



## Prolotherapy Regenerative Injection Therapy

Ali Mohammadian-Erdi  
Assistant Professor of Anesthesiology  
Fellowship of Pain  
Ardabil University of Medical Science, Ardabil

Prolotherapy is an injection – based therapy for chronic musculoskeletal pain. It is a simple, natural technique that stimulates the body to repair the painful area.

In 1956, Hacker (Pioneer of prolotherapy) introduced the term "prolotherapy" as "the rehabilitation of an incompetent structure by generation of new cellular tissue". In practice prolotherapy defined as : Injection of growth factors or growth factors stimulants to grow normal cell or tissues.

Prolotherapy usually consists of several injection sessions that delivered every 2 to 6 weeks. During prolotherapy, some solutions are injected at sites of painful and tender ligament and tendon insertions and joint spaces. These solutions cause local irritation and inflammation , with subsequent tissue healing, resulting in enlargement and strengthening of damaged ligamentous, tendon, and intra – articular structures.

Prolotherapy induce healing cascade , which contain 3 overlapping phases:

- 1- Inflammation
- 2- Regeneration with granulation (proliferation)
- 3- Reparation (remodeling with contraction).

Regenerative Injection Therapy (RIT) stimulates chemo – modulation of collagen by inducing of mentioned first and second stages. As a result , impaired tissues have begun to regeneration and repairing. All of this complex process is mediated by hormones and multiple growth factors.

These growth factors include: Fibroblast growth factors (FGF) , Connective tissue growth factors (CTGF), Insulin like growth factors (IGF), Platelet – derived growth factor (PDGF) and others.

### *Indications and contraindications*

In all conditions that have seen Connective tissue insufficiency , prolotherapy can helps the patients. Some of this conditions include :

- Painful enthesopathies, tendinosis or ligamentosis secondary to sprain or strain and conditions known as repetitive motion disorders (such as shoulder and knee laxity , rotator cuff injury, tennis elbow, Achilles tendinosis and ets.)
- Painful hypermobility , instability , and subluxation of the joints.
- Osteoarthritis , spondylolysis , spondylolisthesis , arthritis.
- Internal disc derangement
- Myofascial pain syndrome
- Sacroiliac joint pain