BIOLOGIC INJECTIONS

MIDWEST
ORTHOPAEDICS
at RUSH
Jourdan M. Cancienne, MD

Cortisone
Injections

Steroids act like the hormone cortisol, which functions as a part of your body's natural defense system to reduce inflammation in the body. For most patients, decreasing inflammation typically translates into pain relief.

WHERE IN OUR BODY DOES CORTISOL HAVE ITS EFFECTS?

Most cells in our body have cortisol receptors. Thus, the hormone has a wide-ranging effect throughout our body: controls blood sugar levels and blood pressure, regulates the metabolism, and affects salt and water balance.

WHAT ARE THE FDA-APPROVED STEROID DRUGS USED TO TREAT OSTEOARTHRITIS?

Methylprednisolone acetate (Depo-Medrol)
Considered the longest lasting cortisone injection.
Triamcinolone (Kenalog)
Most consistently regarded as the best type of steroid for knee osteoarthritis.
Zilretta
Considered a more long-lasting version compared to Kenalog.

WHAT TYPE OF RELIEF CAN I EXPECT?

Generally, the less wear and tear your joint has, the more pain relief you can expect. Cortisol injections are more beneficial when there is no significant joint damage. Therefore, joints with advanced osteoarthritis are less likely to see as good of outcomes from these injections compared to joints with more mild osteoarthritis.

BESIDES POSSIBLE PAIN RELIEF, ARE THERE ANY OTHER BENEFITS OF GETTING AN INJECTION?

Corticosteroid and local anesthetic injections can sometimes aid in your diagnosis. Unlike the precise nerve endings in our fingers, nerve endings in the joints are not as well trained. If the pain is being generated from inside the joint, a complete relief of the symptoms initially should be expected after the injection. If there is no symptomatic relief, other causes of pain should be investigated. In other words, if the pain is not relieved by an intra-articular injection, at least initially with the local anesthetic, it is most likely coming from somewhere outside the joint (muscles, tendons, bone).

HOW DOES THE INJECTION WORK?

Joints, such as a knee, shoulder, or hip, are contained within a bag called the capsule. To take effect, the needle must enter the capsule. An injection into any location of the joint will result in diffuse action of the liquid injected within the capsule, regardless of the needle entry site.

WHAT SHOULD I EXPECT WHEN I GET THE INJECTION?

Prior to the injection, your doctor or PA will mark the location of entry. Next, the area will be cleaned using a brown solution called Povidone Iodine and an alcohol wipe. A cold numbing spray will then be applied to the area that will be injected. Finally, the injection will be administered, with or without ultrasound guidance. When the cortisone is injected, you may feel a sting, followed by a sensation of fullness within the knee.

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WHAT SIDE EFFECTS CAN I EXPECT FROM THE INJECTION?

1- It is not uncommon to feel lightheaded after an injection. Your doctor or PA will remain with you in the room immediately following the injection to ensure that it is safe for you to stand and begin to ambulate about the room.
2- You may feel an increase in pain the day following your injection. This is normal, as the cortisone can stimulate a local inflammatory reaction soon after injection. In order to minimize this, try to ice as much as possible and limit your activity for the first day or so.
3- Irritation of the joint (redness, warmth, pain)
4- Increase in blood sugar levels (diabetic patients should regularly check their blood glucose levels for 1-2 days following the injection)
5- Thinning of the bone structure around the knee (this is a rare side effect)

WHEN WILL I START TO FEEL THE RESULTS?

It is important to understand that it may take a few days for the effects of the cortisone to kick in. However, in addition to the cortisone, the injection also contains lidocaine (bupivacaine), which is a local anesthetic. Thus, most patients experience an immediate relief in pain. This immediate relief only lasts for a few hours. Do not be alarmed if you start to experience an increase in pain after the lidocaine wears off. This is a window period between the local anesthetic diminishing and before the cortisone takes effect.

HOW LONG WILL THE EFFECTS TYPICALLY LAST?

4-6 weeks (not as long as biologic injections)

HOW OFTEN CAN I GET A CORTISONE INJECTION?

Cortisone injections can only be administered at least **3-4 months** apart.

HOW SOON AFTER RECEIVING AN INJECTION CAN I HAVE SURGERY?

3-4 months, depending on the anticipated surgical procedure.

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Gel Injections
(Hyaluronic Acid)

Joints, such as a knee, shoulder, or hip, are contained within a bag called the joint capsule. A healthy knee joint contains up to four milliliters of joint fluid within the capsule. This joint fluid is comprised of multiple different components including hyaluronic acid, salts, collagen, and several types of proteins. Hyaluronic acid (HA) also happens to be one of the main elements of our body's natural cartilage.

HOW DOES HYALURONIC ACID WORK ON MY KNEE?

Hyaluronic acid gives the joint fluid its heavy viscous, slippery quality. It acts as both a shock absorber and lubricant in your knee joint. In a properly working joint, HA allows the cartilage surfaces that coat our bones to glide seamlessly over each other.

HOW DOES THE INJECTION WORK?

When cartilage wears off, such as in the case of osteoarthritis, our body attempts to improve the gliding of our bones and diminish the inflammation by producing a surplus of joint fluid. However, despite this increase in fluid production, there is typically a lower concentration of hyaluronic acid within the fluid. With less HA, an arthritic knee has less protection against joint friction and impact. As a result, the patient not only begins to experience pain, but also accelerated degeneration of their joint. A gel injection may artificially supplement the joint fluid's lacking hyaluronic acid supply, thus restoring the fluid's natural viscosity—a process known as viscosupplementation.

HOW WILL VISCOSUPPLEMENTATION HELP MY SYMPTOMS?

Viscosupplementation has the potential to not only temporarily lubricate the knee joint, but also bind to the excess inflammatory molecules produced within the capsule. As the injected HA fluid is naturally reabsorbed by our body's systemic system over the next twenty-four hours, excess inflammatory molecules are cleared with it from the capsule. Thus, the patient may experience alleviated pain, improved function, and possibly even decelerated degeneration of the joint.

ARE GEL INJECTIONS A SERIES OF INJECTIONS?

Several studies have shown that multiple injections amplify pain relief when compared to single injections of HA. It is recommended that for maximum results, a patient receive a total of three injections—one administered every week for three weeks.

HOW DOES THE INJECTION WORK?

To take effect, the needle must enter the capsule. An injection into any location of the joint will result in diffuse action of the liquid injected within the capsule, regardless of the needle entry site.

WHAT SHOULD I EXPECT WHEN I GET THE INJECTION?

Prior to the injection, your doctor or PA will mark the location of entry. Next, the area will be cleaned using a brown solution called Povidone Iodine and an alcohol wipe. A cold numbing spray will then be applied to the area that will be injected. Finally, the injection will be administered, with or without ultrasound guidance. When the gel is injected, you may feel a sting, followed by a sensation of fullness within the knee.

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Gel Injections
(Hyaluronic Acid)

WHAT SIDE EFFECTS CAN I EXPECT FROM THE INJECTION?

1- It is not uncommon to feel lightheaded after an injection. Your doctor or PA will remain with you in the room immediately following the injection to ensure that it is safe for you to stand and begin to ambulate about the room.
2- You may feel an increase in pain or swelling the day following your injection. This is normal, as the injection can stimulate a local inflammatory reaction soon after. In order to minimize this, try to ice as much as possible and limit your activity for the first day or so.
3- Irritation of the joint (redness, warmth, pain)
4- Allergic reaction—**please inform a member of our team if you have an allergy to eggs, bird feathers, or other bird products.**
5- Infection—although this is rare.

WHEN WILL I START TO FEEL IMPROVEMENT IN MY SYMPTOMS?

Symptomatic relief accumulates with each injection. Although it is not uncommon to begin to experience growing relief with each injection, optimal results are expected 30 days following the initial injection.

HOW LONG WILL THE EFFECTS TYPICALLY LAST?

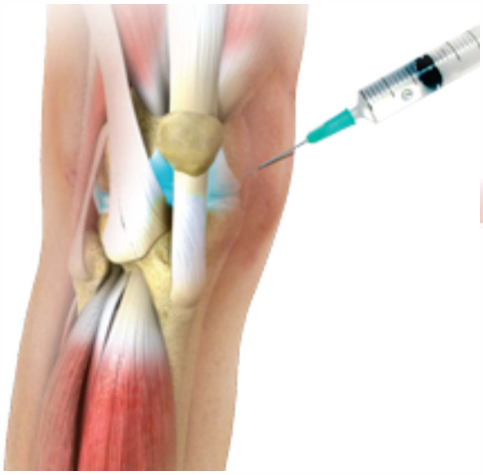
On average, the relief lasts approximately **6-9 months**. Generally, the less wear and tear your joint has, the more pain relief you can expect. Gel injections are more beneficial when there is no significant joint damage. Therefore, joints with advanced osteoarthritis are less likely to see as good of outcomes from these injections compared to joints with more mild osteoarthritis.

HOW OFTEN CAN I GET A GEL INJECTION?

Gel injections can only be administered **every 6 months** if needed

HOW SOON AFTER RECEIVING AN INJECTION CAN I HAVE SURGERY?

Surgery can be performed at any time following a gel injection.



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Platelet Rich Plasma
(PRP) Injections

Blood has four main components: red blood cells, white blood cells, platelets, and plasma (the fluid that carries the other blood components). Platelets are tiny blood cells that are mainly in charge of blood clotting. However, platelets also play a critical role in transporting the proteins that stimulate the proliferation of new cells and collagen (one of the main components of cartilage), suppress inflammation, and impede cell death. PRP injections aim to deliver a large number of platelets to injured tissues to bolster the healing process. Although the functionality of the PRP injection in this manner has been proven by multiple studies, cartilage healing has yet to be demonstrated in clinical studies.

WHAT ROLE DO PLATELETS HAVE IN OUR BODY'S NATURAL HEALING PROCESS?

Platelets play a fundamental role in the healing process. Platelets are a natural source of growth factors (proteins). Growth factors are required for tissue healing and regeneration.

WHAT TYPE OF RELIEF CAN I EXPECT?

Generally, the less wear and tear your joint has, the more pain relief you can expect. PRP injections are more beneficial when there is no significant joint damage. Therefore, joints with advanced osteoarthritis are less likely to see as good of outcomes from these injections compared to joints with more mild osteoarthritis. However, the magnitude of improvements tends to be greater after PRP injections when compared to cortisone injections.

ARE PRP INJECTIONS A SERIES OF INJECTIONS?

Several studies have shown that multiple injections provide better pain relief when compared to single injections of PRP. It is recommended that for maximum results, a patient receive a total of three injections—one administered every week for three weeks. Additionally, it is optimal if each PRP injection is administered simultaneously with a gel (hyaluronic acid) injection. This combination enhances each of the injections' respective effects and demonstrates a significant decrease in symptoms when compared to HA or PRP injection alone.

HOW DOES THE INJECTION WORK?

PRP injections are created using a sample of your own blood. The blood collection will be centrifuged (spun down) in a machine to separate the blood components. The red blood cells and white blood cells are removed, as these components are detrimental to the joint and alleviation of symptoms. The platelets and plasma contain numerous growth factors, and thus are collected in a syringe for injection into the joint. Joints, such as a knee, shoulder, or hip, are contained within a bag called the capsule. To take effect, the needle must enter the capsule. An injection into any location of the joint will result in diffuse action of the liquid injected within the capsule, regardless of the needle entry site.

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Platelet Rich Plasma
(PRP) Injections

WHAT SHOULD I EXPECT WHEN I GET THE INJECTION?

Initially, blood will be drawn from a vein in your arm by a healthcare professional. Next, the blood will be centrifuged in a PRP machine to produce a sample of plasma that contains a concentration of platelets 3-5 times greater than our body's natural plasma. This process takes approximately 12 minutes. During that time, you can relax in the exam room. Prior to the injection, your doctor or PA will mark the location of entry. Next, the area will be cleaned using a brown solution called Povidone Iodine and an alcohol wipe. A cold numbing spray will then be applied to the area that will be injected. Finally, the injection will be administered, with or without ultrasound guidance. When the PRP is injected, you may feel a sting, followed by a sensation of fullness within the knee.

WHAT SIDE EFFECTS CAN I EXPECT FROM THE INJECTION?

1- It is not uncommon to feel lightheaded or dizzy after an injection. Nausea, sweating, gastritis, and rapid heart rate have also been reported. Your doctor or PA will remain with you in the room immediately following the injection to ensure that it is safe for you to stand and begin to ambulate about the room.
2- You may feel an increase in pain or swelling the day following your injection. This is normal, as the injection can stimulate a local inflammatory reaction soon after. In order to minimize this, try to ice as much as possible and limit your activity for the first day or so.
3- Irritation of the joint (redness, warmth, pain)
4- Infection—although this is rare.

WHEN WILL I START TO FEEL IMPROVEMENT IN MY SYMPTOMS?

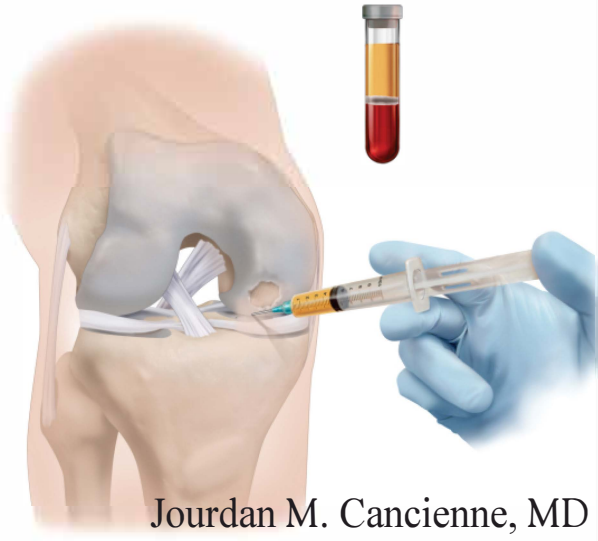
Symptomatic relief accumulates with each injection. Although it is not uncommon to begin to experience growing relief with each injection, optimal results are expected 30 days following the initial injection.

HOW LONG WILL THE EFFECTS TYPICALLY LAST AND HOW OFTEN CAN I GET A PRP INJECTION?

On average, patients experience **about 9 months** of relief.
PRP injections can be administered **every 6 months**. Research is suggestive that yearly injections may prove beneficial in maintaining consistent symptomatic relief.

HOW SOON AFTER RECEIVING AN INJECTION CAN I HAVE SURGERY?

Surgery can be performed at any time following a PRP injection.



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Stem Cell
Injections

Stem cells are a group of cells present within our bodies that function as a type of repair system. Stem cells are the foundation of organ and tissue formation in embryonic development. However, the task of stem cells does not cease at birth. Throughout the entirety of our lives, stem cells are continually at work, within the natural cycle, creating new cells to replace the damaged and dead cells of the body. Unfortunately, as we age, the sum of this group of cells gradually depletes. Therefore, their potential to regenerate and heal damaged cells and tissues diminishes, and signs of aging become apparent. The use of stem cells in orthopedics is an exciting treatment field that continues to evolve at a rapid pace. Still, it is important to recognize that the idealized outcomes driving much of the surrounding interest has yet to be realized to its full potential in clinical practice.

HOW DOES STEM CELL THERAPY PLAY A ROLE IN ORTHOPEDICS?

The goal of stem cell therapy is to amplify the number of stem cells present at injury sites in order to enhance the body's natural healing process. Besides having a regenerative potential, stem cells are powerful signaling cells and growth factors, meaning they can regulate the body's inflammatory response and block inflammation within the joint. Suppression of inflammation, in combination with potential healing and regeneration of tissue, may yield noticeable symptomatic relief in those suffering from osteoarthritis, although this has yet to be proven.

HOW DOES THE INJECTION WORK?

Stem cell injections are created using a sample extracted from your body. Most commonly this sample is taken from bone marrow, otherwise known as bone marrow aspirate (BMAC). Blood, fat, or muscle can also be a source of stem cells. The collection will be centrifuged (spun down) in a machine to concentrate the stem cells in order to be injected into the affected joint. Joints, such as a knee, shoulder, or hip, are contained within a bag called the capsule. To take effect, the needle must enter the capsule. An injection into any location of the joint will result in diffuse action of the liquid injected within the capsule, regardless of the needle entry site.

WHAT TYPE OF RELIEF CAN I EXPECT?

Generally, the less wear and tear your joint has, the more pain relief you can expect. Stem cell injections are more beneficial when there is no significant joint damage. Therefore, joints with advanced osteoarthritis are less likely to see as good of outcomes from these injections compared to joints with more mild osteoarthritis.

WHAT SHOULD I DO PRIOR TO THE INJECTION?

It is imperative that you discontinue the use of non-steroidal, anti-inflammatory (NSAID) medications such as Advil, Motrin, etc. at least two weeks prior to the injection. If you tend to feel lightheaded or queasy following injections, we recommend that you arrange for a ride home following the procedure.

HOW ARE THE STEM CELLS EXTRACTED FROM MY BODY?

Stem cell extraction takes place in the operating room. Most often, bone marrow aspiration is the preferred method of acquiring a sample of these cells. Prior to extracting the cells, your doctor will first clean and numb the point of entry. A needle attached to a special empty syringe is then used to aspirate the bone marrow. Following aspiration, the sample is centrifuged for about 10-15 minutes prior to being re-injected into your affected joint.

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Stem Cell
Injections

WHAT SHOULD I EXPECT WHEN I GET THE INJECTION?

After centrifuging is complete, your doctor or PA will administer the injection, typically while you remain in the OR. First, he or she will mark the location of entry. Next, the area will be cleaned using a brown solution called Povidone Iodine and an alcohol wipe. A cold numbing spray will then be applied to the area that will be injected. Finally, the injection will be administered, with or without ultrasound or x-ray guidance. When the stem cells are injected, you may feel a sting, followed by a sensation of fullness within the knee.

WHAT SHOULD I EXPECT AFTER THE INJECTION?

On the same day as the procedure, you may return home. More than likely, you will be able to return to work the next day. However, we recommend that you take it easy and avoid strenuous activities for approximately one week following the injection. Additionally, it is important to refrain from taking NSAIDs for 2 weeks following the injection, as these medications can affect our body's healing process.

WHAT SIDE EFFECTS CAN I EXPECT FROM THE INJECTION?

1- It is not uncommon to feel lightheaded after an injection. Your doctor or PA will remain with you in the room immediately following the injection to ensure that it is safe for you to stand and begin to ambulate about the room.

2- You may feel an increase in pain the day following your injection. This is normal, as the injection can stimulate a local inflammatory reaction soon after injection. In order to minimize this, try to ice as much as possible and limit your activity for the first day or so.

3- Irritation of the joint (redness, warmth, pain)

WHEN WILL I START TO FEEL THE RESULTS AND HOW LONG WILL THE EFFECTS TYPICALLY LAST?

4-6 weeks and it lasts for **7-9 months.**

SHOULD I USE STEM CELL INJECTIONS TO PREVENT DEVELOPING OSTEOARTHRITIS?

There is no evidence to support stem cells being used as a preventative treatment for knee arthritis. Current literature on the use of stem cells only provides evidence for diseased joints. Given the fact that no therapy is without risks, it is not recommended that these therapies be used for prevention of joint degenerative disease, but rather only for symptomatic treatment.

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