

Cleveland Clinic: Top 10 Innovations announced

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CLEVELAND, Ohio -- Bariatric surgery to control diabetes has been selected as the No. 1 innovation by doctors at the [Cleveland Clinic](#).

The Top 10 medical innovations for 2013 will be announced this afternoon at the Clinic's [10th annual Medical Innovation summit](#). They were selected from 150 nominations of emerging technologies, gathered from more than 110 Clinic experts. The innovations had to have a high probability of commercial success.

"Our list gives you the flavor of where health care is going," says [Chris Coburn, executive director of Cleveland Clinic Innovations](#). It is the Clinic's corporate arm, responsible for creating companies using the health system's research in medical technology.

"If you looked at it the first few years of the Summit, you'd see it dominated by devices and drugs, and we will have a lot of them. But now we're also looking at population management and the ways that would precede what would be the normal stage of medical intervention."

An example of that is the 10th innovation on the list, recognition of a program that encourages behavior change to forestall disease such as diabetes. It's that very disease and resulting problem -- obesity -- that is recognized as the first innovation on the list.

This seems apt, as the Clinic itself has garnered renown for its attempts to spur healthy lifestyle changes in its employees by offering reductions in the health insurance premiums of those who achieve them.

Here are this year's Top 10 innovations:

1) Bariatric surgery for diabetes control. A study released earlier this year by Clinic doctors showed that bariatric surgery is more effective in treating people with Type 2 diabetes than medication alone.

Compared with patients taking diabetes medication and receiving lifestyle counseling, those who had bariatric surgery were far more likely to be free of diabetes, or to have reduced their dependence on diabetes medications, for at least two years, says [Dr. Philip Schauer](#), a surgeon and director of the Clinic's Bariatric and Metabolic Institute.

The weight loss surgery also helped many to lower their blood pressure and cholesterol. Most patients went from a dozen or more medications daily to none, or just a few. "As a result, many diabetes experts now believe that weight-loss surgery should be offered much earlier as a treatment option for patients with poorly controlled diabetes, rather than as a last resort," says Schauer.

"The reason bariatric surgery was chosen as No. 1 was because it's an effective treatment for diabetes, not just for weight loss -- and this will have an impact on health care in 2013."

2) Neuromodulation therapy for cluster and migraine headaches. Some 50 million Americans have headaches so severe that they consult a doctor. This therapy relies on a miniaturized neurostimulator, the size of an almond, which is placed in the upper gum through a small surgical incision. When a patient feels a headache coming, they place a device on the cheek that delivers stimulation to block the headache pain in about 5 to 10 minutes.

3) Mass spectrometry for bacterial identification. While mass spectrometry has been around for 50 years to identify molecules, the new technology -- a soft ionization technique called matrix assisted laser desorption/ionization, or MALDI -- is less destructive because it does not fragment large molecules. Computer software then compares the signature spectrum to a database, and if there is a match, the identification occurs within minutes. This advancement provides organism identification that can accurately identify bacteria in minutes, which allows doctors to more quickly and appropriately treat infections.

4) **Novel medications for advanced prostate cancer.** Five new drugs have been approved in the past two years for advanced prostate cancer. They work by blocking abnormal cell growth.

5) **Handheld optical scan for melanoma.** Skin cancer is the most common cancer in the U.S., and melanoma its deadliest form. A new, FDA-approved, handheld device for dermatologists provides extra information to identify skin lesions that have the characteristics of melanoma -- without cutting the skin. The device uses imaging technology that, in less than one minute, visualizes the micro-vessel structure of the lesion just below the skin's surface.

6) **Femtosecond laser cataract surgery.** Cataract surgery, a common way of correcting vision loss from a clouded lens, has been improved through a new form of laser technology. A femtosecond is one quadrillionth of a second, and it refers to the amount of time that it takes for a surgeon to aim numerous laser pulses of near-infrared light to make a perfect circular hole in the lens, split it into sections, then soften and break up the cataract. Unlike cutting by a surgical blade, this laser separates tissue by ablating and cleaving, making the surgery more precise and causing less inflammation.

7) **Ex-Vivo Lung Perfusion system:** There were more than 1,600 people in the U.S. on the waiting list for lung transplant this year, people with diseases such as COPD, cystic fibrosis, pulmonary hypertension and idiopathic pulmonary fibrosis who have no other options. About 80 percent of donated lungs, though, can't be used, either because they're too full of fluid, infected with bacteria, or otherwise damaged.

A new way of treating these lungs, called ex-vivo (meaning outside the body) lung perfusion, may soon greatly increase the number of donor lungs available. The process involves a 4- to 6-hour period during which a proprietary solution is infused into the lungs while they are attached to a ventilator. This can reverse lung injury and dry out excess fluid. The process has been approved in Europe and Canada, where transplant recipients have had positive results after receiving the reconditioned lungs.

8) **Modular devices for treating complex aneurysms.** When aortic aneurysms rupture, the results are often deadly. And aneurysms are not reversible -- though they can be dealt with using minimally invasive endovascular repair if they are determined to be enlarging rapidly or leaking.

New technology allows this fix to be made with a fabric graft that expands and holds in place a metallic stent. Thanks to this new system, surgeons can now treat patients with complex aneurysms without having to take detailed measurements, then waiting for weeks for custom endografts to be delivered.

9) **Breast tomosynthesis.** This imaging technology improves the accuracy of breast cancer diagnoses. Also called 3D mammography, this procedure allows dozens of images from a number of angles to be made of the entire breast. The technology offers doctors and mammography technicians the opportunity to discover small cancer cells, especially in the case of women with dense breasts, in which tumors often escape detection. Preliminary results of 25,000 women reported a 47 percent increase in cancer detection when tomosynthesis is used.

10) **Medicare Better Health Rewards Act.** Almost three-fourths of all medical costs for Americans are for chronic conditions: cardiovascular disease, obesity, diabetes and cancer. Sixty to 90 percent of these ailments are preventable.

The bipartisan Medicare Better Health Rewards Program Act of 2012, introduced in Congress and referred to committee in July, is part of a movement to encourage people to take a more active role in their well-being. The program recommends annual wellness visits, which Medicare already subsidizes, to determine and measure improvements in six key areas of health: body mass index, diabetes indicators, blood pressure, cholesterol, vaccination status and the use of tobacco products.

Participants would be given up to \$400 after checkups showing they'd met their goals in the second and third years. These monetary incentives would come from savings generated by seniors becoming healthier.