

health

Reporting by Rebecca Boyle

GRAND AWARD WINNER

Open-Heart Alternative

↓ **Each year**, about 1.5 million people in the U.S. suffer from aortic valve stenosis, a narrowing of the heart's aortic valve that can lead to a heart attack. In severe cases, doctors perform open-heart surgery to replace the valve, but many patients are too frail to undergo such a procedure; fifty percent of those who don't get surgery die within two years. The Sapien Transcatheter Heart Valve, which unlike other replacements can be inserted through an artery, should make it possible to give a new valve to many people who were previously ineligible. The Sapien consists of flaps of cow tissue sewn onto a metal frame. It can collapse from a diameter of about an inch to that of a pencil—thin enough to fit through the femoral artery. Once the valve is in the right location, doctors push it open with a balloon. The mesh then holds the device in place, while the flaps prevent blood from flowing in the wrong direction. In trials, patients who received the valve were 40 percent more likely to be alive a year later.



Edwards Lifesciences Sapien Transcatheter Heart Valve

DIAMETER 23 or 26 mm
WEIGHT 2.0 or 2.6 ounces
PRICE \$30,000

BEST OF WHAT'S NEW

- SOFTWARE
- AUTO
- GADGETS
- GREEN
- ENGINEERING
- HOME
- AEROSPACE
- SECURITY
- HARDWARE
- RECREATION
- HEALTH**
- ENTERTAINMENT

Most Natural Prosthetic Leg

The Icelandic firm Össur changed medicine several years ago with its bionic prosthetic knee and ankle, both of which use force sensors and accelerometers to monitor the environment and the body. Now, the company has combined the knee and the ankle into one prosthetic leg. With two intelligent joints cooperating together, users can navigate stairs and inclines with fewer trips and falls. The leg also allows wearers to walk with a better gait, reducing the back and hip pain commonly associated with prostheses.

ÖSSUR SYMBIONIC LEG

- WEIGHT LIMIT**
275 pounds
- BATTERY LIFE**
16–24 hours
- PRICE** Not set



GILEAD SCIENCES TRUVADA

HIV-Preventing Pill

This year, the FDA approved the first drug for preventing HIV infection in adults: Truvada. Doctors have been using the drug to treat HIV-positive patients since 2004, but they only recently determined that people who are HIV-negative can take the drug to prevent infection in the first place. A daily dose, which combines two compounds that block HIV from replicating, reduces transmission rates by 70 percent. **\$37/pill**

LIFE TECHNOLOGIES ION TORRENT ION PROTON SYSTEM

THE SPEEDIEST DNA SEQUENCER

The Ion Proton is 100 times faster than any other sequencer and the first that could become part of everyday medical care. Ion Torrent turned sequencing into a digital process by developing the first transistor array that can directly sense the voltage spike produced every time replicating DNA adds a nucleotide. Now that sequencing has been digitized, it should get faster each year, according to Moore's Law. **\$224,000**



MOBISANTE MOBIUS SP1 ULTRASOUND SYSTEM

CELLPHONE ULTRASOUND

A handheld ultrasound machine can be a lifesaver in remote areas and disaster zones, but workers may not have a specialist available to read the images it produces. The MobiUS SP1 is the first mobile ultrasound device that can encrypt and e-mail images to an off-site physician via smartphone. Health-care workers can use the ultrasound wand to image organs and fetuses, and to check for internal bleeding. **\$7,500 and up (includes phone)**

NIMBIC SYSTEMS AIR BARRIER SYSTEM

Surgery Sterilizer

The air in a sterile operating room isn't nearly as sterile as one would think. About a quarter of hospital-acquired infections start at a surgical site on the body. The Air Barrier System filters microbes out of ambient air and blows a sterile breeze over the patient. In tests, it reduced airborne microbes by 84 percent. **\$3,900**



SOMA ACCESS SYSTEMS AXOTRACK

Needles on Target

When inserting a catheter into a vein, doctors can make mistakes that cause serious complications, such as punctured lungs. They often use ultrasound to visualize the body, but ultrasound can't clearly pick up a needle. AxoTrack makes catheterization almost foolproof by enabling doctors to see both the vein (with ultrasound) and the needle's location (with magnetic sensors) on one video screen. In tests, the device increased first-attempt success rates from 37 percent to 99 percent. **Price not set**



MIT SOLARCLAVE

Off-the-Grid Autoclave

Boiling water isn't enough to sterilize medical instruments, which is part of the reason that a quarter of surgery patients in rural clinics in developing countries end up with infections. What's really needed is an autoclave, which blasts tools with 250°F steam under pressure. MIT researchers figured out how to build an autoclave that requires only inexpensive, commonly available materials—a pressure cooker, small mirrors, and buckets—which together concentrate solar rays and produce microbe-killing conditions in 90 minutes. **Price not set**

ABLE PLANET PERSONAL SOUND AMPLIFIER

The Clearest Hearing Booster

For decades, people who needed reading glasses have been able to pick up a pair at the local drugstore. The Able Planet Personal Sound Amplifier brings the same convenience to the 20 million Americans with mild or moderate hearing loss. The Amplifier is the first over-the-counter device that works similarly to expensive prescription hearing aids: It selectively boosts the frequencies of voices to raise them above the din. **\$500–\$900**



CLOCKWISE FROM TOP LEFT: SAM KAPLAN; COURTESY ION TORRENT; COURTESY MIT

CLOCKWISE FROM TOP LEFT: SAM KAPLAN (2); COURTESY SOMA; COURTESY ABLE PLANET