

# stat

## COMING //

- **OCTOBER 10:** The FDA's newly assembled Nanotechnology Task Force holds its first public meeting to discuss the potential benefits and dangers of nanotechnology materials—measuring one eight-hundredth the width of a human hair or thinner—in drug-delivery systems, surgical implants and prosthetics, among other uses.
- **NOVEMBER 7:** Missouri voters decide upon a proposed amendment to the state constitution to allow stem-cell research and treatment. Some Missouri politicians have tried to ban such research.



**FOCUS // REGRET**—that's what many people with tattoos eventually feel about their body art. Yet the only recourse is a series of laser treatments that leave scars. Doing nothing is not appealing either: Inks include carcinogens such as industrial-grade carbon black and compounds found in auto-body paint. For those whose body art is still on the drawing board, Rox Anderson, director of the Wellman Center for Photomedicine at the Massachusetts General Hospital, has invented bio-resorbable ink encased in polymer beads that burst and disappear after a single treatment.

INTERVIEW //

**Extreme Doctoring**

■ BY JEFF GREENWALD

08



*As the only team doctor on expeditions to Mount Everest, the Amazon rain forest and many inhospitable environments in between, Kenneth Kamler, 58, has used all manner of technology—from the primitive (employing the pincers of soldier ants, gathered from the jungle floor, to suture wounds) to the futuristic (helping develop robotic surgery in NASA’s underwater astronaut-training capsule). Here he discusses the promise and problems of advanced medical technology in places as far-flung as Bhutan and Mars—and questions of survival that no technology can ever address.*

**Q:** Recently mountaineers on Everest drew fire for leaving a climber for dead. Is there a point at which it is acceptable, or even necessary, to leave someone behind?

**A:** Only when there’s significant risk to your own life. But I don’t think the climbers on Everest were in that situation. I’ve been at that height and higher and can’t imagine ever thinking that the summit’s more important than a dying person. It doesn’t fit with anything I believe about mountaineering.

**Q:** You wrote a book called *Surviving the Extremes: A Doctor’s Journey to the Limits of Human Endurance*. Do people who live their entire lives in extreme environments have different expectations of medical science than we do?

**A:** They don’t expect nearly as much. They’re accepting of injury and illness: If they fail to produce, they become a burden on their family and their village. I knew a Sherpa who worked for two years with a dislocated ankle. He had to—otherwise his family would have starved.

**Q:** In everyday life, you’re a microsurgeon, director of the Hand Treatment Center in New Hyde Park, N.Y. How does treating people in extreme environments differ from the way you practice at home?

**A:** In New York I repair nerves and blood vessels under a microscope. It’s quality-of-life work; I don’t treat life-threatening situations. In the field, I’m at the other extreme. I’m working without help, under primitive conditions, trying to save lives.

**Q:** Telemedicine, in which doctors treat patients at a distance by directing other doctors on the scene with verbal and visual online communication, has made it possible to treat people in extreme environments. What experiences have you had with this technology?

**A:** I’ve used telemedicine in the Himalayan kingdom of Bhutan, where doctors in remote villages have posted

patient photos and X-rays on the Internet, and we've advised them on treating problems ranging from rashes to radius fractures.

**Q: What are the biggest obstacles to treating an astronaut injured on the moon—or Mars?**

**A:** The time delay—the time it takes to transmit across vast distances. It's not a huge issue with telemedicine, but for remote surgery it's hard to see how the problem can be overcome. A surgeon, working remotely, can tie a suture with a two-second delay. With a three-second delay, hand-eye coordination is no longer possible; because neural

**Q: Progress is being made on robotic hands that can “feel” texture. Why are such devices desirable?**

**A:** Because there's more to surgery than just looking. It's important to be able to feel tissue planes, scar tissue and organs; sometimes you have to palpate an organ to know a tumor is there. Even when tying a knot, you need to feel the tension to know it's right.

**Q: Would it be feasible today for a specialist in New York to perform robotic microsurgery on injured children in, say, Sri Lanka or Darfur?**

**A:** It's virtually impossible because the local people don't have the expertise

## ■ Each time I return to the West, I come back with a greater appreciation of what the mind can do and how an optimistic outlook can affect healing.

circuits work on immediate feedback, it would be like trying to drive a car by looking out the back window. The time delay on the moon is 2.5 seconds. On Mars it's 20 to 40 minutes.

**Q: How does NASA envision solving that problem?**

**A:** Surgery would have to be pre-programmed, as in a player piano. Magnetic resonance images would be radioed back to Earth and analyzed. Then doctors would figure out the operation needed, program it into a computer and send the information to a robotic surgeon on Mars. That's the only way it could be done—unless you can speed up the speed of light!

to set up the equipment and keep it going. If something breaks, you have to wait months to get it fixed. Even telemedicine poses problems: Because bandwidth is limited, the quality of images sent back and forth is poor.

**Q: What's the single most important thing you've learned from practicing medicine in extreme locations?**

**A:** Each time I return to the West, I come back with a greater appreciation of what the mind can do and how an optimistic outlook can affect healing. You need to have a larger purpose to survive in extreme environments. That's what gives people in those places such incredible energy. ■

BY THE NUMBERS //

## Critical Condition



09

**26** Percentage increase in U.S. emergency room (ER) visits during the 1993–2003 period, compared to a 12.5% increase in the U.S. population during that time

**15** Percentage decrease in the number of U.S. ERs during that period (from 4,791 to 4,073)

**1,440** Average number of ambulances each day turned away from an ER at maximum capacity

**65** Short-term survival rate as a percentage, following cardiopulmonary resuscitation on the TV show *ER* during the 1994–95 season; the actual rate is anywhere from 7% to 15%

**3.2** Average time, in hours, a patient spends in the ER, 46.5 minutes of which are spent waiting

**1.9** Millions of times ER patients left without being treated in 2003—1.7% of all ER visits

**14.1** Percentage of total visits to ERs, in 2003, made by uninsured persons

**5** Percentage of funding that emergency medical services received from the Bioterrorism Hospital Preparedness Program in 2002; the funding, which typically ranged from \$5,000 to \$10,000 per hospital, is not enough to fully equip one intensive care room ■

INFOGRAPHIC //

## Health Coverage for All

■ BY RACHAEL MOELLER GORMAN // INFOGRAPHIC BY FLYING CHILLI

The plan to improve Massachusetts's health-care system seems simple: By July 1, 2007, everyone in the state must be insured. The state will use the money it (as well as insurers, hospitals, and local and federal governments) now spends to subsidize the "free" hospital care the uninsured receive to subsidize insurance for residents whose earnings are too high for Medicaid qualifications but too low to afford insurance.

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### In Massachusetts



**8% OR MORE ARE UNINSURED**

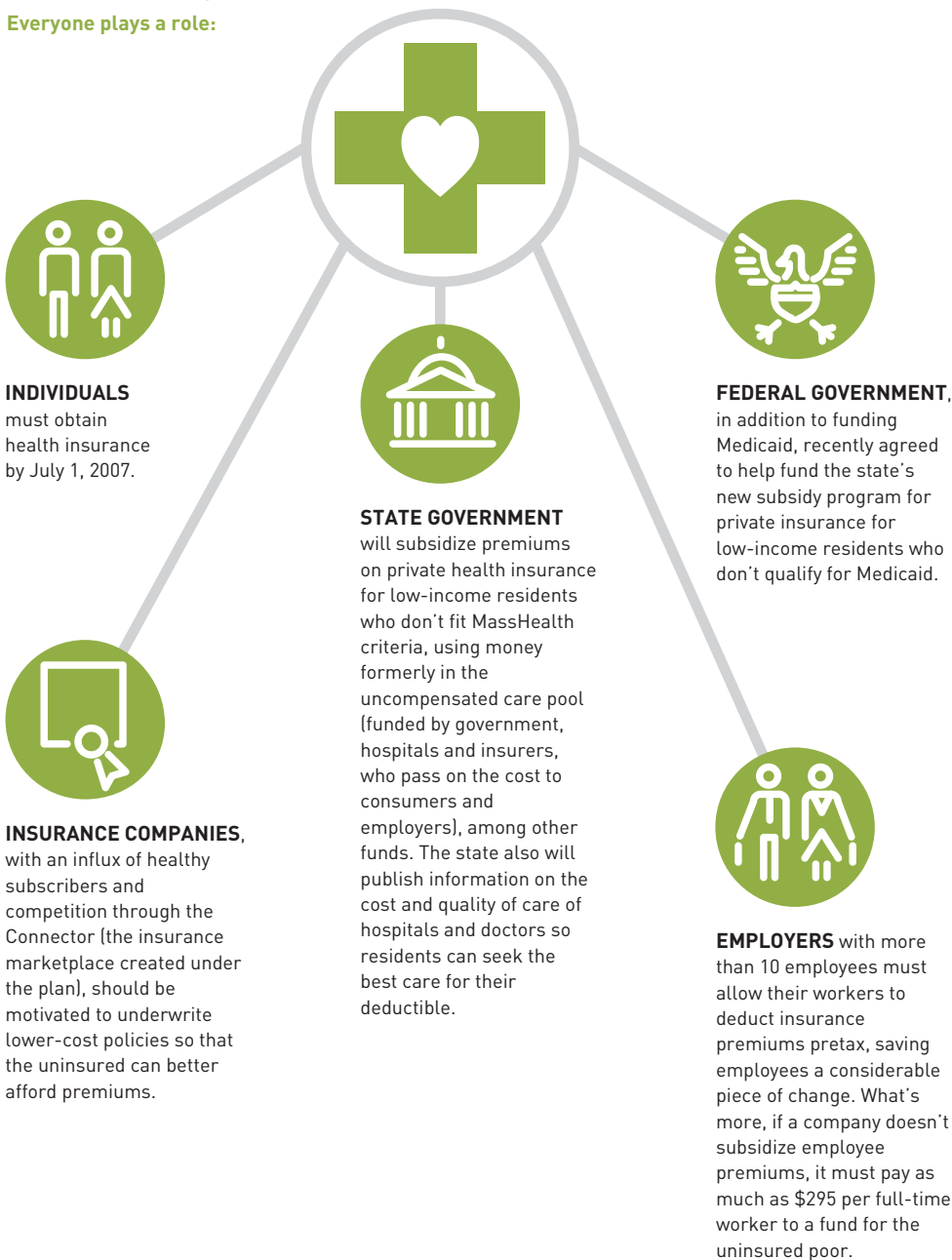
**They include:**

- Low-income residents who don't meet MassHealth (Massachusetts's Medicaid) criteria
- Young adults just entering the workforce
- Workers at companies that don't offer insurance
- Part-time and seasonal employees who don't qualify for their employers' insurance
- The self-employed who can't afford private insurance

**TOTAL COST \$1bn**

### In the new system

Everyone plays a role:



## But will it work...



### ...IN THE BAY STATE?

Everyone, from individuals and employers to insurance companies and the state and federal governments, has a stake in the new system because when some people aren't insured everyone else pays—even individuals, with higher insurance premiums and taxes to support mandatory insurance company and government contributions to free care. Yet despite widespread support for the plan, approved by a Democratic legislature and a Republican governor, success is far from assured. The biggest concern is whether funding will be sufficient to support subsidy programs over many years, and with health costs continuing to skyrocket, prices for insurance plans may remain unaffordable for the two-fifths of the uninsured who make too much money to qualify for subsidies. Finally, enforcement of mandates is often difficult (in Massachusetts in 2007, the punishment for being uninsured will be loss of the personal state tax exemption), and public awareness of the mandate is quite low.



### ...IN OTHER STATES AND FOR THE NATION?

Even if Massachusetts achieves universal coverage, its plan might not serve as a viable model for other states and the federal government. Though this liberal stronghold clearly has the will to insure everyone, many states oppose government mandates. Moreover, Massachusetts has a relatively small population and relatively few uninsured citizens—fewer than one in 10, compared with approximately one in five in California and one in four in Texas. And the proportion of the state's employers already offering insurance is among the nation's highest. Vermont passed similar legislation in May 2006, providing subsidies to low-income residents, and Maine passed a less comprehensive bill in 2003 that also helps people buy insurance, but both lack the individual mandate (that everyone must have health insurance) that Massachusetts believes is essential. So, although the plan may serve as inspiration for other states and the nation, a carbon copy would be unlikely to prove successful.

## ON THE BLOGS //

## For Caregivers, Heavy Cares

*Medical bloggers not only expound on the latest technologies and policy issues but also, as these excerpts show, use the Web as an outlet for the worry they feel and the fears they face in treating patients.*

### A ONE-QUESTION QUIZ

Adapted from a June 27 posting at [scienceblogs.com/thecheerfuloncologist](http://scienceblogs.com/thecheerfuloncologist) by St. Louis oncologist Craig Hildreth.

Last week my partners and I met with a health-care system executive charged with designing a hospital to be built here in suburban St. Louis. Mirabile dictu, the new place will include a cancer center.

As we studied the plans, I was struck with an epiphany that tore me from the banal descriptions of office placement and patient flow.

"Do you know what is the biggest fear of oncologists?" I asked the group. "It is the fear of working alone. Without our nurses, secretaries and partners, without radiation oncologists, social workers, surgeons, radiologists and many other teammates, we could never give our patients anything close to acceptable care, let alone what they deserve to receive. This center is designed exactly the way we wish it could be."

A well-planned cancer center is certainly a compliment to the designers, but to us it is a reprieve from the angst we experience daily.

### TICK, TICK, TICK...

Adapted from a July 19 posting at [docsurg.blogspot.com](http://docsurg.blogspot.com) by "Aggravated DocSurg," a general surgeon.

There is a part of surgery that largely goes unspoken: the worry. Most of the time, the operations I do are "routine," although nothing is ever routine about surgery. But certain situations generate enough worry to make me feel as if the devil himself has taken up residence in my stomach, stoking the furnace of hell.

In the vast majority of cases, all the anguish turns out to be a long night of self-torment, and the patient does just fine. But the need to worry never changes, because not every patient sails through hospitalization without a few squalls. And so I fret. I brood. I stew. I agonize. Because, as my old program director told me, "that's what a good surgeon does. Nobody knows what went on in that operating room except you and God, but only you can correct a problem."

### PRESCRIPTION FOR DANGER

Adapted from a July 15 posting at [medpundit.blogspot.com](http://medpundit.blogspot.com) by Penny Marchetti, an Ohio family doctor.

Hackers can do all sorts of bad things with computers, like create their own prescriptions. The rules that govern computerized prescriptions ostensibly make things more secure, but there is a much more common method of electronic transmission of a prescription. It's used every day in every physician's office, and even in physicians' homes and cars. Just about every patient has one too. It's the telephone. Anyone can call any pharmacy, claim to be a doctor or a doctor's representative, and give themselves a prescription for just about anything. There is absolutely no authentication at the point of use. They just take your word for it. But oddly, there are no rules about telephones. ■

## POLICY WATCH //

### Blood Feud

The balance between individual rights and medical progress has sparked controversy over two trials under review by the Food and Drug Administration (FDA). Both studies are aimed at gauging the effectiveness of blood substitutes in helping trauma victims.

In ambulances and on battlefields, the use of real blood is virtually impossible because of short shelf life, refrigeration requirements and the need to cross-match types. What's more, patients tend to be in no condition to provide informed consent. So one study, recently completed, operated under a waiver of consent (which the FDA may allow for research on acute, life-threatening conditions), as will the other if it's approved by the FDA.

PolyHeme, developed by Northfield Laboratories of Evanston, Ill., was tested in ambulances and emergency rooms at 32 Level 1 trauma centers. In the ambulance tests, PolyHeme offered patients potential benefits because it carries tissue-saving oxygen (otherwise patients would typically receive saline, which only restores blood volume). But the research protocol also called for PolyHeme to be continued up to six units or 12 hours (whichever came first), long after patients reached the ER. This requirement allowed PolyHeme's effectiveness to be directly compared to donor blood instead of saline.

Although Hemopure, the other substitute, would be tested only in ambulances, controversy over PolyHeme may be fueling resistance to the Hemopure trial, stalled



since 2005 because of safety concerns. "PolyHeme has sensitized people to the waiver-of-consent issue," says Guy Schein, a spokesperson for the U.S. Navy, which is helping fund the Hemopure study with its maker, Biopure Corp. in Cambridge, Mass.

Both PolyHeme and Hemopure have been linked to patient risks, including increased hypertension and other cardiac problems. Both manufacturers, however, contend that benefits outweigh risks.

In places where PolyHeme was tested, hospitals consulted with community members about risks and provided a procedure for opting out. But ethical concerns arose over whether these measures were an adequate substitute for traditional informed consent. In 1998, a nonconsent trial of a blood substitute from

Baxter Healthcare was halted after yielding higher mortality rates. Still, Roger J. Lewis, a physician at the Harbor-UCLA Medical Center and chairman of the Data Safety Monitoring Board, an independent oversight body that recommended the halt, doesn't think nonconsent trials are necessarily unethical: "If you take that position, you're condemning all future patients to receive the same therapies we use today."

Others don't agree. "Is it ethical to substitute a known lifesaving intervention with an unproven one without consent?" asks Leonard Glantz, a lawyer and ethicist at the Boston University School of Public Health. (He served on a review board at the BU Medical Center that declined to participate in the PolyHeme trial.) "The answer is no, across the board." ■

## THE CUTTING EDGE //

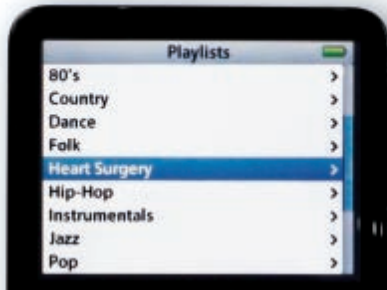
### No Sponge Left Behind

Surgical nurses have the onerous task of ensuring that the dozens of sponges placed in a patient make it back out. Miscounts happen: Approximately 1,500 patients each year "retain" a sponge, according to a 2003 study in the *New England Journal of Medicine*. More than embarrassing oversights, lost sponges can cause serious harm, including infection and intestinal obstruction.

To provide backup for manual counting, ClearCount Medical Solutions has embedded radio frequency ID (RFID) tags into sponges and devised a wand to scan patients post-operation. In a study by Stanford University Medical Center researchers, the scanner found RFID sponges in an average of less than three seconds every time—making for a swift recovery. ■



## Music in the OR



*In many operating rooms, the iPod is as vital a tool as a scalpel. A 1994 Journal of the American Medical Association study reported that surgeons performed better when they listened to music they had chosen. As these surgeons note, music can serve very particular purposes.*

**TO GET PUMPED:** “At the beginning of a total shoulder replacement, the Rolling Stones’ ‘Jumpin’ Jack Flash’ gets your adrenaline going. It feels like game time.”  
—Dan Reilly, hand and shoulder surgeon, Hand Surgery Specialists Inc., Cincinnati

**TO SUSTAIN MORALE:** “When things are going badly during a liver transplant, I put on Mike and the Mechanics’ ‘All I Need Is a Miracle.’” —C. Wright Pinson, chief medical officer and professor of surgery, Vanderbilt University Medical Center, Nashville

**TO KEEP UP A RHYTHM:** “My cases require a lot of suturing, which is repetitive work.

I listen to Motown because it’s basically the same kind of music over and over. It calms me down and helps me concentrate.”  
—Jennifer Butterfield, plastic surgeon, Women’s Plastic Surgery and Rejuvenation Center, Cincinnati

**TO UNWIND:** “I like to play Frank Sinatra during the middle of the operation. When you’re closing up a patient, it’s rock and roll time: Van Halen, Guns N’ Roses and occasionally Metallica. Friday afternoons, by law, you have to listen to Barry White.”  
—S. Russell Vester, chairman and heart surgeon, Cardiac, Vascular and Thoracic Surgeons, Cincinnati ■

## THE LIST //

## New Tech for the Developing World

Vaccines that spoil in tropical heat. Diagnostic tests that don’t provide results in time to treat the sick. Patients who spread disease because it goes undetected. Such are the frustrations that aid workers face in developing countries. Perhaps if they were armed with technologies such as these, they might save more of the 10.6 million children who die yearly from preventable or treatable illnesses.

### AN UNUSUAL TIMEPIECE

First developed to keep African miners healthy (and working), the Gervans Trading Malaria Monitor automatically pricks the skin four times a day to test the blood for malaria parasites. The device, which doubles as a watch, announces the parasite’s presence with an alarm and a flashing picture of a mosquito. Three antibiotic pills within 48 hours of diagnosis can cure a patient before he feels ill. Companies, governments and aid organizations in more than 40 countries have placed more than 1.5 million orders.

### A PAINLESS VACCINE

At 1,500 miles per hour, PowderMed’s Particle Mediated Epidermal Delivery (PMED) gene gun fires microscopic vaccine particles just far enough beneath the skin to reach immunity-producing cells, but just short of nerve endings, thus rendering the shot painless. Because PMED hits its target exactly, rather than overreaching like traditional shots, it administers one-thousandth the dose of needle

injections. And because PMED vaccines are powders, they require no refrigeration and have extended shelf lives. Many vaccines, including those for influenza and genital herpes, are in Phase I clinical trials.

### A SPEEDY DIAGNOSIS

The Diagnostic Development Unit at the University of Cambridge has joined in the fight against trachoma, a chronic eye infection that has blinded approximately 6 million people worldwide. Its new eye swab test has a positive predictive power of 97.3% (compared with 43.6% for current visual inspection methods) and yields a diagnosis in half an hour. If caught in time, trachoma can be treated with one dose of antibiotics.

### A BREATH OF PROTECTION

To combat measles, which kills half a million people (primarily children) each year, engineering research-and-development firm Create Inc. of Hanover, N.H., and the Centers for Disease Control and Prevention are testing a new intranasal vaccine-delivery device. The needle-free method is painless, fits in a child’s nose and would speed mass vaccination campaigns.

### A POCKET-SIZE LAB TEST

Fifteen minutes is all it takes for a miniaturized laboratory on a card (called the Optolab Card) to diagnose tuberculosis and other infectious diseases. The Ikerlan Technological Research Centre in Gipuzkoa, Spain, is developing the portable device, which analyzes each disease’s DNA chain to expedite diagnosis—and treatment. ■

UPDATE //

## Avian Flu, One Year Later

■ BY WENDY ORENT

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Since the publication of my article “Fearing the Flu” (Fall 2005), the avian virus has expanded its range among domestic birds, from Southeast and Central Asia into Asia Minor, the Middle East, Africa and Europe. Among humans, Indonesia and Egypt recently have suffered intense outbreaks. But Vietnam, once an epicenter of infection, has been free of human cases for at least six months. Unfortunately, reports indicate that despite vaccination, culling and surveillance programs, the virus has re-emerged among the people (killing two) and poultry in Thailand, also thought to be free of the virus.

It has become clear as well that migratory birds don’t effectively transmit the disease to domestic birds or continue to circulate it among themselves. There is no evidence in the wild of any bird species that remains asymptomatic and still sheds virus. And of the thousands of migratory birds that have been tested worldwide, none has been shown to be a carrier. Rather, the illicit poultry trade seems responsible for almost all the spread of the disease among domestic birds.

Why is it apparently so difficult for humans to contract and transmit H<sub>5</sub>N<sub>1</sub>? One possible explanation is that normal human flu virus tends to bind onto host cells with a particular molecular receptor, which ends with a sialic acid of type 2,6, as opposed to a “birdlike” receptor ending with sialic acid type 2,3. Humans typically have cells in their respiratory tracts containing 2,3 receptors, but those cells tend to grow deep in lung tissue, perhaps too deep to be coughed up.

In one instance, in Indonesia, there is molecular evidence that the virus did spread from person to person in one family (seven people died). What’s more, recent investigation has established that numerous mutations were observed in the Indonesian cluster, which probably involved two generations of spread. Though the changes represent increased adaptation to human hosts, these strains vanished with the deaths of their hosts. Recent research by the Centers for Disease Control and Prevention using a ferret model (the best approximation of human disease) demonstrates that recombining highly pathogenic H<sub>5</sub>N<sub>1</sub> virus with common human strains does not readily produce a lethal, transmissible strain.

Finally, the degree to which people have contracted asymptomatic infections remains ambiguous. Evidence of infection without sickness has been seen in Turkey and elsewhere. But a survey of blood serum done in Cambodia indicates a very low prevalence of the disease in the bloodstreams of the surveyed population. If the virus has produced a significant number of asymptomatic infections, that would imply a much lower death rate (there have been 241 confirmed human cases and 141 deaths worldwide), and many more immune people, than it now appears. Conversely, if there are few mild infections, it would mean that fewer people have had the opportunity to build up immunity through exposure. That may seem an unsettling fact unless one considers, by the same reasoning, that if few people are getting the disease (whether in severe or mild form), it may, indeed, be very difficult to contract. ■

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## ADVANCES //

### Mixed Signals

**DOCTORS DON'T NEED MORE TESTS** to identify patients at risk for heart conditions, according to an *Archives of Internal Medicine* study. Researchers studied levels of 19 different chemicals in the blood of 16,000 people, and none—not even such markers as C-reactive protein (a detector for heightened inflammation)—had the predictive power of major risk factors (age, high blood pressure, cigarette smoking, elevated total cholesterol and diabetes).

[archinte.ama-assn.org/content/vol166/issue13/index.dtl](http://archinte.ama-assn.org/content/vol166/issue13/index.dtl)

**CAN RATS RECALL EXPERIENCES** as humans do? It seems so, say psychologists at the University of Georgia, whose experiments indicate that rats can synthesize the three elements that form the memory of an experience: what, when and where. After the researchers placed flavored and unflavored foods at different times and in different parts of a maze, the rats remembered where and when to find each type of morsel. The animal could become a model for testing drugs for Alzheimer's and other human memory disorders.

[current-biology.com](http://current-biology.com); search for "Episode-like Memory in the Rat"

**ONE IN EIGHT AMERICAN INFANTS** is born at least three weeks early, according to an Institute of Medicine report. The statistic is dire, considering that infants born before the thirty-seventh week of gestation are at higher risk for incomplete development, asthma, infection and such long-term complications as learning disabilities. The rising incidence—27% since 1981—may be caused, in part, by the increase of births among both adolescents and older women, and the increase of multiple births as a result of in vitro fertilization.

[iom.edu/CMS/3740/25471/35813.aspx](http://iom.edu/CMS/3740/25471/35813.aspx)

**A MOLECULAR SWITCH**, an enzyme called protein kinase G (PKG), turns chronic pain on and off, according to Columbia University researchers. Rat experiments show that when PKG is on, it causes nerve cells to send intense pain signals long after an injury has healed, and that pain stops when PKG turns off, although it's not yet clear how it becomes deactivated. The discovery may lead to a new class of drugs without the side effects of current painkillers.

[pubmed.gov](http://pubmed.gov); search for "Activation and Retrograde Transport of Protein Kinase G"

**MEDICAL RESIDENTS GOING OFF SHIFT** don't relay information about their patients as well as they should. An *Archives of Internal Medicine* survey reports that, of the 202 internal medicine residency programs studied, 55% had inconsistent oral and written sign-out (patient transfer) practices, 60% did not provide training on transfer practices, and 59% had no system for informing nurses that transfers had occurred. Compounding the problem: Residents are now limited to working 80 hours per week, increasing doctor turnover by 11%.

[archinte.ama-assn.org/content/vol166/issue11/index.dtl](http://archinte.ama-assn.org/content/vol166/issue11/index.dtl) ■

## MILESTONES //

### An Aural Art



In 1816, the French physician René Laennec collided head-on with propriety, and the stethoscope was born. Laennec suspected a young lady in his care of suffering from heart distress but felt restrained from placing his ear to her chest to confirm the diagnosis. Searching for a solution, he recalled an acoustic phenomenon in which a person listening at one end of a hollow pole could clearly hear someone scratching a pin at the other. He rolled a piece of paper into a tube and placed it against the woman's chest, allowing a discreet distance from which to listen. Laennec was stunned to hear her heartbeat and her breathing much more loudly and clearly than he ever had with ear to chest.

By using his monaural (single-ear) stethoscope and studying autopsies, Laennec pioneered the diagnosis of a number of conditions, including tuberculosis and pneumonia. One hundred ninety years later, although the stethoscope has evolved (to become binaural, for one thing), it remains largely unchanged and still highly effective. Moreover, it has come to symbolize the "laying on of hands" aspect of the doctor-patient relationship that patients

crave. But among young physicians its use seems to be something of a lost art: One study found that students and interns were able to detect heart and other internal problems only 38% of the time with the correct use of a stethoscope.

The study's lead author, Jeanne DeCara, a cardiologist at the University of Chicago, says younger doctors rely increasingly on such technologies as EKGs and ultrasounds, and so don't learn to trust their senses. But the instrument won't disappear from doctors' necks: Several companies have developed digital stethoscopes, which amplify and record barely audible sounds that can be played back, then looped and run through a database of normal and diseased states.

Increasingly, stethoscopes will be used in conjunction with other technologies. "In our study, doctors who used both a stethoscope and a handheld ultrasound made the most accurate diagnoses," says DeCara. "And the great thing with this combination is that doctors are still laying on hands." The very thing Laennec aimed to avoid. ■

