



Indiana University Health

IU Health Physicians Orthopedics & Sports Medicine

BMAC PATIENT INFO SHEET

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Bone Marrow Aspirate Stem Cell Concentrate (BMAC)

Bone Marrow Aspirate Stem Cell Concentrate (BMAC) is a component of your bone marrow that contains growth factors and anti-inflammatory proteins which have been shown to promote bone and soft tissue healing as well as reduce symptoms of pain related to injuries, tendinitis and arthritis.

How is it done?

Stem cells can be found in many tissues throughout your body, but one of the richest sources can be found in your bone marrow. Fortunately, bone marrow can be harvested from several bones within your body and is relatively easy to access. Your bone marrow will be aspirated through a small needle puncture in your bone and placed in a special processing unit, which will concentrate your body's stem cells, platelets and growth factors. The concentrate will be collected into a sterile syringe and injected into the targeted body area being treated.

Why is this recommended?



BMAC may be recommended for patients that have failed other conservative therapies including physical therapy, medications, rest, and other injections. It is also a good option for those that are not candidates for surgery or prefer to avoid elective surgery.

Conditions that may be treated include: Osteoarthritis of the shoulder, elbow, wrist, hand, hip, knee, ankle and foot, rotator cuff tears, ligament tears including tears of the UCL in the elbow of throwing athletes, hip labral tears, articular cartilage injuries, advanced tendon injuries and high-grade tendon injuries of the shoulder, elbow, hip, knee, ankle and foot and muscle strains or tears.

What can I expect?

Patients may experience soreness at the collection site and treatment site for a few days following the procedure. Most patients will begin to see improvement approximately 1 to 2 months after treatment has been completed. Increased stability and strength are typically reported along with the decrease in pain. Recovery time and outcome will be dependent upon the structure treated and how chronic the problem.

What are the risks?

The risks of stem cell therapy are extremely low but as with any procedure, there are possible risks and complications. Although very unlikely, any injection can potentially cause bleeding, increased pain, infection or nerve damage. Because your own cells are being utilized, there is no risk of tissue rejection of the cells. Many are performed under musculoskeletal ultrasound guidance allowing the physician to perform precision injections into the injured tissue. Multiple studies have confirmed its safety in the short-term but long-term adverse effects are unknown.

What is the cost?

While BMAC is an innovative and often effective treatment option based on emerging evidence, it is not a covered service. This procedure is considered experimental, investigational, non-covered and/or not medically necessary so, you, the patient, will be held financially responsible for the cost related to this procedure.

(One joint) Base BMAC Preparation Fee:

With bilateral sites, for example left and right knee, we also offer a bundled rate:

(Two joint) Base BMAC Preparation Fee:

What should I do next?

If you are interested in learning more about the procedure and whether it is a good option for you, please call us at _____ to set up a consultation with one of our board-certified physicians.

Evidence of efficacy

- Multiple ongoing trials



- Appears to improve pain and function in most studies and systematic reviews
- Usually 1 injection
- Appears safe but long-term adverse effects unknown
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Xing D et al. Mesenchymal stem cells injections for knee osteoarthritis: a systematic overview. Rheumatology 2018: => **4 systematic reviews of high methodological quality and low risk of bias showed moderate confidence could be placed in safety of MSCs therapy for knee OA, but with low confidence in efficacy outcomes due to limitations of the current evidence.**

McIntyre JA, Jones IA, Han B, Vangsness CT, Jr. Intra-articular mesenchymal stem cell therapy for the human joint: a systematic review. Am J Sports Med 2018: => **28 studies reviewed show MSC therapy is safe. Clinical and in some cases radiological improvements for both OA and chondral defects but quality of literature was poor preventing firm conclusions.**

Yobo M et al. Clinical efficacy and safety of mesenchymal stem cell transplantation for osteoarthritis treatment: meta-analysis. PLOS One 2017: => **11 trials, all show potential efficacy**

Pas Hi et al. Stem cell injections in knee osteoarthritis: a systematic review of the literature BJSM, 2017: => **5 RCTs all improved pt outcomes up to 2 yrs f/up**

Wolfstadt JJ, et al. Current concepts: the role of mesenchymal stem cells in the management of knee osteoarthritis. Sports Health, 2015

Adapted from: <https://www.rushortho.com/patients-visitors/medical-resources/bone-marrow-aspirate-stem-cell-concentrate>