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Editors:

Ann Maderer

Scott Epstein, MD

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New Year, New Curriculum

After years of planning and intensive work by TUSM community members, the implementation of the Educational Strategic Plan (ESP), a major restructuring of the four-year curriculum at TUSM, will take place this August with the Class of 2013. The final recommendations of the ESP Steering Committee have been presented and approved by the Dean's Executive Council and the Faculty Senate and will be presented to the TUSM Curriculum Committee for final comment and approval at the March 2009 meeting. The Steering Committee report is a compilation of the work of numerous working groups and more than a hundred faculty and students. The overarching goal is to create a translational educational program, one in which basic science and clinical medicine are effectively integrated across the four-year curriculum. A few ESP highlights:

- The first integrated curricular unit, Scientific Foundations of Medical Science I, begins with students meeting and learning the clinical background of patients with six diseases (coronary artery disease, diabetes mellitus, breast cancer, cystic fibrosis, HIV, and systemic lupus). Much of the teaching in the integrated unit will then use this foundation to reinforce the clinical relevance of basic science principles.
- Students will experience enhanced curricula in ethics and professionalism and in evidence-based medicine.
- There will be improved integration of basic sciences during the core clerkships and during the fourth year. In the latter case, many students will take an advanced rotation in translational science.

Some aspects of the revised curriculum have already been implemented including: a robust system of faculty advisors for all first-year students, based in four new Learning Communities located on Sackler 2 and 3; a fully integrated Microbiology and Infectious Diseases Course; and, the development (and dissemination) of *21 Roles and Responsibilities for Third-year Clerks*.

The ESP process is intended to be an iterative one; extensive and ongoing assessment of the new curriculum will continue after implementation. We anticipate that further modifications will be required over time. Indeed, the *(continued on page six)*

Faculty Focus: Rob Willson, PhD

Course Director, TUSM Clinical Anatomy

Some medical schools have abandoned cadaveric anatomy and substituted a computer based course. Why has TUSM opted to continue with a traditional cadaveric human anatomy course?

Anatomy is the oldest and arguably the most fundamental of the Medical sciences. A sound knowledge of human anatomy is essential to prepare students for their training in physical diagnosis and other clinical disciplines.

I understand that the teaching of Anatomy in the new millennium has changed at some medical schools, and that the trend has been to downsize the subject, often in the face of a more streamlined curriculum or to the lack of availability of qualified instructors or cadavers. However, I believe that given adequate resources, the more traditional approach, involving cadaveric dissection and inspection, is superior to these new methods of teaching. First, although computer models provide a general overview of anatomical structure, they are actually not very realistic. For example, they do not show the substantial amount of fat and connective tissue which every body contains and which surgeons and other clinicians must deal with. There is also substantial anatomical variation in nerves, blood vessels and internal organs, and these can only be fully appreciated by examining as many cadavers as possible. Second, three-dimensional human specimens provide students with the opportunity to study some of the basic pathology that they will encounter later in the curriculum. For example, in the lab, we always see striking examples of such things as ruptured aortic aneurysms, metastatic cancer, and cardiovascular disease and their affects on the body. Third, the process of dissection helps to develop observational and motor skills that are essential in clinical medicine, especially when students take their surgical rotation. Instructors can also demonstrate basic surgical procedures that must eventually be learned during students' third and fourth years of their medical education and beyond. Fourth, we encourage the principles of professionalism, teamwork, communication and small-group active learning among our students and these outcomes cannot be effectively accomplished if students work alone at a computer terminal. We emphasize that these cadavers are the students' first patients, who demand respect and decency at all times and that the cadavers are the students' best teachers.



**Dr. Willson
in Alaska**

How will Anatomy change with the new curriculum (Educational Strategic Plan) at TUSM? The ESP emphasizes translational education - how does the anatomy course promote the integration of science and clinical medicine?

One of the most significant changes in our Anatomy course is that we will begin in early November, rather than in January. The study of the Limbs, Thorax, Abdomen and Pelvis will be part of the MedFoundations II unit which also includes Physiology, General Pathology and Pharmacology. The Head and Neck portion of Anatomy will be part of the "Brain" component of the From Health to Disease unit that will include, among other courses, Neuroscience. As we have done in the current curriculum, we will emphasize the integrative aspects of Anatomy by discussing case studies during lectures and labs. There will also be integrated exam questions that will test not only the students' basic knowledge of Anatomy, but also how it relates to these other areas of basic science. We have also added laboratory sessions on the Back and Brain that, for the first time in many years, will allow students to dissect these important parts of the body. We are always looking for clinicians to help in our course, so if anyone is interested, let me know!

What was your most memorable moment in the Anatomy Lab?

It is difficult to select my most memorable moment in the lab, but it perhaps was the first time I picked up a scalpel and began to dissect a body. Reading
(continued on page three)

(continued from page two) Netter's Atlas of Anatomy really didn't prepare me for what was to come, but I survived! It was difficult to appreciate how much fat typical bodies have beneath the skin, particularly in the abdomen. It made me aware of the perils of junk food and other bad habits most humans have.

What path led you to become the Course Director for the Human Anatomy Course?

When I was an undergrad at Harvard, they and MIT had just started a combined MD/PhD program in Biomedical Engineering. As someone who was interested in science, this seemed like an interesting career path and I thought about applying. But first, I went to the Harvard Coop and bought a few medical textbooks, including a copy of the 1890's edition of Gray's Anatomy. After about ten minutes, I realized I could never learn this anatomical stuff and so abandoned my career in Medicine. Instead I majored in Astronomy and eventually got a PhD in Physics at Tufts. After receiving my degree I stayed on as a Research Professor in the Physics and Astronomy Department, but in 1993 came to the Medical School to run an imaging lab in the Department of Anatomy and Cellular Biology. I also developed a few web pages, including one on Cross-Sectional Anatomy, that we now use in our Anatomy course. Then, one day, my curiosity got the better of me and I wandered down to the gross lab where I met Dr. Walid El-Bermani. He got me hooked on Anatomy, and the rest, as they say, is history. The summer before I began teaching, he put me through the equivalent of Anatomy boot camp and taught me how to dissect and think critically about the human body. He was very tough, but I am very grateful for his mentoring – practically everything I learned, and still learn, about Anatomy I owe to Walid. After teaching Anatomy for about six years, I became Course Director of Dental Gross Anatomy, then two years later, of Medical Clinical Anatomy. I really enjoy my job, and as I tell my students, a day without Anatomy is like a day without sunshine!

Medical Education Literature Updates Project

Want to see what has been recently published in the field of Medical Education?

On January 1, 2009, participating faculty will begin receiving monthly email updates, via the Hirsh Health Sciences Library, on recently published articles in the Medical Education literature. Faculty members can opt to receive citations on one or several topics of interest. A few examples of the many topics available for selection include Clinical Reasoning, Communication Skills, and Mentoring. This opportunity to stay current on new publications within the field of Medical Education is open to all Tufts University faculty.

To receive a full list of topics available, or to sign up to receive the updates, contact librarian Elizabeth Richardson at elizabeth.richardson@tufts.edu or x66774.

Happy New Year!

The OEA took up an internal collection of over one hundred dollars that went toward holiday toys and other gifts for Horizons for Homeless Children - www.horizonsforhomelesschildren.org. Special thanks to Tom Kilduff, OEA Secretary, for coordinating the collection, and to Margaret Ivins, OEA Administrative Coordinator, who as a volunteer at Horizon, facilitated the delivery of items to the children.

TUSK Faculty Development Course Website

We are pleased to announce the launching of our TUSK Faculty Development Course website (Link: <http://tusk.tufts.edu/view/course/Medical/1891>)

On this website you will find videotapes and materials of our faculty development workshops, as well as a compilation of our TUSM Faculty Development Handouts. Please take five minutes to complete the corresponding evaluation form after you review any of these materials. Completed evaluation forms should be sent to Sharon Freeman at sharon.freeman@tufts.edu. Your feedback will help us improve our faculty development efforts and better address your teaching needs.

We hope you find these materials useful and look forward to learning from your feedback.

Student Spotlight:

Veronica Coppersmith

You are working with TUSM faculty on an innovative project that uses CT images of cadavers that are then dissected in the Human Anatomy Course. Please tell us about the project, your role, and how you got involved.

I am working with Drs. Jacobson, Epstein, Polak and Susan Albright on a project that is changing the face of Gross Anatomy at TUSM. Using the Siemens SOMATOM 64-slice scanner, Dr. Stanley Jacobson and I have full body CT scans performed on the cadavers to be dissected in Gross Anatomy. Dr. Joseph Polak, Professor of Radiology, then analyzes each image as though it was a scan of a living person, scrutinizing the entire body for abnormalities such as tumors, muscle atrophy, and hip replacements, to name a few of our findings. Dr. Epstein uses the reported cause of death and the radiological analyses to create a case study for each cadaver.



Veronica Coppersmith

My role is to develop educational and informational movies about each interesting finding from the radiographic images. I create two types of movies: one of the raw images as though the student was reading the CT scan itself, and a movie of a

3D reconstruction (using OsiriX) of the medical findings that the students are to be focusing on. I go through both kinds of movies, highlighting key findings for the students and labeling the anatomy so that these movies can be used as a teaching tool. Case studies, in addition to the movies, turn the cadaver into a virtual patient, allowing medical students to evaluate each case as though it were a live patient, suffering the same diseases as the corresponding cadaver. Each case is relayed to students via TUSK along with questions about the case to ensure their understanding of the material, as well as additional medical information pertinent to the case at hand.

This project offers many benefits to TUSM's Gross Anatomy course, as well as the study of disease manifestation. Even after the cadaver is dissected and gone, we will still have both the CT images and the 3D reconstructions of each body, along with radiological analysis and movies to highlight the key findings associated with each disease. The result is a library of cadaveric full body CT scans, illustrating various disease manifestations.

What are the next steps with the project?

The future of this project involves branching out into multiple directions. Medical Gross Anatomy, which begins this month, will have the project integrated into the curriculum on a much larger scale than it was last year. This year, we have half of the cadavers CT imaged, analyzed, with case histories, educational movies, and relevant outside information about each case. The students will have access to this information via TUSK, and will be expected to investigate all the cases. We hope to continue this project, every year adding more cadavers to our disease manifestation library. To date we have scanned 32 cadavers, and our goal is to complete 100 cadavers, each with different diseases. A library of disease manifestations is useful in medical school as a teaching tool, and later in medical practice. Ideally, this library of cadavers can be used by physicians around the world. The CT scans of these cadavers will give the doctors the ability to investigate the display of disease manifestations in each cadaver, and use it as a means of comparison to
(continued on page five)

(continued from page four) their patients. In addition, OsiriX can be displayed on a hand-held device such as an iPhone or an iPod, expanding the possibilities for availability and communication between doctors.

We understand that you are applying to medical school. Assuming that decision predated your work on the anatomy project, how has your work (e.g. with medical school faculty for the past year and a half) changed your perspective?

When I began applying for medical schools, I had no basis of classifying them other than by hospital affiliation, geographic location, and others' reviews. Now I have a more realistic understanding of the differences between each medical school, most importantly the varying educational systems offered at each school. This is especially the case with Problem Based Learning (PBL), the integration between subjects, and the clinical skills programs, a few innovations that have recently spread through the medical education system. Now, when I investigate potential medical schools, I am critical of how they incorporated these learning models into their curriculum, or if they are still stuck in the traditional education system of lecture-based learning. I also compare each school's learning model to the virtual cadaver project being implemented here. By integrating multiple subjects into each case, and by using Gross Anatomy to introduce medical imaging techniques, we allow students to begin using this technology early on in their medical careers. I have yet to find a school with a program that offers the integration of all of these key learning models, as does the virtual cadaver project beginning at TUSM.

Tell us a little about yourself

I am a Jumbo, graduating from Tufts University this past May with a dual degree in Biology and Biomedical Engineering. In addition to my work at TUSM on the virtual cadaver project, I am a medical population analyst at Harvard Vanguard Medical Associates. My plan is to go to medical school and to specialize in emergency medicine. This interest stemmed from my work on Ossining Volunteer Ambulance Corps, where I have been a member since the age of 16, volunteering as an EMT since the age of 18.

Early on I got addicted to the feeling of saving lives and the adrenaline rush of emergency situations, and that is what led me to pursue a career in medicine. Wearing scrubs to work every day doesn't sound so bad either.



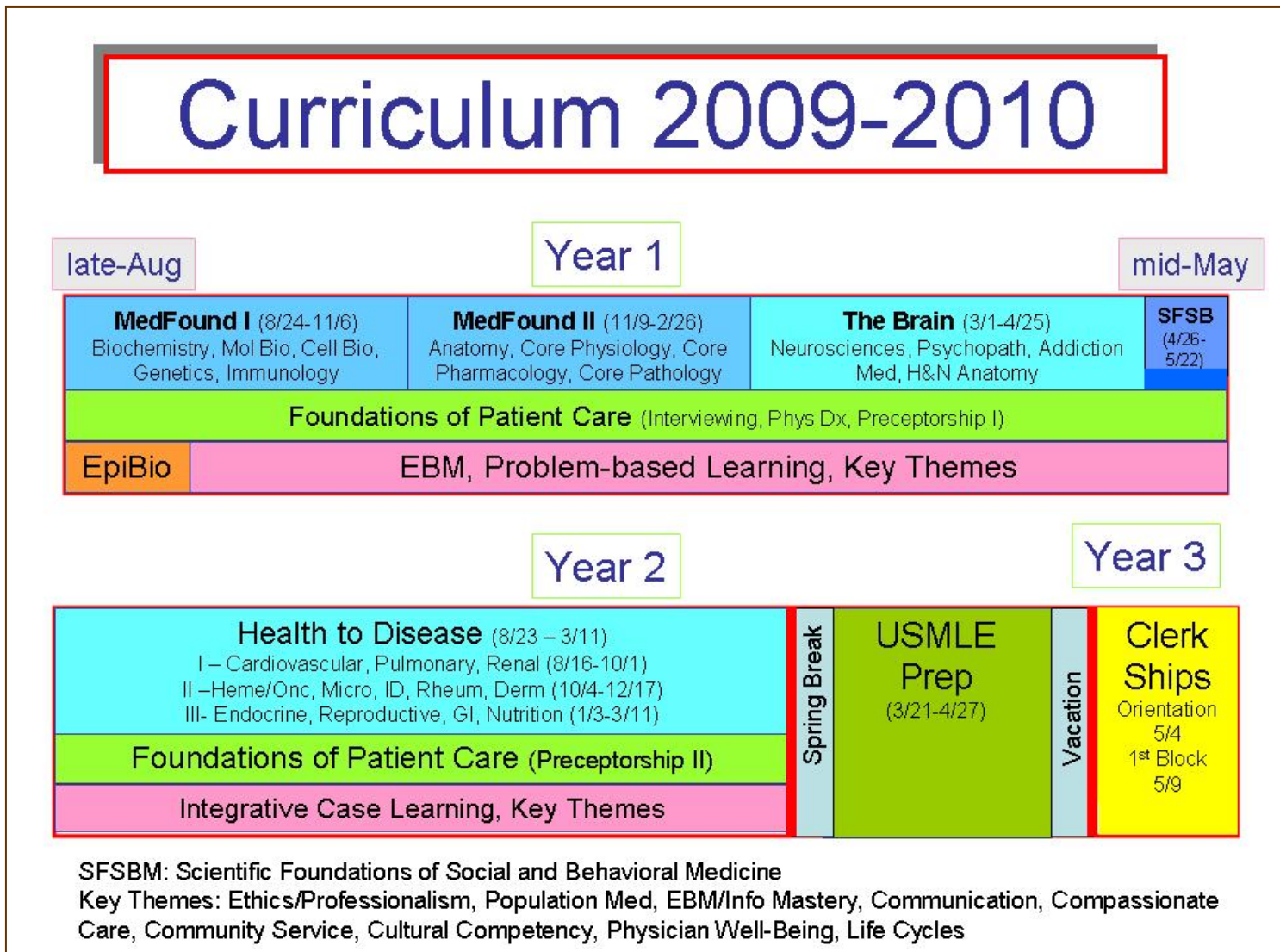
**Virtual Cadaver Project:
Reconstructed CT images shows evidence
(in blue) of a right hip replacement**

Coming Soon ... Teaching and Learning Tips!

Beginning in March, we will offer a new feature: Teaching and Learning Tips of the Month. These tips will be ones that come from you – clinicians, faculty and students – and relate to a variety of educational settings, such as lecture halls, bedside teaching and small-groups. To generate ideas and help document practices that work well, the OEA will administer a brief survey to the TUSM community in the coming months.

ESP – New Curriculum *(continued from page one)*

intent is for the curriculum to be flexible and responsive to the inevitable changes in the scientific foundations of medicine and the nature of medical practice. Monitoring the new curriculum will be the responsibility of the Offices of Educational Affairs and Students Affairs, the ESP Steering Committee and several key working groups and the Curriculum Committee. The latter committee will devote at least one meeting per year to a comprehensive review of the new curriculum. In addition, the Curriculum Committee recently revised its procedures for reviewing individual courses, a process that will inform the overall assessment of the new curriculum. Below is a schematic of the ESP's near-final curriculum for 1st and 2nd year:



NEGEA 2009

The Northeast Group on Educational Affairs (NEGEA) Regional Conference meeting is scheduled to be held May 1 and 2, 2009 in Hershey, Pennsylvania. This year's meeting is hosted by the Penn State College of Medicine. The NEGEA website for submissions for presentation is now open. Abstracts for workshops, short communications and poster presentations can be submitted at: <http://www.hmc.psu.edu/ce/negea/>. The registration portion of the site will be available soon. Please note: all presenters are required to register for the meeting.

Patient Safety and Quality: The 10th Key Theme

The new *TUSM Program in Patient Safety and Quality Education* combines and adapts existing successful programs at TUSM and the teaching hospitals to create an innovative four-year curriculum. The program will emphasize team training that partners students with nurses and allied health care personnel. As residents play a major role in the education of students, the success of the program will be vitally dependent on improved resident education in patient safety and quality.

- 1st Year Population Medicine Course expanded to a new 4-week Course, Scientific Foundations of Social and Behavioral Medicine. The course will teach the principles of quality and patient safety.
- 1st Year Medical Interviewing Course will use standardized patients to enhance communication skills and apology.
- 1st and 2nd Year Primary Care Preceptorships will encourage students to engage in a Quality Improvement (QI) project at their site.
- TUSM initiative to enhance education and communication skills around medical errors and near misses will be expanded to the core clerkships. This program, developed with a Macy Foundation grant, has been implemented during the Medicine Clerkship.
- 4th year 4-week student elective offered by the Baystate Medical Center Division of Healthcare Quality will be expanded to encompass additional clinical teaching sites.
- Comprehensive integration with the robust on-line error reporting systems at Tufts Medical Center, Baystate Medical Center, and Maine Medical Center with a goal of overcoming the barriers that hinder reporting and fostering incident specific discussion between students and faculty with a goal of transforming reporting into a core skill. Based on reporting data, teams of students will work with faculty to develop specific safety and quality improvement projects.
- Incorporation of students into team training: Expansion of current program that pairs 2nd year students with ward nurses; new team training experiences in new Tufts-wide Simulation Curriculum for 3rd/4th year students
- Resident-as-Teachers Faculty Development program administered collaboratively by TUSM Office of Educational Affairs and the individual teaching hospitals will be expanded to include Patient Safety and Quality.
- Expansion of current Tufts residency education programs that teach reporting, disclosure, apology, basic QI, team training, handoffs, AHRQ TeamStepps, and that incorporation of residents into QI teams and committees.
- Extension of the Baystate Medical Center Internal Medicine Residency Education Innovation Project (EIP) to additional residency programs at participating institutions. The EIP is structured to foster inpatient guideline adherence and behavioral health interviewing on apology. It includes a rotation where a resident functions as the quality officer for a teaching team.

Upcoming TUSM Faculty Development Opportunities:

Health Science Mini-Symposium: Information Technology and TUSM Resources for Teaching on Friday, February 6, 2009, 8am-2pm, TUSM.

Constructing Effective and Integrated Exam Questions on Friday, March 20, 2009, 9am-4pm, TUSM.

Please see:

<http://www.tufts.edu/med/about/offices/oea/facultydevelopment/Faculty%20Development%20Calendar.html> or contact Sharon Freeman, sharon.freeman@tufts.edu, 617-636-0891, for more information.