



# Hospital Employee Health®

THE PRACTICAL GUIDE TO KEEPING HEALTH CARE WORKERS HEALTHY

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## Needlesticks, sharps injuries dropping but safety device push must continue

*'Until you eliminate the sharp completely, you still have a risk'*

**R**educing sharps injuries is one of the great success stories of occupational health and infection prevention.

With widespread adoption of safer sharps in hospitals, needlesticks declined by more than half for some of the most hazardous devices. Safety has become the norm in phlebotomy. Needle devices are placed in sharps containers instead of being left on bed linens or carts, where someone else may be stuck.

This month marks the 10th anniversary of the Needlestick Safety and Prevention Act, which is credited with changing the safety paradigm. While many challenges remain to protect health care workers, safety experts are pausing to acknowledge the progress that's been made. They also are touting changes in device design that evolved from simplistic needle shields to passive devices that don't require additional steps to activate safety features.

"If we look back 25 years, before we were so sensitized to the risk of bloodborne pathogen exposure, we can see that all the strategies we've

## Sharps safety comes of age

**I**n this first part of a two-part series, *HEH* recounts the dramatic shift in hospital purchasing of safety devices that resulted in a reduction in sharps injuries. The next phase of sharps reduction may depend on yet another shift — from earlier devices to newer technologies that require little or no extra effort to activate. The story of Karen Daley illustrates why sharps safety is so important. Daley, PhD, MPH, RN, FAAN, now president of the American Nurses Association, acquired hepatitis C and HIV infection from a needlestick. Next month, *HEH* will explore remaining gaps in sharps safety, including challenges in the OR and home health.



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put into place have had a huge impact," says Janine Jagger, PhD, director of the International Healthcare Worker Safety Center at the University of Virginia in Charlottesville and a pioneer in sharps safety.

Market data of medical device sales illustrate that U.S. hospitals have shifted significantly in their purchases. In 2002, less than half (46%) of core hypodermic needles had safety features, according to Global Healthcare Exchange, a Lou-

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isville, CO-based collaborative of manufacturers, distributors, hospitals and group purchasing organizations. Today, 95% of core hypodermic needles purchased by acute care hospitals are safety-engineered.

A similar pattern occurred with blood collection needles. More than one-third (38.6%) of blood collection needles in acute care hospitals were conventional devices in 2002, but today, 94% are safety devices. (See chart on p. 123.)

In fact, Becton, Dickinson and Company of Franklin Lakes, NJ, the world's largest manufacturer of needles and syringes, discontinued sales of conventional blood collection needles in the U.S. market in 2009. The company said it plans to discontinue conventional blood collection sets in 2011. Conventional blood collection wingsets represent less than 1% of wingsets sold by BD in the U.S. market, according to Mike Borlet, senior director of U.S. marketing for BD Diagnostics — Preanalytical Systems.

#### Risk of transmission drops

Advances in vaccination, rapid testing, and post-exposure prophylaxis also have greatly reduced risk for health care workers.

In 1983, the year the hepatitis B vaccine became available, 10,721 health care workers acquired hepatitis B. By 1999, seven years after the U.S. Occupational Safety and Health Administration required health care employers to offer hepatitis B vaccine, the number had dropped to 384.

Vaccination, though widespread, is not universally accepted. A study of data from 2002-2003 found that 81% of nurses and physicians but only 71% of phlebotomists and nurses' aides received the hepatitis B vaccine.<sup>1</sup>

"We've also made very significant progress in reducing health care workers' risk from HIV," says Jagger. HIV patients are often on medications that lower their viral load, which also lowers the risk of bloodborne transmission, and they receive more care outside the hospital setting.

"We've come a long way and we've made significant progress," says Gina Pugliese, RN, MS, vice president of the Premier Safety Institute, part of the Charlotte, NC-based Premier Inc. healthcare alliance.

Of course, needlesticks continue to occur — and now a majority of them are with safety-engineered devices. "Until you eliminate the sharp completely, you still have a risk of injury," says Pugliese.

## ADOPTION OF SHARPS SAFETY DEVICES

	2010		2009		2008		2007	
	Conven.	Safety	Conven.	Safety	Conven.	Safety	Conven.	Safety
<b>Peripheral IV Catheters</b>								
Acute Care	3	97	3	97	3	97	3	97
Alternate Site	11	89	12	88	15	85	17	83
<b>Core Hypodermic</b>								
Acute Care	5	95	6	94	12	88	12	88
Alternate Site	52	48	52	48	53	47	53	47
<b>Blood Collection Sets</b>								
Acute Care	0.4	99.6	0.9	99.1	2.7	97.3	2.7	97.3
Alternate Site	19.8	80.2	23.2	76.8	27	73	28.4	71.6
<b>Blood Collection Needles</b>								
Acute Care	5.7	94.3	15	85	19.8	80.2	20.9	79.1
Alternate Site	21	79	32	68	31	69	33	67
	2006		2005		2004		2003	
	Conven.	Safety	Conven.	Safety	Conven.	Safety	Conven.	Safety
<b>Peripheral IV Catheters</b>								
Acute Care	4	96	5	95	6	94	8	92
Alternate Site	17	83	20	80	24	76	29	71
<b>Core Hypodermic</b>								
Acute Care	16	84	20	80	25	76	28	62
Alternate Site	54	46	57	43	59	41	61	39
<b>Blood Collection Sets</b>								
Acute Care	1.3	98.7	1.9	98.9	4.2	95.8	6.9	93.1
Alternate Site	29.6	70.4	33	67	33.8	66.2	40.5	59.5
<b>Blood Collection Needles</b>								
Acute Care	22	78	23.4	76.6	26.3	73.4	31.5	68.5
Alternate Site	37	63	38	62	40	60	43	57
	Conn							

Source: GHX: Global Healthcare Exchange, a provider of medical device sales data from hospitals and distributors.

Chart represents distributor sales data percentages of conventional versus safety devices in the U.S. market. For example, the U.S. market for blood collection sets in acute care has almost completely converted to safety engineered devices. Chart provided by Becton, Dickinson and Co.

### Nurses still at greatest risk

To evaluate needle safety, it's important to look at both the big picture and the individual event, safety experts say.

Surveillance data reveal the areas of progress as well as gaps. For example, in Massachusetts, where state law requires all hospitals to report needlestick data each year, the rate per 100 beds has declined from 19.7 in 2002 to 17.2 in 2008, a reduction of 13%. Nurses remained at greatest risk of needlesticks, despite overall reductions

(41% of needlesticks in 2002 compared to 38% of needlesticks in 2008).<sup>2</sup>

Sharps injuries vary greatly both within hospitals and from one hospital to another. Operating rooms are the riskiest location, accounting for 38% of needlesticks, according to the Massachusetts data. Large teaching hospitals experience the most needlesticks, and about half (47%) of the sharps injuries to physicians involve medical residents or medical students.

The EPINet system, a voluntary surveillance program with 29 participating hospitals, had simi-

lar findings. The overall rate of needlesticks in 2007 was 28 per 100 occupied beds, with greater rates in teaching hospitals (33 per 100 occupied beds) than non-teaching hospitals (16 per 100 occupied beds). Nurses were stuck in 34% of the reported injuries, and medical residents and medical students were more likely to be stuck than other physicians. EPINet is coordinated by the International Healthcare Worker Safety Center.<sup>3</sup>

While needlesticks have declined, surveillance shows where more work is needed to protect health care workers from bloodborne pathogens. But arguably, the most important data for any hospital comes from the facility's own sharps injury log, safety experts say.

"People need to focus their energies in looking at their own experiences in their own facilities, doing an analysis of why these injuries are happening," says Pugliese. "Even one injury can give you information. That's really where prevention is going to happen."

Employee health professionals should not feel discouraged when they see a higher proportion of injuries occurring with safety devices, says Jagger. That reflects the overall shift to safety devices. However, as safety technology evolves, it's important to evaluate whether your hospital is using the best possible device, she says.

"When you look at the big picture, we should recognize this huge public health success," says Jagger. "Have we implemented as many safety devices as we can? What do we know about the most effective designs of safety devices?"

## Better sharps, fewer injuries

A case study at Good Samaritan Hospital Medical Center in West Islip, NY, illustrates how safety design can impact injury risk. When the hospital investigated why phlebotomists continued to be injured with safety-engineered winged steel needles, a pattern emerged of injuries in which the safety feature had not been activated.

The safety mechanism typically required two-handed activation, which was especially difficult when the phlebotomist was also tending to the patient during the withdrawal of the needle, the hospital reported in a 2009 Joint Commission journal. "If two hands are used to activate the safety feature, this series of events would best be accomplished with three hands rather than two," commented Mary Hotaling, MS, MT(ASCP), DLM, a laboratory safety officer.<sup>4</sup>

The hospital evaluated blunting and retractable devices and ultimately chose a retractable device, even though it was about a third more expensive. The retractable device led to an 88% reduction in needlesticks, Hotaling reported.

That experience was actually reflected in a recent French study, which compared the effectiveness of different types of safety devices. An analysis of 435 sharps injuries at 61 hospitals in France found that passive devices — which are activated in use without additional steps by the health care worker — were involved in the fewest injuries. Self-blunting needles would be one type of passive device.

"Semi-automatic" devices, in which the user must apply extra pressure to activate the safety mechanism — such as some retractable syringes — were associated with the next fewest injuries. Those with a "toppling shield" that requires one-handed activation to cover the needle were more effective than sliding shields, which often require two-handed action and were the least effective, the authors said.<sup>5</sup>

While we celebrate the advances in sharps safety, it's important to continue to work for further improvement, safety experts say. "It's a work in progress. We can't let our guard down," says Pugliese.

Hospitals also should realize that they are setting the standard for safer devices and techniques around the world, says Jagger, who recently was tapped by the European Union to provide input on the U.S. experience on sharps safety legislation. She also has worked to advance sharps safety in Africa, Asia and South America.

"We in the United States have a huge global impact. What we do here is very often looked at as state of the art in other places of the world," she says.

As we develop and introduce better technologies, we also are raising the bar for safety everywhere, she says. "It's very important that we use our influence strategically and wisely to bring better conditions to health care workers around the world," she says.

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## The needlestick that changed her life

*ANA pres recalls injury that led to HIV, HCV*

**K**aren Daley, PhD, MPH, RN, FAAN, remembers the stick as if it happened in slow-motion, the details still clear to her 12 years later. She had helped a co-worker draw blood from a patient in the emergency department. She turned to reach behind her for the sharps container. Mounted high on the wall, it was overfilled, but she couldn't see it well because it was above eye level.

As she released the device, she felt a deep puncture through the index finger of her gloved hand. Someone else's needle had stuck her. Source patient unknown.

The odds, seemingly, were in Daley's favor. What's to say that source patient had a bloodborne disease? Even if he or she did, the rate of conversion for hepatitis C is estimated at just 5 in 1,000 (.5%) and at 3 in 1,000 (.3%) for HIV.

At first, she was inclined to just rinse off her finger and ignore the injury. "I wanted to just forget about it and go home," she recalls.

She reported to urgent care for evaluation because her co-worker urged her to do so. She declined the post-exposure prophylaxis for HIV because she was aware of the toxic nature of the side effects of the anti-viral medicines.

Even when she began to have symptoms — weight loss, nausea, fatigue, abdominal pain — she didn't connect them to the needlestick. After all, she was suffering from emotional stress because of the recent death of her brother.

But Karen Daley, now president of the American Nurses Association in Silver Spring, MD, was

doubly unlucky. She became infected with both hepatitis C and HIV from that needlestick. It was a moment that altered her life — and made her a vocal advocate for sharps safety.

"When my needlestick occurred, few employers were making safety devices available to workers. Only 15% of employers provided any type of sharps safety device," says Daley.

### Laws spurred sharps safety

California became the first state to mandate safety-engineered sharps devices in 1998. In 1999, when the National Institute for Occupational Safety and Health issued an alert to hospitals regarding sharps injuries, an estimated 600,000 to 800,000 health care workers were being stuck every year.

Yet hospitals were still arguing that new safety devices were too expensive. "You hope employers and workers will do the right thing for the right reason. That's not always the case and it wasn't the case here," says Daley.

Daley traveled the country, speaking out about her needlestick and its dire consequences — and the simple device that could have saved her health. She testified before state legislatures and Congress, and helped promote ANA's campaign, "Safe Needles Save Lives."

Other states began requiring the use of safety devices, but the passage of the Needlestick Safety and Prevention Act in 2000 propelled the issue forward with a mandate that employers purchase the safety devices.

Now, when Daley has her blood drawn for regular lab work, she is gratified to see the nurse or phlebotomist using safety equipment. "Nurses who practice now as recent grads don't know there was a time when we didn't have access to these devices. It's just the norm," she says.

Maintaining enforcement is critical, she says. "I want every nurse in the country and every employer to realize what their obligation is under this law, and I want to see them comply with that," she says.

### Moving forward after stick

The day that Daley learned she was both HCV and HIV positive was her last day of work as a practicing nurse. Emotionally, the news was devastating. "I was dealing with a life-threatening illness," she says.

Physically, she was in bad shape. She developed acute hepatitis and she had a high HIV viral load. She went on a year-long therapy for hepatitis C and was able to clear the infection. She also took anti-viral drugs for HIV, which was a struggle.

"I had a difficult couple of years trying to get on a regimen that was tolerable for me," she says. "At one point, I had to stop the entire treatment. I couldn't eat. The fatigue was so excessive."

She tried about four different drug protocols until finding one she could maintain. She has been on the same drug regimen for seven years.

As ANA president, Daley is committed to working on some of the remaining gaps in sharps safety — the lack of access to safety devices in the OR, the failure of some employers to include frontline nurses in device selection (as required), the lack of availability of safety devices in some categories.

Most of all, Daley wants to promote a culture of safety that compels workers to report their injuries and that encourages timely post-exposure prophylaxis.

"Where there are opportunities for us to make the workplace a healthier, better place, we have an ethical obligation to do so," she says. "We've still got some work to do." ■

## CDC: Monitor HCWs for flu symptoms

*Guidance stresses masks, vaccine*

During last year's H1N1 influenza pandemic, health care workers inadvertently transmitted flu to their co-workers, in some cases triggering a hospital-based outbreak. That and other information about H1N1 transmission helped shape new guidelines from the Centers for Disease Control and Prevention that rely on vaccination, respiratory hygiene, and monitoring of ill employees by employee health professionals.

"When it's spreading in the community you have to be vigilant for symptoms," says John Jernigan, MD, MS, medical epidemiologist with CDC's Division of Healthcare Quality Promotion and an author of the guidelines. "More efficient recognition and handling of the ill health care workers can make a big difference in transmission."

The guidance, *Prevention Strategies for Seasonal Influenza in Healthcare Settings*, promotes a variety of measures to prevent transmission of

influenza. As expected, it treats H1N1 as a seasonal rather than a pandemic strain, and it advises the use of droplet and contact precautions. Masks are sufficient protection, except when performing aerosol-generating procedures, CDC says.

"To effectively prevent transmission, it's going to take a multifaceted approach," says Jernigan.

The most important preventive measure is annual influenza vaccination, according to the guidance. "Achieving high influenza vaccination rates of HCP and patients is a critical step in preventing healthcare transmission of influenza from health care personnel to patients and from patients to health care personnel," it states.

CDC did not address the issue of mandatory influenza vaccination of health care workers. Infection control organizations such as the Society for Healthcare Epidemiology of America (SHEA) recently released position papers favoring mandatory vaccination. The Advisory Committee on Immunization Practices (ACIP), an expert panel that advises CDC, is considering the issue and will report at its June meeting, Jernigan noted. The National Vaccine Advisory Committee is also considering whether to recommend mandatory vaccination of health care workers.

CDC offers some guidance directed at employee health professionals. According to the guidance, they should establish procedures for:

- tracking absences;
- reviewing job tasks and ensuring that personnel known to be at higher risk for exposure to those with suspected or confirmed influenza are given priority for vaccination;
- ensuring that employees have prompt access, including via telephone to medical consultation and, if necessary, early treatment;
- and promptly identifying individuals with possible influenza.

"Health care personnel should self-assess for symptoms of febrile respiratory illness," CDC stated. "In most cases, decisions about work restrictions and assignments for personnel with respiratory illness should be guided by clinical signs and symptoms rather than by laboratory testing for influenza because laboratory testing may result in delays in diagnosis, false negative test results, or both."

CDC acknowledges that airborne transmission may occur with influenza, but notes that "the relative contribution of the different modes of influenza transmission is unclear." While previous H1N1 guidance advised health care workers to wear N95 respirators when caring for patients

## What HCWs need to know about flu

Training and education of health care workers is an important aspect of preventing transmission of flu. The Centers for Disease Control and Prevention offers this specific recommendation:

Healthcare administrators should ensure that all HCP receive job- or task-specific education and training on preventing transmission of infectious agents, including influenza, associated with healthcare during orientation to the healthcare setting. This information should be updated periodically during ongoing education and training programs.

Competency should be documented initially and repeatedly, as appropriate, for the specific staff positions. A system should be in place to ensure that health care personnel employed by outside employers meet these education and training requirements

with suspected or confirmed influenza, the current guidance recommends donning a mask when entering a patient's room.

"Mask use and hand hygiene do actually reduce the transmission of influenza in health care settings," says Jernigan.

Vaccination and prompt treatment with anti-viral medications are even more important for health care workers at higher risk of complications from influenza — such as pregnant or morbidly obese workers or those with chronic health conditions. CDC does not recommend reassignment, but notes: "Work accommodations to avoid potentially high-risk exposure scenarios, such as performing or assisting with aerosol-generating procedures on patients with suspected or confirmed influenza, may be considered in some settings, particularly for health care personnel with more severe or unstable underlying disease."

[Note: A copy of the influenza guidance is available at [www.cdc.gov/flu/professionals/infection-control/healthcaresettings.htm](http://www.cdc.gov/flu/professionals/infection-control/healthcaresettings.htm).] ■

## OSHA may crack down on sleepless doctors

*Considering petition on long work hours*

The problem of fatigued medical residents has gotten the attention of the U.S. Occupational

through programs offered by the outside employer or by participation in the healthcare facility's program.

Key aspects of influenza and its prevention that should be emphasized to all HCP include:

- Influenza signs, symptoms, complications, and risk factors for complications. HCP should be made aware that, if they have conditions that place them at higher risk of complications, they should inform their healthcare provider immediately if they become ill with an influenza-like illness so they can receive early treatment if indicated.
- Central role of administrative controls such as vaccination, respiratory hygiene and cough etiquette, sick policies, and precautions during aerosol-generating procedures.
- Appropriate use of personal protective equipment including respirator fit testing and fit checks.
- Use of engineering controls and work practices including infection control procedures to reduce exposure. ■

### Safety and Health Administration.

Public Citizen, a consumer and health advocacy group, the Committee of Interns and Residents/SEIU Healthcare, a union that represents resident physicians, and the American Medical Student Association petitioned OSHA to regulate work hours of medical residents and got a surprising, same-day response.

"We are very concerned about medical residents working extremely long hours, and we know of evidence linking sleep deprivation with an increased risk of needle sticks, puncture wounds, lacerations, medical errors and motor vehicle accidents. We will review and consider the petition on this subject submitted by Public Citizen and others," Assistant Secretary of Labor for OSHA David Michaels, PhD, MPH, said in a statement.

"It is clear that long work hours can lead to tragic mistakes, endangering workers, patients and the public. All employers must recognize and prevent workplace hazards. That is the law. Hospitals and medical training programs are not exempt from ensuring that their employees' health and safety are protected," he said.

The petition, which was also signed by some leading physicians in sleep medicine or preventive medicine, asks for a maximum of 16-hour shifts and 80-hour work weeks for all medical residents. It was submitted about two months after the Accreditation Council for Graduate Medical Education [ACGME] released proposed standards that include new limits on duty hours that empha-

# Current and proposed resident work limits

## Current ACGME standard (2003)

- 80-hour work week averaged over four weeks, including in-house call;
- Maximum onsite work shift of 24 hours with up to six additional hours of educational or patient transfer-related activities (a maximum 30-hour shift);
- In-hospital call limited to one night in every three, averaged over four weeks;
- One day in seven off without educational or clinical duties, averaged over four weeks.

## Institute of Medicine Recommendations

- 80-hour work week, averaged over four weeks;
- Maximum shift length of 16 hours. For training to continue with a 30 hour shift, it must provide a mandatory five-hour protected sleep period between 10 p.m. and 8 a.m., with no new patients admitted after 16 hours;
- In-hospital call limited to one night in every three (not averaged over four weeks)
- At least one 24-hour period off per week (no averaging) and at least of one 48-hour period off per month;
- Night work must not exceed four consecutive nights and must be followed by a minimum of 48 continuous hours off, if three or four shifts are worked;
- At least 10 hours off after a regular work shift, 12 hours off after night work, and 14 hours off after

size greater limits on first-year residents.<sup>1</sup> (For a comparison of current and proposed work limits, see box on p. 128.) An ACGME task force drafted the proposed standard after considering oral and written testimony from medical organizations and others.

**At issue:** How long can medical residents work without suffering from fatigue that can increase medical errors, decrease patient safety, and impact the doctors' health and safety? Who should regulate those work hours — the accrediting body that oversees medical education or OSHA?

"[ACGME] is not doing a good job of keeping the residencies compliant with the rules," says Charlie Preston, MD, MPH, a health researcher at Public Citizen and medical resident in the Department of General Preventive Medicine at the Johns Hopkins School of Public Health in Baltimore. "We need a governmental body to regulate, like we do in other industries."

an extended duration (> 24-hour) work shift (and the physician must not return before 6 a.m. the next day).

## ACGME Proposed Standard (2010)

- 80-hour work week, averaged four weeks (weekly work-hour exceptions of up to 88 hours per week);
- Maximum shift length of 16 hours for first-year resident physicians; Maximum 24-hour shifts plus up to four hours for education and patient transfer responsibilities (28 hours) for intermediate- and senior-level resident physicians;
- In-hospital call limited to one night in every three, no averaging;
- One day off per week, averaged over four weeks;
- Night work must not exceed six consecutive nights;
- At least eight hours off between work shifts, with some exceptions.

## OSHA Petition Request:

- 80-hour work week (no averaging);
- Maximum shift length of 16 consecutive hours for all resident physicians and subspecialty resident physicians;
- In-hospital call limited to once every three nights, no averaging;
- At least one 24-hour period of time off of work per week (no averaging) and at least one 48-hour period of time off of work per month (no averaging);
- At least 10 hours off after a day shift, and a minimum of 12 hours off work after a night shift;
- Night work must not exceed four consecutive night shifts, with a minimum of 48 hours off after a sequence of three or four night shifts. ■

However, ACGME asserts that it should be responsible for monitoring resident duty hours as a part of the broader focus on quality medical education. ACGME also plans to implement an annual Patient Safety and Quality Assurance review of every institution that sponsors residency programs.

"ACGME strove to make the new standards evidence-based, and to make them reflect the experience and best practices of the medical profession," ACGME said in a statement. It noted that OSHA had rejected a previous petition in 2002.

## Should feds step in?

Fatigue clearly can lead to worker errors, and in some industries — trucking, airline, nuclear power — the public expects governmental limits on work hours to protect the public. Studies also show that

fatigue can increase medical error rates, motor vehicle crashes, and needlesticks.<sup>2,3</sup>

"If policy is to be based on evidence and not opinion, the federal government is obligated to protect resident physicians and their patients by reducing resident physician work hours," the advocacy groups state in their petition. (The petition is available at [www.wakeupdoctor.org](http://www.wakeupdoctor.org).)

ACGME acknowledged the concerns about fatigue, alertness and error, but noted that the evidence is clearest for first-year residents (interns). The proposed ACGME standard places greater limits on interns than on other medical residents.

The OSHA petitioners oppose that two-tiered system, noting that fatigue is a biological issue. "We would just say that sleeplessness and fatigue applies to everybody," says Preston. "It's possible interns may make more mistakes when they're sleep-deprived than upper-year residents, but it's still unsafe for those groups."

The ACGME task force on duty hours raised the concern that residents wouldn't use their extra hours to sleep and emphasized that the rules must be part of a well-supervised, quality educational program.

"Illness and the need for medical care are unpredictable, and circumstances arise when physicians must overcome fatigue to help patients in need," ACGE task force members said in the *New England Journal of Medicine*. "Even more important is the obligation of resident physicians to realize the effect that activities outside the program have on their alertness when in their roles as learners and providers of care."

The advocacy groups note that past efforts by ACGME resulted in poor compliance — and little improvement. A study of the working hours of 4,015 interns found that 84% worked longer hours than allowed by the ACGME standard.<sup>4</sup>

In its 2009 report, *Resident Duty Hours: Enhancing Sleep, Supervision and Safety*, an Institute of Medicine panel cited gaps in compliance with the ACGME standard that left residents "susceptible to acute and chronic sleep deprivation."<sup>5</sup>

ACGME has acknowledged "the need for enhanced measures to promote compliance," but says annual site visits would ensure "provision of a safe and effective environment for care and learning."

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## Fighting fatigue requires more than caffeine

*Scheduling, sleep breaks lessen fatigue risk*

Medical residents aren't the only hospital employees suffering from fatigue. Night shifts, rotating shifts, long work hours, and sleep disorders can lead to fatigue — and risks for both health care workers and their patients. Hospitals must be proactive and take steps to address the problem of fatigue, says Todd Dawson, Vice President, Circadian Technologies of Stoneham, MA, a consulting firm that specializes in fatigue management.

Too often, nurses, physicians, and other health care professionals believe their sense of dedication can supersede their bodily fatigue, Dawson says. If the tasks are very important, "then I'm not going to fall asleep." The problem is we do fall asleep. Even people driving fall asleep," he notes.

"How much incentive do you need with 40 or 50 passengers on your bus? People's lives are in your hands. But we know people do fall asleep behind the wheel," he says.

Health care workers who are fatigued may lose their focus, especially when performing routine tasks. With more extreme fatigue, they may experience "microsleep," episodes of involuntary sleep. In fact, studies show that working while fatigued can be equivalent to working under the influence of alcohol.

"If there does happen to be a case where fatigue is cited as a problem [related to medical error], organizations can't say 'Oh, we didn't know,'" says Dawson.

Dawson recommends that hospitals provide training to raise awareness about fatigue. Employers also should consider the systemic issues that influence fatigue.

**Schedules:** “The schedule has the strongest influence on an individual’s ability to get good sleep,” he says. “What we like to see is a schedule that provides the right opportunity to get good rest so people have the best opportunity to be alert and be well-rested at work.”

Shift-workers should minimize the number of transitions — day to night or night to day, Dawson says. Extremely fast rotations lead to fatigue. The minimum should be 24 hours between shifts, and ideally employees should have 48 hours from the end of one shift to the beginning of the next, he says.

## Murderer’s row

How many days in a row you work also has an impact on fatigue, he says. Four 12-hour shifts in a row should be the maximum, he says. Even more than six or seven 8-hour shifts can lead to increased fatigue, he says.

Overtime is another common factor in fatigue, as employees take on hours beyond their scheduled shifts and lose the time they needed to recuperate.

**Circadian rhythm:** Alertness is governed, in part, by our biology. Adrenaline kicks in when there’s an emergency. “Your body will start to change to give you that boost of energy and awareness that you need,” Dawson says. But as soon as the tasks return to the routine — reading charts, reading orders — fatigue can set in, depending on your natural body clock.

If you have gotten a good night’s sleep, your alertness will naturally be high in the morning — at around 8 a.m. to 10 a.m. Alertness steadily drops until it reaches a low between noon and 2 p.m. Then the cycle repeats, rising until mid-evening — around 6 or 7 p.m., Dawson says.

Alertness will fall at night, with a steep drop after midnight or 1 a.m., to a low-point at about 5 a.m. (Of course, there are some individual differences — among “night owls” and “larks.”) The night-time drop-off in alertness is good for people who are sleeping — but not so good if you’re trying to work.

Employees and supervisors should be aware of the body’s natural rhythms of alertness and fatigue, Dawson says.

**Caffeine:** Caffeine can be useful to combat the circadian low-point in a worker’s shift — as long

as they don’t drink excessive amounts (four cups of coffee or more), he says. Caffeine will provide alertness for about four to six hours, he says.

“Used properly and timed when you need it, caffeine is a pretty powerful tool that people can use,” he says.

**Sleep:** “The antidote for lack of sleep is sleep,” says Dawson. That sounds rather obvious — but how do you add more sleep to your day? For some night-shift workers, that may involve a short nap during a mid-shift break. People driving home after a night-shift — during that low-point of diminished alertness — may benefit from a brief nap before getting on the road, he says.

“If you can take a 15 or 20 minute nap, that’s going to give you a boost for the next three hours without impacting your ability to sleep later in the day,” he says.

**Exercise and diet:** Regular exercise — at least three times a week for 30 minutes at a time — has an overall benefit on sleep patterns.

“There are several studies showing that people who do exercise on a regular basis sleep longer on average,” Dawson says. “The quality of their sleep is improved. The sleep latency, the time it takes to fall asleep, is improved. Shift workers tend to recover from their shifts quicker. They also adapt to their shifts better.”

Exercise also has some immediate benefits to boost alertness. Night shift workers might want to do some moderate exercise at around midnight or 1 a.m., such as walking, biking on a stationary bike, or stretching, he says.

**Food:** A sugary snack, such as a candy bar or soda, can give a burst of energy. But the energy spurt is short-lived and, unlike caffeine, it is followed by a crash. The best strategy is to “graze” during the night shift, eating small amounts of healthy foods, Dawson says.

The digestive system follows a circadian rhythm of its own, he says. “For most of us, our nighttime stomach rhythm is to basically be shut down. Your ability to eat and digest efficiently is much reduced at night,” he says.

“You will get hungry because you’re using energy,” he says. “You’ll want some energy [from food], but you don’t want it in big blocks of food. Stay away from fatty or greasy foods. They’re more difficult to digest, which is even more of a problem at night.”

**Age:** As the health care workforce ages, how do they cope with shift work? In general, it takes more time to recover from changes in sleep pat-

terns and alterations to the circadian rhythm, Dawson says. But those workers who have been on rotating shifts or the night shift for many years still tend to cope well, he says.

"They're naturally predisposed to handle shift work, or they biologically need less sleep," he says. "They've figured out what works and what doesn't."

For those who are chronically sleep-deprived, napping can help fill in gaps, he advises. It doesn't necessarily benefit workers to have regular night shifts as opposed to rotating shifts that have enough time in between for adequate sleep, he says. After all, on days off, most people revert to a day schedule.

"When we look at rotating shifts versus fixed [night] shifts, we find for the most part it comes down to personal preference," he says. "A review of the literature is fairly inconclusive about which is better." ■

## CNE OBJECTIVES

After reading each issue of Hospital Employee Health, the nurse will be able to do the following:

- identify particular clinical, administrative, or regulatory issues related to the care of hospital employees;
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- cite solutions to the problems faced in the care of hospital employees based on expert guidelines from relevant regulatory bodies, or the independent recommendations of other employee health professionals.

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## CNE QUESTIONS

17. According to sharps injury surveillance data, which group of health care workers sustains the most needlesticks?

- A. Physicians
- B. Nurses
- C. Phlebotomists
- D. Lab workers

18. In updated H1N1 guidance, the CDC emphasized efforts to keep health care workers from coming to work sick because:

- A. sick health care workers are susceptible to influenza.
- B. sick health care workers cannot be vaccinated.
- C. transmission has occurred between health care workers and co-workers.
- D. sick health care workers are not using respiratory hygiene.

19. According to a petition to the U.S. Occupational Safety and Health Administration by advocacy groups, the maximum shift length for medical residents should be:

- A. 12 hours
- B. 16 hours
- C. 18 hours
- D. 24 hours

20. According to **Todd Dawson**, Vice President, Circadian Technologies of Stoneham, MA, a consulting firm that specializes in fatigue management, the low point for alertness in the 24-hour circadian rhythm is at:

- A. 1 a.m.
- B. 3 a.m.
- C. 5 a.m.
- D. 7 a.m.

**Answer Key: 17. B; 18. C; 19. B; 20. C**

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