



Smart ways to live well
Prevention

January 2008

 *top*
BREAKTH
of **2007**

10 REMARKABLE INNOVATIONS IN DETECTION
A STUNNING IMPACT ON WOMEN'S HEALTH

162 ■ PREVENTION.COM JANUARY 2008

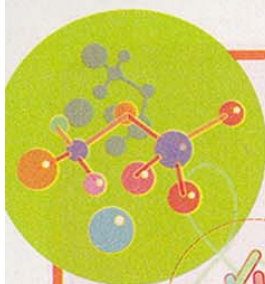
medical

ROUGH

Over the past 12 months, cutting-edge scientists have unveiled an astonishing array of drugs, devices, and treatments that foreshadow a fresh approach to preventing and conquering disease. With the help of our esteemed editorial advisors, we assembled a list of the most impressive among them, then asked ourselves which advances would most interest our readers and their families. From noninvasive alternatives to breast biopsies to new weapons against deadly infections, here are the most promising health advances of the last year.

AND TREATMENT THAT ARE MAKING

■ BY **RICHARD LALIBERTE** ■ ILLUSTRATIONS BY **FERIC**



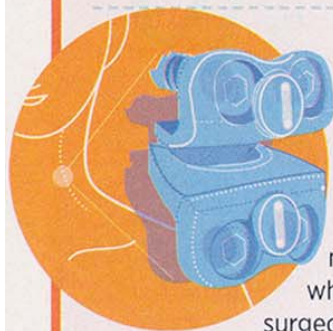
BREAKTHROUGH THAT COULD WIPE OUT “SUPERBUGS”



Researchers at the University of North Carolina at Chapel Hill discovered a new weapon to fight the growing threat of drug-resistant bacteria—and it may already be in your medicine cabinet. **Bisphosphonates**—compounds in the bone-building drug Didronel—prevent superbugs from sharing their DNA, halting the spread of resistant strains. “Even more surprising, bisphosphonates kill cells that harbor resistant DNA, selectively eliminating the most dangerous germs,” says Matt Redinbo, PhD, a professor of chemistry, biochemistry, and biophysics at UNC. Some doctors are already prescribing bisphosphonates off-label to fight infections, though the drugs can have side effects such as gastrointestinal irritation and bone damage in the jaw.

BREAKTHROUGH THAT SPEEDS TREATMENT OF VAGINAL INFECTIONS

Probiotics—friendly bacteria that thrive in the body—are known to prevent or even cure yeast infections and bacterial vaginosis. Now there’s an **OTC supplement containing the two *Lactobacillus* strains** documented to promote vaginal health. The probiotic pill Fem-Dophilus has erased up to 90% of vaginal bacterial infections and significantly reduced yeast growth in trials by coating the lining of vaginal tissues and producing acids that keep pathogens from gaining a foothold. When women take antibiotics, Fem-Dophilus doubles the drugs’ effectiveness by recolonizing the vagina with healthy flora.



BREAKTHROUGH THAT RESTORES NECK MOVEMENT AFTER SURGERY

People with cervical degenerative disk disease who receive a new **flexible artificial disk implant** can bend their necks normally after surgery—a vast improvement over patients who undergo standard spinal fusion, a procedure in which a surgeon removes the diseased disk and locks adjoining vertebrae, limiting range of motion. In a 2-year, 541-patient clinical trial, patients who received the Prestige Cervical Disc System from Medtronic (approved by the FDA in July) had greater range of motion, felt less pain, and returned to work 16 days faster than patients who got the standard treatment. A 7-year follow-up study is under way to evaluate long-term safety and effectiveness.

BREAKTHROUGH THAT COULD PREVENT 90% OF OVARIAN CANCER DEATHS

Ovarian cancer, a stealthy killer responsible for about 15,000 deaths in 2007, may not be so silent after all: Recent studies show that even **early-stage ovarian cancer reveals itself with subtle symptoms** up to a year before typical diagnosis.

Now the American Cancer Society is spreading the word. When cancer is detected while it's still confined to the ovary, you have

Recurring symptoms women shouldn't ignore

- >> **Pelvic or abdominal pain**
- >> **Bloating** >> **Feeling full quickly or having difficulty eating**
- >> **Having to urinate often or feeling an urgent need to go**

a 90% chance of being cured, but those odds drop to 20% if the cancer is advanced, which is when it's usually diagnosed. Telltale symptoms (see at left) are common and often due to something other than cancer, so you don't have to worry about every bloating episode. But if symptoms occur almost daily and last more than a few weeks, the ACS recommends seeing a gynecologist.



BREAKTHROUGH THAT COULD SAVE MILLIONS OF LIVES

If you're not revived within 5 minutes after cardiac arrest, you're as good as dead. But researchers now know that the window of time for survival could triple if **the body is cooled by several degrees** soon after the heart stops beating. In hospitals, doctors are using cooling blankets that circulate icy water to minimize brain damage and revive "temporarily dead" people who had no heartbeat for up to 15 minutes, according to Lance Becker, MD, director of the Center for Resuscitation Science at the University of Pennsylvania. In a 2007 animal study, cooling boosted the rate of survival immediately after cardiac arrest from 10 to 60%, Becker says. Researchers are now trying to develop an injectable, icy slurry that lowers body temperature within seconds and that emergency workers could administer on the spot. (Doctors say putting ice or cold compresses on a heart attack victim at home is unlikely to help much: The brain and organs are too well insulated to be affected by simple aids.)



WANT TO KNOW MORE?

For more detailed information on each of these remarkable advances—the deep science behind their development, how soon they will be available, and whom they're most likely to benefit—go to prevention.com/breakthroughs.

BREAKTHROUGH THAT TAKES THE FEAR—AND WAITING— OUT OF BREAST BIOPSIES

A new ultrasound technique called **elasticity imaging** can determine with nearly 100% accuracy whether breast lesions are cancerous or harmless without a surgical sample. The FDA-approved system combines a manual exam with scanning to gauge how tissue inside the breast moves when pushed; malignant growths appear stiffer. Developers say elasticity imaging could reduce unnecessary breast procedures—80% of breast biopsies turn out to be benign, according to the ACS—and spare women days of anxiety waiting for biopsy results. “Decreasing invasiveness while increasing accuracy and convenience makes this a great technology,” says *Prevention* advisor Pamela Peeke, MD, an assistant professor of medicine at the University of Maryland.



BREAKTHROUGH THAT REDUCES MENOPAUSE SYMPTOMS BY HALF

A fast-drying, colorless gel absorbed by the skin, **Elestrin** treats moderate to severe hot flashes by delivering an effective low estrogen dose (0.0125 mg). That's important: The American College of Obstetricians and Gynecologists recommends using the lowest effective dose of estrogen for the shortest time because of possible cardiovascular and cancer risks. Four to 5 weeks into clinical trials, women using Elestrin had fewer and less severe hot flashes—usually reducing symptoms by half or more—followed by greater relief each week for most of the 12-week study.



BREAKTHROUGH THAT COULD WARN OF DIABETES YEARS BEFORE IT DEVELOPS

Tests for three proteins—all telltale signs of inflammation that are linked to insulin resistance—can **predict whether women will develop diabetes years before standard screenings indicate a problem.** In a 6-year study of more than 82,000 women ages 50 and older, researchers at UCLA found that the tests (already available but not widely used) accurately warned of diabetes even in people with normal blood sugar. Early alerts could enable those at high risk to make preemptive lifestyle changes and potentially help prevent the disease.





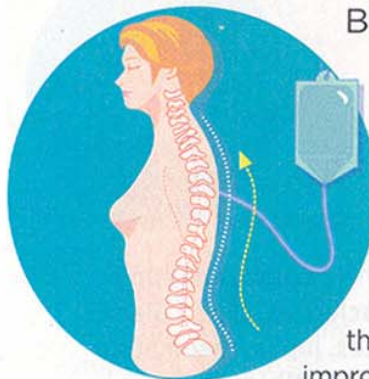
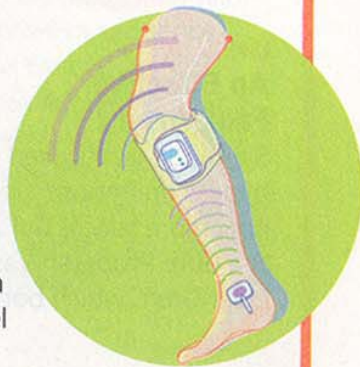
BREAKTHROUGH THAT MAKES MAMMOGRAMS MORE ACCURATE AND COMFORTABLE

A low-radiation three-dimensional mammography CT

developed at Duke University is twice as accurate and much less painful than scans that flatten the breast. Patients lie facedown on a bed with a cutout for the breast while the scanner circles it from below, eliminating distortion found in standard images of compressed breasts. However, developers say commercial use is still years away.

BREAKTHROUGH THAT COULD HELP STROKE VICTIMS WALK AGAIN

Stroke and other neurological impairments often cause “foot drop”—a gait condition in which patients can’t step heel first, making it difficult to walk without stumbling. A new system called **the NESS L300** uses a sensor in the shoe to tell a lightweight wireless device worn below the knee when the heel is on or off the ground. With this information, the device sends electrical pulses to the leg nerve that controls lifting the foot so that some patients can walk more naturally. “This is a huge improvement over wearing a brace,” says Gad Alon, PhD, PT, an associate professor in the department of physical therapy and rehabilitation science at the University of Maryland School of Medicine.

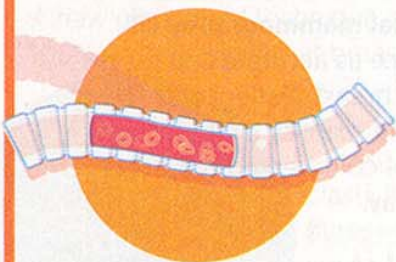


BREAKTHROUGH THAT PROTECTS BONES IN ONE 15-MINUTE DOSE

Half of people on oral bone-building drugs don’t keep up with their meds (irritating side effects, such as stomach pain, are common). They take less than 80% of their prescribed pills each year. That’s not an issue with **Reclast**, a new medication for treating postmenopausal osteoporosis that’s given just once annually in a 15-minute infusion. Reclast improved bone density, reducing spine fractures by 70% and hip fractures by 41%, compared with a placebo, in a 3-year clinical trial of 7,765 women. Administering the infusion directly into the bloodstream eliminates digestive problems that are common with oral meds; Reclast side effects, such as fever and bone or muscle pain, usually disappear within 3 days.

BEST UPGRADES

4 PROVEN TOOLS GET EVEN BETTER



UPGRADE: An Effective Faux Artery

Synthetic grafts used in bypass operations are now more successful with the Gore Propaten Vascular Graft, which bonds

the anticoagulant drug heparin to the surface of an artificial blood vessel. The embedded drug **prevents blood clots** formed in response to grafts created with veins or other synthetic blood vessels.

UPGRADE: An Insulin Pen with a Memory

People with diabetes can keep better track of insulin injections



with **the first digital pen dispenser that records time and dosage data.**

The memory capability of HumaPen Memoir should mean better blood sugar control for forgetful patients.

HIGH HOPES FOR 2008 OUR EXPERTS RAVE ABOUT THESE IN-THE-WORKS INNOVATIONS

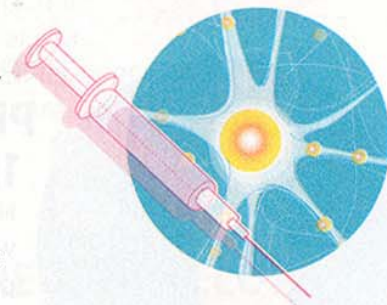
INNOVATION: A way to heal the heart with- out bypass surgery

Using an injected drug that spurs blood vessel growth, researchers in Germany **have boosted heart patients' performance** in exercise tests by 80% while reducing symptoms like angina and chest pain. Animal

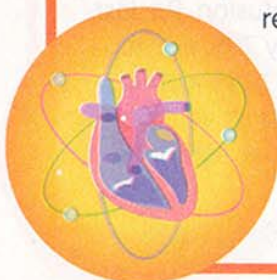
studies in the United States by the biotech company CardioVascular Bio-Therapeutics suggest the drug's active ingredient, fibroblast growth factor, also reduces brain damage from stroke. The drug has passed US safety tests and is green-lighted for clinical trials for severe coronary disease by the FDA.

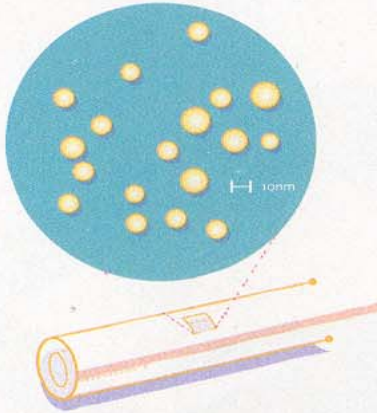
INNOVATION: A vaccine for MS

The first vaccine for autoimmune diseases may



help **combat multiple sclerosis, type 1 diabetes, lupus, rheumatoid arthritis,** and other immune system diseases that collectively affect up to 24 million people. Results published in the August 2007 *Archives of*





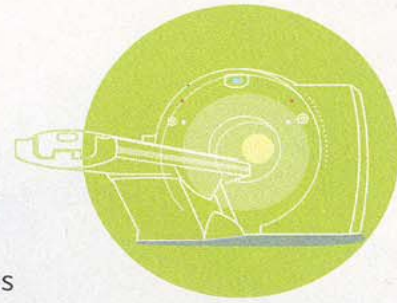
UPGRADE:
Catheters that Conquer Infection

A new antimicrobial silver coating for bacteria-prone medical devices, such as catheters, is **impervious**

to bacteria that cause 99,000 infection deaths in US hospitals a year. Nanotechnology that's used to treat tube surfaces can keep them antiseptic for months at a time.

UPGRADE:
A Quicker, Safer CT Scan

CT scans of the heart using the GE LightSpeed VCT XT **expose patients to 70% less radiation** than conventional CT



scans by taking images in rapid-fire sequence rather than in one continuous exposure. Scans are completed in as little as 5 seconds instead of the 10- to 12-second exposures needed with older CT machines.

Neurology show that the vaccine limits production of activated immune cells called T cells, which cause the chronic inflammation characteristic of MS. It's now headed for more clinical trials.

INNOVATION:
A drug that fights Alzheimer's disease

The first Alzheimer's drug that **blocks the disease rather than just fighting symptoms** has passed efficacy trials at six sites around the country. The once-a-day pill is a compound known as a gamma-secretase inhibi-



tor, which interferes with an enzyme that produces the brain-clogging plaques that characterize Alzheimer's, reducing them by 38%, according to preliminary results.

INNOVATION: **A molecule that makes cancer self-destruct**

Canadian researchers believe they've developed

a simple molecule **that dramatically slows tumor growth without affecting healthy cells**. Called DCA (dichloroacetate), the novel compound revives mitochondria—power packets in cells that regulate cell death but are switched off by cancer. By flipping the “on” switch of an enzyme, DCA commands abnormal cells to destroy cancer from within. ■

