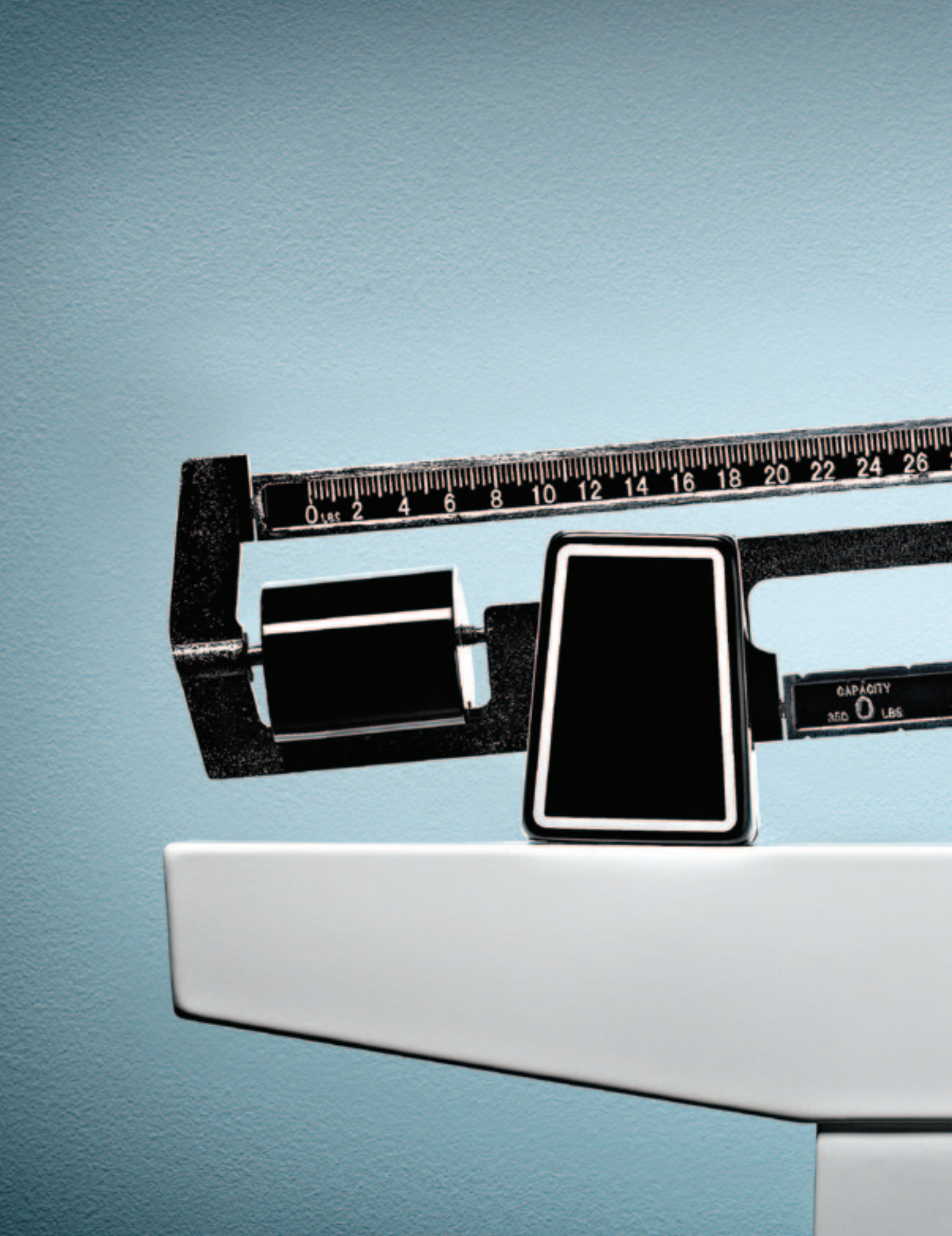
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OUR FIGHT WITH FAT

(WE'RE LOSING.)

by Nancy Ross-Flanigan

The moment of truth for Beverly Johnson came in the women's dressing room at J.C. Penney.

Unable to squeeze into any of the size 22 dresses in her closet, Johnson had set out to find a suitable Easter outfit, with her sister, daughters and boyfriend along for company and consultation. After pawing through an uninspired assortment of plus-sized floral prints, Johnson finally found a stylish, cream-colored skirt, top and jacket and prepared to model the ensemble for her shopping companions.

"But when I went into the dressing room and got undressed and looked in the mirror, I was so disgusted," says Johnson, a 39-year-old administrative assistant and mother of four from Ypsilanti, Michigan. "I just hated what I saw. I didn't even try the outfit on; I just put my clothes back on and left."

It wasn't that she'd "let herself go" over the 20 years since she was a shapely size 10. But with each pregnancy her weight and dress size had crept upward, in spite of her best efforts.

"I had tried every diet, every nutrition regimen, every over-the-counter diet aid; I had gone to Medical Weight Loss Center and Weight Watchers. I wasn't losing anything. Nothing was working, and I was so frustrated," Johnson says, tears welling up as she relives the dressing room moment.

EPIDEMIC: OBESITY

Moments like Johnson's are everyday occurrences in dressing rooms and bathrooms across the nation, as all too many Americans find themselves slightly to seriously overweight, repulsed by what they see in the mirror but seemingly unable to shed the excess pounds.

Two-thirds of Americans age 20 and older weigh more than they should, according to the Centers for Disease Control and Prevention, and the ranks of overweight children and teens are expanding, too. What's more, the proportion of people who are not merely overweight but classified as obese has approximately doubled in the last 25 years, says John Birkmeyer, M.D., the George D. Zuidema Professor of Surgery and director of the Adult Bariatric Surgery Program. The proportion of those at least 100 pounds overweight has increased six-fold.

"So the obesity epidemic is not simply that we've all gotten lazy and put on 20 or 30 pounds; there's a real epidemic of people whose weight has gotten totally out of control, and that's the group whose health status and longevity are most affected by the weight," Birkmeyer says. Type 2 diabetes, sleep apnea, high blood pressure, osteoarthritis, acid reflux, high cholesterol, certain cancers and other health problems are associated with excessive body weight, and a 2009 study by researchers at the U-M, Harvard University and the National Bureau of Economic Research found that if current trends continue, the negative effects of obesity on Americans' health will cancel out the health gains from the decline in cigarette smoking.

Clearly, we need to slim down, but the odds are not in our favor. Experts acknowledge that taking off weight is a Herculean struggle, and putting it back on as easy as well, pie (and cake and super-sized muffins and pizza and pop and all the other temptations we face daily). In spite of the billions spent annually on weight loss products and procedures and gym memberships, we're losing our fight with fat.

Why? The simple answer is that we're collectively consuming more calories than we're burning off, hence the oft-repeated admonition to eat less and exercise more. But the real question is, why is it so hard for us to translate that simple advice into behavior that produces tangible, lasting changes in body mass? And to that, the answer is much more complex, with roots that reach back millions of years, according to Charles Burant, M.D., Ph.D., director of the University of Michigan Metabolomics and Obesity Center and the Dr. Robert C. and Veronica Atkins Professor of Metabolism.

WHY IS IT SO HARD FOR US TO TRANSLATE SIMPLE ADVICE INTO BEHAVIOR THAT PRODUCES TANGIBLE, LASTING CHANGES IN BODY MASS?
THE ANSWER IS COMPLEX, WITH ROOTS THAT REACH BACK MILLIONS OF YEARS.

PREVIOUS PAGE: CLINT BLOWERS PHOTOGRAPHY

John Birkmeyer, M.D.: "The obesity epidemic is not simply that we've all put on 20 or 30 pounds."

SCOTT SODERBERG, U-M PHOTO SERVICES

For all our 21st century trappings, we're still very much the progeny of our early human ancestors, who never encountered an all-you-can-eat buffet. In their world, food was scarce and obtained only through the physically demanding work of hunting and near-constant foraging. Gorging on high-calorie foods whenever any could be found insured survival in leaner times, so the tendency was passed along, and over time our brains developed multiple pathways to stimulate eating behavior, Burant says.

Even our more recent ancestors, just a generation or two back, had to work harder for their relatively meager meals than we do, he notes.

"If you had to spend three hours preparing a meal, starting with killing and plucking the chicken, it was a lot of work. And then it was probably only a scrawny chicken that had to feed the whole family. People were always at least a little bit hungry."

Today, thanks to mass production, food is for the most part abundant and affordable. Supermarkets are heaped not only with the healthful produce, grains and lean protein sources we're encouraged to eat, but also with frozen and packaged foods that require almost no time and effort to prepare. Take-out restaurants and fast food drive-throughs make calorie-dense meals and snacks even more readily available. We never have to be hungry for long, and most of us never are.

At the same time that food-gathering has become less energy-intensive, other changes have been occurring that also contribute to the calories-consumed-versus-calories-burned imbalance.

"The first is modern transportation," Burant says. Walking or riding a horse clearly takes more energy than driving a car or sitting on a bus. In addition, the average temperature in homes has increased, so our bodies use less energy to keep warm than our grandparents' did.

The decline in cigarette smoking, while laudable, also may be a factor, says Burant. Because nicotine speeds up metabolism, smokers typically put on weight when they withdraw from the stimulant. That's no argument for

people to keep smoking, he stresses, "but the fact that many smokers are quitting may explain some of the rise in obesity."

Our busy lifestyles factor in, too, not only by creating stress, which some of us counter with comfort food, but also by cutting into our sleep time. "Sleep deprivation does stimulate appetite," Burant says.

Charles Burant, M.D.: "Thin people may be the key to understanding the biology of weight control."

TIPPED SCALES, CHANGED LIVES

So here we are, with a deep-seated biological drive to eat everything in sight, little incentive to exert ourselves, and a host of other factors conspiring to keep us from burning calories. Is there any way at all to literally tip the scales in our favor?

That's what Beverly Johnson wanted to know when, discouraged and desperate, she expressed her frustration to primary care physician Charisse Gencyuz, M.D., who had been working with her on weight management for more than a year.

"Dr. Gencyuz told me about the bariatric surgery program and gave me a referral so I could attend an informational meeting, just to find out if it was something I might be interested in," Johnson recalls. With a body mass index of 40.7, Johnson met the program's criterion of having a BMI of at least 40 (35 for those with weight-related health problems), and she had been under medical supervision for weight loss for at least six months, as also required.

A few weeks later, Johnson attended the meeting and came away "really impressed" by the presentations. "They went into so much depth about the different procedures, the pros and cons and the chances of this or that happening," Johnson says. She left with a thick information packet that she read all the way through as soon as she got home.

"After I read it, I thought, 'Wow, I could actually do this program and succeed, and be happy with me,'" Johnson says. Still, she didn't rush into the surgery. She gave herself several months to consider whether it was right for her and whether she could make the necessary commitment.

SCOTT SODERBERG, U-M PHOTO SERVICES

"When I told people I was thinking about bariatric surgery, they said, 'You're taking the easy way out.' But there is nothing easy about it," Johnson says. Before being accepted into the program, patients must undergo medical, nutritional and psychological evaluations, compile relevant health records and fill out piles of paperwork. Once accepted, there are still more requirements: meetings with the surgeon, nurse, physician assistant and anesthesiologist; educational sessions on exercise and nutrition; and support group meetings. Patients also must follow a prescribed diet for several weeks before surgery, with the goal of losing at least 15 pounds. Such pre-op weight loss shrinks the liver, making surgery easier, and has been shown to boost weight loss after surgery. Sticking to the diet also gets patients in the habit of eating differently, which is essential after bariatric surgery, and demonstrates their commitment to making the kinds of lifestyle changes that are necessary for success.

The U-M program offers three types of bariatric surgery, all of which are appropriate only for the "heaviest of the heavy" — the three percent of the U.S. population whose BMI is 40 or greater, which generally translates into being overweight by at least 100 pounds, Birkmeyer says. The types of surgery differ not only in how they're performed, but also in how they accomplish weight loss, how much weight loss they typically produce, and the lifestyle adjustments and possible complications that come with them.

A 2009 STUDY FOUND THAT IF CURRENT TRENDS CONTINUE, THE NEGATIVE EFFECTS OF OBESITY ON AMERICANS' HEALTH WILL CANCEL OUT THE HEALTH GAINS FROM THE DECLINE IN CIGARETTE SMOKING.

But overall, bariatric surgery — now the second-most commonly performed abdominal surgery in the U.S. — results in a loss of 40 to 70 percent of excess weight and is becoming so safe that deaths and serious complications are rare, Birkmeyer says. Since 2006, he and his wife Nancy Birkmeyer, Ph.D., a clinical epidemiologist, have headed the Michigan Bariatric Surgery Collaborative, which compiles statistics on the 5,000 or so bariatric procedures performed annually in the state and is funded by Blue Cross Blue Shield of Michigan.

"We track obvious things like rates of complications and things that happen around the time of surgery, but we also track the effects of bariatric surgery on people's lives over the long term, in terms of weight loss, quality of life and improvement in other aspects of their health," Birkmeyer said. "The goal is partly to help insurers make good decisions about what to cover, but we also do it to ensure that surgery is being done safely and as effectively as possible." Surgeons from the 24 hospitals involved in the program meet quarterly to review the data and share knowledge.

"By comprehensively tracking our data, feeding that data back and getting surgeons to learn from each other about practices, our mortality rate has gone down, down, down," Birkmeyer says. "It's almost zero now. In the entire calendar year of 2009, there were only two deaths from bariatric surgery out of more than 6,300 cases in Michigan."

The statistics document successes, but they don't tell the full story of changed lives that Birkmeyer witnesses when he sees patients on follow-up visits.

"By the time I see patients back at two months after surgery, and they've lost their first 50 pounds, they're already off their diabetes and blood pressure medications and taking half the number of pills they were taking before," he says. "When I see them at six to 12 months, I hardly recognize them. Women who haven't worn makeup in 15 years are all made up, and they've traded their sweat pants for new wardrobes. These patients are getting jobs, starting to date again, going to graduate school. It's so remarkable to see how empowered they are and how differently people feel about themselves as a reflection of just their weight."

Count Beverly Johnson as one of those people. Seven months after her gastric bypass surgery, she had lost 99.5 pounds of the 109 pounds she hoped to lose, and she was back to wearing a size 10.

"I feel good," Johnson says, "Really, really good. When I get tired now, I know it's because I've been running like a little crazy person, not because I'm trying to tote all that weight around while I'm doing the running. And when I look in the mirror now, I think, 'I know that woman; I rec-

ognize who she is. She was lost up under there somewhere, but now I've found her. I've found her, and I'm so, so happy.'"

Bariatric surgery patient Beverly Johnson: "I know that woman; I recognize who she is."

LOOKING FOR ANSWERS AT THE MOLECULAR LEVEL

Stories like Johnson's are heartening to people who have a lot of weight to lose, but what about those who don't qualify for weight loss surgery? For them, diet, exercise and drugs are still the only options, and while all can produce weight loss, keeping the weight off is the perennial challenge.

Dieting alone has a miserable track record for sustained weight loss. A 2007 analysis by researchers at the University of California, Los Angeles, found that within four or five years of losing weight by dieting, up to two-thirds of people regained more weight than they had lost. Other studies suggest the relapse rate may be even higher.

Data from the National Weight Control Registry, which is tracking more than 5,000 people who have lost significant amounts of weight and kept it off for long periods, suggest that exercise improves the odds considerably. But it's lifelong commitment to sensible eating and daily exercise, not short-term health kicks, that make the difference, the registry's research indicates. And keeping that kind of commitment runs counter to those biological urges and cultural disincentives that Burant detailed.

That's why he's banking on biologically-based approaches to developing new drugs or combinations of drugs. Currently available weight loss drugs are only marginally effective, and side effects are problematic, Burant says. So he and other researchers at the Metabolomics and Obesity Center are searching for alternatives by investigating, at the molecular level, how the body breaks down and uses food and how metabolism varies among individuals.

In one line of research, for example, they're looking at differences in oxidative capacity, a measure of muscle's ability to use oxygen. Using mice bred for intrinsic run-

SCOTT SODERBERG, U-M PHOTO SERVICES

SURGICAL OPTIONS

The U-M program offers three types of bariatric surgery that differ in how they're performed, how they accomplish weight loss, how much weight loss they typically produce, and the lifestyle adjustments and possible complications that come with them.

ROUX-EN-Y GASTRIC BYPASS

Method: Surgeon reduces the stomach to an egg-sized pouch to restrict food intake. A Y-shaped section of the small intestine is attached to the pouch to allow food to bypass the lower stomach and the first two segments of the small intestine. This reduces the amount of calories and nutrients the body absorbs. The smaller stomach also results in a feeling of fullness with less food.
Typical weight loss: 70 percent of excess body weight
Risks: Death, 0.3 percent; major complications, 3 percent
Other issues: Patients must take vitamin and mineral supplements daily for life. Most effective in improving obesity-related health problems. Most effective for long-term control of morbid obesity.

LAP BAND (LAPAROSCOPIC GASTRIC BANDING)

Method: Surgeon installs an adjustable silicone band at the point where the esophagus joins the stomach and adjusts the size of the opening by filling the band with saline or withdrawing saline from the band. The band restricts the opening, decreasing the amount of food that can comfortably be eaten.
Typical weight loss: 40 percent of excess body weight
Risks: Death, 0.1 percent; major complications, 1 percent
Other issues: The band can erode into the stomach or slip up and down, requiring more surgery and possibly removal of the band. Patients must take vitamin and mineral supplements daily for life.

SLEEVE GASTRECTOMY

Method: Surgeon permanently removes about 85 percent of the stomach, creating a sleeve-shaped organ. Original connections to the esophagus and intestines are maintained, so nutrient absorption is not affected; weight loss comes mainly from a smaller stomach size and the feeling of fullness with less food.
Typical weight loss: 60 percent of excess body weight
Risks: Death, 0.2 percent; major complications, 3 percent
Other issues: Long-term dietary requirements are not as strict as with gastric bypass. May not be covered by insurance. As a relatively new procedure, comprehensive data on long-term results are yet to be compiled.

ning ability — a reflection of oxidative capacity — they've found that those with the highest oxidative capacity are less prone to weight gain than their more sluggish counterparts.

In parallel studies with people, Burant and colleagues are studying not just those with weight problems, but also those without. In the end, he says, the answer to the obesity problem may very well come not from the heaviest of the heavy, but from the other end of the body weight spectrum.

"I believe we need to be studying thin people," Burant says. "If you think about it, they're the abnormal ones now, and they may be the key to understanding the biology of weight control." [M]

MORE ON THE WEB

Bariatric surgery patient Leissa Tasker shares her story