Communities Days (LCDs):

Campus-wide **CONVERGENCE**-inspired Learning Community Days will be a forum for the advancement of integrated and interdisciplinary education, training, and career development in the basic, clinical, and translational sciences focused on one of UT Southwestern's Science of Medicine themes. This event will serve as a means 1) to foster advances in translational research through bidirectional integration of basic and clinical research, 2) to enhance the education of our students and 3) to improve health and patient care. Ultimately there will be two Learning Community Day events on separate themes annually.

Purpose

The purpose of Learning Community Days is related directly to UT Southwestern institutional goals including:

1. Facilitate the translation of UT Southwestern research discoveries to appropriate

applications for the health of all people

    a. Showcase current research and patient care related to the chosen topic

    b. Provide a multidisciplinary approach to learning

2. Educate a diverse group of high-quality health professionals to serve the needs of Texas

3. Educate a diverse group of high-quality biomedical researchers to serve the needs of the international science community

4. Educate, train, recruit, and develop outstanding faculty members who will contribute to the increasing body of knowledge and provide excellent teaching instruction

Format

The proposed format for the Learning Community Days is as follows. Day 1 will be the scientific session in which biomedical research investigators, health professionals, and clinical faculty teach the students from all three schools. The case-based format and interactive break-out sessions will encourage all interested students to participate. This day will provide the students with the scientific underpinnings to prepare the Community Day/ Public Event (Day 2) which will be led by the students and postdoctoral scholars.

On Day 2 students will work together to educate the public about health issues centered on the disease-themed Learning Community Days. The plan is for there to be multiple breakout sessions in which students from the graduate, health professions, and medical school will work with faculty advisors to prepare topics to be presented to the lay audience. This forum will give our students experience communicating basic science principles and research problems to a lay audience and working in teams to foster and promote advocacy. As funding for biomedical research is largely dependent upon taxpayer and philanthropic support, development of such skills can greatly enhance lay interest in biomedical research and promote support. Furthermore, participation in the public forum is a first step to learning a holistic, multidisciplinary approach to patient advocacy by increasing awareness of today's problems and educating community members so they can make informed decisions.

Day 1: Scientific Session of Learning Community Days

    Timing: Friday
    Location – Gooch Auditorium
    Proposed Session Spring 2010 – Theme: Cancer
    Target Audience – UT Southwestern Medical Center faculty, postdoctoral scholars, clinical fellows, residents and students from the graduate, health professions, and medical school

- Schedule – Morning
  - Interactive Case Presentation based on SMIG Theme (9 – 10:30 AM)
    - Highlight important clinical findings
    - Emphasis on the biomolecular basis of disease
  - Plenary Address (10:45 AM – Noon)
    - Science of medicine
    - Normal structure and function
    - Transition to abnormal
    - Epidemiology and genetics
    - Pathology
    - Diagnostics, Imaging and technology

- Basis of therapeutics
  - Panel of experts:
    - Cutting edge basic research
    - Clinical trials and technology

- Schedule – Afternoon
  - Focus Groups for Cancer LCD from 1 PM to 3 PM are limited to 100 participants in each. Students will select two sessions from the list below to participate in – the first from 1 – 2 PM and then rotate to a different session from 2:15 to 3:15 PM.

    1. Public health e.g. screening, prevention, economics
    2. Clinical Trials
    3. Advances in Cancer Research and Treatment – Breast
    4. Advances in Cancer Research and Treatment – Cervix
    5. Advances in Cancer Research and Treatment – Colon
    6. Advances in Cancer Research and Treatment – Lung
    7. Advances in Cancer Research and Treatment – Melanoma
    8. Advances in Cancer Research and Treatment – Ovary
    9. Advances in Cancer Research and Treatment – Prostate
    10. Advances in Cancer Research and Treatment - Children

Medical, graduate and health professions students can present research, posters, or works in progress if applicable during the focus groups

Reception and Posters (3:30 to 5:30 PM)

Medical, graduate and health professions students' posters will be displayed during the reception

Day 2: Public Forum of Learning Community Days

Timing: Saturday 9:00 AM – 12 Noon four to six weeks after Day 1
Location: South Campus auditoriums and atrium area
Target Audience: UT Southwestern Medical Center employees and the public

The Community Day Public Forum event will be organized with a health fair like atmosphere that includes presentations by Science of Medicine Focus Groups. It will be held four to six weeks after Day 1 (the scientific session) so that students can use the information from the Scientific Session Learning Community Day to prepare their materials for the lay presentations.

- Individual students and trainees present or demonstrate their research
- Groups of students and trainees demonstrate their learning
  - Medical school students (Academic Colleges)
  - Graduate students
  - Postdoctoral scholars (e.g. to meet requirement for a certificate in educational techniques or a SMIG topic)
  - Health Professions students
  - Combinations of students

Each Community Day Science of Medicine Focus Group will be led by students and assisted by 3 faculty advisors – one from each school. Each attendee can participate in three different sessions. The students will decide the session format and the material to be covered. One possibility for the structure of the session is a presentation by the students to the group followed by a brief question and answer period. The total session will last no longer than 50 minutes.

Community Day Science of Medicine Focus Groups for the Cancer LCD may include but are not limited to the following:

1. Public health e.g. screening, prevention, economics
2. Advances in Cancer Research and Treatment – Breast
3. Advances in Cancer Research and Treatment – Cervix
4. Advances in Cancer Research and Treatment – Colon
5. Advances in Cancer Research and Treatment – Lung
6. Advances in Cancer Research and Treatment – Melanoma
7. Advances in Cancer Research and Treatment – Ovary
8. Advances in Cancer Research and Treatment – Prostate
9. Advances in Cancer Research and Treatment of Children
10. Clinical Trials

Community Service Projects

Following the **Learning Community Day** events the students will have the opportunity to engage in service-learning activities. Seifer defines "service-learning" as a structured learning experience that combines community service with preparation and reflection [41]. Students engaged in service-learning provide community service in response to community-identified concerns and learn about the context in which service is provided, the connection between their service and their academic coursework, and their roles as citizens and professionals.

The students will plan and implement an interprofessional community outreach project aimed at addressing a specific identified need. Joined by similarly-minded students from other professions, the team will design and implement a health-related project in a clinical or community setting. The student team, guided by faculty advisors, will create a timeline for key steps to be completed, design the measurement criteria by which they will evaluate their project, and identify resources required. Project areas include health screening, staffing free clinics, public health, error reduction and patient safety, quality improvement, and health care policy. Advisors for the projects will be selected from the full-time faculty of the three schools and medical center leadership.

UT Southwestern students currently have multiple opportunities to engage in service-learning and provide community service projects. Medical and health professions students have opportunities to volunteer to work in a free clinic, participate in a local health fair, conduct classes on wellness, contribute in Children's story time with topics on community health concerns, participate in health promotion and prevention activities (presentations, focus group, immunization program, walking program, etc), participate in health screenings campaigns and develop video production to document health events and/or interactions within the community. Graduate students and postdoctoral scholars frequently serve as judges at science fairs, plus participate in STARS activities including laboratory tours and

development of exhibits at the natural science museum, tutor children in the Dallas Independent School System, participate in the United to Serve health fair, and as presenters of scientific material at local elementary, junior high and high schools.
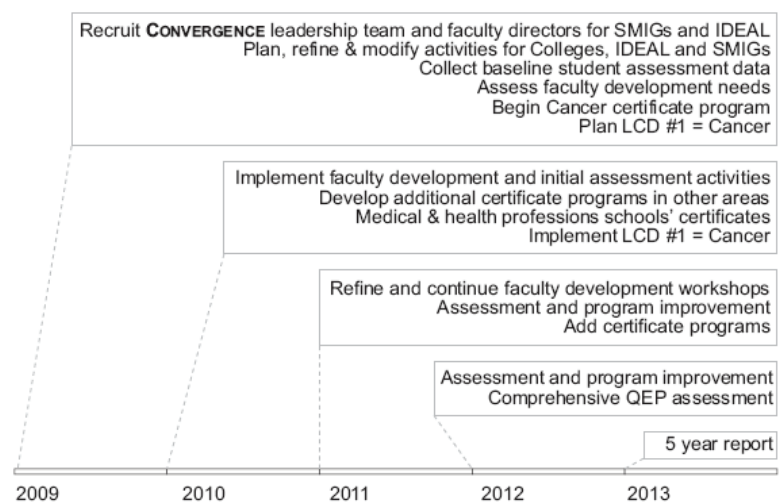
Faculty Development

Faculty development is critical to the success of our **CONVERGENCE** initiative. Development workshops will be provided to address the following topics:
- Small group teaching
- Professionalism
- Communication Styles
- Interprofessional education
- Creating and strengthening interprofessional teams
- Basic teamwork skills

These workshops will be offered annually during the first several years of the **CONVERGENCE** project. They will be open to all faculty and postdoctoral scholars. Emphasis will be placed the need for faculty leaders wishing to participate in **CONVERGENCE** to attend. All faculty will be encouraged to complete surveys of knowledge and attitudes as described in the assessment section below. The results of these surveys will be used to update and focus the content of the faculty development sessions in order to achieve the intended learning community environment that fosters IPE. The workshops will be offered through the Southwestern Academy of Teachers and the **CONVERGENCE** Leadership, but content experts from outside the institution may be invited to present some programs.

VII. Timeline

The timeline for implementing various activities associated with **CONVERGENCE** is shown below. There are new positions established and many key personnel will be recruited from our faculty. To date most of these positions have been identified and leadership recruited. The Provost/ Dean, Associate Dean for Academic Planning/ SACS Liaison, and the **CONVERGENCE** Director will appoint all committee members during year 1.

Recruit **CONVERGENCE** leadership team and faculty directors for SMIGs and IDEAL
Plan, refine & modify activities for Colleges, IDEAL and SMIGs
Collect baseline student assessment data
Assess faculty development needs
Begin Cancer certificate program
Plan LCD #1 = Cancer

Implement faculty development and initial assessment activities
Develop additional certificate programs in other areas
Medical & health professions schools' certificates
Implement LCD #1 = Cancer

Refine and continue faculty development workshops
Assessment and program improvement
Add certificate programs

Assessment and program improvement
Comprehensive QEP assessment

5 year report

2009   2010   2011   2012   2013

A.   CONVERGENCE Year 1

Activity	Responsible
Recruit **CONVERGENCE** Leadership Team	Provost and Associate Dean Academic Planning / SACS Liaison
Identify **CONVERGENCE** committee members	Provost and Associate Dean Academic Planning / SACS Liaison
Perform needs assessment for faculty development opportunities	**CONVERGENCE** assessment advisory group and **CONVERGENCE** Director
Plan first Learning Community Days event – Theme: Cancer	**CONVERGENCE** implementation advisory group, **CONVERGENCE** Director, Oncology Faculty, and Office of Public Education
Science of Medicine Interest Groups: Identify and link campus wide learning communities to the SMIGs	SMIG Director and **CONVERGENCE** Director
Refine and modify the defined communication skill competencies in Academic Colleges	**CONVERGENCE** Director and Colleges Director and Co-Directors
Pilot assessment process for evaluating student learning across learning community experiences	**CONVERGENCE** assessment advisory group and **CONVERGENCE** Director
Obtain baseline student assessments – currently enrolled students will be administered assessment instruments	**CONVERGENCE** assessment advisory group and Director **CONVERGENCE** implementation advisory group, **CONVERGENCE** Director
Distribute and collect Defining Issues Test 2 (DIT2) and Jefferson Scale of Physician Empathy (JSPE) (baseline data)	**CONVERGENCE** Assessment advisory group, **CONVERGENCE** Director, Colleges Director and Colleges Coordinator
Recruit GSBS faculty director for the SMIGs	**CONVERGENCE** implementation advisory group and **CONVERGENCE** Director
Begin certificate program in cancer	SMIG Director, **CONVERGENCE** Director and GSBS faculty
Identify and recruit SHP QEP committee (new committee will be composed of IDEAL advisors and IDEAL Director as Chair)	**CONVERGENCE** Director, Dean (SHP), Associate Dean (SHP)
Academic Colleges - development of curricular materials and defined learning activities	**CONVERGENCE** Director, College Directors and Colleges Project Manager
SMIGs - development of curricular materials and defined learning activities	**SMIG** Director, **CONVERGENCE** Director, Associate Dean (GSBS) and SMIG coordinator
IDEAL orientation - development of curricular materials and defined learning activities	**CONVERGENCE** implementation advisory group, **CONVERGENCE** Director, Dean (SHP), Associate Dean (SHP), Project Director, IDEAL coordinator

B.   CONVERGENCE Year 2

Activity	Responsible
Implement faculty development sessions	**CONVERGENCE** Leadership Team = (**CONVERGENCE** assessment advisory group, **CONVERGENCE** Director, Colleges Directors, SMIG Director, IDEAL Director), SWAT, and OME
Review pilot assessment results and provide feedback to faculty	**CONVERGENCE** Leadership Team
Implement first round of assessment activities	**CONVERGENCE** Leadership Team
Develop two or more additional certificate programs in other interest areas (to be implemented in fall 2011)	SMIG Director and Coordinator
Assess the success of the initial Cancer Interest Groups	SMIG Director and Coordinator
Determine how participation in certificate activities can be made available to trainees in the medical school and health professions school	SMIG Director and Coordinator with **CONVERGENCE** assessment advisory group and **CONVERGENCE** Director
Implement the first Learning Community Day - Cancer	**CONVERGENCE** Leadership Team, Oncologist, Office of Public Education

C.   CONVERGENCE Year 3

Activity	Responsible
Refine and continue faculty development workshops (3 half day/ year) and twice-a-month one-hour sessions	**CONVERGENCE** assessment advisory group, **CONVERGENCE** Director, SWAT, and OME
Review and use assessment results for program improvement	**CONVERGENCE** assessment advisory group with curriculum committees
Develop and add certificate programs in areas where there is sufficient interest on campus	SMIG Director and Coordinator

D.   CONVERGENCE Year 4

Activity	Responsible
Provide **CONVERGENCE** Leadership Team with assessment feedback.	**CONVERGENCE** assessment advisory group
Provide faculty with assessment feedback and recommendations	**CONVERGENCE** assessment advisory group and **CONVERGENCE** Leadership Team
Review and use of assessment results for program improvement	**CONVERGENCE** assessment advisory group and **CONVERGENCE** Leadership Team
Implement comprehensive assessment of QEP	**CONVERGENCE** Leadership Team

E.   CONVERGENCE Year 5

Activity	Responsible
Five year report due to SACS	**CONVERGENCE** Director and Leadership Team

VIII.   Qualified Personnel Descriptions and Organizational Chart for CONVERGENCE

Implementation of **CONVERGENCE** will succeed through the commitment of University leadership at all levels.   An organizational structure has been designed, which includes oversight and accountability (Fig. 8.1).

Provost: The Provost is the Executive Vice President for Academic Affairs as well as the chair of the Academic Affairs Committee. This is the person to whom the **CONVERGENCE** leadership will report directly (see **CONVERGENCE** Organizational Chart at the end of this section). The overall responsibility for **CONVERGENCE** rests with the **Provost.**

Academic Affairs Committee: The Academic Affairs Committee was formed to provide a forum to discuss issues affecting academia at UT Southwestern. Topics that are covered address issues in the School of Health Professions, Southwestern Graduate School of Biomedical Sciences and Southwestern Medical School. The purpose of the Academic Affairs Committee will be to provide advice regarding issues related to the acquisition of resources and to ensure the advancement and integration of **CONVERGENCE** campus wide. The membership consists of:

> Raul Caetano, Dean, Southwestern School of Health Professions
> Melanie Cobb, Dean, Southwestern Graduate School of Biomedical Sciences
> Susan Cox, Associate Dean, Medical Education
> Jennifer Cuthbert, Director of Web Curriculum
> Wendy Deaner, Director, Office of the Provost
> Alfred G. Gilman, Executive Vice President for Academic Affairs and Provost
> Charles Ginsburg, Sr. Associate Dean, Academic Administration
> Lynne Kirk, Associate Dean, Undergraduate Medical Education
> Willis Maddrey, Executive Vice President, Clinical Affairs
> Daniel K. Podolsky, President, UT Southwestern Medical Center
> Michael Roth, Assoc. Dean, Southwestern Graduate School of Biomedical Sciences
> Keith Wharton, Associate Dean, Undergraduate Medical Education
> James Willson, Associate Dean, Cancer Programs
> Ruth Womack, Director, Office of the Dean of Southwestern Medical School
> TBA, Dean Southwestern Medical School

CONVERGENCE Director (0.20 FTE): Dr Susan Cox will lead the **CONVERGENCE** initiative with the responsibility of **CONVERGENCE** Director. She is the Associate Dean for Medical Education and has been allocated adequate time to provide leadership for **CONVERGENCE**. She will report to the Provost and the SACS Accreditation Liaison. The **CONVERGENCE** Director will oversee and provide leadership for the ongoing development and implementation of this institution-wide education initiative. The Director will administer all activities for the QEP implementation and further development; assure that ongoing communication occurs with all component groups involved with the initiative; assume responsibility for assuring the assessment, budgetary and reporting requirements are met; and prepare regular reports on the progress and outcomes of **CONVERGENCE** to meet the requirements of SACS and for internal review. The Director will also assume responsibility and oversight for implementing and supporting **CONVERGENCE** learning activities and participate as a member of the assessment team.

CONVERGENCE Implementation Advisory Group: The purpose of this advisory group is to facilitate the implementation of **CONVERGENCE** by supporting the Director in countless ways. This group will offer guidance in the bringing together of key participants, help solve logistical problems, provide direction, trouble shoot, think strategically, and promote **CONVERGENCE** integration in general. The committee will be composed of key personnel who served on the QEP Planning Committee and also include the coordinators described below. Dr Jennifer Cuthbert, the Director of the Web Curriculum, will serve as chair of the **CONVERGENCE** Implementation Advisory Group and will be given 0.1 FTE to direct these activities**.**

CONVERGENCE Assessment Director (0.20 FTE): The **CONVERGENCE** Assessment Director (Kim Hoggatt) will lead the committee to ensure that all aspects of program evaluation and ongoing program improvement occur on schedule. The **Assessment Advisory Committee** will include representation from all three schools and will work closely with the implementation group to ensure that **CONVERGENCE** assessment becomes integrated into all aspects of our QEP initiative.

Learning Community Directors for UT Southwestern Academic Colleges, Health Professions IDEAL teams, and Science of Medicine Interest Groups (SMIGs): The course directors for each element of the **CONVERGENCE** initiative will serve as the liaisons with the curriculum committees from each school. Individually the course director will be responsible for the development and implementation of the **CONVERGENCE** curriculum in his or her school.

Southwestern School of Health Professions (SSHP) IDEAL Director (0.1 FTE): This individual will be responsible for oversight and development of all aspects for ongoing QEP for SSHP; will serve as primary contact for university QEP director and assessment director; will coordinate assessments, scoring and reports for QEP documentation; and will serve as chair of SSHP QEP committee.

Colleges Coordinator (1.0 FTE): Presently employed by the Office of Medical Education, this individual (Ben Eckert) coordinates our **Colleges** learning activities. Responsibilities will include maintaining the Web site, distributing syllabus materials, procurement of supplies, and collection of assessment materials.

SMIG Coordinator (1.0 FTE): Person who will manage program organization, scheduling and advertising, including the annual retreat. The coordinator will maintain the SMIG web pages.   The coordinator will work with the registrar to enroll students, will monitor attendance, and will organize distribution of assessments for student learning outcomes and for program effectiveness. The individual will also be involved in program budgeting.

IDEAL Coordinator (.5 FTE): This administrative support person will serve as primary contact for faculty advisors; schedule meetings; take and distribute meeting minutes; handle room scheduling for IDEAL's; order lunches; copy materials and assist IDEAL faculty advisors with materials preparation; prepare and distribute calendars and schedules for QEP activities; set-up and administer QEP web-page.

Learning Community Day (LCD) Coordinator (0.2 FTE): Presently employed by the Office of Public Education, this individual will coordinate our community day learning activities and events. Responsibilities will include scheduling rooms, planning meals, inviting speakers, and seeking unrestricted educational grant support from industry and foundations.

Additionally this individual will work with the faculty coordinators to design the pre and post test assessment, assessment form for the speakers and the post-meeting outcome assessment tool.

Web Support Manager (1.0 FTE): Situated in the Office of Medical Education, this new person will oversee the technology support needed to effectively carry out all **CONVERGENCE** activities that involve online presentation and collection of information. In particular the work will include developing and maintaining the institution-wide repository of learning communities (*viz*, SMIG, work in progress, journal clubs, etc). The Web support manager will report directly to the **CONVERGENCE** leadership team (Cox, Cuthbert, and Hoggatt).

VIII. CONVERGENCE
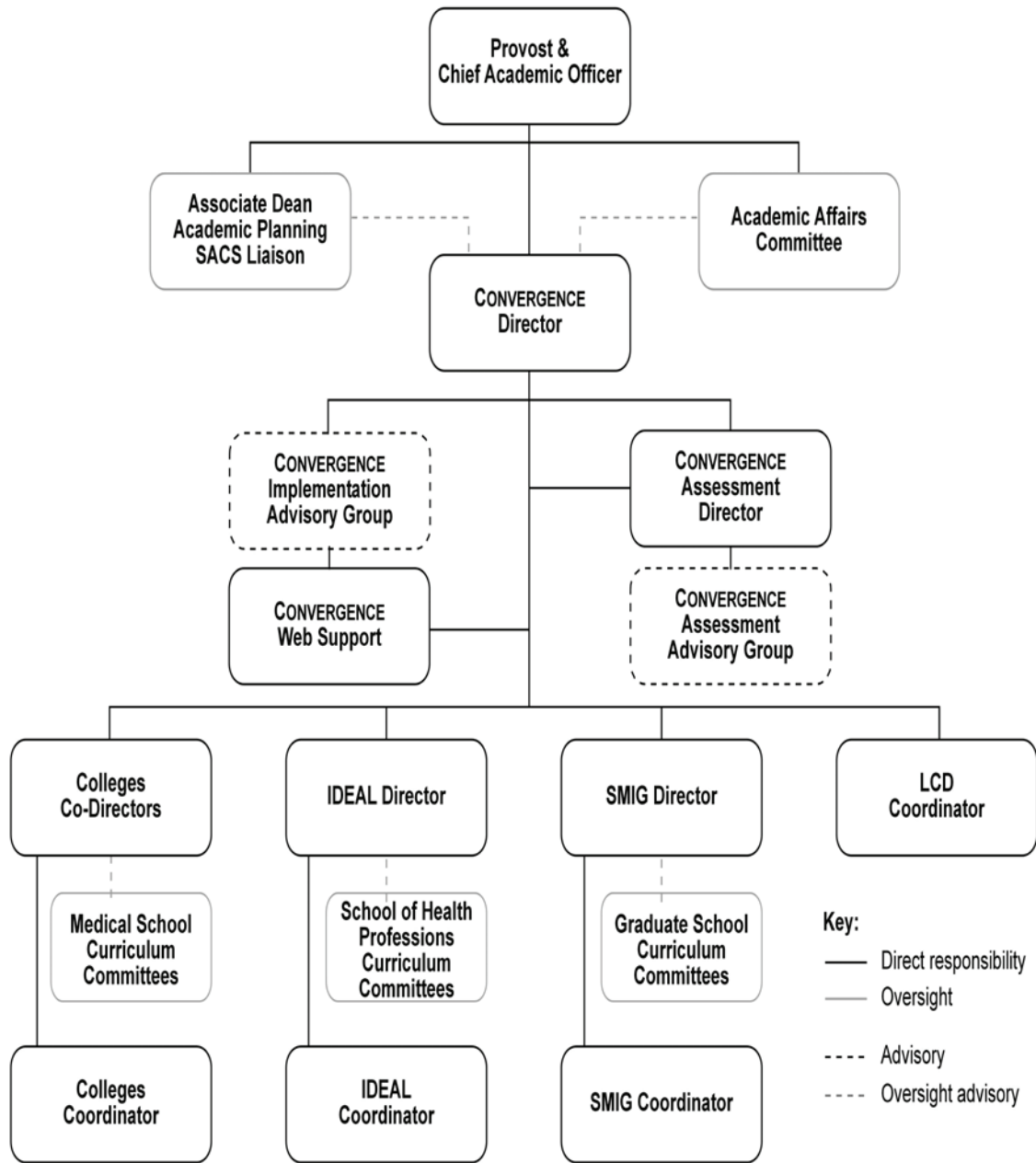## Organizational Structure

Fig. 8.1. Organizational structure for implementation and oversight of the **CONVERGENCE** Quality Enhancement Plan.

IX. Resources

The budget shown below is evidence of UT Southwestern's commitment to make available ample resources to support CONVERGENCE. The budget covers a five-year period and to the extent possible draws on existing resources. A modest amount of new annual funding is allocated for the five year period. Over time there may need to be funds shifted to sustain CONVERGENCE. The CONVERGENCE Leadership Team along with the President/Provost/ Dean will annually review the budget and need for additional resources. Additionally, there may be opportunities for external fundraising for CONVERGENCE.

YEAR 1	Faculty Support	Admin Support	Faculty Develop. and LCDs	QEP Assess- ment	M & O	Travel	Start Up Costs	Totals
* Total Estimate	$705,000	$199,500	$26,603	$42,000	$65,500	$7,500	$53,900	$1,105,003
New Money	$421,000	$132,000	$26,603	$42,000	$65,500	$7,500	$53,900	$753,503

YEAR 2 * 3% cost of living increase	Faculty Support	Admin Support	Faculty Develop. and LCDs	QEP Assess- ment	M & O	Travel	Tech. Support	Totals
Estimate	$730,980	$226,405	$32,402	$42,000	$65,500	$7,500	$26,200	$1,130,987

YEAR 3 * 3% cost of living increase	Faculty Support	Admin Support	Faculty Develop. and LCDs	QEP Assess- ment	M & O	Travel	Tech. Support	Totals
Estimate	$757,609	$232,837	$38,224	$42,000	$65,500	$7,500	$33,000	$1,176,670

YEAR 4 * 3% cost of living increase	Faculty Support	Admin Support	Faculty Develop. and LCDs	QEP Assess- ment	M & O	Travel	Tech. Support	Totals
Estimate	$784,887	$239,462	$44,071	$42,000	$65,500	$7,500	$39,800	$1,223,220

YEAR 5 * 3% cost of living increase	Faculty Support	Admin Support	Faculty Develop. and LCDs	QEP Assess- ment	M & O	Travel	Tech. Support	Totals
Estimate	$807,835	$246,285	$49,943	$42,000	$65,500	$7,500	$46,600	$1,265,663

* Year 1 total includes new money

X. Assessment

CONVERGENCE will enhance students' learning by improving a) their knowledge and understanding of common diseases including concepts related to clinical and translational research including how research is conducted, evaluated, explained to patients, and applied to patient care and b) their ability to communicate this knowledge to peers, professionals, and the public. Assessment will include instruments to measure learning outcomes for participants across all schools and instruments that will be used for learning outcomes relative to longitudinal activities within the individual schools.

An assessment expert, Marilla Svinicki, Ph.D. from the Department of Education Psychology at the University of Texas at Austin, consulted with us on various aspects of measurement and appropriate tools to evaluate the **CONVERGENCE** learning outcomes. Assessment instruments are linked to learning outcomes specific to **CONVERGENCE** goals. (Table 10.1)

Table 10.1: Matching Assessment Instruments to Learning Outcomes of CONVERGENCE Goals

CONVERGENCE Goals	Learning Outcomes	Assessment Instruments
GOAL 1	Students will be able to demonstrate understanding of the concepts related to basic, clinical and translational research including how research is conducted, evaluated, explained to patients, and applied to patient care.	**CONVERGENCE** Knowledge and Attitude Probe (Appendices D,E,F)
	Students will become competent in verbal communication skills including oral presentation to peers the objectives, background, experimental design and methods, results, interpretation and critique of research.	**CONVERGENCE** General Effective Interprofessional Communication Rubric (Peer and faculty scored) (*Appendix G*) **CONVERGENCE** Activity Specific Effective Interprofessional Communication Rubric (Peer and faculty scored) (*Appendix H*) **CONVERGENCE** Interprofessional Presentation Rubric (Peer and faculty scored) (*Appendix I*)
GOAL 2	Students will demonstrate increased fundamental understanding of the topic of interest and knowledge about how this understanding is translated into clinical practice, competency, and enhanced cross-disciplinary and interprofessional communication with patients and other healthcare professionals.	**CONVERGENCE** Knowledge and Attitude Probe **CONVERGENCE** General Effective Interprofessional Communication Rubric (Peer and faculty scored) **CONVERGENCE** Activity Specific Effective Interprofessional Communication Rubric (Peer and faculty scored)

		CONVERGENCE Interprofessional Presentation Rubric (Peer and faculty scored)
	Students will display an attitude of cooperation, collaboration, and respect for professional roles in interactions with scientists, members of the health care team, patients and the community.	**CONVERGENCE** Knowledge and Attitude Probes
GOAL 3	Faculty will utilize teaching styles that reflect diversity of teaching methods such as more experiential learning activities and constructive feedback.	Faculty Self-Assessment Survey (to be developed) Teacher-Designed Feedback Form (to be developed)
GOAL 4	Students will demonstrate increased knowledge of the latest scientific and clinical research and the ability to lead community outreach activities on preventive health.	**CONVERGENCE** General Effective Interprofessional Communication Rubric (Peer and faculty scored) **CONVERGENCE** Activity Specific Effective Interprofessional Communication Rubric (Peer and faculty scored) **CONVERGENCE** Interprofessional Presentation Rubric (Peer and faculty scored) **CONVERGENCE** Learning Community Day Public Survey (*Appendix J*)

1. Activity: Baseline data / CONVERGENCE Knowledge and Attitude Probe
 1a. Knowledge/familiarity probe to establish baseline assessment data on the current **CONVERGENCE** Learning Community Day topic (e.g. cancer)
 1b. Baseline questionnaire(s) of student's attitudes toward interprofessional learning, survey of professional identity, state of empathy, and willingness to collaborate.

Goal of Assessment: Baseline measurement and assessment of effect of **CONVERGENCE** activities

Strategy: The **CONVERGENCE** Knowledge and Attitude Probe (exam/survey) will be conducted anonymously to establish baseline data for students who have never participated and those about to participate in **CONVERGENCE** activities. The probe will initially be given in the spring 2009 to all students to establish a control and baseline prior to the initiation of **CONVERGENCE** activities. In the fall 2009, the probe will be given to all students ready to participate in learning communities and the spring 2010 Learning Community Day. The **CONVERGENCE** Knowledge and Attitude Probe will be given in spring 2010 to all students who have participated in **CONVERGENCE** activities.

Assessment Tool: The Knowledge Probe [42], (pg. 64) combined with traditional exam-type questions will be developed by the Assessment Advisory Group and relevant resource personnel to measure changes in knowledge of the topic. The Readiness for Interprofessional Learning Scale (RIPLS) [43] and the Professional Identity Scale [44] will

be modified for **CONVERGENCE** to assess attitudes and professional identity and will be utilized to evaluate changes in student behaviors and self-assessed confidence *(See Appendices D, E and F)*.

Timeline: After establishing the baseline data in spring 2009, pre-assessment data will be collected in fall 2009 from all students ready to participate in **CONVERGENCE** activities and again in spring 2010 after participation in learning communities and Learning Community Day. This will continue each following year with the modification of knowledge questions relative to the Learning Community Day topic that year.

Data Repository: QEP data server (individual scores) and TracDat system (overall scores for program evaluation).

2. Activity: Oral and poster presentations for longitudinal learning community activities and Learning Community Days

Goal of Assessment: Determine if students demonstrate enhanced communication skills with colleagues and lay audience.

Strategy: Students will participate in longitudinal learning community activities and Learning Community Days by giving oral presentations, creating poster presentations and /or completing written assignments. Students and faculty will complete rubrics to assess communication of one aspect of the science of medicine topic (i.e. research, diagnosis, therapy) to interprofessional and lay audiences. Students and faculty will complete rubrics to assess the contribution of learning community and Learning Community Days oral presentations to learning outcomes.

Assessment Tool: The Assessment Advisory Committee has developed effective interprofessional communication (general and specific activity) [45] and presentation rubrics [46] for faculty and student (peer) scoring that can be used for all student presentation activities. *(See Appendices G, H and I)*

Timeline: Presentations will be scored as needed during learning community activities and during the Learning Community Days. All scores will be given to students for review.

Data Repository: Individual schools and forwarded to QEP data server

3. Activity: Faculty leadership of learning communities

Goal of Assessment: Determine relevant faculty leadership for learning community activities.

Strategy: Faculty will provide relevant leadership for longitudinal learning community activities and Learning Community Days. Students will complete a Teacher-Designed Feedback form and faculty will complete a self-assessment to evaluate the contributions of individual faculty members to learning community leadership and learning outcomes.

Assessment Tool: The Teacher-Designed Feedback form [42] will be developed as a focused feedback form to assess learners' reactions to teachers and teaching. The

faculty self-assessment will be developed by the Assessment Advisory Group and relevant personnel for faculty reflection and comparison to the learner feedback.

Timeline: The Teacher-Designed Feedback form and Faculty Self-Assessment will be completed in the spring of each year. Scores will be given to individual faculty to review, as well as the learning community directors for the individual schools and the **CONVERGENCE** Director. Scores will also be reviewed during annual QEP program evaluation.

Data Repository: Individual schools and forwarded to QEP data server.

4. Activity: Public Participation in Learning Community Days

Goal of Assessment: Determine success of communication to the public during Learning Community Day activities.

Strategy: It is anticipated that students will provide relevant information on science of medicine topics to the public during Learning Community Days. Members of the public participating in Learning Community Days will complete a survey to assess the success of the student's communication to the public.

Assessment Tool: A survey for members of the public participating in Learning Community Day activities will assess the public's feedback for presenters on the science of medicine topic. The CONVERGENCE Learning Community Day Public Survey (Appendix J) was modified from the public survey utilized by the UT Southwestern Office of Public Education for a Women's Health Symposium.

Timeline: The CONVERGENCE Learning Community Day Public Survey will be completed in the spring of each year during the Learning Community Day. Feedback will be given to presenters to review, as well as the **CONVERGENCE** Director. Data from the Public Survey will also be reviewed during annual QEP program evaluation.

Data Repository: QEP data server (TracDat)

Evaluation for program efficiency will occur annually in the late spring. The **CONVERGENCE** Director and Leadership Team will review the faculty and learning community evaluations and feedback from Learning Community Day and make changes, if necessary, to improve **CONVERGENCE** implementation.

TracDat data on **CONVERGENCE** will be reviewed annually by the **CONVERGENCE** Program Director, Assessment Director and the Assessment Advisory Group. They will meet in the late spring to review whether the **CONVERGENCE** Program is effective in achieving the desired learning outcomes and make changes if necessary.

Figure 10.1 shows the **CONVERGENCE** assessment timeline for development, gathering baseline data, program implementation, and program evaluation and modification.
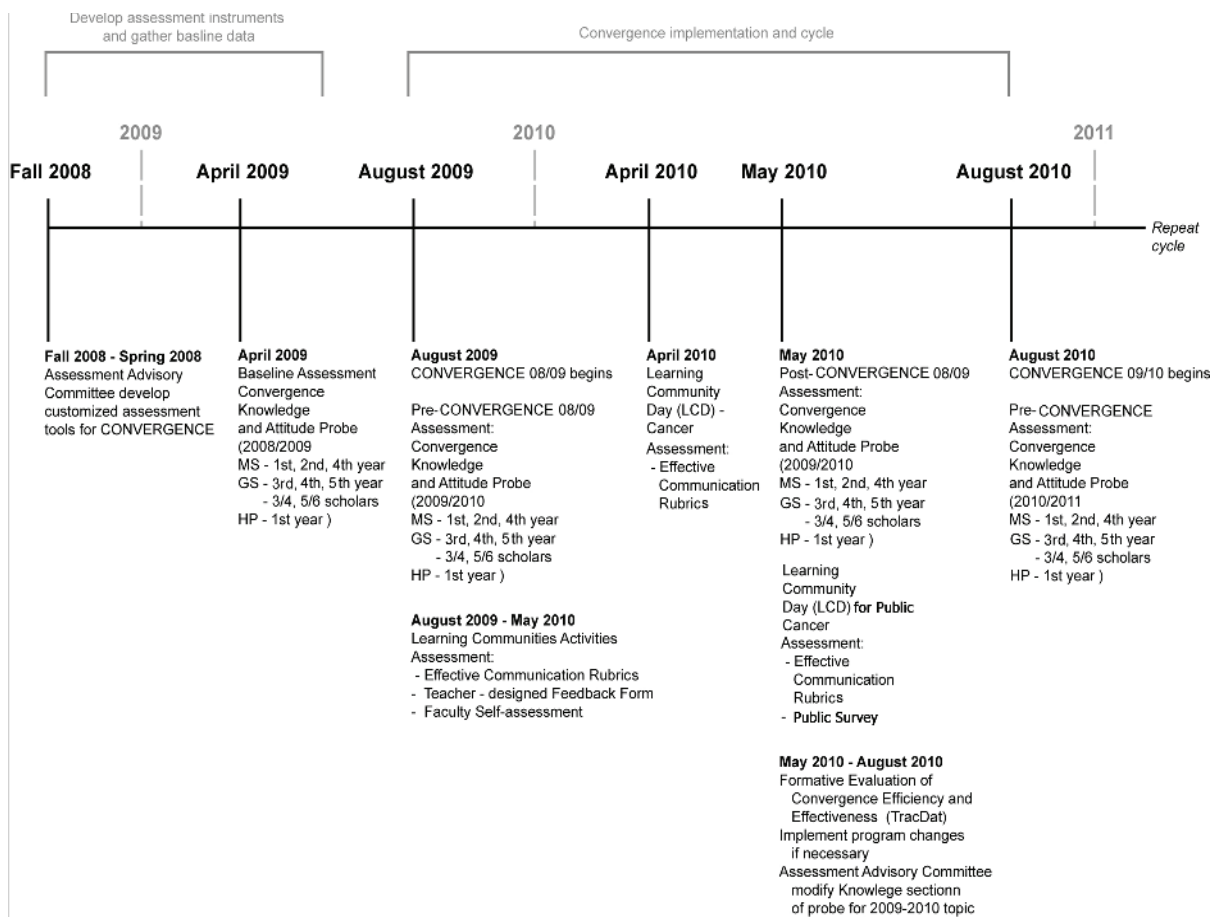
Fig. 10.1. Timeline for development and implementation of QEP assessments.

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XII. Appendices

Appendix A: Faculty Senate Study Project 2006 - 2007

UT SOUTHWESTERN
MEDICAL CENTER

Faculty Senate Study Project

2006-2007

What should UT Southwestern do to achieve significant, even transforming improvements in the quality of student learning?

Introduction

During the 2006-2007 academic year, the UT Southwestern Faculty Senate focused its attention on student learning issues. This topic was relevant to the now ongoing SACS accreditation process, which requires the university to prepare a Quality Enhancement Plan (QEP) by January 2009. The purpose of the QEP should be to delineate how transforming improvements in the quality of student education at UT Southwestern will be achieved.

To begin the process of determining what might be the focus of such a transformation, the Faculty Senate interviewed medical students and residents; deans involved in medical school education; graduate students and postdoctoral fellows; deans involved in graduate school education; and students, faculty and deans involved in allied health sciences education.

Transformation through integration of interdisciplinary resources

As might be expected, there were different sets of concerns raised in each of the group interviews, and the focus was at different levels, e.g., instructional quality (how good are my courses), diversity of opportunities (am I receiving the necessary training for my future career), and integration of my experience within the medical center as a whole.

Overall, enhancing instructional quality was of greatest concern in the medical school. In the graduate school, while enhancing instructional quality also was very important, enhancing diversity of opportunities received even greater emphasis. The difference can be understood in terms of career paths, which are relatively clear for medical students and residents but in transition for graduate students and postdoctoral fellows. The traditional function of graduate education to train academic teachers and researchers is increasingly only part of a more diversified set of potential outcomes. Finally, for the school of allied health sciences, given the breadth of programs and students, developing a unified identity and sense of integration with the medical centers was the highest priority and appears to remain an unrealized challenge.

In the context of the differences mentioned above, it might seem at first sight that there would be few potential common themes for transforming changes in student learning. The following observation, however, suggested that the lack of unity might itself provide an opportunity.

> Allied health students will likely function as part of interdisciplinary teams, but organization of the curriculum includes few opportunities for interdisciplinary instruction and interactions between bachelor and master's programs and between allied health students and medical students....As a result, interactions between research, clinical, and allied health components of the medical center are not actively promoted at the level of students or faculty.

The size and complexity of UT Southwestern creates a vast, yet untapped source of enrichment for medical students, residents, allied health students, graduate students and post doctoral fellows. These groups of students function mostly in their individual realms with little or no interaction with other students or members of the "outside world" with whom they

will most likely interact in the "real world" of their future. We suggest that through integration of interdisciplinary resources this separation could be transcended.

Medical students may be totally unaware of the research being conducted virtually next door, research that almost certainly will impact their later clinical practice. Furthermore, some of these medical students will undoubtedly find themselves in an academic setting in the future. Nevertheless, they may have missed the opportunity to learn from their counterparts in the research arena at the time they were forming their clinical background. A suggestion was made that medical students could be attached to a research project that they could follow over an extended period of time. The interaction could benefit both the researchers and the future clinicians.

The opportunities and benefits of interaction between medical and allied health students are even more immediate and practical. Clearly they will be members of the same health care teams in the future. There is no better time to foster mutual understanding and appreciation of their complementary roles than in their student years. All parties, including their future patients, will benefit from the experience.

The integration of interdisciplinary resources approach might be equally applicable to solve the problem of graduate education opportunities.

> As a standalone university without undergraduate programs or non-biomedical scientific fields, opportunities for teaching experience or engagement in interdisciplinary research are highly limited....Joint ventures with regional universities and/or industry could be developed to provide a broad range of interdisciplinary opportunities to both graduate students and postdocs.

Graduate students and post-doctoral fellows have noted some deficiencies in their training and preparation for future careers. Their paths may lead to academics or to industry, but too much time may be spent in the vacuum of the laboratory. They have suggested improved mentoring or some sort of career center to facilitate their transition. Others who lean more toward teaching than research criticize their lack of teaching opportunities and experience. UT Southwestern has sister institutions in Dallas and Arlington; UT Southwestern has business connections throughout the Metroplex. Integration of these students into our sister universities and into allied industries should prove fruitful for all.

It would seem that the University could tap into resources that already exist within the system and enrich student learning through cross-pollination, both internally and externally: between the clinical and research sectors; between the medical and allied health students; between graduate students/post doc fellows and regional universities/industry. On-campus and regional integration would achieve significant, even transforming improvements in the quality of student learning, and in the process, would greatly strengthen the University.

Summary of 2006-2007 meetings

November 2006, Medical Students & Residents

1) Increase access to mentoring: Not all students want a mentor, but those who do have a hard time finding appropriate mentors. What students need depends on their backgrounds, e.g., science vs. humanities. Chemistry of personalities is key so finding the right person is somewhat a matter of serendipity. The new Colleges program might help. [One concern raised from the Senate about the new Colleges program was that the masters are individuals perceived as already overcommitted in their responsibilities.]

2) Increase continuity of instruction: Currently, the curriculum lacks continuity within courses (too many instructors and styles) and between courses. Technology (e.g., streaming video), and the integrated curriculum (2nd year) are helpful. The perception overall, however, is that the science is disconnected from clinical reality, and there is no clear connection made between the curriculum and the question "How will this help me be a physician?"

3) Re-conceptualize medical education: Current medical education is philosophically the same now as 10 years ago with the central core feature: memorize the facts. What is needed is an entirely different approach that emphasizes process over of facts, that is, information gathering, utilization of resources, and integration of puzzle pieces into the whole. Medical education should place less emphasis on the memorization mode and increase activities that promote a reflective approach with central features of flexibility, adaptation, and critical thinking.

4) Other Comments:

The syllabus: Students felt some could be confusing because they were all so different. It was suggested course directors address this problem and find a way to resolve the issue.

One-time lecturers: If there is a onetime lecturer, then the students do not have an opportunity to develop an interactive relationship with a lecturer or visiting professor. It can be frustrating and diminish the students' retention and/or comprehension of the lesson.

Mentors: Students desire mentors whose goals are well defined and who are inspiring. On the other hand, some students need to have a field of study or a specialty in mind to select the right mentor. It would also behoove the medical school to have a wide selection of mentors.

Early interaction with patients: Students need opportunities early on to interact with patients and to apply ethics and humanities. More inclusion of these activities during the MS1 and MS2 years would be welcome.

Mission of the medical school: Each medical student should be encouraged to be a lifelong learner, to have an open mind, to always ask questions and to delve for answers long after degrees are obtained.

December 2006, Deans Involved In Medical School Education

1) Undergraduate Medical Education

Novel programs should be developed recognizing that UT Southwestern has a very large medical student classes (3rd largest in the country).

We should aim to transform our students into self-directed, life-long learners.

Ongoing improvements need to continue integrating the first year curriculum and the integration of the second year curriculum.

Introduction of simulated instruction will increase opportunities for experiential, hands-on learning.

Further development of the Southwestern Academy of Teachers (SWAT) should encourage ongoing commitment to excellence of individual teachers.

Implementation of the college system offers many different types of opportunities for improved student learning through:

- Physical continuity created by teaching carrel college homes will lead to enhanced communication and cooperative (teamwork) skills
- Development of advisory relationships with more senior faculty who will facilitate the ability of student to find mentors and to serve as conduits for students to the full range of campus opportunities
- Patient-related interactions and instruction moved into the first year
- Increased focus on patient safety and care (including recognition of medical error)
- Expanded research/medicine interface (integrated with Dept. of Clinical Sciences) creates additional opportunities for understanding research opportunities as well as development of critical thinking skills

MD/PhD training has specific challenges for which new programmatic developments would be helpful:

- Need to remain competitive vs. other top-tiered schools
- Current models for PhD training focus primarily on hypothesis-driven research and pay less attention to more descriptive (discovery) models, but latter are increasingly important (e.g., computational analysis and translational studies).
- Weak biomedical engineering program.

2) Graduate Medical Education

At the graduate medical educational level, the challenges are (1) dealing with a large number (> 80) of distinct residency and fellowship programs; and (2) decrease residency duty hours (which challenges continuity of patient care and fulfilling educational goals)

One potential response to these challenges is the increased use of passports (ongoing documentation of specific skill sets learned) and portfolios (self and programmatic

assessment), which together have the potential to help ensure breadth and success of completing specific educational goals.

Introduction of simulated instructional opportunities may increasingly become an important part of graduate medical education.

January 2007, Graduate Students & Postdoctoral Fellows

1) <u>Concerns about course work</u>

Statistics: Training in statistics currently is viewed as inadequate but often important for data analysis and required for writing papers. This issue may already be resolved, however, since the students have approached the administration and seem satisfied with the response that they received, i.e., a proposed new course.

Depth of Coursework: Some students have concerns about the depth of current coursework, both the Core Course and Advanced Courses. Cell Signaling was mentioned as a model of what a substantive course could offer whereas the Core Course several years ago was mentioned as a model of teaching to the lowest level of students. What should be the appropriate balance between coursework and laboratory work appears to be a subject about which the students lack a coherent philosophy.

Paper and Grant Writing: Some students feel that additional seminars or courses are needed to help build expertise and confidence in writing papers and grants.

2) <u>Concern about choosing advisors</u>

The predocs suggested that there are widespread concerns amongst students about finding postdoc or other positions, and the postdocs expressed similar feelings about finding jobs. As one postdoc put it: "No one really cares if you get a job!" Many research advisors are perceived as more interested in students and postdocs as employees than as trainees. To help students and postdocs make decisions about whether particular laboratories are good places to work in terms of future opportunities, it was suggested that information should be made easily available regarding the next place where previous students and postdocs moved after they finished in a particular laboratory. A distinction was made between residency programs where there is great concern about resident placement as a major aspect of resident recruitment, which typically is not the case for the Ph.D. program.

3) <u>Postdoc and advisor evaluation</u>

It would benefit postdocs if there was a formal evaluation process that would track the postdoc development and progress towards accomplishing their career goals.

It would also be valuable if evaluation of advisors was carried out by students and postdocs. Such evaluations might influence advisor behavior if they were used by graduate school and department chairs to evaluate faculty. For political reasons, such evaluations might have to be accomplished by exit interviews although other methods might be feasible as well.

4) <u>Career center</u>

Both students and postdocs felt that there was an urgent need for a career advisory and placement (CAP) center. Research advisors are not necessarily good career advisors nor are they familiar with the breadth of career opportunities beyond the traditional academic or perhaps biotech path. The CAP center should be able to help students and postdocs identify a range of potential career opportunities; carry out evaluations and goal setting to help individuals become qualified for the careers in which they are interested; and become a potential liaison between students and employers (academic institutions, biotech companies, vendors, etc.) who contact the advisory/placement center regarding available opportunities. The data base (see above) regarding where previous students and postdocs moved after they finished their work at UT Southwestern might be useful for networking purposes. The CAP center also would take over and increase the impact of currently student-run programs such as Quest for a Career and Career Day.

5) General note

One important challenge is to develop these programs in a way that meets the needs of international students who now represent more than 50% of UT Southwestern postdocs as well as a significant percentage of graduate students.

February 2007, Deans Involved In Graduate School Education

1) Current Status and Challenges

Changing job market has resulted in decreased opportunities for students interested in traditional academic positions. Consequently many more graduate students have become interested in non-academic careers.

UT Southwestern graduate training has the traditional focus towards continuing in academic research in preference over other career paths and still aims to recruit the most elite students who would be most likely to end up in academic positions. According to attendees at a meeting of a UT System committee analyzing student goals, a high percentage of UT Southwestern trainees continue to be interested primarily in academic positions in the future.

As a standalone university without undergraduate programs or non-biomedical scientific fields, opportunities for teaching experience or engagement in interdisciplinary research are highly limited.

The funding mechanism for most graduate students is through research grants, which inherently emphasizes research over training and creates a potential conflict of interest because what is in the best interests of the grant and the student may be different.

Similarly, most postdoctoral trainees are supported through grants, and many laboratory directors recruit postdoctoral trainees primarily to become the laboratory workforce rather than to be trainees.

2) Enhancing Career Placement

Further development of a placement service can help students identify diverse career paths and opportunities. The Quest for a Career Seminar Series informs students and postdocs about career options or opportunities other than the academic path.

Tracking UT Southwestern alumni can create a national network to help current students and postdocs find positions. Tracking would have to be done on a voluntary basis, however, because of privacy issues.

3) Enhancing Career Opportunities

New programs for graduate students are being created such as 1) an accelerated program for more advanced students to be completed in 4 years (i.e. core courses would be skipped) and 2) a translational research program for students interested in clinical research.

A new training program for postdoctoral fellows specifically focuses on different aspects of career development such as grant writing, teaching, ethics, etc. This program will include recorded material available through the university intranet to enhance accessibility.

Joint ventures with regional universities and/or industry could be developed to provide a broad range of interdisciplinary opportunities to both graduate students and postdocs.

March 2007, Students, Faculty & Deans Involved In Allied Health Sciences Education

1) Course organization and facilities

During the summer core curriculum course, tutoring opportunities are available for all students before the first exam. This program, which many would like to have continued for all students throughout the course because they find it highly beneficial, is limited to poorer students for subsequent exams.

Some instructors provide lecture outlines to the students after rather than before the lectures, which the students find less useful. Also, in some programs, student opportunities for faculty evaluation are limited.

Students also find allied health study facilities limited, including the absence of lockers, a study center, a library substation, access to fax machines, scanners, computers, and the inability to enter the building before 7:30 a.m. even though many students arrive on campus earlier, etc.

2) Course content

Allied health students will likely function as part of interdisciplinary teams, but organization of the curriculum includes few opportunities for interdisciplinary instruction and interactions between bachelor and master's programs and between allied health students and medical students. For example: The interaction of the city manager concerning Katrina and disaster response pointed to as representing the type of interdisciplinary opportunity that is desirable.

3) Institutional barriers

Philosophy of medical education still tends to separate issues relating to public health, e.g., wellness, prevention and accessibility from issues relating to treatment. As a result, interactions between research, clinical, and allied health components of the medical center are not actively promoted at the level of students or faculty.

Medical students and graduate students lack sufficient access to public health electives, and there are not enough opportunities for community-wide programming focused on public health issues.

Distance learning opportunities in allied health sciences, which are becoming popular nationally, are not being given sufficient support for development at UT Southwestern.

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Appendix B: Medical School Educational Objectives

#	Learning Objectives	Courses	Evaluation Methods	LCME Standards	ACGME Competencies
1.0	**The student, before graduation, must have demonstrated to the satisfaction of the faculty, knowledge of the:**			ED-6	
1.1	Normal structure and function of the body (as an intact organism) and of each of its major organ systems	Anatomy Embryology Biology of Cells & Tissues Physiology Endocrinology Neuroscience SMIG* LCD*	Course Examinations (MCQ's), USMLE Part 1	ED-11	Medical Knowledge
1.2	Molecular, biochemical, and cellular mechanisms that are important in maintaining the body's homeostasis	Biochemistry Biology of Cells & Tissues Physiology Endocrinology Neuroscience Pharmacology SMIG* LCD*	Course Examinations (MCQ's), NBME Shelf exam, Small group cases, USMLE Part 1	ED-11	Medical Knowledge
1.3	Various causes (genetic, developmental, metabolic, toxic, microbiologic, autoimmune, neoplastic, degenerative, and traumatic) of maladies and the ways in which they operate on the body (pathogenesis)	Genetics Embryology Endocrinology Neuroscience Microbiology Pathology Pharmacology Clinical Medicine SMIG* LCD*	Course Examinations (MCQ's), NBME Shelf exam, Small group cases, USMLE Part 1, OSCE	ED-11, ED-12, ED-13	Medical Knowledge
1.4	Altered structure and function (pathology and pathophysiology) of the body and its major organ systems that are seen in various diseases and conditions, including aging.	Microbiology Pathology Clinical Medicine SMIG* LCD*	Course Examinations (MCQ's), NBME Shelf exam, Small group cases, OSCE, USMLE Part 1and 2	ED-11 and ED-13	Medical Knowledge
1.5	Most frequent clinical, laboratory, roentgenologic, and pathologic manifestations of common maladies	Pathology Clinical Medicine Clerkships SMIG* LCD*	Course Examinations (MCQ's), NBME Shelf exam, Small group cases, OSCE, USMLE Part 1and 2	ED-11, ED-12, ED-13	Patient Care, Medical Knowledge, Practice-based Learning
1.6	Important non-biological determinations of poor health and of the economic, psychological, social, and cultural factors that contribute to the development and/or continuation of maladies (e.g. domestic violence, cultural sensitivity)	Colleges Clerkships SMIG* LCD*	OSCE, USMLE Part 1 and 2	ED-10, ED-20, ED-21, ED-22	Medical Knowledge, Practice-based Learning
1.7	Principles of quality improvement, its use in patient care, and use of common patient safety/quality tools (fishbone diagrams, process mapping, etc.)	Clerkships Fourth year courses	QI Project		Medical Knowledge Practice-based Learning Systems-based Practice

#	Learning Objectives	Courses	Evaluation Methods	LCME Standards	ACGME Competencies
1.8	Epidemiology of common maladies within a defined population, and the systematic approaches useful in reducing the incidence and prevalence of those maladies	Pathology Clinical Medicine Clerkships SMIG* LCD*	Course Examinations (MCQ's), NBME Shelf exam, Small group cases, OSCE, USMLE Part 1and 2	ED-11	Medical Knowledge, Practice-based Learning
1.9	Clinical experience as appropriate in the seven major disciplines: family medicine, internal medicine, obstetrics and gynecology, neurology, pediatrics, psychiatry, surgery and core senior rotations (acute care, ambulatory care and medicine sub-internship)	Clerkships Senior Rotations	NBME shelf exams Clinical Skills Passports USMLE Part 2 Clinical Logbooks	ED-14, ED-15, ED-16	Patient Care, Medical Knowledge, Interpersonal & Communication Skills, Professionalism
1.10	Multidisciplinary areas such as geriatrics, emergency department, and primary care	Clerkships Senior Rotations	NBME shelf exams and USMLE Part 2	ED-14 and ED-17	
1.11	Relieving pain and ameliorating the suffering of patients	Pharmacology Clinical Medicine Clerkships	Course Examinations (MCQ's), NBME Shelf exam, Small group cases, OSCE, USMLE Part 1and 2	ED-13	Patient Care, Medical Knowledge, Practice-based Learning
#	**Learning Objectives**	**Courses**	**Evaluation Methods**	**LCME Standards**	**ACGME Competencies**
2.0	**The student, before graduation, must have demonstrated for the faculty, an understanding of the:**			ED-6	
2.1	Power of the scientific method in establishing the causation of disease and efficacy of traditional and non-traditional therapies	Genetics Pathology Clinical Medicine Pharmacology Clerkships Senior Rotations SMIG* LCD*	Small group cases Clerkships OSCE	ED-11, ED-12	Medical Knowledge, Practice-based Learning
2.2	Ethical aspects of medicine to include ethical principles of research involving human subjects, the common presentations of ethical conflict in medical practice, and the ethical roles and responsibilities of the physician to society.	Colleges Human Behavior Clerkships Senior Rotations SMIG* LCD*	Small group cases Clerkships OSCE	ED-20, ED-17A	Professionalism
2.3	Epidemiological factors that place individuals at risk for disease or injury, basic concepts of Bayesian analysis, and to select appropriate tests for detecting patients at risk for specific diseases or in the early stages of disease, and to determine strategies for responding appropriately	Pathology Clinical Medicine Clerkships SMIG* LCD*	Small Group (cases & clerkships), OSCE, USMLE Part 1 and 2	ED-11, ED-17A	Patient Care, Professionalism, Systems-based Practice

#	Learning Objectives	Courses	Evaluation Methods	LCME Standards	ACGME Competencies
3.0	**The student, before graduation, must have demonstrated for the faculty, knowledge of and ability to:**	Clerkships Senior Rotations	Clinical Skills Passports Clinical Logbooks	ED-6	
3.1	Obtain an accurate medical history that covers all essential aspects of the history, including issues related to age, gender, and socio-economic status	Colleges Clinical Medicine Clerkships Senior Rotations	Resident and faculty observation, OSCEs in MS1 & MS2	ED-13, ED-14, ED-15, ED-16, ED-19	Patient Care, Interpersonal & Communication Skills, Professionalism
3.2	Perform both a complete and an organ system specific examination, including a mental status examination	Colleges Clinical Medicine Clerkships Senior Rotations	Resident and faculty observation, OSCE in MS2	ED-13, ED-14, ED-15, ED-16	Patient Care
3.3	Reason inductively and deductively in solving clinical problems	Colleges Clinical Medicine Clerkships Senior Rotations	Chart review; Case presentations; Write-ups, OSCE	ED-13, ED-14, ED-15, ED-16	Patient Care, Medical Knowledge
3.4	Retrieve (from electronic databases or other resources), manage, and utilize biomedical information for solving problems and making decisions that are relevant to the care of individuals and populations	Clinical Medicine Clerkships Senior Rotations	Chart review; Case presentations; Write-ups; OSCE Resident and faculty observation,	ED-7	Patient Care, Practice-based Learning
3.5	Perform laboratory or other practical exercises that entail accurate observation of biomedical phenomenon and critical analyses of data	Anatomy Biology of Cells & Tissues Microbiology Pathology Clinical Medicine Clerkships Senior Rotations SMIG* LCD*	Case presentations; Resident and faculty observation, OSCE; Practical examinations	ED-12	Patient Care, Medical Knowledge, Practice-based Learning
3.6	Perform routine technical procedures including at a minimum venipuncture, inserting an intravenous catheter, arterial puncture, inserting a nasogastric tube, inserting a Foley catheter, and suturing lacerations	Colleges Clinical Medicine Clerkships Senior Rotations	Resident and faculty observation, OSCE, Clinical Skills Passports	ED-13, ED-14, ED-15, ED-16	Patient Care
3.7	Interpret the results of commonly used diagnostic procedures	Colleges Clinical Medicine Clerkships Senior Rotations	Resident and faculty observation; Chart review; Write-ups; Case presentations; USMLE Part 2; OSCE	ED-13, ED-14, ED-15, ED-16	Patient Care, Medical Knowledge

#	Learning Objectives	Courses	Evaluation Methods	LCME Standards	ACGME Competencies
3.8	Construct appropriate management strategies (both diagnostic and therapeutic) for patients with common conditions, both acute and chronic, including medical, psychiatric, and surgical conditions, and those requiring short- and long-term rehabilitation, and end-of-life-care.	Clinical Medicine Clerkships Senior Rotations	Resident and faculty observation; Chart review; Write-ups; Case presentations; USMLE Part 2; OSCE	ED-13, ED-14, ED-15, ED-16	Patient Care, Medical Knowledge
3.9	Recognize patients with immediately life-threatening cardiac, pulmonary, or neurological conditions regardless of etiology, and to institute appropriate initial therapy	Clinical Medicine Clerkships Senior Rotations	Resident and faculty observation; Case presentations; USMLE Part 2; OSCE	ED-13, ED-14, ED-15, ED-16	Patient Care, Medical Knowledge
3.10	Recognize and outline an initial course of management for patients with serious conditions requiring critical care	Clerkships Senior Rotations	Resident and faculty observation; Case presentations; USMLE Part 2; OSCE	ED-13, ED-14, ED-15, ED-16, ED-17	Patient Care, Medical Knowledge
3.11	Communicate effectively, both orally and in writing, with patients, patients' families, colleagues, nurses and other staff with whom physicians must exchange information in carrying out their responsibilities	Colleges Clerkships Senior Rotations SMIG* LCD*	Resident and faculty observation; Case presentations; Chart review	ED-19, ED-20, ED-21, ED-22	Patient Care, Practice-based Learning, Interpersonal & Communication Skills
#	**Learning Objectives**	**Courses**	**Evaluation Methods**	**LCME Standards**	**ACGME Competencies**
4.0	**The student, before graduation, must have demonstrated for the faculty, knowledge of and ability to:**			ED-6	
4.1	Effectively use clinical information systems to: a. Retrieve patient-specific information or data from a clinical information system. b. Display selected subsets of information available about a given patient. c. Record in clinical information systems specific findings about a patient. d. Record orders directing the further care of the patient.	Clerkships Senior Rotations	Resident and faculty observation; Case presentations; Chart review	ED-27, ED-28	Patient Care Practice-based Learning
4.2	Interpret laboratory tests, demonstrating the following: a. Knowledge of the limitations of standard laboratory measurements. b. Ability to integrate clinical and laboratory findings.	Colleges Clinical Medicine Clerkships Senior Rotations	Resident and faculty observation; Case presentations; Chart review	ED-12, ED-13	Medical Knowledge Patient Care
4.3	Incorporate uncertainty explicitly into clinical decision making, demonstrating the ability to quantify and communicate the degree of certainty associated with specific items of scientific and clinical information.	Clinical Medicine Clerkships Senior Rotations SMIG* LCD*	Resident and faculty observation; Case presentations; Chart review	ED-6, ED-7, ED-19	Medical Knowledge Patient Care Interpersonal & Communication Skills Practice-based Learning
4.4	Identify and locate, when possible, the crucial pieces of missing clinical information, and determine when it is appropriate to act on incomplete information.	Clerkships Senior Rotations	Resident and faculty observation; Case presentations; Chart review	ED-6, ED-7, ED-28	Medical Knowledge Patient Care Practice-based Learning Systems-based Practice

4.5	Integrate verbal and statistical sources of medical knowledge with the facts of a specific clinical case.	Colleges Clinical Medicine Clerkships Senior Rotations	Resident and faculty observation; Case presentations; Chart review	ED-6, ED-7, ED-28	Medical Knowledge Patient Care
4.6	Critically use decision support tools to assess and balance textbook and journal articles with diagnostic expert systems	Colleges Clinical Medicine Clerkships Senior Rotations	Resident and faculty observation; Case presentations; Chart review	ED-6, ED-7, ED-28	Medical Knowledge Practice-based Learning
4.7	Assess and disseminate advisories and alerts issued from a computer based record.	Clerkships Senior Rotations	Resident and faculty observation; Chart review	ED-6, ED-7	Medical Knowledge Practice-based Learning
4.8	Formulate a treatment plan, demonstrating the ability to express the relative certainties of a differential diagnosis and the relative risks and benefits of outcomes and treatment options.	Colleges Clinical Medicine Clerkships Senior Rotations	Resident and faculty observation; Case presentations; Chart review	ED-6, ED-7, ED-28	Medical Knowledge Patient Care
4.9	Use available information resources and tools: a. Medline and other relevant bibliographic databases. b. Textbooks and reference sources. c. Diagnostic expert systems. d. Medical internet resources.	Colleges Clinical Medicine Clerkships Senior Rotations	Resident and faculty observation; Case presentations; Chart review	ED-6, ED-7	Medical Knowledge Patient Care
4.10	Understand the basic types of clinical studies, including case report and case series, case-control studies, cohort studies, and randomized controlled clinical trials, the advantages and limitations of each kind of study, and how each type has contributed and continues to add to the body of medical knowledge, the role of randomization and blinding or masking in clinical research, types of bias in observational studies, including definition bias, information bias, selection bias, and confounding, and the concepts underlying the common parametric and nonparametric statistical methods used in analyzing research data.	Colleges Clinical Medicine Clerkships Senior Rotations		ED-17A	Practice-based Learning Medical Knowledge Patient Care
4.11	Retrieve information by: a. Performing database searches using logical (Boolean) operators, in a manner that reflects understanding of medical language, terminology and the relationships among medical terms and concepts. b. Refine search strategies to improve relevance and completeness of retrieved items.	Colleges Clinical Medicine	Small group exercises	ED-7	Practice-based Learning Systems-based Practice
4.12	Use a standard bibliographic application to download citations from a search and organize them into a personal database.	Colleges Clinical Medicine	Small group exercises	ED-7	Practice-based Learning
4.13	Identify and acquire full-text electronic documents available from the World Wide Web or a local "virtual" library.	Colleges Clinical Medicine	Small group exercises	ED-7	Practice-based Learning

4.14	Filter, evaluate, and reconcile information, demonstrating the following: a. Knowledge of the factors that influence the accuracy and validity of information in general. b. Ability to discriminate between types of information sources in terms of their currency, format (for example a review vs. an original article), authority, relevance, and availability. c. Ability to weigh conflicting information from several sources and reconcile the differences. d. Ability to critically review a published research report. e. Knowledge of copyright and intellectual property issues, especially with regard to materials that are retrieved electronically.	Colleges Clinical Medicine Clerkships Senior Rotations	Resident and faculty observation; Case presentations; Chart review	ED-6, ED-7, ED-28	Medical Knowledge Patient Care Practice-based Learning Systems-based Practice
4.15	Use multiple information sources for problem solving.	Colleges Clinical Medicine Clerkships Senior Rotations	Resident and faculty observation; Case presentations; Chart review	ED-6, ED-7, ED-28	Medical Knowledge Patient Care Practice-based Learning
4.16	Maintain a healthy skepticism about the quality and validity of all information. (This includes recognition that technology which provides new capabilities also has potential to introduce new sources of error.)	Colleges Clinical Medicine Clerkships Senior Rotations	Resident and faculty observation; Case presentations; Chart review	ED-7, ED-28	Medical Knowledge Patient Care Practice-based Learning
4.17	Make decisions based on evidence, when such is available, rather than opinion.	Colleges Clinical Medicine Clerkships Senior Rotations SMIG* LCD*	Resident and faculty observation; Case presentations; Chart review	ED-7, ED-28	Medical Knowledge Patient Care Practice-based Learning
4.18	Maintain awareness of the many ways information becomes lost or corrupted and the need to take appropriate preventative action (for example, routinely employing backup procedures for personal and institutional data).	Colleges Clinical Medicine Clerkships Senior Rotations	Resident and faculty observation; Case presentations;	ED-7, ED-28	Practice-based Learning Systems-based Practice
4.19	Protect confidentiality of private information obtained from patients, colleagues, and others.	Colleges Clinical Medicine Clerkships Senior Rotations	Resident and faculty observation; Case presentations; Chart review	ED-23	Practice-based Learning Systems-based Practice

#	Learning Objectives	Courses	Evaluation Methods	LCME Standards	ACGME Competencies
5.0	**Before graduation, the student must demonstrate to the satisfaction of the faculty, the following:**			ED-6	
	A. Interactions with Professionals				
5.1	Students' interactions reflect a spirit of cooperation and respect in working with members of the health care team including patients and community	Colleges Clerkships Senior Rotations SMIG* LCD*	Resident and faculty observation; OSCEs in MS1 and MS2	ED-19	Practice-based Learning, Professionalism, Systems-based Practice

5.2	An understanding of, and respect for, the roles of other health care professionals, and of the need to collaborate with others in caring for individual patients and in promoting the health of defined populations	Clerkships Senior Rotations SMIG* LCD*	Resident and faculty observation	ED-7, ED-10	Patient Care, Interpersonal and Communication Skills, Systems-based Practice
5.3	Knowledge of various approaches to the organization, financing, and delivery of health care	Clerkships Senior Rotations	Resident and faculty observation	Not in LCME Standards	Systems-based Practice
	B. Responsibility to Patients and Society				
5.4	Student should exhibit tolerance towards the values and beliefs of others serving and served by the health care system, should facilitate the clarification and negotiation of differences in values and beliefs in others, and should avoid the use of physician authority to advance personal values and beliefs of a nonclinical nature	Human Behavior Colleges Clinical Medicine Clerkships Senior Rotations	MCQ's, Resident and faculty observation; Essays; OSCE	ED-21, ED-22, ED-23	Patient Care, Professionalism
5.5	Compassionate treatment of patients, and respect for their privacy and dignity	Human Behavior Colleges Clinical Medicine Clerkships Senior Rotations	Resident and faculty observation; OSCEs in MS1 and MS2	ED-21, ED-22, ED-23	Patient Care, Interpersonal and Communication Skills, Professionalism
5.6	Honesty and integrity in all interactions with patients' families, colleagues, and others with whom physicians must interact in their professional lives.	Colleges Clinical Medicine Clerkships Senior Rotations	Resident and faculty observation	ED-23	Patient Care, Interpersonal and Communication Skills, Professionalism
5.7	A commitment to advocate the interests of one's patients over one's own selfish interests	Colleges Clinical Medicine Clerkships Senior Rotations	Resident and faculty observation	ED-22, ED-23	Patient Care, Interpersonal and Communication Skills, Professionalism
5.8	An understanding of the threats to medical professionalism posed by the conflicts of interest inherent in various financial and organizational arrangements for the practice of medicine	Colleges Clerkships Senior Rotations	Resident and faculty observation	Not in LCME Standards	Patient Care, Professionalism, Systems-based Practice
5.9	A commitment to provide care to patients who are unable to pay and to advocate for access to health care for members of traditionally underserved populations	Colleges Clerkships Senior Rotations	Resident and faculty observation	ED-10	Patient Care, Professionalism, Systems-based Practice
5.10	Students demonstrate personal qualities of reliability, dependability, open-mindedness, and curiosity	Human Behavior Colleges Clerkships Seniors Rotations	Observation, Record Review	ED-23	Patient Care, Professionalism
5.11	Students should understand and pursue a balance between their professional and personal life	Student Affairs Office	Mental Health Clinic Graduation Questionnaire	ED-23	Patient Care, Professionalism
5.12	Students must respect patient (and physician) confidentiality, demonstrating knowledge of the legal, ethical, and medical issues surrounding patient documentation, including confidentiality and data security and ability to use security-directed features of an information system.	Colleges Clinical Medicine Clerkships Senior Rotations	Resident and faculty observation; Case presentations; Chart review	ED-23	Professionalism Systems-based Practice

	C. Life-long Learning				
5.13	Performance that steadily improves as a result of self-reflection, critical self-appraisal and openness to feedback	Clerkships Senior Rotations SMIG* LCD*	Observation, Record Review	ED-5	Practice-based Learning, Professionalism
5.14	The capacity to recognize and accept limitations in one's knowledge and clinical skills, and a commitment to continuously improve one's knowledge and ability	Clerkships Senior Rotations SMIG* LCD*	Observation, Record Review	ED-5	Practice-based Learning, Professionalism
5.15	Ability to engage in lifelong learning in order to maintain sufficient familiarity with scientific advances to ensure they are integrated appropriately with patient care	Pathology Clinical Medicine Clerkships Senior Rotations SMIG* LCD*	Small Group (cases & clerkships)	ED-5	Practice-based Learning
5.16	Have opportunities to participate in service-learning	Colleges Electives		IS-14-A	Patient Care

SMIG* (Science of Medicine Interest Group)
LCD* (Learning Community Days)

Appendix C: Graduate School Division of Basic Science Learning Outcomes and Assessment Methods. Table demonstrates where QEP activities enhance learning outcomes.

Student Learning Outcomes: Program graduates will	Means to Achieve Outcomes	Methods of Student Assessment
1. Demonstrate an extensive and intensive knowledge of subject matter defined by the graduate program.	Coursework Qualifying Examination	Exams Problem Sets Written Papers and Proposals Oral Presentations
2. Understand and critically evaluate current research in subject matter defined by the graduate program.	Coursework Program Works-in-Progress Journal Club Qualifying Examination Dissertation Research SMIG* LCD*	Exams Problem Sets Written Papers and Proposals Presentations Annual Performance Reviews
3. Demonstrate proficiency of knowledge in laboratory techniques necessary to contribute to knowledge in subject matter defined by the graduate program.	Coursework Program Works-in-Progress Journal Club Qualifying Examination Dissertation Research	Exams Problem Sets Written Papers and Proposals Oral Presentations Annual Performance Reviews
4. Effectively communicate their research in writing and oral presentation.	Program Works-in-Progress Dissertation Research SMIG* LCD*	Presentations Dissertation Annual Performance Reviews Scientific manuscripts
5. Develop an ability to identify new research opportunities, plan effective strategies to explore these, and conduct research that contributes in a meaningful way to current knowledge in subject matter defined by the graduate program.	Qualifying Examination Dissertation Research SMIG* LCD*	Written Proposal Presentations Annual Performance Reviews Dissertation Scientific manuscripts
6. Recognize their ethical and professional responsibilities to ensure the integrity of the research process.	Coursework SMIG* LCD*	Case Study Discussions Written Reflections

* SMIG = Science of Medicine Interest Group, LCD = Learning Community Days

CONVERGENCE Knowledge and Attitude Probe
Attitude Section*
*Customized from the Professional Identity Scale (Adams, K., et al, 2006) and
Readiness for Interprofessional Learning Scale (RIPLS) (Reid, R., et al, 2006)

** Items in parentheses will be used for graduate school version

Indicate the extent of your agreement or disagreement with each of the following statements. Strongly agree (5),
Agree (4), Neutral (3), Disagree (2), Strongly Disagree (1)

1. Professional Identity Scale
   (1) I feel like I am a member of this profession... 5 4 3 2 1
   (2) I feel I have strong ties with members of this profession.. 5 4 3 2 1
   (3) I am often ashamed to admit that I am studying for this profession. 5 4 3 2 1
   (4) I find myself making excuses for belonging to this profession................................. 5 4 3 2 1
   (5) I try to hide that I am studying to be part of this profession.......... . ... 5 4 3 2 1
   (6) I am pleased to belong to this profession...................................... . ... 5 4 3 2 1
   (7) I can identify positively with members of this profession......... . ... 5 4 3 2 1
   (8) Being a member of this profession is important to me................ . ... 5 4 3 2 1
   (9) I feel I share characteristics with other members of the profession.... . ... 5 4 3 2 1

Team-work and collaboration

2. Learning with other *students (students and trainees in other programs)* will
   help me become a more effective member of a *health care team (biomedical research team)…* 5 4 3 2 1
3. Shared learning with other *health care students (trainees)* will increase my ability to
   understand *clinical (research)* problems…………………………………………………….... 5 4 3 2 1
4. Communication skills are enhanced with other *health care students (trainees)…………………..* 5 4 3 2 1
5. For small group learning to work, *students (trainees)* need to trust and respect each other……. 5 4 3 2 1
6. Team-working skills are essential for all *health care students (trainees)* to learn……………….. 5 4 3 2 1
7. Interprofessional learning will help me to better understand my own limitations……………….. 5 4 3 2 1
8. Relationships across professions should be included in educational programs……………….. 5 4 3 2 1

Interprofessional identity

9. I don't want to waste my time learning with other *health care students (trainees)* ……………… 5 4 3 2 1
10. Problem-solving skills are best learned with *students (trainees)* from my own program……. 5 4 3 2 1
11. Interprofessional learning with other *health care students (trainees)* will help me to
    communicate better with *patients (non-experts)* and other professionals ……………….……… 5 4 3 2 1
12. I would welcome the opportunity to work on projects with other *health care students
    (trainees)in other disciplines*…………………………………………………………………….. 5 4 3 2 1
13. Shared learning will help to clarify the nature of patient problems ……….……………………. 5 4 3 2 1

Roles and responsibilities

14. I'm not sure what my role will be in an interprofessional *healthcare(research)* team ….………. 5 4 3 2 1
15. I have to acquire much more knowledge and skills than other fields of study …..……………… 5 4 3 2 1

Appendix E

<p style="text-align:center">Convergence Knowledge and Attitude Probe
Attitude Section for Graduate Students and Trainees (proposed 11/21/08)</p>

Indicate the extent of your agreement or disagreement with each of the following statements. Strongly agree (5), Agree (4), Neutral (3), Disagree (2), Strongly Disagree (1)

1. I feel prepared to be an effective member of an interprofessional biomedical research group………………………………………………………………....… 5 4   3   2   1

2. I have confidence in my formal communication skills with trainees and professionals, both peers and those from other disciplines.………………… …… ………………… 5 4   3   2   1

3. I can communicate with my professional interests to both non-experts and peer professionals. ……………………………………..………………………………… 5 4   3   2   1

4. I would welcome the opportunity to work on projects with trainees and professionals from other disciplines……………………………………………………..……… 5 4   3   2   1

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**CONVERGENCE Knowledge and Attitude Probe
Knowledge Section**

For the following four items, please indicate your level of familiarity with the subject.

1. Tumor vasculature
    A. Never heard of it.
    B. Heard of it, but don't know what it is.
    C. I have some idea of what it is, but not too clear.
    D. I have a clear idea of what it is, and can explain its significance in tumor biology.

2. Soft-agar colony forming assay
    A. Never heard of it.
    B. Heard of it, but don't know what it is.
    C. I have some idea of what it is, but not too clear.
    D. I have a clear idea of what it is, and can explain use in defining transformation.

3. Oncogene
    A. Never heard of it.
    B. Heard of it, but don't know what it is.
    C. I have some idea of what it is, but not too clear.
    D. I have a clear idea of what it is, and can explain its role in cancer.

4. Food And Drug Administration (FDA) Clinical Trials
    A. Never heard of them.
    B. Heard of them, but don't know what they are.
    C. I have some idea of what they are, but not too clear.
    D. I have a clear idea of what they are, and can explain their importance in cancer
        treatment.

For the following multiple-choice items, please select the most correct response.

5. Carcinomas originate in
    A. connective tissue cells   D. blood cells
    B. <u>epithelial tissue cells</u>   E. muscle, bone or cartilage cells
    C. lymphatic system cells

6. Which of the following is NOT a hallmark of cancer:
    A. evading apoptosis   D. invasion and metastases
    B. limitless replicative potential   E. <u>metaplasia</u>
    C. sustained angiogenesis

7. A possible origin for a sarcoma is
    A. <u>skeletal muscle cells</u>   D. intercalated duct cells
    B. neuronal cells   E. blood cells
    C. adrenocortical cells

8. Angiogenesis is
    A. a type of malignant brain tumor   D. a target for cancer therapy
    B. the formation of new blood vessels   E. <u>more than one of the above</u>
    C. critical to tumor development

9. Which of the following about cancer stems cells is most correct?
    A. current cancer therapies are effective in these cells
    B. these are generally more differentiated cells
    C. they occur in preneoplastic disease
    D. they are capable of long term renewal of the tumor
    E. they become depleted with each cell division

10. Which phase of clinical trial includes dose escalation as part of the design of the trial?
    A. Phase I   C. Phase III
    B. Phase II   D. Phase IV

11. The physical principles of magnetic resonance imaging (MRI) rely on proton signals from:
    A. glycolipids in the cell membrane
    B. DNA in nuclei
    C. water across different organ systems
    D. protein across different organ systems

12. Of the various human gene families, the most frequent cancer-related mutations are found in the:
    A. G protein family   C. transcription factor family
    B. kinase family   D. ion channel family

13. The best current estimate of the risk that a woman in the U.S.A. will develop cancer in her lifetime is:
    A. one in a thousand   D. one in ten
    B. one in a hundred   E. one in three
    C. one in thirty

14. Among these forms of cancer, which is the most common in the U.S.A.?
    A. Sarcoma - all groups included
    B. Retinoblastoma (eye tumor) in children
    C. Lung in never-smokers
    D. Glioma (brain tumor) in adults
    E. Pancreatic - all groups included

15. The greatest single risk factor for the development of adult-onset cancer in the U.S.A. is
    A. genetic predisposition
    B. lifestyle (e.g. foods you eat, smoking, etc.)
    C. increased age
    D. viral infections
    E. telomerase

16. Which one of the following confers the highest risk of developing breast cancer in women?
    A. personal history of "cured" (10 year disease-free survival) breast cancer
    B. breast and ovarian cancer in three relatives
    C. estrogen replacement therapy
    D. early onset of menarche in a Caucasian woman
    E. obesity and exposure to a high fat diet

17. Which group of 60-year old males who have lived their entire lives in the U.S.A. are at the highest risk of developing prostate cancer before they reach age 70?
    A. African American   C. Irish descent
    B. Pacific island descent   D. Southeast Asian descent

18. Which of the following cancers is most common in teenage males and females?
   A. brain and kidney tumors
   B. leukemia
   C. multiple myeloma
   D. lymphoma and sarcomas

19. Identification of drug targets is typically a goal of research in:
   A. basic science
   B. translational science
   C. clinical medicine
   D. none of the above

20. Basic science research into disease impacts clinical practice by:
   A. challenging our current theoretical models of patient care
   B. improving outcomes in all patient-populations
   C. using evidence-based medicine for clinical interventions
   D. changing our current interventions which are no longer valid

21. Cancer cells usually become capable of dividing indefinitely because:
   A. they exist in nutrient-rich tumor environments
   B. they bypass senescence
   C. patients under chemotherapy are often given replication-promoting erythropoietin
   D. they readily detach from extracellular matrices

22. Almost all forms of cancer:
   A. frequently regress from invasive to pre- invasive stages
   B. proceed from pre-invasive to invasive stages upon differentiation of stem cells in the tumor
   C. progress rapidly from a pre-invasive to invasive stage.
   D. none of the above

23. Fluoro-deoxyglucose positron emission tomography (FDG-PET) is widely-used in cancer diagnosis and management because:
   A. the 'Warburg effect' is a fundamental property of tumor cells
   B. the fluoro-deoxyglucose is incorporated into energy-storing glycogen polymers, which are particularly abundant in cancer cells
   C. most chemotherapy regimens include treatment with fluoro-deoxyglucose
   D. all of the above

24. Targeted therapies refer to drug design:
   A. which aims to treat all forms of a targeted tumor class, e.g. brain or liver, specifically after occurrence of distal metastasis
   B. directed against tumors with specific underlying gene mutations
   C. which is targeted to the late stages of cancer
   D. none of the above

25. Distal metastasis:
   A. causes discomfort, but is rarely a threat to patient's long-term viability
   B. is not thought to be a target for anti-angiogenesis therapy
   C. is the leading cause of cancer-related death
   D. does not correlate with tumor invasiveness

26. Cancer 'cure' rates, defined as disease free survival longer than 10 years:
   A. are lower among children compared with adults
   B. are higher among children compared with adults
   C. are similar among children compared with adults
   D. do not correlate with the age of the patient

27. Neuroblastoma, a tumor of childhood:
   A. has a highly predictable clinical course
   B. has a tendency to regress from a malignant to a benign phenotype

C. rarely regresses from a malignant to a benign phenotype
D. is highly metastatic to the lung

The following three Items are formatted similarly. Please respond regarding your confidence with research papers dealing with clinical, translational, and basic cancer biology, as you personally define these three different areas.

28. For *clinical* research papers regarding cancer:
    A. I feel naïve and not yet able to understand and/or discuss such literature
    B. I have some exposure to this sort of literature and feel that I could understand a discussion between other knowledgeable people.
    C. I have enough exposure and experience to *evaluate* and participate in an intelligent discussion of a paper from this field.
    D. I have enough exposure to the field and experience to *lead a discussion* of a paper from this field.

29. For *translational* research papers related to cancer:
    A. I feel naïve and not yet able to understand and/or discuss such literature
    B. I have some exposure to this sort of literature and feel that I could understand a discussion between other knowledgeable people.
    C. I have enough exposure and experience to *evaluate* and participate in an intelligent discussion of a paper from this field.
    D. I have enough exposure to the field and experience to *lead a discussion* of a paper from this field.

30. For *basic science* research papers in the area of cancer:
    A. I feel naïve and not yet able to understand and/or discuss such literature
    B. I have some exposure to this sort of literature and feel that I could understand a discussion between other knowledgeable people.
    C. I have enough exposure and experience to *evaluate* and participate in an intelligent discussion of a paper from this field.
    D. I have enough exposure to the field and experience to *lead a discussion* of a paper from this field.

The following three items ask for your perceptions about a possible career in cancer biology.

31. My feelings about cancer as a career focus:
    A. Never considered it for myself, and never will
    B. Was (or am) considering it, but not a high priority now
    C. Seriously considering it
    D. Definitely want to pursue it

32. Regardless of your answer above, if you were to pursue cancer as a career focus, do you feel equipped to make intelligent decisions about which research questions would be most important to solve?
    A. I do not feel equipped.
    B. I feel somewhat equipped.
    C. I feel well equipped.
    D. I feel like an expert – I could contribute ideas for a grant proposal.

33. How do you feel about your ability to translate basic research findings into clinical practice?
    A. I do not feel equipped
    B. I feel somewhat equipped.
    C. I feel well equipped.
    D. I feel like an expert – I could contribute ideas for a grant proposal.

Appendix G

CONVERGENCE Activity: _____   **Date:** _____

School: ___ Medical School   ___ Graduate School   ___ School of Health Professions
Learning Community: ___ College   ___ SMIG   ___ IDEAL   ___ LCD
I am a: ___ Student   ___ Postdoc   ___ Trainee   ___ Faculty member

Please circle the appropriate score below:

SCORE	DESCRIPTION
5	Demonstrates **excellence** in understanding and conveying ideas in diverse contexts to an interprofessional audience, especially through reading, writing, speaking, and listening. **Consistently** demonstrates the ability to use resources, technology, and skills appropriate to the aural, visual, and/or language arts.
4	Demonstrates **proficiency** in understanding and conveying ideas in diverse contexts to an interprofessional audience, especially through reading, writing, speaking, and listening. **Usually** demonstrates the ability to use resources technology, and skills appropriate to the aural, visual, and/or language arts.
3	Demonstrates **adequacy** in understanding and conveying ideas in diverse contexts to an interprofessional audience, especially through reading, writing, speaking, and listening. **Frequently** demonstrates the ability to use resources, technology, and skills appropriate to the aural, visual, and/or language arts.
2	Demonstrates **limitations** in understanding and conveying ideas in diverse contexts to an interprofessional audience, especially through reading, writing, speaking, and listening. **Occasionally** demonstrates the ability to use resources, technology, and skills appropriate to the aural, visual, and/or language arts.
1	Demonstrates **deficiency** in understanding and conveying ideas in diverse contexts to an interprofessional audience, especially through reading, writing, speaking, and listening. **Rarely** demonstrates the ability to use resources, technology, and skills appropriate to the aural, visual, and/or language arts.

Comments:

_____
_____
_____
_____
_____

*Based on Effective Communication Rubric. General Education Core Assessment Rubric Templates. College of Health Sciences, University of Cincinnati, 2004 http://www.uc.edu/gened/assessment.html

CONVERGENCE
ACTIVITY SPECIFIC EFFECTIVE INTERPROFESSIONAL COMMUNICATION RUBRIC*

CONVERGENCE Activity: _____ **Date:** _____

School: ___ Medical School ___ Graduate School ___ School of Health Professions
Learning Community: ___ College ___ SMIG ___ IDEAL ___ LCD
I am a: ___ Student ___ Postdoc ___ Trainee ___ Faculty member

Students need to demonstrate effective communication skills (writing, reading, speaking, and listening) and the ability to use various communication tools. They must also be able to assess the receiver of the communication in terms of health profession, literacy, cultural diversity, receptivity, and comprehension. Competency should be demonstrated by the following:

5 (Excellent) = consistently demonstrates the listed skills
4 (Proficient) = usually demonstrates the listed skills
3 (Adequate) = frequently demonstrates the listed skills
2 (Limited) = occasionally demonstrates the listed skills
1 (Deficient) = rarely demonstrates the listed skills

Check the appropriate skills and score each according to the above competency scale: **SCORE**

___ *Written skills* (documentation, lay and technical writing, educational materials)   _____
 - Informs, persuades, and motivates.
 - Utilizes correct grammar, spelling, punctuation, and writing style appropriate for audience and situation.
 - Clearly conveys information to the intended audience. Information is well organized and content is appropriate.
 - Competently and appropriately utilizes technology to communicate in writing (word processing software, e-mail)
 - Understands when, where, and how to document information to comply with policy or legal requirements.

___ *Oral communication skills* (teaching, group presentations, counseling, one-on-one communication)   _____
 - Clearly conveys information to the intended audience. Information is well organized and content is appropriate.
 - In one-on-one or group situations, informs, persuades, motivates, counsels, and negotiates.
 - In one-on-one or group situations, elicits information.
 - Utilizes correct grammar, intonation, projection.
 - Demonstrates ability to competently and appropriately utilize supportive audiovisuals and/or technology (presentation software, equipment) to enhance oral communication.

___ *Listening skills* (counseling, obtaining information, group activities, collaboration)   _____
 - Listens to individual speaking and hears what is communicated.
 - As appropriate provides feedback to speaker to verify what was heard.
 - Interprets non-verbal cues.

___ *Reading skills* (research, general information, technical information, medical records)   _____
 - Has good grasp of vocabulary commonly utilized in field of food and nutrition.
 - Comprehends and appropriately interprets published information from a variety of sources ranging from consumer to professional publications and on a variety of topics from general information to primary research.

___ *Interprofessional communication skills*   _____
 - Demonstrates consideration of interprofessional members through active learning and listening

___ *Interpersonal communication skills*   _____
 - Demonstrates sensitivity in when, where, and how to communicate to a variety of people in a way that promotes collaboration and places them at ease.

Comments:-

_____
_____
_____

*Based on Effective Communication Rubric. General Education Core Assessment Rubric Templates. College of Health Sciences, University of Cincinnati, 2004 http://www.uc.edu/ge

Appendix I

CONVERGENCE Activity: _____ Date: _____

School:	___ Medical School ___ Graduate School ___ School of Health Professions
Learning Community:	___ College ___ SMIG ___ IDEAL ___ LCD
I am a:	___ Student ___ Postdoc ___ Trainee ___ Faculty member

Circle the level of skill demonstrated for each category and enter score at right.

	PROFESSIONAL=4	ADEQUATE = 3	NEEDS WORK = 2	DEFICIENT = 1	SCORE
Content	Full grasp (more than needed) of material in initial presentations and in answering questions later.	Solid presentations of material and answers all questions adequately but without elaboration.	Less than a full grasp of the information revealed rudimentary presentation and answers to questions.	No grasp of information, some misinformation, and unable to answer questions accurately.	
Organization	Information is presented in a logical interesting sequence that is easy for the interprofessional audience to follow.	Information is presented in a logical sequence that is easy for the interprofessional audience to follow but a bit dull.	Presentation jumps around a lot and is not easy for the interprofessional audience to follow although it is possible.	Interprofessional audience cannot follow presentation because it follows no logical sequence.	
Graphics	Graphics explain and reinforce the rest of the presentation.	Graphics relate to the rest of the presentation.	Graphics are too few or not sufficiently related to the rest of the presentation.	Graphics are either not used or are superfluous.	
English	No misspelled words or grammatical errors.	No more than two misspelled words or grammatical errors.	Three misspelled words or grammatical errors.	Four or more misspelled words or grammatical errors.	
Elocution	Speaks clearly, correctly, and precisely, loud enough for audience to hear and slowly enough for easy understanding	Speaks clearly, pronounces most words correctly, loud enough to be easily heard, and slow enough to be easily understood.	Speaks unclearly, mispronounces many major terms, and speaks too softly or rapidly to be easily understood.	Mumbles, mispronounces most important terms, and speaks too softly or rapidly to be understood at all.	
Eye Contact	Eye contact constant, minimal or no reading of notes.	Eye contact maintained except when consulting notes, which is too often.	Some eye contact, but mostly reading from notes.	No eye contact; reads from notes exclusively.	

*Based on Presentation Rubric. Stevens DD and Levi AJ. 2005. Introduction to Rubrics: An Assessment Tool to Save Grading Time, Convey Effective Feedback and Promote Student Learning. Stylus Publishing. LLC. Sterling, VA. p. 90.

Appendix J

LEARNING COMMUNITY DAY TOPIC: _____ **Date:** _____

Please tell us whether you agree or disagree with the following statements about each speaker for the event and provide your comments:

1= Strongly Disagree   2= Disagree   3= Undecided   4= Agree   5 = Strongly Agree

---

Title: _____

Presenter: _____

Presentation was very effective   1 2 3 4 5
Presentation was relevant to me   1 2 3 4 5
Presentation was excellent   1 2 3 4 5

Title: _____

Presenter: _____

Presentation was very effective   1 2 3 4 5
Presentation was relevant to me   1 2 3 4 5
Presentation was excellent   1 2 3 4 5

Title: _____

Presenter: _____

Presentation was very effective   1 2 3 4 5
Presentation was relevant to me   1 2 3 4 5
Presentation was excellent   1 2 3 4 5

Please give additional comments on the following aspects of the CONVERGENCE Learning Community Day format:

Length of the program: _____

Time of day: _____

Number of speakers: _____

* Based on community survey from the UT Southwestern Office of Public Education.