

# Warmth After Surgery Can Save Lives

Mothers everywhere exhort their children, "Bundle up, or you'll catch your death of cold." Apparently the prescription applies in the recovery room, too. A new study shows that keeping people warm after surgery can save lives.

Despite their bright lights, operating rooms are kept at a cool 65° to 70°F. Doctors and nurses do their work sheathed in gowns that retain heat, but patients are naked, apart from paper-thin drapes and perhaps a skimpy blanket. Chill air bathes their organs.

Anesthesia puts the hypothalamus—the brain's thermostat—to sleep, depriving patients of the body's innate safeguards against cold. Patients can no longer shiver to generate warmth, and their blood vessels no longer constrict to retain heat. Their bodies are cooled by the surrounding air.

In effect, warm-blooded people become temporarily cold-blooded, like reptiles, says Steven M. Frank of the Johns Hopkins Medical Institutions in Baltimore.

People aren't designed to be cold-blooded. A drop in body temperature of just 3.5°F induces hypothermia, Frank says. In the operating room, however, hypothermia has little effect. Anesthesia prevents the release of stress hormones known as catecholamines, which constrict veins, raise blood pressure, and tax the heart.

Once the anesthesia wears off, in the chilly recovery room, the hypothalamus awakens. At a body temperature 4°F below normal, it boosts catecholamine concentrations 200 to 700 times, sending the heart into overdrive.

Eight million people at risk of heart problems in the United States undergo

surgery each year. About 50,000 of these patients survive their operation only to die within days of heart attack or other cardiac complications, the most common causes of postoperative deaths.

Frank and his colleagues studied 270 people over age 60 at risk of heart complications. They compared 143 who were covered with thin cotton blankets during and after surgery with 127 whose temperatures were kept normal using blankets with tiny jets that bathe the patient in warm air.

Keeping people warm did not measurably affect the complication rate during surgery. Statistical analysis showed, however, that it reduced by 55 percent the incidence of heart complications within 24 hours after surgery, the researchers say. Just two of the warmed patients suffered angina pain, death of heart tissue, or cardiac arrest—compared to 10 patients who weren't warmed.

"We've shown that prevention of hypothermia is a simple, inexpensive way to reduce the incidence of cardiac deaths," Frank says.

The report appears in the April 9 JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION.

The research runs counter to the long-cherished notion that a small drop in body temperature during and after surgery is either inconsequential or protects the patient by slowing metabolism and reducing the body's demand for blood and oxygen. The report buttresses earlier studies showing that postoperative cold may have tragic consequences.

"We, as a profession, had never really paid attention to the minor 1 or 2 degree drops in temperature that we see during surgery. But small declines we never thought were a problem do have effects we never dreamed of," says Frederick W. Cheney, an anesthesiologist at the University of Washington School of Medicine in Seattle.

Cheney, who wrote an editorial accompanying the report, raised one issue that concerns him. None of the studies has been duplicated by other researchers. If doctors respond to the new report by routinely warming patients, such studies may never be done, depriving doctors of information about other possible effects—even though their new diligence may save lives.

"He's right," Frank observes. Yet Frank argues that the individual studies, taken together, demonstrate conclusively the value of warming patients. "The pieces fit together," he says. — S. Sternberg

## Viruses may leave a weighty legacy

It all started 7 years ago with a chance remark by a Bombay veterinarian.

Discussing some diseased chickens with nutritionist Nikhil V. Dhurandhar, the vet mentioned a puzzling observation. Within a few days of contracting what would prove a lethal virus, his birds began to gain weight. Over a mere 3 weeks, the chickens gained 60 to 75 percent more fat than did chickens that were not infected.

"I became curious," recalls Dhurandhar, now at the University of Wisconsin Medical School in Madison. Dhurandhar started probing whether this fattening infection has a human corollary. This week, he reported startling data suggesting that viral infections may indeed play a role in some human obesity.

The Bombay chickens had been infected with SMAM-1, an avian adenovirus. This virus has not appeared in the United States, so when Dhurandhar arrived in Wisconsin, he began working with AD-36, a related adenovirus.

Last October, at a meeting of the North American Association for the Study of Obesity, he and his Wisconsin colleague Richard L. Atkinson reported finding not only that AD-36 provokes rapid obesity in chickens but that, like SMAM-1, it leaves infected birds with "paradoxically low serum cholesterol and triglycerides." Ordinarily, fat birds, like fat people, develop elevated concentrations of cholesterol and triglycerides in their blood; both are potent risk factors for heart disease.

Because AD-36 can also infect people, inducing coldlike respiratory symptoms and diarrhea, the Wisconsin researchers decided to screen men and women for antibodies to the virus. The volunteers included 45 lean individuals and 154 obese persons, weighing in at about 250 pounds each.

None of the lean men or women had the antibodies, but 15 percent of the obese volunteers did carry these telltale markers of prior infection. What's more, among the obese, only those with antibodies to the adenovirus had cholesterol and triglyceride concentrations well within the normal range. Men, but not women, with the antibodies lost 1.6 times the weight in a reduction program than those without antibodies. Dhurandhar reported the findings this week in New Orleans at Experimental Biology '97, a meeting of seven research societies.

In chickens, AD-36 infection alters metabolism such that, even with the same food and exercise, infected birds gain more weight than uninfected ones. Because obese people suffer discrimination and tend to have a poor self-image, linking their portliness with something besides gluttony or inactivity "can, emotionally, be quite important," Atkinson says.

Establishing whether such a link exists will be difficult, however, requiring prompt culturing of newly infected persons and tracking of their weight. If there is a tie, Atkinson says, there will be tremendous impetus to develop a vaccine.

For now, the Wisconsin researchers have formed a company and applied for federal approval to market a test for the antibody.

— J. Raloff