

# FREEZE! ZAP! BYE-BYE, FAT

By MELINDA BECK

Fat cells, watch out.

Two new devices—one that deflates fat cells, one that destroys them—have just been cleared for “body contouring” in doctors’ offices by the Food and Drug Administration.

Zeltiq grabs onto love handles and belly pouches and freezes the fat cells inside, causing them to self-destruct over several months. Zerona is a low-level laser that rotates around the waist, hips and thighs, forcing the fat cells to empty in a matter of weeks. In both cases, there are no incisions, no downtime and no need for anesthesia. The fat is reabsorbed by the body.

Several other devices that claim to painlessly blast away fat with ultrasound, radio waves or lasers are already on the market

Two new methods that claim to blast away pounds are less invasive than liposuction. But what happens when fat cells are set loose in the body?

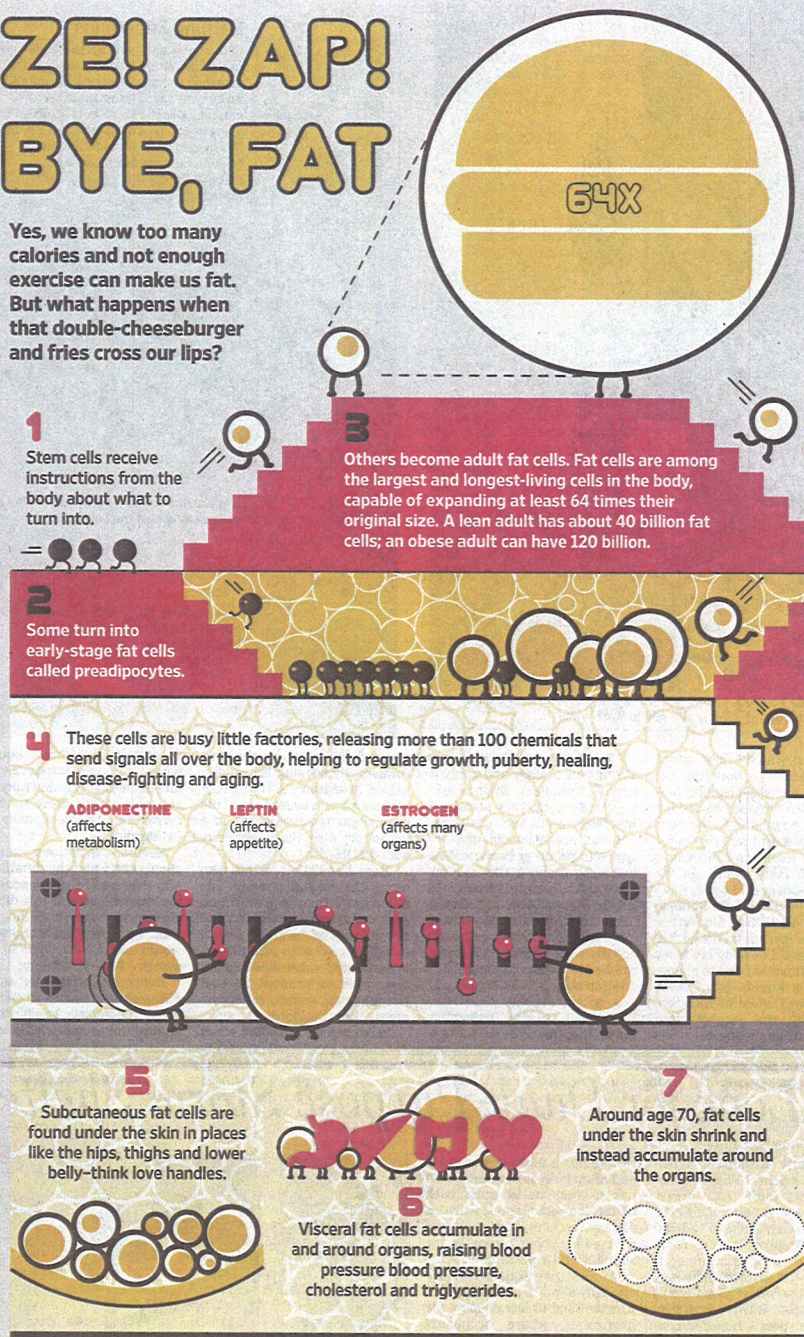
or hoping for FDA approval soon. These high-tech weapons in the battle of the bulge are less invasive than liposuction—which involves loosening fat internally and vacuuming it out with a tube, a procedure that nearly 200,000 Americans had last year.

Of course, there is still no magic wand for the 66% of us who are overweight or obese: Eliminating fat cells without also eating less or exercising more may make fat crop up elsewhere and ultimately do more harm than good.

That’s because fat cells are not just passive storage depots for surplus calories. They are busy chemical factories that send signals all over the body, helping to regulate growth, puberty, healing, disease-fighting and aging. Among the 100 or more hormones that fat cells secrete are adiponectine, which helps manage metabolism, and leptin, which tells the brain to eat more or less (although the brain doesn’t always listen).

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**Yes, we know too many calories and not enough exercise can make us fat. But what happens when that double-cheeseburger and fries cross our lips?**



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# More Weapons in Fight on Fat

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Much about fat cells remains mysterious. They're among the largest and longest-living cells in the body, capable of expanding at least 64 times their original size (the upper limit is unknown). A lean adult has about 40 billion fat cells; an obese adult can have 120 billion.

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In general, it's healthier to have a larger number of

small fat cells than fewer, fatter ones. Subcutaneous fat cells, under the skin in places like the hips, thighs and lower belly, may be unsightly, but they are relatively benign.

Their principal work is to pull excess fat out of the bloodstream, package it and store it in big droplets—one per fat cell—until the body needs it for energy.

Healthy fat cells are precisely attuned to the body's needs, says Michael D. Jensen, an endocrinologist at the Mayo Clinic in Rochester, Minn. "When you eat too much, the fat cells store it up, and when you miss a meal, they give it back to you."

But if fat cells aren't working properly, they don't store and release fat effectively. Harmful versions called visceral fat cells accumulate in and around organs like the heart and liver, and release fat into the bloodstream, raising the risk for heart disease, diabetes, stroke and Alzheimer's disease.

Why some fat cells stop working, and why some proliferate while others just balloon isn't understood. Heredity clearly plays a role, as does taking in more calories than the body needs. But fat-cell

function doesn't necessarily correlate with weight gain. Some people are able to carry 100 extra pounds and still have functioning fat cells; others run into metabolic trouble when they gain just a few pounds, says Dr. Jensen.

Until recently, experts thought that all the body's fat cells were created by around age 20, and that they never died, just grew and shrunk as people gained or lost weight. But scientists at Sweden's Karolinska Institute recently discovered that even in lean people, about 10% of the body's fat cells die and are replaced each year.

"The fact that the number seems to remain constant over the years indicates that something is very much regulating the number of fat cells. That's what I'm interested in right now," says neuroscientist Kirsty Spalding, the lead researcher.

The amount and distribution of fat also changes naturally with age. "People tend to gain subcutaneous fat through middle age, and then it starts to diminish, first on the back of the hands, then in the lower legs and elsewhere," says James L. Kirkland, a professor of aging at the Mayo Clinic. It piles up as visceral fat instead—and eventually appears in muscle, liver and even bone marrow, where the fat is a substitute for new bones. "Losing subcutaneous fat is not good, paradoxically," Dr. Kirkland says.

That's partly why some obesity experts are wary of the new fat-blasting techniques. The devices can't target visceral fat, only subcutaneous fat, and if patients continue to consume more calories than

they burn, they may hasten that process of accumulating harmful fat instead.

Some experts also worry that forcing fat out of fat cells can increase the level in the bloodstream.

"Fat is very toxic," says Dr. Jensen. "It's not something you want in large amounts floating around free. You want it inside a cell, protected."

Another danger is that losing fat cells could will lower leptin levels, signaling to the brain to eat more.

"That's one of the reasons it's so, so hard to maintain weight loss—the body is trying to defend a weight it got used to," says Mitchell Lazar, director of the Institute for Diabetes, Obesity and Metabolism at the University of Pennsylvania.

Officials at **Zeltiq**, of Pleasanton, Calif., and **Erchonia Corp.**, the McKinney, Texas, company that makes **Zerona**, say they had to demonstrate to the FDA that triglyceride levels in the body did not rise significantly after their procedures.

"It's the equivalent of eating three to five french fries per day," says Mitchell Levinson, Zeltiq's founder and chief scientific officer.

They also say the process is gradual and involves a small percentage of the body's overall fat.

Still, both companies stress that it's important for patients to change their eating and exercise lifestyle habits as well.

"This is for patients who have a discreet bulge they want to get rid of," says Mr. Levinson. "Your love handle will get smaller, but you won't any weight unless your change your behavior."

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## How Fat-Blasting Devices Work

Two medical procedures tout the ability to rid the body of fat without the need for surgery. Here's an overview of how they work.

With **Zeltiq's** CoolSculpting device, you sit in a chair while a technician sucks a handful of fat into a gizmo the size of a paperback that holds on tight and starts chilling. The area goes cold, then numb while you read, sleep or relax for about an hour while your fat cells receive a fatal, freezing dose. It isn't painful—just slightly uncomfortable—and the area may feel stiff, with mild bruising or redness for several days.

The freezing technology causes the fat inside fat cells to crystallize, and then the cells die an early, natural death, and wait to be reabsorbed into the body. It takes three to four months to see results. Once gone, the fat cells don't grow back—or grow back very slowly, says Mitchell Levinson, the company's founder, who adds that some patients have been followed for three years now without seeing fat deposits return. To date, more than 7,000 patients have had the CoolSculpting Procedure worldwide safely, Mr. Levinson says.

Each Zeltiq treatment costs between \$1,500 and \$3,000. You'll need one for each love handle; a large



**Zerona laser**

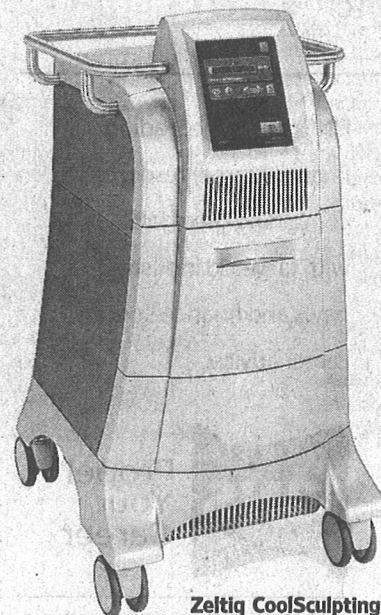
belly or muffin top may require two. As of now, the device is only for use on "discreet bulges"—not large areas of fat, Mr. Levinson says.

Rival technique **Zerona** doesn't kill fat cells. The low-energy laser device—it looks like a high-tech spider—creates tiny pores in the cell membranes that cause the fatty contents to seep out and the cells to deflate, like squishing a grape, says Ryan Maloney, chief research officer of the manufacturer, **Erchonia Corp.** The cell is still viable and can still secrete beneficial hormones.

Patients lie on a table while the device rotates around the waist, hips and thighs. The procedure takes 40 minutes—20 minutes on each side—and is repeated three times a week for two weeks, for a total of \$1,800 to \$3,000. There's no pain, skin irritation or blistering. Results are visible in about two weeks.

In a placebo-controlled double-blind trial with 67 patients, those who had **Zerona** lost an average of 3.65 inches from their waist, hips and thighs (that is, about an inch per area), compared with only a half-inch in the placebo group. "It's not going to give you ripped, defined abs, but it will create an obvious slimming," Mr. Ryan says.

—Melinda Beck



**Zeltiq CoolSculpting**

(t-b): Erchonia Medical; Zeltiq