

Osteoarthritis patients don't need to come to grinding halt



Mercedes Levis, 76, walks with her poodle at her home in Birchrunville, Pa. Levis had a knee replacement with the hope that she would be able to live her life without pain from arthritis.

Photo by: Jim Graham for USA TODAY

Kathleen Fackelmann, USA TODAY

Mercedes Levis took a chance last month and got the latest upgrade on the artificial knee, one designed for women. The 76-year-old Birchrunville, Pa., woman figured the next generation in knee implants would let her live her life again — without disabling pain.

Levis is one of about 400,000 Americans who will get an artificial knee this year, a number that will explode in the next 25 years as aging Americans start to develop osteoarthritis in record numbers. Experts like Steven Kurtz of Exponent Inc., a technology consulting firm, predict that by the year 2030, nearly 3.5 million Americans will need an artificial knee.

"We're living longer and, as a consequence of living longer, our joints begin to give way," says Christopher Buckland-Wright, an arthritis researcher at the King's College in London.

Researchers today are searching for new drugs that would go beyond treating the symptoms to push back the disease itself. They also are looking at futuristic techniques like stem cell therapy that promise to repair long-term damage. Meanwhile, companies are improving artificial joints to give people like Levis a better quality of life

Stem cells offer promise

Drugs available today can ease symptoms of osteoarthritis — the most common type of arthritis — but don't halt the underlying destruction of the cartilage, the slippery tissue that cushions the joints, says Debra McCoy, a vice president for research at the Atlanta-based Arthritis Foundation.

That's in sharp contrast to the treatment for rheumatoid arthritis: Drugs called biologic response modifiers can, in many cases, stop the ongoing damage to the joints caused by an autoimmune attack.

But if research by Buckland-Wright and others pans out, Americans at risk of getting osteoarthritis might be able to count on new techniques or drugs that would push back the disease or even repair existing damage.

Osteoarthritis not only destroys cartilage, it also weakens the bones that form the joint. Buckland-Wright and his colleagues now have evidence that risedronate, an osteoporosis drug, might help slow the progression of osteoarthritis. His team gave the drug to people with severe osteoarthritis of the knee for two years.

WHAT WILL HAPPEN?

Diagnosed U.S. cases of arthritis in millions*:

Now: 48

2030: 67 (projected)

After years of wear and tear on joints, osteoarthritis occurs when the cartilage -- the tissue that cushions the ends of bones within a joint -- begins to decay.

Normal knee:

- The ends of the bone are covered with **cartilage**.
- Tendons attach the muscles to the **bones** on either side of the joint.
- The joint is surrounded by the **synovium**, a membrane that produces a thick fluid. The synovium's outer layer, called the capsule, stops the bones from moving too much.
- **Ligaments** on either side of the joint keep the bones in place.

Mild osteoarthritis:

- The **cartilage** roughens and grows thin.
- The **bone** underneath thickens.
- The **synovium** may produce extra fluid, which makes the joint swell.
- The capsule and **ligaments** thicken and contract.

Severe osteoarthritis:

- **Cartilage** is too thin to cover the bone ends.
- **Bone** ends touch and start to wear away.
- The decay and bone spurs can change the shape of the joint, causing bowlegs.

Sources: U.S. Centers for Disease Control and Prevention; National Institute of Arthritis and Musculoskeletal and Skin Diseases; Arthritis Research Campaign; *U.S. Census Bureau

stem cells go beyond treating simple injuries and stop an ongoing disease process — one that constantly grinds up cartilage?

Fleischmann calls that concept "pie in the sky" but says that years from now doctors might have injectable stem cell therapy or some other technique that could hold the line on osteoporosis. "If we could regrow cartilage," Fleischmann says, "that would be the holy grail."

Better artificial joints available

But patients like Levis can't wait for stem cell therapy or any other futuristic techniques. Levis says osteoarthritis had destroyed most of the cartilage in her knees, making it painful to walk even short distances. That's why she opted for the new knee by Zimmer. The company just received Food and Drug Administration approval to market the knee, which is shaped to fit the female knee, says Robert Booth, the orthopedic surgeon at Pennsylvania Hospital who helped develop the device.

The Zimmer knee joins a long list of upgrades to artificial joints, improvements that give people like Levis the assurance that they have an artificial joint that will move more like their own knee did when it was healthy. Levis hasn't gotten there yet. She's still has some pain.

But she had the surgery to replace both knees last month and, despite a little pain, she's still out gardening and taking short walks. She's hoping that by the end of the summer she'll be pain-free and able to reclaim her life. "I'm looking forward to walking a couple of miles a day with my dogs."

"The drug stopped bone loss dead," Buckland-Wright says. A higher dose seemed to actually restore some bone in the knee joint, he says. His team presented the research in November at the American College of Rheumatology meeting held in San Diego.

But additional studies must prove that risedronate or similar drugs can slow the disease, cautions Roy Fleischmann, a rheumatologist at the University of Texas Southwestern Medical Center in Dallas. "There isn't enough evidence to recommend that people use (risedronate) for osteoarthritis yet," he says.

Stem cell therapy — a technique that relies on the idea that stem cells can be prompted to turn into cartilage cells that will grow and repair damage — is another possible avenue for future treatment. Johns Hopkins researcher Jennifer Elisseeff has used the method in rats, finding that stem cells can fill in holes in the cartilage.

"These cells have the amazing ability to repair parts of the body," says Thomas Vangsness, an orthopedic surgeon at the University of Southern California in Los Angeles.

Vangsness and his colleagues are testing a stem cell therapy developed by Osiris Therapeutics. The Baltimore company has developed a solution of stem cells taken from a single adult donor. Vangsness and his colleagues injected the stem cell solution into the knees of 55 patients with a torn meniscus, cartilage-like tissue in the knee. They're hoping the stem cells will turn into cartilage cells and repair the injury, but the data are just now being analyzed, Vangsness says.

He hopes to have some answers in the fall. "If it does work — that would be a huge deal," Vangsness says. But can