

LOWDOWN: The New Hampshire Department of Health and Human Services says DHMC's rate of hospital-acquired infections is 36% lower than the U.S. average. Nationwide, such infections lead to an estimated 99,000 deaths and \$30 billion in excess costs each year.



An alarming result (and that's a very good thing)

Amid the bustle of DHMC's orthopaedic unit sits a monitor displaying each patient's vital signs in neat, orderly rows. As a nurse zips by, she hovers for a moment, assesses the colored squares, then bustles off again. If a patient's oxygen level or heart rate should plummet, she knows her beeper will sound and that within seconds she can be at the proper patient's bedside.

"Many people, nationwide, have died because they weren't monitored" continuously, says DHMC's Kenneth Lee. "They could have been rescued." Lee, a clinical manager in biomedical engineering, helped install and test the new monitoring system, Patient SafetyNet, on DHMC's 36-bed orthopaedic unit.

Pagers: The system uses a network of pulse oximeters, which measure heart rate and blood oxygenation through a probe placed on a patient's finger. The devices are linked to the central monitor and to nurses' pagers.

In most hospitals, monitoring

in surgical units involves "sampling of intermittent vital signs and clinical examinations," plus closer surveillance of high-risk patients, wrote Drs. Andreas Taenzer and George Blike of DHMC in *Anesthesiology*. The paper detailed the orthopaedic unit's experience with Patient SafetyNet, which is made by a company called Masimo.

Unit: For 11 months before and 10 months after the system's installation, the unit tracked how many patients had to be transferred to the ICU or treated by special resuscitation teams. The authors also compared results on the orthopaedic unit to those of other units.

They found the system significantly reduced rescues and ICU transfers; they estimate it will save 150 ICU bed-days a year. "It's not a given that every safety investment is cost-effective," says Blike, "but in this case it was. The system paid for itself."

The results were so impressive that the project received this year's Health Devices Achievement Award from the ECRI Institute, a non-profit dedicated to evidence-based patient care. Two addition-

al DHMC surgical units and four medical units have since adopted the system. More are likely to follow, says Jean Avery, senior clinical quality specialist.

But the system's success was not a foregone conclusion. On a busy inpatient unit, where one nurse cares for several patients, it is important that alarms sound only when action needs to be

taken. Otherwise, nurses can become desensitized to alarms, as the authors of the paper found when they tested the Masimo system on another unit. If it's calibrated for high sensitivity, it can generate too many false alarms—such as if a patient changes position and bumps the pulse oximeter. By the time the nurse gets to the patient's bedside, his or her vital signs would have recovered.

Delays: To combat this problem, the team built in two delays: a 15-second delay before the alarm goes off at the bedside, and an additional 15-seconds before the nurse is paged.

Such monitoring "could potentially become the standard of care," Avery believes, since it reduces costs and complications and keeps ICU beds open for patients who really need them.

She had a chance to experience its benefits from a patient's as well as a nurse's perspective. A relative and a friend had surgery at DHMC during the test period. "I felt better knowing that they had that system there watching them at night," says Avery. "It was comforting."

ELIZA C. MACKINTOSH

THEN & NOW

A reminder of the pace of change, and of timeless truths, from the 1980 DMS admissions brochure:

"Although Dartmouth did not admit its first woman medical student until 1960, the percentage of women in DMS classes since 1968 has consistently exceeded the national average. . . . Since 1976, graduating classes have averaged 26% women."



1852

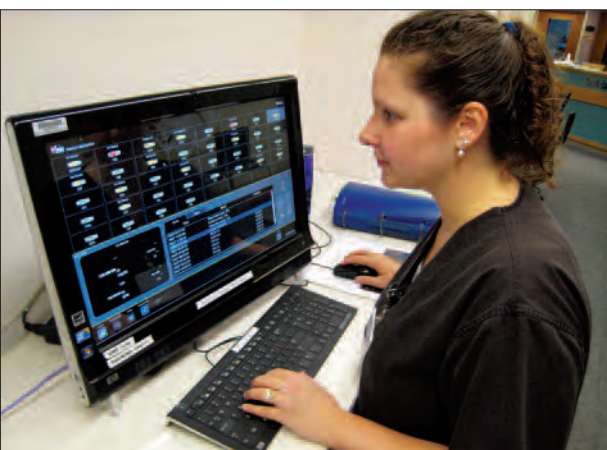
Year DMS denied admission to Emily Blackwell, sister of Dr. Elizabeth Blackwell, the first American woman to earn an M.D.

58%

Percentage of women in DMS's 1987 entering class

49%

Percentage of women in all graduating classes nationwide in 2007



JUNIPER TRAILS

Staff nurse Kimberly Belanger-Demers checks the monitor.