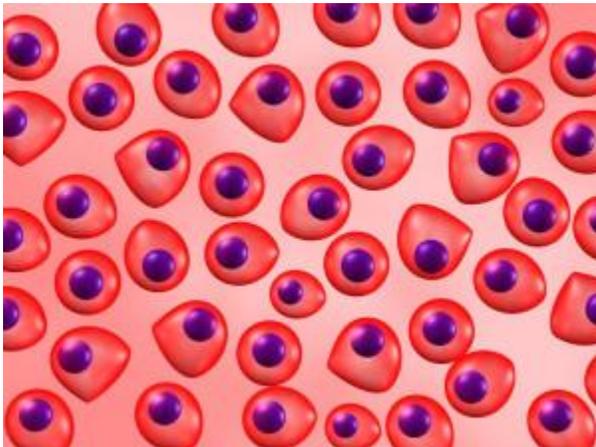


# Stem Cell Injections



As modern medicine moves forward, increasing emphasis is being placed on restoration of the body versus simply replacing body parts or just suppressing pain. It has been a long time in the making due to multiple considerations.

When the bone marrow produces stem cells, they are essentially a precursor to skin,



Stem cell injections can differentiate into cartilage, tendon, ligament or muscle cells.

muscle, bone, cartilage or other types of specialized cells. By introducing those precursor stem cells into an area of the body that is damaged, the hope has been to perfect treatment methods that will repair and restore the damage back to functionality.

This may include cartilage that has been damaged with arthritis, soft tissues that have been damaged such as in the rotator cuff, or problems such as in the spinal cord, heart, and organs such as the kidneys and pancreas, and more.

This article will focus on musculoskeletal considerations such as arthritis and ligament injuries along with disc problems.

## The Body's Repair Ability and Options Available



One of the main problems when an area such as the spinal disc is damaged is that the ability for the human body to repair those areas is very low. The blood flow to the area is poor, therefore, it simply does not have the ability to regenerate damaged disc tissue very well at all. Stem cells however, can provide that ability by introducing cells that can differentiate into those necessary to restore the area.

So far, there are multiple different methods of obtaining stem cells being introduced into the market. None of these has an extensive track record or large research projects to back them up in a statistically significant manner. However, all are showing promise in the treatment of musculoskeletal conditions. Here is a rundown of the stem cell injection options.

### Amniotic Based Stem Cell Rich Material

The first is obtaining stem cells that are not from the person's own body. One source that has a considerable amount of stem cells is amniotic fluid. The amniotic fluid has stem cells that are in very high concentration. The amniotic fluid contains exponentially more stem cells than the human bone marrow of an adult.

What has been found is that amniotic fluid is usually disposed of after birth, but can be harvested and processed to produce a biologic injectable. It is not fetal derived so there are no ethical concerns. The material is processed in an FDA regulated lab and evaluated for the typical array of diseases.

The injection substance has anti-inflammatory agents along with hyaluronic acid as well, which can help with pain relief and additional tissue regeneration. Studies are ongoing looking at amnion-based stem cell rich injection material and so far the results have been very promising in small studies. Interestingly, using amniotic fluid based stem cell rich injections have been shown not to produce a graft versus host problem.

### Stem Cell Injections Derived from the Patient

The second source of stem cell material is from the body itself. This material can then be injected into the area where damage is looking to be restored. Research on this is also in the early stages and there's really not much to report other than anecdotal excellent results. Doctors aspirate a patient's bone marrow, the fluid is processed immediately, and the resulting concentrate is injected in the same setting into the damaged area.

The next source of stem cells is fat derived. In this technique, pain management doctors will harvest fat cells from a patient and process it to achieve a concentration of stem cells. This resulting fluid is injected into the area of damage. As with the other techniques, it is unclear whether this is any better as research is in the early stages.

The last major method of stem cell acquisition is through a procedure known as platelet



PRP in the centrifuge.

rich plasma for PRP for short. PRP is the least invasive of the various harvesting techniques. While PRP itself doesn't have many stem cells, it has a tremendous ability to call in stem cells from the body. This is why it is referred to as a stem cell injection.

Venous blood is obtained and processed through a centrifuge and then injected into the damaged area. Three professional sports leagues have approved of PRP therapy along with the World Anti-Doping Agency.

### **Which is Most Effective?**

While all of these stem cell injection techniques that involves a patient's own tissue are fairly safe, It is unclear which method is most effective. For instance, which method achieves the highest concentration of stem cells and does that answer really matter?

In addition, PRP also has platelet derived growth factors in it, while looking at DM the exploited it has considerable other substances. Are these important to the end result of tissue regeneration? Or do they not really matter?

As more research is performed, it will become evident which of these methods are most effective for various musculoskeletal conditions such as ligament and tendons tears along with extremity and spinal arthritis. [Article References Here](#)