

Joint Effort

Fall 2023



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The Future of Joint Repair

The science of regenerative medicine has not caught up with the hype, but shows potential for pain relief.

Regenerative medicine is an umbrella term for a branch of medicine that uses stem cells and tissue engineering to “fix” tissues that have failed to repair themselves. But expectations for regenerative medicine have sometimes gotten ahead of the science. Although its potential to repair and rebuild cartilage has not been fulfilled yet, it has had successes, especially for pain relief.

This booming field has been largely unregulated. So it's important to separate what goes on in reputable research institutions from certain for-profit clinics that hawk therapies of questionable value. Regenerative medicine – which is being tried primarily in osteoarthritis (OA) -- has two branches. One is tissue engineering, which tries to create replacements for damaged tissue. The other is self-healing, which uses injections of stem cells or blood products to push the body to repair itself.

Platelet-rich Plasma

Platelet-rich plasma (PRP) is probably the most widely performed of these procedures. Blood is drawn from the patient and spun in a centrifuge to separate the platelets from other blood components. The platelets are then injected into problem areas.

How it Works: Your body's first response to injury is to send platelets to the site. This blood component contains growth factors and other nutrients. PRP is thought to boost that natural response.

Benefits: PRP is done fairly quickly and generally requires only one injection. It provides symptomatic relief that may last three to six months. In some studies, PRP outperformed and sometimes outlasted hyaluronic acid or corticosteroid injections. “But does it have a benefit that goes beyond pain relief? We just don't know,” says Christopher Evans, PhD, director of Mayo Clinic's Musculoskeletal Gene Therapy Research Lab.

Keep in mind: Studies suggest the preparation method, the type of centrifuge used and even the delivery method can significantly affect the results. Most insurers don't cover PRP; out-of-pocket costs can range from \$500 to \$2,000.

Autologous Conditioned Serum (ACS)

Called Orthokine in Europe and Regenokine in the United States, ACS uses the patient's own blood to fight pain. Your blood is processed to increase the anti-inflammatory proteins and growth factors it contains. Then it is injected in your affected joints, usually in a series of shots.

How it works: Regenokine blocks interleukin-1 (IL-1), a key player in inflammation. It relieves pain and could conceivably slow OA damage.

Benefits: Dr. Evans says the treatment is safe and well-tolerated. Like PRP, studies show only symptom relief, but no evidence of any tissue regrowth.

Keep in mind: ACS is more commonly used for muscle, tendon and ligament damage than it is for arthritis. It is more complex and less readily available than PRP and the cost may be as high as \$10,000 a session.

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Information - Education - Support

The Future of Joint Repair - *Cont'd from page 1*

Stem Cells

Stem cells can make copies of themselves and turn into other types of cells. In adults, a small number of these unspecialized cells lie dormant in many organs and tissues. The idea that stem cells might be a source of renewable tissue for almost any part of the body is the basis for this line of treatments.

How it works: Mesenchymal stem cells (MSCs), which are found mainly in bone marrow and fat, are usually used for these procedures. The stem cells are separated from other tissue components and are then injected into your painful joint. The theory is that the stem cells will initiate tissue regeneration in the joint.

Benefits: MSCs stimulate the production of anti-inflammatory proteins and growth factors. There is evidence – from studies of varying quality – that MSCs are safe and can improve pain and function in arthritic joints. Riley Williams III, MD, who directs the Institute for Cartilage Repair at the Hospital for Special Surgery (HSS) in New York City says, “I’m really excited about the prospects for treating very early arthritis and some chronic overuse injuries. Stem cells are not going to work for bone-on-bone arthritis, but they are helpful when people are just starting to have some pain and swelling.”

Keep in mind: There’s no evidence that stem cells can restore lost tissue or cause cartilage to grow. “The number of true stem cells in bone marrow and fat is vanishingly small,” explains Brian Halpern, MD, a sports medicine specialist at HSS. “If we could take the bone marrow to the lab and isolate the small population of stem cells and expand them in culture – then we’d really have something,” he says. But the FDA prohibits that in the US at this time. It’s done in much of the rest of the world, however. Most insurers won’t pay for stem cell therapies. The price of a single knee injection at direct-to-consumer stem cell clinics is around \$5,100.

Cartilage Repair and Restoration

When small holes or tears develop in cartilage, usually as a result of injury, they can leave areas of bare bone. Over time, these can lead to OA. Filling them with repair tissue can relieve pain, improve function and delay or prevent the need for surgery later on. A few different techniques are available.

How it works: Micro fracture involves drilling tiny holes in the bony layer under the defect, where a blood clot forms and eventually fibro cartilage grows. Fibro cartilage isn’t as strong or durable as the cartilage we were born with (called hyaline cartilage). In cartilage transplantation, a plug of cartilage and bone is taken either from a healthy part of your knee or from a donated source at a tissue bank. The plug is then transplanted into the cartilage defect.

Matrix-associated autologous chondrocyte implantation (MACI) involves removing a small piece of cartilage from a non-weight-bearing part of the knee. It’s sent to a lab where the cartilage cells are grown on a membrane. The resulting membrane sheet can be cut to fit the defect. Two similar procedures – NeoCart and Novocart 3D – are in clinical trials and likely to be approved within the next few years.

Benefits: Most cartilage transplants are successful, and 88% of patients return to sport. Allograft and auto graft transplants are becoming primary treatment strategies, particularly for younger athletes and active people. Studies show that about 85% of MACI implants survive and integrate with existing cartilage.

Keep in mind: None of these cartilage restoration techniques are intended for people with widespread damage from arthritis. In-network cost for a single-knee allograft is about \$14,000, and auto grafts are about \$11,000. Current pharmacy prices for MACI are around \$40,000; the other two will be priced after they receive FDA approval.

Works in Progress

Stem cells wrapped in cartilage: Jeffrey Lotz, PhD, director of the Orthopaedic Bioengineering Laboratory at the University of California, San Francisco, wrapped MSCs in a sheath of cartilage cells that signal the MSCs to become cartilage. It’s worked in animal models of arthritis; whether it will work in other larger animal models and humans remains to be seen.

Hydrogel scaffolds: Doctor Jennifer Elisseeff, who is the director of the Translational Tissue Engineering Program at the Johns Hopkins University, invented a scaffold to help repair cartilage defects. The gel starts out soft, smooth and watery, and cartilage cells grow in it. In a small clinical trial, the gel, injected into a defect after micro fracture, significantly improved results of the procedure. Patients formed less scar tissue and more “normal” cartilage. Elisseeff also invented an adhesive that bonds to the hydrogel and cartilage, which helps new cells to integrate with existing tissue.

Anti-inflammatory solutions: Farshid Guilak, PhD, co-director of the Washington University Center of Regenerative Medicine in St. Louis, Missouri (and an Arthritis Foundation-funded researcher), is working on anti-inflammatory solutions that include purified stem cell injections and a combination of gene therapy and tissue engineering to improve the body’s repair mechanisms.

SEASONAL CALENDAR - Fall 2023

For more information on our programs and activities, please contact us. While some programs/activities are free to members, others require a charge to cover expenses. Payment is required at least two (2) weeks prior to the start date to ensure sufficient participation. **Cancellation policy** in effect: a) full credit prior to start date or b) reimbursement of remaining sessions, less \$10 administrative fee (for illness only).

Exercise



Pre-registration is a must (Tax receipt available upon request)

DORVAL DAYTIME classes
Sarto Desnoyers Community Centre
1335 Lakeshore Drive

Wednesdays

11:00am - 12:30pm or from 1:00pm - 2:30pm

11 weeks - **Sept 28 to Dec 7**

\$71.50 (members) / **\$82.50** (others)

DDO DAYTIME class

DDO Civic Centre
12001 De Salaberry Boulevard

Fridays

11:00am - 12:30pm

10 weeks - **September 29 to December 1 - \$65**

(Residents of DDO and AWISH members 55+)

PIERREFONDS DAYTIME class

Gerry Robertson Community Centre
9665 Gouin Blvd West

Tuesdays

10:30am - 12:00

12 weeks – **Sept 19 to Dec 5**

\$78.00 (members) / **\$90** (others)

Thursdays

10:30am - 12:00

12 weeks – **Sept 21 to Dec 7**

\$78.00 (members) / **\$90.00** (others)

Led by certified, professional fitness instructors. Well designed to meet individual needs and abilities. Joint and muscle-friendly whole-body exercises, including resistance, aerobics and stretching.

Support



SOCIAL BRUNCHES ARE HELD ON 3RD SUNDAY OF EACH MONTH. CALL THE OFFICE TO CONFIRM YOUR ATTENDANCE. OUR CARING & SHARING SUPPORT GROUP WILL START UP IN THE NEW YEAR! OTHER ASSISTANCE - NEED SOMEONE TO TALK TO, OR NEED PRINT DOCUMENTS, OR WISH TO HAVE AN IN-PERSON PRESENTATION, WE WILL GET IN TOUCH WITH YOU!

Living with Arthritis

Series of **5 weekly** interactive and informal information sessions (in English) where participants are encouraged to share their day-to-day experience, coping skills and ideas. **FREE** admission. Instructor: **Ariana Parolini** - Health & Wellness Coach.

- 1) The nitty-gritty of arthritis.
- 2) Nutrition - Creating the right habits.
- 3) Exploring your options - Relaxation, massage, posturology, therapies,
- 4) Movement matters!
- 5) Staying engaged. Critical to your overall wellbeing.



Tuesday evenings from September 12 to October 10 - **6:30 to 8:30. (Doors open at 6:00)**

Sarto Desnoyers Community Centre, Dorval

Pre-registration is a must: 514-631-3288 or arthritis@awishmontreal.org

Keep the date! Information Session, Wednesday Nov 8, 2023

7 pm at the Sarto Desnoyers Community Centre, Salon A, 1335 Lakeshore, Dorval

Topic: **Response to Crisis / Critical Incident Stress.** (in English with bilingual Q & A)

Speaker: **Mr. William Timmons**, Fire Chief (retired) Westmount Borough, Montreal QC



Mr. Timmon's presentation, developed for Emergency Response Personnel and family, is also helpful for those dealing with everyday stressful issues, such as learning to cope with the stresses of arthritis and chronic pain.



Pain relievers may worsen knee arthritis, study suggests

Knee arthritis patients who regularly took nonsteroidal anti-inflammatory drugs (NSAIDs) wound up with worse knee inflammation and weakened cartilage, compared to a "control" group not taking the medications, a new study found.

UPI

Over-the-counter pain relievers like aspirin, Aleve or ibuprofen don't do a thing to slow the progression of knee arthritis, and might even make things worse, a new study suggests. Knee arthritis patients who regularly took nonsteroidal anti-inflammatory drugs (NSAIDs) wound up with worse knee inflammation and weakened cartilage, compared to a "control" group not taking the medications, researchers report. "We found that the participants who were taking NSAIDs regularly for four years showed worse results with regard to synovitis," which is inflammation within the knee, said lead researcher Dr. Johanna Luitjens, a postdoctoral scholar with the University of California, San Francisco's department of radiology and biomedical imaging. "Also, we saw that the composition of the cartilage was worse in the group of NSAID users compared to the controls," Luitjens added.

Aspirin, ibuprofen (Motrin, Advil) and naproxen sodium (Aleve) are the most common NSAIDs, available over the counter at any pharmacy or grocery store. For this study, Luitjens and her colleagues analyzed data gathered from more than 1,000 participants in a federally funded long-term observational study of knee arthritis. Participants entered the study between February 2004 and May 2006.

The researchers compared 277 people who were prescribed NSAIDs regularly for at least a year, with 793 people not treated with the drugs. All of the participants received knee MRI scans at the beginning of the study, and then four years later. The researchers looked over the MRIs to see if NSAID treatment helped or hurt, adjusting their findings using a graded arthritis measurement to provide a better apples-to-apples comparison between the two groups, Luitjens said.

The results showed that NSAID users had worse joint inflammation and cartilage quality at the beginning of the study compared to the control group, and their knee health had deteriorated even more after four years. "There were no protective mechanisms from NSAIDs in reducing inflammation or slowing down progression of osteoarthritis of the knee joint," Luitjens said. "The use of NSAIDs for their anti-inflammatory function has been frequently propagated in patients with osteoarthritis in recent years and should be revisited, since a positive impact on joint inflammation could not be demonstrated."

NSAIDs might not be effective in controlling the sort of inflammation that comes with knee arthritis, Luitjens suggested. It's also possible that NSAIDs cause cartilage to become weaker, similar to the way that steroids affect cartilage. It also might be that people taking NSAIDs tend to be more active, using the meds so they can be pain-free while they play, Luitjens added. That sort of activity could cause more wear and tear and create more knee inflammation. A randomized, controlled clinical trial will be needed to confirm what was observed in this study, Luitjens noted.

Orthopedic surgeon Dr. Nicholas DiNubile said he won't be changing his practice based on these findings. "This study raises an interesting question, but I don't think it answers it. Not even close," said DiNubile, who practices in Havertown, Pa., and serves as an expert for the American Academy of Orthopaedic Surgeons.

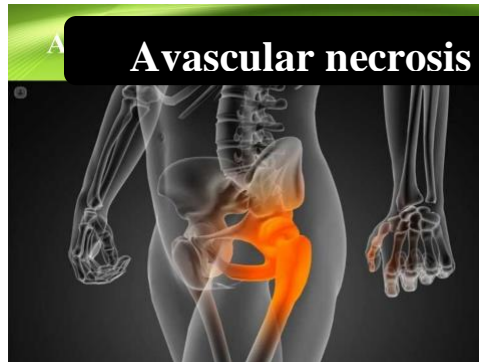
DiNubile agreed that a clinical trial is needed to confirm these results, but he added that the type of NSAID use documented in this study doesn't really happen anymore. "The days of taking NSAIDs chronically are pretty much over. We really try to avoid that at all costs because NSAIDs have a wide range of other issues associated with them, including ulcers, bleeding and damage to the liver, kidneys and heart", DiNubile said. "The days of popping them like M&Ms are over," he added.

People living with knee arthritis - or who hope to avoid it - would do best to lose weight and exercise, DiNubile said. "It's been shown that even an 8- to 10-pound weight loss can significantly lower your risk of getting a knee replacement," DiNubile said. "Small amounts of weight loss are always recommended."

Exercise also creates stronger muscles that can take pressure off the knee joint, he added. "Exercise and weight loss are two things that have strong data behind them," DiNubile said. "Everything else is that holy grail we're waiting to come one of these days."

The study was presented in November 2022 at a meeting of the Radiological Society of North America, in Chicago.

MAYO CLINIC



Avascular necrosis is the death of bone tissue due to a lack of blood supply. Also called osteonecrosis, it can lead to tiny breaks in the bone and cause the bone to collapse. The process usually takes months to years. A broken bone or dislocated joint can stop the blood flow to a section of bone. Avascular necrosis is also associated with long-term use of high-dose steroid medications and too much alcohol. Anyone can be affected, but the condition is most common in people between the ages of 30 and 50.

Symptoms

Some people have no symptoms in the early stages of Avascular necrosis. As the condition worsens, affected joints might hurt only when putting weight on them. Eventually, you might feel the pain even when you're lying down. Pain can be mild or severe. It usually develops gradually. Pain associated with Avascular necrosis of the hip might center on the groin, thigh or buttock. Besides the hip, the shoulder, knee, hand and foot can be affected. Some people develop Avascular necrosis on both sides, such as in both hips or in both knees.

When to see a doctor

See your health care provider for ongoing pain in any joint. Seek immediate medical attention for a possible broken bone or dislocated joint.

Causes

Avascular necrosis occurs when blood flow to a bone is interrupted or reduced. Reduced blood supply can be caused by:

- **Joint or bone trauma.** An injury, such as a dislocated joint, might damage nearby blood vessels. Cancer treatments involving radiation also can weaken bone and harm blood vessels.
- **Fatty deposits in blood vessels.** The fat (lipids) can block small blood vessels which can reduce blood flow to bones.
- **Certain diseases.** Medical conditions, such as sickle cell anemia and Gaucher disease, also can lessen blood flow to bone.

Sometimes the cause of Avascular necrosis not brought on by trauma isn't fully understood. Genetics, combined with overuse of alcohol, certain medications, and other diseases likely play a role.

Risk factors

Risk factors for developing Avascular necrosis include:

- **Trauma.** Injuries, such as hip dislocation or fracture, can damage nearby blood vessels and reduce blood flow to bones.
- **Steroid use.** Use of high-dose corticosteroids, such as prednisone, is a common cause of Avascular necrosis. The reason is unknown, but some experts believe that corticosteroids can increase lipid levels in the blood, reducing blood flow.
- **Drinking too much alcohol.** Having several alcoholic drinks a day for several years can also cause fatty deposits to form in blood vessels.
- **Bisphosphonate use.** Long-term use of medications to increase bone density might contribute to developing osteonecrosis of the jaw. This rare complication has occurred in some people treated with high doses of these medications for cancers, such as multiple myeloma and metastatic breast cancer.
- **Certain medical treatments.** Radiation therapy for cancer can weaken bone. Organ transplants, especially kidney transplants, also are associated with Avascular necrosis.

Medical conditions associated with Avascular necrosis include:

- Pancreatitis
- Gaucher disease
- HIV/AIDS
- Systemic lupus erythematosus
- Sickle cell anemia
- Decompression sickness, also known as divers' disease or the bends.
- Certain types of cancer, such as leukemia.

Continued on page 6



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Avascular necrosis cont'd from page 5

Complications

Untreated, Avascular necrosis worsens. Eventually, the bone can collapse. Avascular necrosis also causes bone to lose its smooth shape, possibly leading to severe arthritis.

Prevention

To reduce the risk of Avascular necrosis and improve general health:

- **Limit alcohol.** Heavy drinking is one of the top risk factors for developing Avascular necrosis.
- **Keep cholesterol levels low.** Tiny bits of fat are the most common substance blocking blood supply to bones.
- **Monitor steroid use.** Make sure your health care provider knows about your past or present use of high-dose steroids. Steroid-related bone damage appears to worsen with repeated courses of high-dose steroids.
- **Don't smoke.** Smoking narrows blood vessels, which can reduce blood flow.



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