



Prolotherapy (Regenerative Injection Therapy)

Repair Your Body the Natural Way

Prolotherapy (or Regenerative Injection Therapy) was originally used by Hippocrates over 2500 years ago to heal a javelin thrower's shoulder pain. The concept was investigated, utilized, and refined by George Hackett, MD, in the 1950's, and has been used by many other physicians since, including the former **Surgeon General of the United States, C. Everett Koop, MD**. The cause of a great deal of musculoskeletal pain is related to damage, laxity, or weakening of connective tissue, which normally controls joint movement and provides support for standing, sitting, and movements of the extremities. These tissues are frequently damaged by trauma, and the initial healing response may not adequately repair the structures. Anti-inflammatory medications, frequently taken after an injury, also dampen the healing response and result in limited connective tissue healing. The structures may also become weak because of hormonal variations and deficiencies, such as with pregnancy, hypothyroidism, menopause, or "andropause" (male hormone deficiency associated with aging). Other individuals are predisposed because of genetic variation, possibly because of weaker collagen or more elastic ligaments (double-jointed-ness) and perhaps other as yet undiscovered causes. The result of the reduced structural stability is a chronic strain of the remaining ligament and tendon fibers, which are connected to the extremely sensitive periosteum of the bone, which, through nerves, sends pain signals to the brain.

Pain can originate from virtually any ligament, tendon, or joint in the body, and Prolotherapy can **strengthen** each of these types of structures. These structures include the **hip, knee, ankle, toe, shoulder, elbow, wrist, finger, and thumb, as well as the neck, low back and rib cage**. Pain that can be reproduced by pressure on the injured area can usually be improved or relieved with reconstructive injections.

Has Prolotherapy been studied and proven?

Numerous studies have shown a **success rate of over 80%** over many thousands of patients, with success judged as at least **50% reduction in pain**. This is quite remarkable, given that the treatment has minimal side effects and cost compared to other surgical and non-surgical treatment. It is estimated that over 3,000,000 patients have been treated with Prolotherapy over 80 years.

How is Prolotherapy administered?

Injections containing growth factors including dextrose (sugar), local anesthetic, and other agents are placed at the attachments of ligament and tendon tissue to initiate a healing response, which results in the growth (or proliferation) of fibrous tissue. This creates a stronger bond at these attachment points, lessening the load on the individual fibers. The attachment points may also become less sensitive. Usually patients report significantly **less pain, improved range of motion, and improved function, permanently**. The body continues to "remodel" the bond so that even more stability and strength occurs over the year following the treatment.

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How many treatments are needed?

The injections are administered approximately 4-6 weeks apart, with an average number of 4-6 injections. The typical time frame for a course of treatment is 4-6 months. Patients are usually sore for 3-7 days after the procedure and may begin to see benefit after the first treatment, although many patients may only begin to note significant improvement by the third or fourth treatment.

What restrictions are there after Prolotherapy?

Patients are advised to **avoid use of anti-inflammatory medication**, about 2 days before and 4-5 days after the procedure, as these are proven to inhibit the healing response of connective tissue. Aspirin to prevent stroke or heart attack is acceptable. Heat, ice, massage, chiropractic manipulation, physical therapy, and other typical strategies to reduce pain do not interfere with the process. Tylenol, Ultram, or other pain medications that do not contain strong anti-inflammatory compounds are helpful and do not interfere with the collagen-healing process. There are **no specific work or activity restrictions**, although patients may alter their activities based on the soreness from the procedure for a few days.

Is Prolotherapy covered by insurance?

At this time, Medicare and most commercial insurance carriers consider Prolotherapy to be investigational. Patients may pay for Prolotherapy on a cash-pay, time-of-service basis.

If Prolotherapy is so successful, why don't more doctors perform it?

Prolotherapy requires a broad musculoskeletal background, extensive training and years of experience to perform it well. More and more doctors are learning how to provide Prolotherapy, including Platelet-Rich Plasma and biocellular techniques. The therapy has become more popular as many famous athletes have started to choose Regenerative Medicine techniques instead of surgery so that they can stay active in their sports.

What is the future of Prolotherapy?

Impressive results are already proven with standard solutions and techniques. In difficult cases, advanced solutions using growth factors and stem cells to expedite the repair process are showing exceptional potential. **Platelet-Rich Plasma** can be drawn from the blood and concentrated to deliver a more powerful combination of growth factors directly to the site of injury. In extreme cases of damage, such as a complex meniscus tear of the knee, or the labrum of the hip or shoulder, **Mesenchymal Stem Cells (MSC's)** derived from liposuction of fat tissue or bone marrow aspirate from the hip bone may provide additional reparative power by placing healing cells and growth factors directly into the defects of the damaged structure.

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