BIOLOGICS

Biologics are cells, blood components and other natural substances that harness the body's own power to promote healing and decrease inflammation. At Midwest Orthopaedics at Rush, our physicians are committed to providing patients access to a promising collection of biological treatments.

Our physicians and research staff are at the forefront of developing and vetting these emerging therapies through rigorous basic science research and on-going clinical trials. The result has been the careful application of techniques that expand our offering of less-invasive treatment options or augment our surgical solutions.

Because the level of discomfort and loss of function varies from patient to patient, so does our approach to each individual's care. As part of this mission, your treatment regimen may include biologics -- used alone as a more conservative method of intervention -- or as a supplement to a surgical procedure.

With a long list of academic credentials, industry awards, orthopedic leadership positions and clinical experience, our physicians can recommend the best course of treatment for you.

INJECTIONS

Our own blood, bone marrow, and fat contain potent elements that naturally reduce inflammation and promote healing. By utilizing these substances in qualifying patients, including platelet-rich plasma, bone marrow derived stem cells or adipose tissue, our physicians are able to tap into the body's own natural resources to either avoid or delay surgery, or improve the outcomes of operative intervention.

Platelet-Rich Plasma

Platelet-rich plasma (PRP) contains a high concentration of platelets and a variable amount of white blood cells (depending on the application), which enhance the body's natural ability to heal, can reduce inflammation in tendons and arthritic joints and accelerate the repair of damaged tendons and ligaments.

The process of utilizing PRP starts with a simple blood draw. After platelets are isolated using a special device called a centrifuge, they are then injected directly into a damaged area. This can be done alone in an outpatient setting or in conjunction with a surgical procedure to help reinforce a repair, speed healing and shorten recovery time.

STEM CELLS

Studies show that stem cells can have the ability to reduce inflammation and provide important proteins that may promote healing, particularly at the site where they are injected. The cells can be acquired from a patient's own body or potentially from

donated human tissue. Because stem cells have natural healing properties, they may be used to reinforce a surgical repair in the joints, spine, or tendon. More specifically, patients suffering with osteoarthritis, chronic tendon or ligament injuries or cartilage defects, may also benefit from stem cell injections. In order to establish best clinical practices, our office offers these treatments as part of clinical trials when indicated.

Bone Marrow Aspiration

Bone marrow is an abundant resource of stem cells. Extracted from the inner cavity of the pelvis, humerus or tibia, these stem cells provide proteins that can promote healing and decrease inflammation. The product is referred to as bone marrow aspirate concentration (BMAC).

Once extracted, the bone marrow is spun in a special device called a centrifuge so that the stem cells separate from other components. The isolated cells are then injected into the area of concern. The procedure can be performed in tandem with a surgical procedure or alone in an outpatient setting. There is increasing evidence that using bone-marrow-derived stem cells along with existing surgical techniques may improve outcomes, particularly for patients undergoing revision procedures. Surgeons at MOR are actively engaged in BMAC research to demonstrate improved healing in patients with rotator cuff tears and knee meniscus tears and osteoarthritis.

Adipose Tissue

Fat plays an essential role in the way our body functions and may also play a role in how we heal. Also called adipose tissue, fat contains a network of blood vessels, connective tissue, and potentially regenerative cells, including adipose-derived stem cells. Studies over several decades have discovered that fat's reparative cells can help promote a healing environment in response to a tissue injury and can also enhance surgical outcomes for the right patients.

Adipose tissue is harvested from a patient's own body. During the collection procedure, a physician makes a tiny puncture through the skin and draws a small amount of fat from either the midsection or "love handles." Next, the collected fat is processed to eliminate any impurities, toxins, and inflammatory elements. After processing, a small needle is used to inject the tissue into the treatment site.

Amniotic Products

Amniotic fluid contains hyaluronic acid, an agent known for its anti-inflammatory properties. It also contains a cellular component that may also aid in its effect. Amniotic membrane is the thin, inner layer of the placenta. Like amniotic fluid, the membrane has the potential to decrease inflammation, but it's also been found to boost tissue healing. These are typically harvested from healthy, elective cesarean sections by a third party and screened before use. The products can come in the form of a patch or, more commonly, an injection. The use of amniotic tissue may help patients with mild to

moderate osteoarthritis decrease pain and swelling, particularly in the knee and can also be used as an adjuvant during a surgical procedure to promote healing and reduce scar formation.

SURGICAL INTERVENTIONS / CARTILAGE TRANSPLANT

Cartilage helps a joint glide smoothly and acts as a cushion between bony structures. But as we age, it's vulnerable to wear and tear, or it can be damaged due to an injury. This deterioration process is called osteoarthritis.

Cartilage transplants can help reduce pain and increase function by restoring the joint's natural anatomy. At the same time, the procedure may slow the progression of osteoarthritis and help patients delay the need for a more invasive procedure, particularly those considered too young to undergo total joint replacement.

Advances in preserving donor tissue as well as the technique and tools used to place newly grown or donor cartilage have greatly improved in the last several years, making the outcome of this course of treatment more predictable.

Most commonly performed in the knee, cartilage transplantation may also benefit patients with early joint damage in the shoulder, elbow and ankle. These procedures are not intended for patients who have been told they have bone-on-bone arthritis or if they have been told they need a joint replacement.

Factors that affect the success of these procedures include age (ideally under 45 years) and prior surgical history. These are complex situations that require careful consideration of both patient factors as well as issues specific to the knee itself.

Osteochondral Autograft Transplantation

In some cases, a patient's own cartilage may be harvested and transferred from one part of the joint to another during a single procedure. The surgeon will remove a small piece of healthy cartilage and bone, typically from a non-weight-bearing area of the joint. The graft will then be used to plug, or fill in, the area of reduced cartilage.

Osteochondral Allograft Transplantation

Just like an organ, such as a heart or kidney, cartilage can also be donated. When donor cartilage is used, the surgeon shapes the graft to fit precisely into the patient's area of reduced cartilage and underlying damaged bone, creating a smoother and more natural surface. This procedure is well suited for active individuals or those who have failed other cartilage procedures. Unlike other forms of tissue transplantation, this procedure does not require patients to be on medication to prevent tissue rejection.

Autologous Chondrocyte Implantation

This is a two-stage procedure that requires the harvest of cartilage from a patient's knee during an initial staging procedure. Subsequently, the cells are grown in a lab where they can later be implanted during a second surgical procedure. This procedure is typically utilized for cartilage defects in the patellofemoral joint (behind the knee cap) or in young patients who have lost areas of the cartilage surface with relatively normal underlying bone.

Meniscus Transplantation

For patients who have had the meniscus completely removed in a previous surgery, a meniscus transplant can be an option. Using this technique, surgeons transplant size-matched, donated meniscus cartilage which has been tested to ensure that it is free of any transmittable disease. Unlike other forms of tissue transplantation, this procedure does not require patients to be on medication to prevent tissue rejection.

To replace meniscus cartilage, surgeons can arthroscopically, through small incisions, sew in a meniscus transplant that heals and functions much like the patient's own meniscus. This leads to a more stable and less painful knee that might otherwise have developed progressive arthritis.

CLINICAL TRIALS

If you are interested in learning more about a Midwest Orthopaedics at Rush biologics clinical trial, following is a list of open studies with specific contact information for each:

Rotator Cuff Stem Cell

Cartilage Restoration in the Knee

PRP for Osteoarthritis in the Knee

http://www.briancolemd.com/regenerative-medicineorthobiologics/

For more information on the use of biologics, please view the following short videos:

If you are interested in speaking with a physician about biologic treatments, contact MOR scheduling to find the best physician for you: 877-MD-BONES.