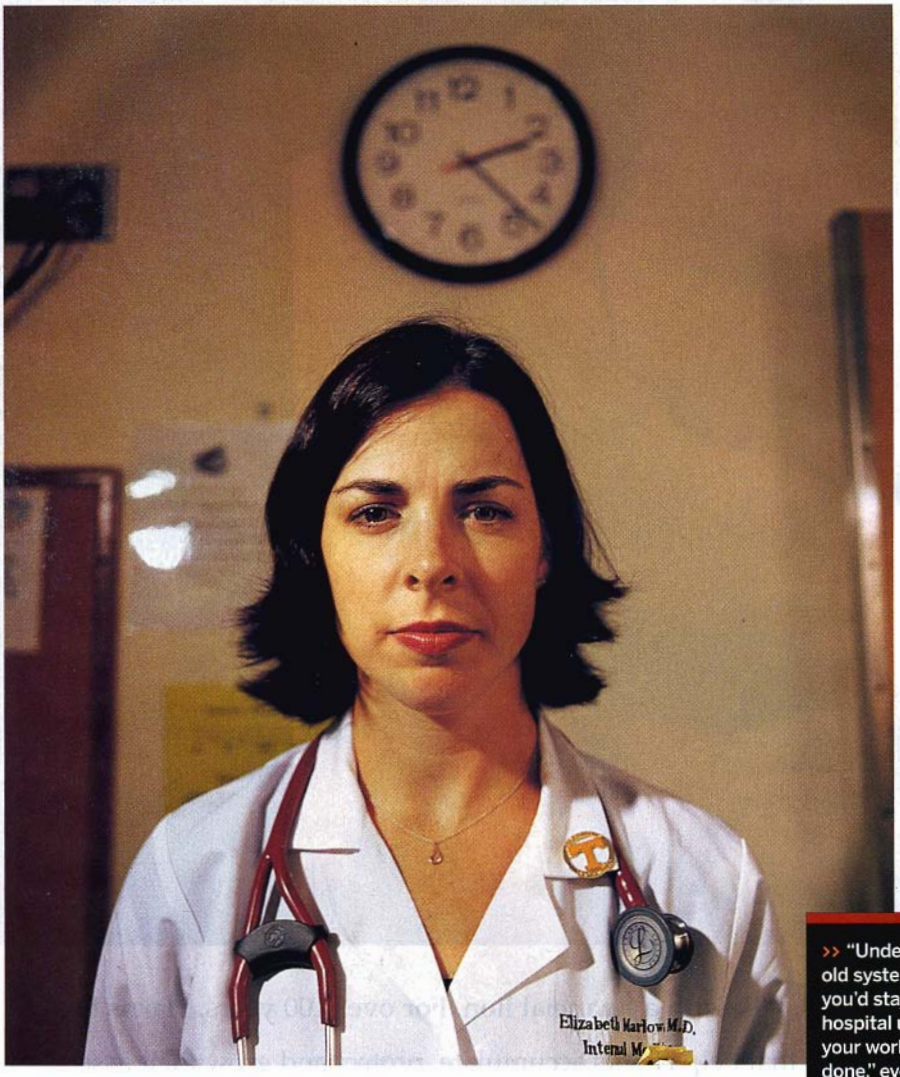
Doctors with Borders

Until recently, there were no limits on the number of hours medical residents worked at hospitals while learning to be full-fledged doctors. Rules now hold them to 80 hours a week. They have more time for rest, but are they learning less?



>> "Under the old system, you'd stay in the hospital until all your work was done," even if it meant working a 36-hour shift, says resident Beth Marlow (above).

IT HAD BEEN a grueling shift for Sook Im Hong, a young doctor at Rush-Presbyterian-St. Luke's Medical Center. By the time she left the hospital on a July night in 1997, she had worked virtually nonstop for 36 hours. She had spent the previous day ordering tests and adjusting treatments, admitting new patients and taking their histories, working with the drive and adrenaline that typically sustain hospital interns (residents in their first year out of medical school). During the night, she had taken on the care of other interns' patients as well, because she was on call. The sun rose while she toiled under fluorescent lights, and at 8 a.m., after nearly 24 hours on the job, she went on rounds with her teachers and colleagues to discuss in detail the condition of each patient. Then she wrote charts, attended a noon conference, and continued to care for her patients. One woman, in particular, required special attention. Struggling with end-stage cancer, she needed oxygen, pain medication, and possibly a move to intensive care. Until the patient stabilized, Hong would not leave.

A little after 9 p.m., Hong finally got into her car and headed toward home in the western suburbs. Battling the fatigue of her on-call shift, a marathon she performed twice a week, she approached a construction site on the highway. Traffic thickened, slowed, and stalled. Ahead of her, taillights pulsated in a mesmerizing pattern of red dots. Staring into their glow, she became, as she later recalled, "kind of very, very sleepy . . . very sleepy."

With red dots dancing before her eyes, she fell asleep. Her Honda Civic crashed into the car in front of her. The impact flung her car sideways, causing it to collide with a car in the next lane. Metal crushed metal as that car hit the one in front of it, and the Honda bounced back to hit the first car again. Hong was badly bruised but would be OK. Tragically, though, a young woman named Heather Brewster sustained brain injuries that left her physically and mentally disabled. On the threshold of a career devoted to curing illness, a young doctor had been involved in a devastating injury.

The resulting lawsuit could make history. Illinois courts will be the first in the country to decide whether a hospital should pay for harm caused by off-duty residents who have been required to work "excessive hours"—a term that judges and juries would have to interpret case by case. (At press time, the Illinois Appellate Court had heard arguments in the case but had not yet come to a decision.) The parties to this tragedy are local, but it raises issues that challenge the premises of medical education from coast to coast.

AFTER FINISHING MEDICAL SCHOOL, freshly minted M.D.'s spend from three to seven years (depending on their level of specialization) as "residents" at teaching

hospitals, where they take care of patients under the supervision of experienced attending physicians. Until two years ago, residents worked as many as 120 hours a week, leaving only 48 hours to accomplish everything else in their lives. (Even someone sleeping the entire 48 hours, a practical impossibility, would have averaged an inadequate 6.9 hours of sleep a night.) Every third or fourth night, residents were scheduled to be on call in the hospital for 36 hours, instantly available to treat trauma victims arriving by ambulance and sick babies recovering from surgery. They might steal a nap in the on-call room, a cell furnished with bunk beds and an explosive telephone, but they seldom slept adequately, according to research into residents' sleep patterns.

Quentin Young, a venerable Chicago physician and social activist, began his residency at Cook County Hospital in 1947 and later became director of medicine there. "As an intern," he says, "I got all the milk I could drink, a place to sleep, and zero dollars a month." Now in his 80s and still seeing patients at a Hyde Park clinic, Young strongly supports limits on the number of hours residents work. "A traditional residency is an old-fashioned apprenticeship, very grueling," he says. "At a certain point of sleeplessness, a resident's judgment can go bad. Then he gets hysterical. There may be rage reactions. I've seen it all."

Doctors, like anyone else, are more likely to crash vehicles and make mistakes when they work around the clock. Yet while truck drivers and airline pilots have their work hours limited by federal regulation, doctors do not. New York is the only state with a law that limits the work time of residents. The law was passed because of public pressure resulting from the widely reported case of Libby Zion, who died in 1984 from a drug interaction attributed to the medical error of an exhausted resident.

It took almost 20 years after Libby Zion's death for limits on hours to reach residents in the rest of the country. The growing weight of scientific evidence about the dangers of sleep deprivation, coupled with a petition filed in 2001 by several groups—Public Citizen, the American Medical Student Association, and the Committee of Interns and Residents—finally prompted the industry in 2003 to adopt a set of work-hour limits. The current approach is essentially one of self-regulation, given that the enforcing agency, the Chicago-based non-

REPORTER

profit Accreditation Council for Graduate Medical Education, is made up of doctor, hospital, and university representatives. The new rules provide that residents may not work more than 80 hours a week, averaged over four weeks, or more than 30 hours consecutively. They must be allowed ten hours off between work periods and a full day off once a week.

Beth Marlow, 29, started her residency at the University of Chicago Hospitals before the rules took effect. "Under the old system," she says, "you'd stay in the hospital until all your work was done. If you were there until 7 p.m., you were there until 7 p.m., and it could be 36 hours. Occasionally, I did that. It wasn't standard, but it certainly wasn't something that was frowned upon. The intern year is the most intense, so you internalize it and keep going. You don't question it. You pay your dues."

While there were sensible reasons for reducing residents' work hours, the medical community is still grappling with the fallout from that change. For starters, the reduction in hours has affected the dynamic between teacher and student, creating divisions between doctors trained under the old system and their young colleagues weaned on the new. But beyond the generational tension looms a debate about the wisdom of the new approach. While proponents applaud the more humane hours and the reduced likelihood of mistakes due to fatigue, critics worry that something vital is being lost—that doctors starting out today are more inclined to watch the clock instead of their patients, less likely to develop a full sense of responsibility, and ultimately less effective at treating the ill.

THAT DOCTORS ARE SOME OF THE smartest, most dedicated people in our society is beyond question. So one might ask why it has taken physicians—who have studied the effects of sleep deprivation on the human brain—so long to heal themselves when it came to protecting residents (and patients) from the risks of practicing medicine without sufficient sleep. One reason is simple economics. The typical resident at a Chicago hospital earns $40,000 to $45,000 a year—or roughly $10 to $11 an hour, assuming an 80-hour workweek. "Residents are incredibly cheap labor," says Chris McCoy, legislative affairs director of the American Medical Student Association. "Replacing them with board-certified physicians costs $50 to $75 an hour, so

REPORTER

even if they are slow and inefficient, they are much cheaper than 'real' doctors on a per-hour basis." Besides, they occupy a special niche in the medical economy. Medicare pays most of their salaries, and hospitals do not bill patients for the services of residents.

Perhaps a more important reason is that, in the past, the long hours of servitude may have produced better doctors. While forswearing any existence outside the hospital may have taken a toll on residents' personal lives, the payoff—by some accounts—was in heightened competence and capability. Long hours enabled residents to turn years of book learning into the real-world knowledge, skills, and stamina they needed to excel at their jobs. "I loved my residency," says David Frechette, a 60-year-old emergency room doctor. "I missed three years of life as a person, but I had three great years as a doctor."

A final reason for the resistance to change may lie in the culture of medicine itself—in some sense, to survive the traditional residency was to prove oneself a strong, dedicated, and superior being. By working inhumanely long hours, a young doctor qualified for full admission into the guild of medicine. Cutting hours has eliminated this rite of passage. Today, doctors who trained the old way are teaching residents who cannot work more than 80 hours a week. Some of the older doctors are having a hard time adjusting to rules that dilute the experience and, coincidentally, give residents far more personal time than their teachers got.

"I think it's human nature to say you served in World War II, so you're different from anyone who didn't," says Young. "It's a macho thing."

Ingrid Philibert directs field activities for the Accreditation Council, which enforces the rules through hospital site evaluations. She sees a rift between generations of doctors. "There may be a sense of envy," she says. "Maybe older faculty members didn't spend much time with their children, didn't do so well socially, and now they're on their third marriage. They see young people having it both ways, but they were told they could not have it both ways.

"The disconnect of the younger generation is that they do not want to be available 24/7. But they expect the same rewards of salary and social admiration as their older colleagues, who did devote their lives to medicine. At some point, these expecta-

REPORTER

tions are going to run into each other in an uncomfortable way."

THE EXPECTATION THAT DOCTORS make a quasi-monastic commitment to medicine dies hardest among surgeons. A story is told about a surgical resident who had to work 24 hours straight, every other day.

"How can you stand it?" asked a friend.

"It's terrible," said the surgeon. "I miss half the cases!"

I thought this was a joke until I met Michael Ujiki, a personable man of 36 whose Japanese heritage is reflected in his intelligent face. He began his general surgery residency at Northwestern Memorial Hospital in 2000, before the rules changed,

> "New residents have a different attitude. They are very serious about getting home, whereas in the past, no one left until their work was done."

so he worked 110 to 120 hours a week. He then spent two years doing research on pancreatic cancer. Now back at the hospital to finish his five-year residency, he must work within the time constraints of the new order. "I don't think even 110 hours a week for five years is enough for everything I want to learn," he says. "The best doctors are the ones who have seen the most. You see less when you're working 30 hours less a week."

There is no simple solution to the math problem Ujiki poses. Hospitals and residents are scrambling to accomplish the same amount of medical education and care today as they did when residents worked 20 to 25 percent longer. None of Chicago's teaching hospitals has added another year to the residency, although some are considering it. They may want to hire more residents to fill the time gaps, but they can't. The Accreditation Council requires programs to balance ratios between teachers, students, and patients to optimize medical education. Some hospitals hire nurse practitioners and physicians' assistants to fill the breach, while others rely on a staff of "hospitalists," full-time doctors who work exclusively with patients in hospitals, and "intensivists," who concentrate on the technology of intensive care.

"All changes are disruptive, but this is not necessarily a bad change," says Mark Neaman, president of Evanston Northwestern Healthcare. "Residents used to provide a lot of night coverage and be on call all the time, and with the reduction in work hours they just don't do that as much anymore. Using intensivists and hospitalists, we have more consistent coverage, because these people are there all the time. It might actually be a little better than using residents, who rotate in and out."

Meanwhile, residents like Ujiki struggle to absorb the knowledge they will need. "I may have to stop operating after 30 hours," he says, "but I can still stay and watch. That's my free time. There are easy procedures that take 30 minutes, but there are difficult ones, with abnormal anatomy, that may be one in 100. I want to be there for the difficult ones while I'm a resident, so I can do them with a teacher standing next to me. I would rather do 100 procedures now, before I go out on my own, than leave the hospital six hours earlier."

In addition to practicing surgical procedures, Ujiki wants time to see his patients conscious, both before and after surgery, so he can learn about the full spectrum of disease and treatment. Usually he manages to stay conscious himself, but there was the time he fell asleep at a stop sign and, he says, "tapped" the car in front of him. (In an informal study of pediatric residents, roughly half said they had fallen asleep at the wheel while driving or stopped in traffic after being on call, according to an article in the *Journal of Sleep Research*.) And then there was the time he fell asleep at the table during his fiancée's birthday dinner.

Residencies are notoriously hard on personal relationships, which is one of the reasons work hours were reduced. Ujiki is skeptical about the value of the tradeoff. "New residents have a different attitude," he says. "They are very serious about getting home, whereas in the past, no one left until their work was done. If that meant your wife or boyfriend expected you for dinner at eight and you didn't show up until ten, they had to cope. That wasn't great, either, but at least you had time to do what you needed to do."

MANY DOCTORS SAY THE MIDDLE OF the night is the best time to learn. "The most valuable education a resident gets is during the night," says Donald Zimmerman, head of the endocrinology division at Children's Memorial Hospital. "When a sick person comes in and you are the doctor, there is no one else to make decisions. This person seems really, really sick, and the person in charge of making things OK is you."

As a result of reduced hours, though, residents at Children's Memorial are spread so thin during on-call shifts that they often cover floors of patients they barely know. "I do rounds every day with my residents," says Zimmerman, "but that's only in endocrinology. Tonight, my residents will cover endocrine, cardiology, and infectious disease. They've never heard of those other patients. They've certainly never 'rounded' on them.

"All they get about some of those patients," he continues, "is a little, tiny sign-out summary. How good it is depends on how much the resident in that specialty understood from the discussion during rounds earlier in the day. It's like a game of telephone."

But despite already curtailed hours, some critics argue that the new rules don't go far enough—that allowing residents to work 30 hours straight is still excessive. After 24 hours, according to a paper published in *Nature*, psychomotor impairment is equivalent to a blood-alcohol level of 0.10 percent—substantially higher than the 0.08-percent legal limit for driving in Illinois. Residents who work longer than 24 hours are more than twice as likely to crash their cars on the way home and more than five times as likely to have a near miss in traffic, says a study published in *The New England Journal of Medicine* in January. An alarming number of residents admit to falling asleep at the wheel, while driving or standing in traffic, at some time during their training.

If fatigue is making residents hurt themselves and others outside the hospital, imagine the opportunities for mistakes in medical practice and judgment inside the hospital. Indeed, attentional failures increase significantly when residents are fatigued, according to a study published last October in *The New England Journal of Medicine*. If they work through the night during an 85-hour workweek, they double the risk that such failures can lead them to misdiagnose a patient, botch a procedure, or prescribe the wrong medicine.

To reduce the possibility of error caused by fatigue, the Accreditation Council rules say that residents cannot take on new patients in the last six hours of a 30-hour

REPORTER

shift. (Instead, those hours may be devoted to education, administrative chores, and the transfer of patients to the next team of doctors.) Programs that break the rules risk losing their accreditation, and residents who graduate from unaccredited programs cannot become board-certified physicians. The Accreditation Council polices hospitals by visiting sites and issuing citations, though it declines to identify particular program violations.

As teaching hospitals strive to meet the work-hour requirements, they go about it in different ways with, apparently, little discussion outside their own walls. Strategies vary from scheduling 12-hour shifts in the general surgery department at Northwestern to setting a complex array of on-call and short-call shifts at the University of Chicago's Department of Internal Medicine. Doctors at Children's use a rotational system of shifts by floor. Some hospitals use night floats, meaning residents or fellows who work the night shift exclusively for some period of time.

However effective the medical industry has been at policing itself, the current rules offer no whistleblower protection, impose no fines, and continue to allow residents to work with patients for more than 24 hours straight, says Chris McCoy of the American Medical Student Association. The group, which represents 60,000 medical students, continues to work for federal legislation that would give its members greater protection. Bills in Congress sponsored by Senator Jon Corzine and Representative John Conyers Jr. would empower the secretary of health and human services to limit work hours, protect residents who complained about their programs, and impose civil fines on programs that broke the rules.

ANY FURTHER EROSION OF RESIdents' hours would put an even heavier burden on attending physicians, who have taken more responsibility for patients' care as residents have cut back, according to the Accreditation Council. While this may be good for patients in the short term, it diminishes the decision-making experience that, ultimately, produces capable doctors. Meanwhile, a sense of frustration afflicts attending physicians, who must administer rules that seem counterproductive. "The 80-hour workweek is very well intended," says William Pearce, an attending vascular surgeon at Northwestern Memorial Hospital, "but as a teacher, the hardest thing for me is to tell residents to go home and leave their patients. You just hope it doesn't become ingrained in them, because they should not do that in private practice. Sometimes it's not OK to go home."

Rhonda Stein, who did her residency in pediatrics 16 years ago, worries that today's residents may be developing a shift-work attitude. "I'm afraid we're training a generation of clock watchers," she says. "They are getting used to leaving in the middle of a case, signing off their patients to someone else. When I ask about a patient, the resident may say, 'That's not my patient. I'll have to read the chart.' But it *is* their patient. I know it can be hard to feel a sense of ownership, a real connection to a patient you haven't seen from the beginning, so I'm worried about what's happening to the quality of medical education."

Signing off patients at shift changes is the most difficult problem created by the work-hour rules, according to my conversations with residents and attending physicians at the University of Chicago, Northwestern Memorial Hospital, Children's Memorial, Rush–Presbyterian–St. Luke's, and Advocate Lutheran General. Now that residents have to leave when the clock dictates, they often sign over patients at critical or inconclusive stages of care. It is difficult for them to convey the essence of a patient's condition in the oral and written form of a sign-off.

As a new team of residents starts a shift, it may alleviate the problem somewhat if the old crew escorts them to meet patients. But according to Marshall Sparberg, an attending physician at Northwestern Memorial, a patient admitted to the hospital may see four different teams of residents during the first 24 hours. From the patient's point of view, such redundancy is invasive and bewildering. From the resident's perspective, it's an inefficient use of educational time.

"If I were a patient," says Ujiki, "I would rather have a tired doctor who knows me well than a wide-awake doctor who got a three-minute summary from another resident."

MEANWHILE, THE APPEALS COURT IS deciding whether a hospital can be held responsible in a case like *Brewster v. Hong et al.* The accident happened long before the Accreditation Council adopted its work-hour rules, but the rules did not make the case—or the issue—go away. The question remains whether the hospital made Hong work "excessive hours" knowing this would cause fatigue. That issue can arise whether residents are allowed to work 80 hours a week, as now prescribed, or an unlimited number, as was the case when Hong fell asleep at the wheel.

"This is something for a legislature to decide," says George F. Galland Jr., the lawyer representing Rush-Presbyterian in the case. "If Illinois law leaves this to the courts, then 'excessive hours' means whatever a group of jurors thinks it means."

In an unusual twist, the adversaries in the case—the Brewsters and Hong—are united in wanting the hospital to help pay damages to Heather Brewster. Kevin Conway, the Brewsters' lawyer, argues that "the defendant hospital caused the fatigue that caused the defendant doctor to fall asleep at the wheel and injure Heather Brewster."

The Brewsters have refused to settle with Hong, who offered to provide free medical services to Heather Brewster for life. Conway, who made millions of dollars in asbestos litigation and is immediate past president of the Illinois Trial Lawyers Association, says he prefers to go to trial. "I need [Hong] as a defendant," he says, "so I can cross-examine her about the hours she worked and the hospital's knowledge of fatigue."

A large judgment could cripple the hospital, says Galland. "Teaching hospitals are always close to losing money on their operations. Rush is now self-insured for about $20 million, which means if it were found liable for a huge judgment, it would have to pay that much out of its own operating funds. And what's striking about this case is how few there are like it. Residents are a radically responsible group of people, among the least likely to hurt people when they are tired. This is not the time or the format to impose a new liability on teaching hospitals because of a few situations that are, undeniably, tragic."

Meanwhile, one relatively simple solution to the problem of weary drivers lurks amid all the complexity. For years, taverns have been sending their inebriated patrons home in taxis—improving public safety and reducing their own liability. Yet few hospitals have extended the same courtesy to tired residents. One local exception is the University of Chicago Hospitals, where a former internal medicine resident, an anonymous donor, has quietly paid for cabs to take residents safely home at the end of their long shifts and bring them back the next day. ■