fourth year DMS and Dartmouth/Brown students met on a wintry first day of spring to learn their internship and residency placements for 2002. Contagious joy filled the bustling room as parents, staff, children, spouses, faculty and students awaited the destinies of tomorrow’s doctors.

Of the 47 DMS seniors expected to receive their medical degree this June, 44 joined 14,336 graduating US medical school seniors matching for residency training positions. One has deferred and two were military program participants matched in December.

DMS Dean John C. Baldwin, MD, began the Match Day ceremonies by reminding the assembled students of their orientation four years ago, when he stressed, “Remember the importance of being a scientist for life as well as a physician as you move into this next very defining phase of your careers.” Then he advised them not to let all the learning ahead of them remove the scientific curiosity. Likewise, he expressed the hope that all the learning they had to do in their residency would not defeat the humanism they had shown over the years. Quoting noted Massachusetts General Hospital physician Francis Peabody, Baldwin said that, “One of the essential qualities of the clinician is interest in humanity, for the secret of the care of the patient is caring for the patient.”

With hearty handshakes and warm hugs, Baldwin and Susan Harper, MD, assistant dean for medical education, called the names of Dartmouth’s newest cadre of young physicians. Some reacted with unrestrained enthusiasm, others with breathless joy as their future destinations were revealed. The largest proportion of the class (nine) will go to Massachusetts, followed by New York (seven), and six each to New Hampshire and California. The most popular choices are internal medicine and radiology, each with nine (or 20 percent). Four students each chose pediatrics, emergency medicine, obstetrics and gynecology, surgery or family practice.

Experience Counts

Older patients who need high-risk heart or cancer surgery fare better in hospitals experienced in those procedures, a nationwide DMS study confirms. Elderly patients who had any of 14 high-risk cardiovascular or cancer operations in hospitals highly experienced with their particular procedure were more likely to survive than those who went to less experienced hospitals. The research, published April 11 in The New England Journal of Medicine, was led by Dr. John D. Birkmeyer, associate professor of surgery (below, center).

Going to the most experienced hospitals (with the highest volume of procedures) made the biggest difference for patients undergoing surgery for two cancers: pancreas (4% of such patients at the highest volume hospitals died, compared to 16% at lowest volume) and esophagus (8% at highest volume hospitals vs. 20% at lowest volume). Hospital volume was also important for having heart valve replacement, abdominal aneurysm repair and surgery for lung.

(continued on page 4)
Dean’s Column

Early last month I participated in the Salzburg Seminar in Austria as a Presidential Fellow and speaker on the topic of rights.

The Salzburg Seminar is one of the world’s foremost international educational centers and is committed to the principles of reconciliation and intellectual inquiry in order to promote the free exchange of ideas, experience and understanding in a multi-disciplinary, cross-cultural environment. I spoke about the question of the right to health care in a broad context of human rights, and how this issue has played out in the international community in the last 50 years since the United Nations published its “Universal Declaration of Human Rights” in 1948.

It is clear that this issue is one of great concern to many people, and provoked lively debate with experts from around the globe, mostly developing countries. I believe that while we continue to struggle in this country with our own deeply flawed health care system, we must keep in mind all those throughout the world who are struggling with far fewer resources than we enjoy here in the United States. We are the largest economy and the wealthiest country in the world, though we are alone in not having articulated a right to health care.

The attainable level of care in our country is great, and we must strive to improve the access of Americans to the unparalleled biomedical resources that our taxpayers and scientific community have created.

John C. Baldwin, MD
Dean, Dartmouth Medical School
Vice President for Health Affairs, Dartmouth College

DMS Develops Web-Based Anatomy Instruction

Dartmouth Medical School is developing and testing an innovative new dissection-based learning tool on the web to supplement its first year anatomy courses.

In explaining why the project was necessary, anatomy department chair Martha McDaniel, MD, says, “First-year medical students the world over are daunted by their first course in human anatomy. Elaborate atlases, teaching models, mounds of textbooks both recent and remote, and glitzy web sites all purporting to make human anatomy easily understandable can lure eager students away from productive, efficient studying. What should they really learn to function as effective physicians?”

McDaniel adds, “The DMS anatomy faculty strongly believe that medical students’ first study of human anatomy should equip them to understand the most prevalent injuries, diseases and other malfunctions from which their patients will suffer.” They wondered whether course-specific electronic learning aids might help students gain the relevant knowledge more efficiently. So, with the strong support of DMS Dean John C. Baldwin, MD, and DMS computing director Stephen McAllister, they applied for and received a startup Venture Fund grant from academic computing at Dartmouth College for the project dubbed, “Improved Efficiency in Elementary Anatomical Learning.”

Baldwin says, “It is particularly gratifying to see how our faculty in the department of anatomy are achieving national pre-eminence in developing fundamentally new and truly exciting ways of teaching anatomy...that emphasize the clinical relevance of the subject matter.”

Venture Fund grants help faculty to explore and develop ways of applying computer technology in direct support of Dartmouth’s curriculum. The support helped interested anatomy faculty to work in conjunction with Sarah Horton, an curricular web site developer, designer and author. Horton says a high priority is to focus students’ attention on, “what they need to know right now,” instead of a comprehensive view of anatomy.

Development of the web site began last summer when McDaniel and DMS anatomy faculty members Arnold Fabricant, MD, Rand Swenson, MD, Brian Catlin, MD, radiology professor James Lenz, MD, and Horton began mapping out the project. They decided to create a pilot module on the wrist and hand to see whether the resource helped students learn more effectively and/or more efficiently.

“It is a lifetime’s worth of work,” says McDaniel, who sees this growing to include the entire human anatomy over time. “The site is meant to be fun and accessible, with the added bonus to students and professors that they get more done in class.” In addition, there are the intrinsic time management benefits and the possibility for supplemental study. It also supplies first-year students with much desired radiograph experience. McDaniel used her own hand for the radiograph images, vividly showing the complex bone structures.

Before a lecture or laboratory session, for example, the students were able to work through the wrist and hand module to prepare. They had the opportunity to review the names of the muscles of the hand to be dissected, see how they are grouped, where they attach and how they are innervated. Students can investigate the bony structure of the wrist and hand using radiographs and watch QuickTime videos that demonstrate what the dissection will look like. After the lab, they can then work through review modules to pull together and extend what they learned in the pre-lab modules and in lecture and lab, then do a self-test to see how much they remember about the wrist and hand structures. DMS is collaborating on aspects of the project with the University of North Carolina, which shares its goals, says McDaniel, of open access of academic material.

For a view of the new anatomy department wrist and hand module, go to http://www.dartmouth.edu/~anatomy/index.html.
The Bottom Line on Doctoring

An old adage heard around tax time says, “It’s not how much you make, but how much you keep.” To a medical student leaving school with tens of thousands of dollars of debt and facing four years of residency making around $37,000 per year, it might be said, “It’s not how much you make, but how much you owe.”

In the early years, debt repayment may be at best difficult, more likely impossible, for a young doctor.

Eric Wadsworth, former Dartmouth Medical School chief financial officer and currently a consultant to the fiscal office, addressed these real world challenges for today’s young physician in a recent workshop presented annually through the Health, Society and the Physician (HSP) program.

Residing within the department of community and family medicine, HSP was developed on the premise that physicians should incorporate relevant concepts from social sciences and humanities disciplines into their practices with the belief that such integration would benefit their patients and their communities. Course directors and faculty constantly scan the education and practice horizons for important themes and issues to which students should be exposed before moving on to residency. DMS was on the cutting edge when it instituted this required fourth year course in the early 1980s. Recently, other medical schools have instituted similarly pioneering curricula that teach about the world outside basic and clinical sciences—the real world of patients, career decisions and the modern healthcare industry.

In a mere two hours, Wadsworth, a Colby-Sawyer College business professor, CPA and certified financial planner, moved seamlessly through debt, budgets, student loans, insurance, 401(k)s, keogh plans, the beauty of Roth IRAs, retirement, saving for college, tax strategy and a variety of investing models. Wadsworth’s presentation held the crowd spellbound with insider’s secrets of asset allocation, market segmentation, investment diversification and other topics typically not known to excite anyone beyond a convention of stock brokers.

Historically, doctors are often too busy to devote a great deal of time to financial planning until well into their careers, but Wadsworth showed them how, by starting now, life could be made much less complicated down the road. He showed in eye-opening charts and startling graphs that time and money can be enemy or friend, with debt eating away financial security if improperly managed. Wadsworth gave the fourth-year students clear goals for planning for the future as well as budgeting for the present so they could take control and, through basic financial discipline, develop a successful plan for their future.

He advised inexperienced investors to get advice from a qualified financial adviser with solid credentials and a good track record and suggests only working with someone who listens to your issues and is willing to work with your situation.

DMS financial aid director Nancy Cirone explains that for a student entering medical school, two terms are of supreme importance, “base loan” and “scholarship.” After determining an accepted student’s financial aid eligibility, the School sets an amount that he or she would be required to contribute and the remainder is the base loan. The need beyond the contribution and base loan is awarded as scholarship.

The upshot of the low unit loan figure is that it attracts a larger pool of applicants and, therefore, a higher standard from which to choose the entering class. Simply put, the lower the real cost of tuition, the better the chances of attracting more top-notch students. Over time, this is considered a valuable way of improving the overall quality of the School. An added bonus is that the School is more attractive to students who must weigh how much debt they want to incur in obtaining a medical degree.

Wadsworth classifies debt as a “cancer” on the financial health of the physician, and keeping it low benefits the graduate, who typically leaves DMS with around $95,000 in debt—much lower than the $118,000 the typical American medical student might incur upon graduation from a private medical school. Says Wadsworth, “this low net cost has given DMS additional competitiveness among its peers—perhaps the best value among the Ivies.”

Another indicator of DMS’ value as a medical school is fewer Dartmouth grads leave with debt than do their counterparts. Additionally, only 14 percent graduate with debt over $150,000 while the average for private US medical schools is 35 percent.

Financial Take Home Points for Young Doctors and Medical Students

- Minimize student debt.
- Pay off student loans within 10 years—consolidating debt where appropriate.
- Budget income as soon as possible—allowing for savings and debt repayment.
- Establish a retirement savings plan now.
- Invest long term with a diversified portfolio.
Cancer Killing Gene Found

Cancer researchers have identified a gene that triggers the death of leukemia cells, opening a novel target for anti-cancer drugs.

This new genetic switch, reported in the March 19 Proceedings of the National Academy of Sciences, turns on a program to destroy some leukemic and possibly other tumor cells. It is activated by treatment with retinoic acid, a vitamin A derivative used in cancer therapy and prevention.

Finding a mechanism that sets a cell death program in motion paves the way for developing new cancer-killing drugs, notes Dr. Ethan Dmitrovsky, professor and chair of pharmacology and toxicology. He headed the research team that included Sutisak Kitareewan, Ian Pitha-Rowe, Sarah Freemantle and David Sekula, and collaborated with Dr. Christopher Lowrey, associate professor of medicine and of pharmacology and toxicology, and Michael Nemeth.

Retinoids are natural or synthetic compounds derived from vitamin A. The retinoid all-trans retinoic acid (RA) causes remissions in the rare, but lethal acute promyelocytic leukemia (APL). In APL an unusual genetic defect rearranges the RA receptor. A hallmark of the retinoid response is the degradation of the abnormal receptor and induce cell death. Introduced into leukemic cells, this gene (UBE1L) reproduced key aspects of retinoic acid response and signaled a death program.

Parasite Disarmed

DMS geneticists have discovered how to disable a common human parasite to prevent disease in an animal model. The work, published February 21 in Nature, opens new avenues for the development of vaccines and treatments for diseases such as toxoplasmosis caused by protozoan parasites.

Barbara A. Fox, a research associate, and David J. Bzik, PhD, associate professor of microbiology and immunology, found that inactivating a single enzyme in a key biochemical pathway weakened the parasite Toxoplasma gondii and prevented disease. Commonly spread through undercooked meat (and occasionally through cats), T. gondii causes toxoplasmosis, which can be life threatening in immunocompromised patients and lead to severe birth defects in newborns of mothers infected during pregnancy. It is a close relative of Plasmodium falciparum, a malaria parasite.

Fox and Bzik devised a T. gondii strain that causes no disease and protects against the normal parasite. “It could be used as a prototype vaccine strain,” said Bzik. Added Fox, “It has an amazing ability to elicit a strong immune response that is likely to be beneficial for certain vaccines targeted against other challenging infectious diseases or cancer.”

Using a novel genetic approach, the investigators knocked out a single enzyme to block T. gondii from making some essential components of parasite DNA and RNA. This destroyed its ability to replicate and survive in an animal host.

One dose of the parental type parasite will kill a mouse, yet all mice survived exposure to millions of mutant parasites without ill effects. Moreover, mice immunized with a single dose of the mutant strain, when challenged with a lethal dose of a highly virulent T. gondii, were completely protected from infection.