



## ***Injectable Treatment Options for Osteoarthritis of the Knee***

There are multiple treatment options available for patients with knee osteoarthritis that do not require surgical intervention.

### **Intra-Articular Injections General Information**

Frequently, intraarticular injections placed within the knee joint can provide significant benefit, although frequently they are temporizing with regard to their symptom resolve. They may allow for at least a window of opportunity to provide relief of the more active synovitis, or pain cycle, which creates discomfort, swelling and motion loss. If can be relieved, effective unloading of the knee through appropriate weight reduction and strengthening to alter the biomechanics and restore more normal function to the knee in a pain free environment. Intraarticular injections are an excellent way to use injectable materials. Although frequently only temporizing, this may provide a window of opportunity to achieve these goals and occasionally allow for acute resolve of symptoms that allow more rapid return of restoration of function so significant motion loss as well as strength deficits can be avoided as well control of acute pain secondary to the underlying osteoarthritic condition. There are side effects of any injection within the joint as the injection goes through the skin into the joint. There are some relative risk of creating an opening for bacterial colonization within the joint. Patients who are going to undergo knee joint replacement in the near future, cautious use of intraarticular injections is recommended due to risk of infections of their pending joint arthroplasty.

### **Viscosupplementation/Hyaluronic Acid Injections**

These come in varying dosages and constituents. It can be used to relieve osteoarthritic pain through blunting inflammation much like the corticosteroids. They may have less overall side effects as they would typically not elevate ones blood sugar, but still have to be used as an injectable agent, therefore risk of infectious process are still present. Occasionally people have a “pseudo infectious” reaction to the viscosupplementation injections which makes the knee sore and inflamed following an injection. More recent literature and analysis of studies using hyaluronic acid injections have seen minimal benefit above that of a placebo therefore the American Academy of Orthopaedic Surgeons is not recommending them for osteoarthritic care at this point in time. It is still noted anecdotally that physicians are using the viscosupplementation or hyaluronic acid injections as they have seen benefits in groups of patients within their practice. Again, controversy exists with regard to their benefits. They are marketed strongly and therefore there maybe some internal biases with regard to their use. At this point, although they are relatively costly and not felt to be cost efficient according the American Academy of Orthopaedic Surgeons, they are still typically approved by insurance carriers for use under certain circumstances and can be used at this point in time at approximately six month duration intervals.

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### **PRP Injections**

Most recently, PRP or Autologous Conditioned Plasma injections have been used to blunt the inflammatory effects of osteoarthritis of the knee. Recent perspective unbiased studies have shown significant benefit for up to year duration with significant improvement in patient visual analog pain scores. These were significantly beneficial above the level of placebo. Some correlation with other injectable materials including comparing PRP injections with viscosupplementation or hyaluronic acid injections have also shown benefit in the PRP arms of the studies. There are still some paucity of information available for comparison and effects but more recent studies are showing benefit of using the PRP study may provide pain relief for longer periods of time in giving patients a window of opportunity to improve their biomechanics of their knee through appropriate weight reduction and exercise efforts. It may certainly also be able to delay considerations of arthroplasty or be used in patients who have underlying significant medical co-morbidities which may necessitate significant concerns with regard to proceeding with surgical treatment. The injections are now available for outpatient use. Typically they are done in a series of two to three injections at approximately a week to ten days interval. Over half of the patients after two injections are seeing relief of their symptoms according to more recent literature necessitating not having the third in the series of injections. The technical aspects of the PRP injections are such that blood is taken via standard phlebotomy, 15 cc, and spun down using a centrifuge. The platelet rich plasma which has active factors that blunt certain joint cytokines that create cartilage damage and inflammation. Although these factors do not specifically build cartilage up in the knee or restore the normal cartilage constituents, they may provide both relief of pain with associated blunt of the inflammatory response that allows for patient directed biomechanical unloading of the joint through graduated weight reduction and exercise during those protracted times of pain relief up to a year as reported. Certainly this would be a very positive entity for most patients. At this point the use of PRP injections are not covered by insurance carriers but are available for use by the FDA.

### **Stem Cell Injections**

An additional injectable material, stem cells, which are harvesting the marrow constituents through an aspiration of specific areas of the marrow of the patient and then re-injected in the knee in a concentrate similar to that with PRP injections is also available at a much higher cost schedule. Again this is not approved by insurance carriers and it is uncertain whether there is significant benefit from a clinical standpoint of the stem cell injections versus PRP injections or other injectable materials. Much more limited studies are available for the stem cell injections but certainly they have some biologic benefit that has not been captured from a clinical standpoint or patient use phenomena at this point with known literature to support their use on a regular basis but certainly has promise for the future and may need to be combined with other materials to help provide for true cartilage growth or restoration of cartilage structures or tissue structures that have been damaged due their pluri-potential differentiating capability. At this point in time, that capability is not known with injection of those materials in ones knee joint. It is possible that they provide similar anti-inflammatory blunting as seen with other injectable materials such as PRP injections but certainly at much more costly level. Therefore, the cost effectiveness ratio at this point is most likely somewhat uncertain and there are some increased donor site morbidity rates as well as increased pain associated with the harvest of those marrow constituents.