

GAME CHANGERS

IN THE LAND OF 10,000 INNOVATIONS, VISIONARIES FROM THE GREATER MSP REGION ARE CHANGING THE WAY SPORTS ARE PLAYED.

Profile: Mayo Clinic Sports Medicine, Center for Regenerative Medicine

Because of sports, many Americans can now accurately describe what an ACL is, or how plantar fasciitis happens. They also know how devastating these injuries can be to a player, which can require surgery or long rehabilitation.

PROFILE > Mayo Clinic Sports Medicine, Center for Regenerative Medicine

TYPE > Medical research and practice

STORY THEMES > Injury and rehabilitation
Stem cells
Medical research
Sports medicine

OVERVIEW > Recovering from injury is challenging for athletes at any level. But innovative new therapies, including many researched and put into practice at the world-renowned Mayo Clinic and its sports medicine practice in downtown Minneapolis, use stem cells and other biological tools to help athletes regenerate damaged tissue to recover from injuries faster, slow or reverse the effects of overuse in joints, and extend their playing careers. These same approaches may also be able to save and transform the lives of people of all walks of life who suffer from serious diseases or injury.

KEY PEOPLE > Dr. Jonathan Finnoff, medical director of Mayo Clinic Sports Medicine

KEY QUOTE > *“Recent research has shown if you do repeated cortisone injections, that actually makes arthritis accelerate and get worse faster. If you’re a young player and getting these, you could potentially be shortening your career. This is where regenerative therapies come in. We’re trying to enhance the overall health of the joint.”*
- Dr. Jonathan Finnoff

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Because of sports, many Americans can now accurately describe what an ACL is, or how plantar fasciitis happens. They also know how devastating these injuries can be to a player, which can require surgery or long rehabilitation.

Unfortunately, injury is part of any sport. Fortunately, medical and technological advances in healing and recovery pioneered and put into practice in Minnesota are helping athletes get back on the field faster, helping injured people improve their quality of life, and in many cases, have applications that can help players avoid or reduce the chance of injury in the first place.

At Rochester, MN-based Mayo Clinic, and especially in its sports medicine practices located in Rochester and Minneapolis, doctors are using stem cells and other regenerative therapies to help athletes (including many professional players) get back in the game faster, avoid or delay surgery, or heal faster or stronger after a surgery.

“We’ve been doing regenerative medicine in the sports medicine center at Mayo Clinic for nearly 15 years,” said Dr. Jonathan Finnoff, medical director of Mayo Clinic Sports Medicine at Mayo Clinic Square in downtown Minneapolis. As the technology has advanced, the field has risen in importance to Mayo, which established its Center for Regenerative Medicine in Rochester in 2011. “This is a big deal for Mayo Clinic,” Dr. Finnoff said.

Minnesota’s long history as a leading region in the field of medicine and med-tech make this a natural focal point for many advancements.

- The region is home to several of the nation’s leading medical research and treatment centers, including Mayo Clinic, the University of Minnesota and others
- It is the home or home base of many large medical device and biotechnology companies
- Those med-tech and biomedical companies have attracted a large, skilled workforce in this demanding field

HELPING THE BODY HELP ITSELF

Stem cells are perhaps the most widely known component of regenerative therapy, but they are not the only one, Dr. Finnoff said, and each has its own applications:

- Stem cells, special cells can be used to grow new tissue of any type in the body if injected at the site of injured or damaged tissues and activated.
- Growth factors, a term for biological materials that stimulate healing as a kind of catalyst – these can be used in conjunction with stem cell injections, or used to stimulate growth and repair
- Other biological material used in the therapy. Notably, doctors can construct a type of “bio-scaffold” at the site of an injury, around which new tissue will grow.

Generally, these procedures involve harvesting biological materials from the patient. So in a sense the body is helping heal itself.

For regenerative medicine treatments, a common approach is to use platelet-rich plasma. “We take a blood draw – like a blood sample, but a larger amount,” explained Dr. Finnoff. “We put it in a centrifuge and it

separates into layers.” One layer is rich in platelets, which cause clotting and act as a sort of glue, as well as have multiple growth factors involved in healing. This layer is drawn off and injected at the site of the injury, promoting regrowth and healing.

A NEW APPROACH TO TREATING DAMAGED JOINTS

In the sports world, these therapies are commonly used on the tissues and joints, where there are both traumatic and overuse injuries.

Trauma can take the form of torn or ruptured ligaments; in these cases there may be a surgery paired with regenerative therapy to speed recovery.

But for many players, generalized damage like arthritis is especially challenging. In arthritis caused by trauma, common in football players, an entire area of a joint is weakened and damaged. Surgery often can’t help in these cases, unless it’s a career-ending joint replacement. So players often live with this pain or use therapies like cortisone injections to temporarily relieve pain and improve mobility.

But it comes at a cost. “Recent research has shown if you do repeated cortisone injections, that actually makes arthritis accelerate and get worse faster,” said Dr. Finnoff. “If you’re a young player and getting these, you could potentially be shortening your career. This is where regenerative therapies come in. We’re trying to enhance the overall health of the joint.” Players in all the major sports turn to Mayo Clinic Sports Medicine for help, and the new location in downtown Minneapolis which opened in 2015 makes consultations easier, Dr. Finnoff said. Since the Minneapolis-Saint Paul region features teams on all the major leagues, players from around the country have reason to stop by.

Another reason players turn to Mayo Clinic Sports Medicine, Dr. Finnoff said, is their familiarity with anti-doping regulations. “It’s really important to go to a place that not only works in this field, but understands the implications for athletes,” he said. “For example, you can’t do a growth factor injection into muscle.” A player can be suspended or banned for that, which can cut into or even shut down a finite career.

FUTURE POTENTIAL FOR ADDITIONAL INJURIES AND CONDITIONS

In the future, Mayo Clinic is working on stem cell therapies that might help players (and others) with life-altering serious conditions.

One area where the Mayo Clinic is a leader is regenerative therapy for the heart. “We were one of the first centers to inject stem cells into heart muscle,” said Dr. Finnoff. This new option might not only help the millions of people suffering from heart failure or damage, but opens the possibility of using stem cells to repair muscle tissue itself, another area of research at Mayo.

Mayo is also investigating the use of stem cells to help in some of the most traumatic injuries, those involving the spinal column. If stem cells can be shown to regrow nerves, it could potentially help badly injured players some of their former lives. And that’s more important than any game, Dr. Finnoff said. “Ultimately, what we want to do is improve the public’s health.”

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