



DMS nutrition researcher Lisa Sutherland, Ph.D., led an analysis of 200 top movies; 69% had at least one food brand placement, with sweet (26%) and salty (21%) snacks most prevalent.

## Study suggests when to bypass a bypass

**E**ight million Americans suffer from a condition called lower extremity peripheral arterial disease. The sickest of them are crippled by the narrowing of arteries in their legs. Bypass surgery, which uses grafts—vessels from elsewhere in the patient’s body—to reroute blood, can be an effective treatment. But for some patients, postsurgery complications, such as a blocked graft, can lead to pain or even a leg or foot amputation. So surgeons would like to have a way to predict which patients are at highest risk of these unfortunate outcomes.

**Traits:** A recent study offers some guidelines. Led by DMS vascular surgeon Philip Goodney, M.D., the study pinpointed patient traits suggesting that surgery could lead to complications. “We tried to pick out the preoperative patient traits that might help us to predict, on an individual patient basis, what the likelihood of [a blockage or amputation] is,” Goodney says.

Goodney and his colleagues reviewed 2,306 lower extremity bypass procedures performed at 11 hospitals in northern New England, including DHMC, from 2003 through 2007. The study, published in *Annals of Vascular Surgery*, found that in 277 of the cases, the graft became blocked

within one year of the operation. Some of the graft occlusions led to amputation of the patient’s foot or leg. Other patients didn’t suffer blocked grafts but still required an amputation, usually because of complications such as a foot infection or wound. Overall, 143 amputations were performed within a year, most of them—83%—as a result of a clogged graft.

**Proxy:** The researchers identified eight risk factors. For example, patients who experienced occlusion or amputation tended to be less than 50 years old. Goodney believes this relative youth is a proxy for patients who were heavy smokers and had other medical problems.

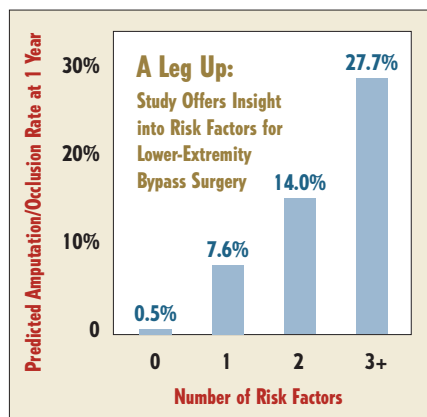
**Patients with several risk factors might consider alternatives.**

Other presurgery risk factors include being unable to walk independently, living in a nursing home, requiring dialysis, having critical limb ischemia (severe artery blockage), needing venovenostomy (a bypass that requires several veins sutured together), and needing surgery with a tarsal target (that is, connecting to very tiny arteries in the foot).

Goodney says patients flagged with several of these traits “might, unfortunately, consider alternatives other than bypass surgery.” Current alternatives include angioplasty, which flattens plaque against artery walls. New therapies, now in clinical trials, seek to grow new blood vessels through genetic manipulation. Ongoing research is examining the effectiveness of these alternatives.

**Awry:** The researchers were surprised by how frequently bypass surgery—the “gold standard” for treating severe arterial disease—could go awry, says Goodney. The finding “will help surgeons choose their patients more effectively [and] allows us to compare risk-adjusted results across surgeons, so that we can find out who’s doing things well, and then study . . . what it is that they do well.”

RICH BARLOW



This graph shows some data from Goodney’s study.

### Of place and race

To better understand the interaction of race and place in cancer care, DMS researchers mined U.S. Census and Medicare data. Urban African Americans have better access to specialized cancer care than urban Caucasians and are 70% more likely to use National Cancer Institute-designated centers, they determined.



But in rural locales, the opposite was true, with African Americans 58% less likely to go to an NCI-designated center. “Efforts to understand and redress racial disparities should take into account interacting demographic and residential influences,” concluded the authors in the *Journal of Rural Health*.

### Paging all nurses

In a study conducted in DHMC’s 36-bed orthopaedic unit, researchers found they could significantly reduce the number of rescues and transfers to the ICU by continually monitoring patients’ blood-oxygen levels. Nurses were automatically notified via pager when patients’ oxygen saturation level dropped or heart rate was too fast or too slow. But, warned the authors in *Anesthesiology*, “a high frequency of alarms will desensitize staff, leading to delayed responses.” So it is necessary to limit “the nuisance alarms generated by self-correcting changes or false readings,” they observed.





A study in the *Journal of the American Medical Association* by Dartmouth economist Douglas Staiger showed that the average hours worked by physicians dropped 7% from 1996 to 2008.

## Study conclusion: Last is far from least

**M**others who breast-feed their last-born child have a reduced risk of ovarian cancer compared to mothers who do not, according to a study led by DMS researchers Linda Titus-Ernstoff, Ph.D., and Judy Rees, M.D., Ph.D.

The link between breast-feeding and the risk of ovarian cancer has long been a subject of debate. Some studies have found that mothers who breast-feed are less likely to get ovarian cancer than those who do not, but other research has contradicted those findings. The lack of clarity makes it difficult for physicians to advise mothers about how breast-feeding may affect their future health. With 20,000 cases of ovarian cancer diagnosed each year in the U.S., it's a matter of concern to many women.

**Tease:** This controversy intrigued Titus-Ernstoff, inspiring her to take a new look at the issue. She hoped to tease apart the factors affecting the risk of ovarian cancer in women who have given birth.

Titus-Ernstoff, Rees, and two collaborators at Brigham and Women's Hospital in Boston examined data from a population-based study of women in Massachusetts and New Hampshire. They compared the breast-feeding patterns of mothers who had been diagnosed with ovarian

cancer to those of mothers without the disease. As other researchers have done, they analyzed the duration of breast-feeding and number of children breast-fed. They also examined a factor overlooked in previous studies—whether the mothers breast-fed their youngest child.

**Effect:** Writing in the journal *Cancer Causes and Control*, the authors reported that breast-feeding offered a substantial protective effect only when a mother breast-fed her last child. These women were 42% less likely to get ovarian cancer than mothers who did

**"If you are going to breast-feed . . . breast-feed your last child."**

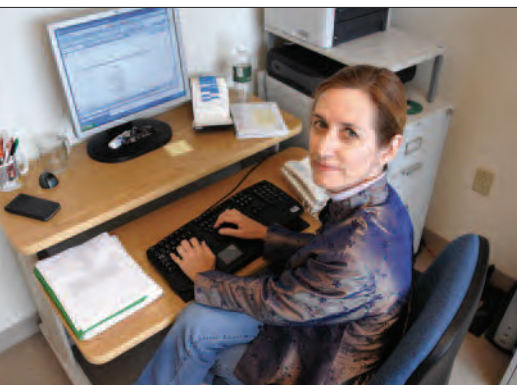
not breast-feed any of their children. The authors confirmed this connection by looking at women with exactly two children. In this group, women who breast-fed only their second child were 64% less likely to get ovarian cancer compared to women who breast-fed only the first of two children. "These provocative findings were seen in all child-bearing women," Titus-Ernstoff says. The findings were also seen in subsets of the study group defined by number of children per mother.

One possible explanation is that breast-feeding may counteract pregnancy-related changes that increase ovarian cancer risk. Titus-Ernstoff cautions that this hypothesis needs to be examined by further research, but she says it might explain why breast-feeding the last child would offer protection, while breast-feeding earlier children would not.

**Risk:** Excited that her decision to delve into this subject has led to such a surprising finding, Titus-Ernstoff plans to look next into how patterns of breast-feeding may affect the risk of breast cancer.

Meanwhile, until her conclusions are tested by subsequent studies, Titus-Ernstoff offers this advice: "If you are going to breast-feed at all, breast-feed your last child."

TINA TING-LAN CHANG



Titus-Ernstoff studied the impact of breast-feeding.

PHOTO: SQUIRREL GRAPHICS

### Port authority

If you need a chest port—for chemotherapy or blood draws—it doesn't matter if a radiologist, a resident, or a nurse practitioner puts it in; whoever does it just needs to be well-trained in the procedure. That's what several DMS radiologists found on reviewing the records of 536 patients who received a totally implanted subcutaneous central venous access device (a.k.a. chest port). "There was no statistically significant difference in overall complication rates, including infection rates, among operator groups," they wrote in *Academic Radiology*.



### Balancing act

In the process of investigating a gene-regulating protein called *Chd6*, DMS scientists may have pinpointed the cause of some forms of human ataxia, a rare neurological disease. When they created a mouse model with a *Chd6* mutation, they found that the animals had "coordination defects most consistent with a cerebellar neuron disorder," according to a paper in *Mammalian Genome*. "Behavioral testing indicated that only coordination and balance are impaired in [the] mice," wrote the researchers. "Although *Chd6* is expressed ubiquitously, the only consistent phenotype [of the mutation] appears to be the impairment in sensorimotor performance."





At last count, DMS had received more than \$32 million in research funding through the American Recovery and Reinvestment Act, advancing research (and securing jobs).

## Allergies may affect skin graft rejection

Could an allergic reaction complicate a skin graft? Graduate student Victor de Vries asked himself that question when he started working in a DMS immunology lab, and he recently reported the results of his investigation.

The lab, led by Randolph Noelle, Ph.D., uses mice to study how the body accepts or rejects skin grafts and transplanted organs. For a skin graft to be successful, the immune system has to be suppressed. Otherwise, it will attack the graft as if it were any other foreign object.

**Mast:** Just prior to de Vries's arrival in the lab, Noelle's team had discovered that mast cells, a type of immune cell, are required for skin graft tolerance. (For more on that study, see [dartmed.dartmouth.edu/w06/d01](http://dartmed.dartmouth.edu/w06/d01).) That finding was surprising, de Vries says, because mast cells are best known for their ability to activate the immune system in response to allergens. When mast cells encounter an allergen, they release molecules that cause inflammation—a process called degranulation. But this previous discovery indicated that mast cells were required for suppressing the immune system in response to a skin graft, leading de Vries to ask what would happen if the cells reverted to their proinflammatory ways.

**“Usually the general principles [in] mice . . . are true in humans.”**

In a study published in the *American Journal of Transplantation*, de Vries and colleagues simulated an allergic response in mice that had been given skin grafts. When the researchers forced mast cells in a skin graft to degranulate, the graft was rejected within 15 days.

**Allergen:** Furthermore, where the allergen entered the body didn't matter, indicating that if an allergen arrives through the airway—as happens with hay fever in humans—it could cause rejection of an organ transplant. In a control group of mice that were given grafts but no allergens, it took about 70 days for tolerance to start to break down.

Noelle says the paper shows “for the first time that allergy can disrupt the delicate balance of tolerance in the immune system.” Though the study was in mice, “usually the general principles that mice teach you are true in humans.”

In another experiment, the researchers found that cromolyn, an allergy drug that stabilizes mast cells, stopped the grafts from being rejected, even if degranulation had already occurred. In fact, the use of cromolyn resulted in grafts lasting for more than 120 days. Cromolyn has been used in humans to treat allergies for more than 30 years. So, two immunologists pointed out in an editorial that accompanied the Dartmouth paper, “it should be straightforward to test whether it could improve the success of organ transplantation in humans.”

**Triggering:** The study has implications for cancer therapy, too, says de Vries. Many tumors have an increased number of mast cells, so triggering degranulation around a tumor might help the body's immune system to fight it off. Immune tolerance may be crucial for successful grafts and transplants, but no one wants a tumor sticking around. KATHERINE VONDERHAAR

MARK WASHBURN



Noelle's lab studies immune system activation.

### Primary numbers

A popular health-care reform idea is to pay doctors based on how well they care for patients rather than the number of procedures they perform. But most primary-care physicians don't see enough patients “to produce statistically reliable performance measurements on common quality and cost measures,” according to a paper in the *Journal of the American Medical Association* by researchers at Dartmouth and the Centers for Medicare and Medicaid. Few primary-care practices are big enough to reliably measure performance in blood-sugar testing, for example. “Novel measurement approaches appear to be needed,” the authors wrote.



### Sick of smoke

Smoking can make one more susceptible to infectious diseases, such as influenza and pneumonia. Exactly how it does that was the focus of a recent study conducted at DMS. In cell cultures of human airways, the researchers found that cigarette smoke thwarts the body's own innate antimicrobial properties. “Cigarette smoke is a complex mixture and has many biological activities,” they wrote in the *Open Immunology Journal*. “Additional studies are needed to better understand the effects of this and other environmental pollutants on functions of the innate immune system.” ■

