

**NEWS TO USE:** Dartmouth research on health-care utilization, including from *The Dartmouth Atlas of Health Care*, was quoted during the first six months of 2009 in 200 unique media outlets which reached 117 million consumers of news.



THEN & NOW

**A reminder of the pace of change, and of timeless truths, from the 1984 Mary Hitchcock Memorial Hospital Annual Review:**

“In the summer of 1982, [high school football player] Alan [Brown] injured his knee during football training, [tearing the] fibrocartilaginous cushion of the knee called the meniscus. . . . Prior to 1980, Alan’s injury would have required a three-to five-day hospital stay [and] a total recuperation time of eight to ten weeks.” But thanks to an arthroscopic procedure performed by Hitchcock orthopaedist Dr. Robert Porter, “‘Alan was able to go home the same day and, best of all, was back on the football field within three weeks,’ stated Porter.”



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Number of weeks following knee arthroscopy after which it’s usually possible to resume sports today

**Stanching the hemorrhage of health-care data**

If you’re like most people, you’re much more concerned about protecting your credit card number than your health-insurance number. But health-care information is increasingly being exploited by ill-intentioned individuals, says M. Eric Johnson, a professor at Dartmouth’s Tuck School of Business who studies what is known as medical identity theft.

**Motives:** The motives behind medical identity theft vary. Uninsured individuals may try to receive free health services; illegal immigrants may want to avoid being deported; criminals on the run may be evading the law. Between 1998 and 2006, the Federal Trade Commission received 19,000 complaints of medical identity theft—a number that’s “the tip of the iceberg,” says Johnson.

In a recent paper on the problem, he wrote that “hospital employees historically comprise the largest known group of individuals involved in traditional medical fraud.” Yet patients can unwittingly foster fraud by, for example, scanning health-care paperwork and storing it on an unsecured computer.

But Johnson, who directs the Center for Digital Strategies at Tuck, believes that digitizing medical records is part of the solution rather than part of the problem. In fact, he and several other Dartmouth faculty members—including Dr. Andrew Gettinger, head of informatics for DHMC—just received a \$3-million grant from the National

Science Foundation to develop secure computing systems for the health-care industry.

**Peer:** Johnson’s research places the blame for medical data hemorrhages on antiquated information technology (IT) in doctors’ offices and hospitals, as well as on peer-to-peer (P2P) file-sharing client software—programs used to share music.

Health-care workers often have easy access to confidential employee and patient information when such data is stored in insecure formats like Microsoft Word or Excel. These formats can easily be e-mailed, uploaded, or otherwise transported out of a health-care facility, usually with no way of identifying the culprit, let alone that data has been compromised.

Johnson also examined how P2P software facilitates medical identity theft. For example, a malicious P2P client may ask for access to a user’s entire “My Documents” folder if just one music file is stored there. Or a client may just automatically access a user’s entire hard drive, without even asking permission.

**Footprint:** In his study, which Johnson presented at the 2009 international Financial Cryptography and Data Security conference, he explained how easy it is to mine personal health information via P2P file-sharing software. First, he created an electronic “footprint,” a set of search terms that lead back to an original query, for each of the top 10

publicly traded health-care firms. Pulling randomized samples over two weeks, he recovered 3,328 documents from P2P networks, 5% of which “could be used to commit medical or financial identity theft.” These documents included health plan information, examination records, medical and psychiatric histories, and other sensitive data.

Then, by employing more specific searches, Johnson gained access to even more compromising data, including one file containing Social Security numbers, dates of birth, and insurer information for 9,000 patients.

One hospital system inadvertently leaked a spreadsheet with 82 pieces of information on each of 20,000 patients.

While no secure system is perfect, many large hospitals—including DHMC—use an electronic medical record (EMR)

**In his study, Johnson gained access to lots of compromising health data.**

DAVE BRADLEY



**Johnson studies medical identity theft.**

system. DHMC developed its own EMR in 1985—one of the earlier institutions to do so; it restricts access to patient files based on an employee's role.

Douglas Madory, manager of information systems security at DHMC, explains that the institution is currently in transition to a new system that will have even more sophisticated capabilities. DHMC takes patient privacy very seriously, says Madory. "There's not a lot of leeway" regarding breaches, he notes, even if their cause is not criminal—looking up a friend's birthday, for example. Disciplinary action can range from a formal warning to termination, depending on the severity of the case.

**Data:** Employees are also told that if they use a laptop for work, they must always ensure that sensitive material is encrypted so that, if the computer is lost or stolen, the data on it can't be accessed by anyone else.

But people shouldn't rely just on IT to protect their health information, Johnson points out. Patients can ask for an audit of their EMR if they ever suspect a privacy violation.

Finally, Johnson advises people never to put sensitive information on their home computer. "The greatest risk is home machines," he points out. With multiple users, there is a chance that a family member can unintentionally share a computer's whole hard drive with the click of a mouse over a P2P client.

"I have teenagers at home, so I worry," says Johnson. "You need to be careful."

REBECCA E. GLOVER

## INVESTIGATOR INSIGHT

In this section, we highlight the human side of biomedical investigation, putting a few questions to a researcher at DMS-DHMC.

**C. Harker Rhodes, M.D., Ph.D.**  
**Associate Professor of Pathology**

*Rhodes, who studies the genetics of neurodegenerative disorders and the molecular biology of gliomas, is the medical director of the Pathology Shared Resource at Dartmouth's Norris Cotton Cancer Center. He has been on the DMS faculty since 1990.*

### What do you consider your most important work?

I'm tempted to say something predictable about my contribution to patient care. And the neuro-oncology tumor board on Tuesday afternoons is probably the part of my work-week I enjoy the most. But my teaching activities—mentoring new residents—is, in the overall scheme of things, probably the most important thing I do.

### What famous person, alive or dead, would you like to meet?

[Swiss mathematician] Leonhard Euler. There is a mathematical problem that has become central to some of the research I'm doing which I'm sure could be solved more elegantly than the way I'm approaching it. I suspect that his intuitive but often not exactly rigorous approach to mathematics is what is needed to get it right.



### What place that you've never been to would you like to visit?

My next trip to somewhere that I've never been before will be this fall to Wales, where

I'm co-teaching a neuroanatomy practicum at Cardiff University. I really enjoy traveling as a tourist, and Snowdonia National Park in North Wales is supposed to be absolutely beautiful. And to make up for the fact that I'm flying into the world's worst airport (Heathrow), I'm giving myself a weekend in London. But the real attraction about the trip to Wales is that I'll spend

some days in Benllech Tyn-Y-Gongl—at the beach and sailing.



### If I had more time I would . . .

I've always made my family my first priority, so the conventional answer—"spend more time with my wife/kids"—wouldn't be accurate. Of course, like everyone else, I've got a long list of unfinished professional projects. For example, my editor at Cambridge University Press is still waiting for the first draft of the book *Genetic Polymorphisms Affecting Human Cognition*, and I genuinely regret not having more time for that project. But especially now that my sons are away at college and law school, I'm spending so much time at work that to wish for more of that would be pretty silly. So I'll give a selfish answer and wish for time to learn to play the piano.

### What music CD did you purchase most recently?

*David Garrett* by David Garrett.

### What book you read this summer did you enjoy the most?

*The Enchantress of Florence* by Salman Rushdie, because it brought back memories of an afternoon I spent wandering around Fatehpur Sikri with my wife.

### What are your favorite nonwork activities?

Skiing, scuba diving, and horseback riding.

### What is the hardest lesson you ever had to learn?

To recognize the value of constructive criticism, no matter what the source.

### Are there misconceptions people have about your field?

Absolutely. Americans are terrified of anything that has the word "genetics" in it. They've got to come to terms with the fact that there are important genetic differences between individual human beings, and that the philosophical principle that "all men are created equal" does not require that we pretend that they are identical. Our diversity is our greatest strength, and we need to embrace it and recognize that the elucidation of the molecular basis of that diversity is going to be one of the most scientifically productive endeavors of the 21st century.