

PRP FOR KNEE PAIN

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Disclaimer

- None



History

- **1930s**
 - Dr. Gedney, Hackett, Shuman and others, develop the idea of prolotherapy/sclerotherapy
- **1950s**
 - Techniques become popular among veterinary doctors, Prolotherapy gained more attention with many doctors
- **1990s**
 - PRP becomes a novel approach
- **2000s**
 - PRP is being used, better machines and more access in the office setting has allowed for more use, and better platelet concentrations
- **Present and future:**
 - **PRP, Bone Marrow, Adipose mesenchymal stem cells are being harvested and used**

Dogma Shift for treatment of OA

Current treatment

- Bracing – cumbersome, evidence mixed
- Weight loss – difficult
- NSAIDs (anti-inflammatory)
- Corticosteroids (anti-inflammatory)
- Viscosupplementation
- Arthroplasty
- **What about regenerative?**

Knee osteoarthritis



Steroids for MSK pain

6

- Provides short term analgesia, may inhibit collagen synthesis and decrease tendon strength
- Systematic review of 41 RCT for corticosteroid injections: Short term relief, reversed at intermediate or long term. Worse outcome than patients who did not receive injection
- Placebo Controlled study: 165 Patients with Lateral epicondylitis >6 weeks randomized in 4 groups: 2 with C Inj + PT, & 2 with placebo inj +PT: Participants at 1 year with Corticosteroid injection had worse clinical outcomes and higher rates of recurrence at 1 year compared to placebo

The Lancet 2010, Vol 376 (9754), p1751-1767

Corticosteroids

- Insulin resistance, atrophy of muscle and skin, reduced bone mineral density
- Corticosteroid injection into tendon tissue leads to cell death and tendon atrophy
- Corticosteroids inhibit collagen synthesis .

MOLECULAR ACTIONS OF GLUCOCORTICOIDS IN CARTILAGE AND BONE DURING HEALTH, DISEASE, AND STEROID THERAPY

**Kerstin Hartmann, Mascha Koenen, Sebastian Schauer, Stephanie Wittig-Blaich,
Mubashir Ahmad, Ulrike Baschant, and Jan P. Tuckermann**

Institute for Comparative Molecular Endocrinology, University of Ulm, Ulm, Germany; and Division of
Endocrinology, Diabetes, and Bone Diseases, Department of Medicine III, Technische Universität Dresden,
Dresden, Germany

- Chondrocyte apoptosis
- Chondrogenic matrix production and expression of genes that mark chondrocyte maturation are reduced

The Effect of Intra-articular Corticosteroids on Articular Cartilage

A Systematic Review

Chloe Wernecke,* BS, Hillary J. Braun,* BS, and Jason L. Dragoo,*[†] MD

Investigation performed at Stanford University, Redwood City, California, USA

- Time- and dose-dependent deleterious effects on articular cartilage and chondrocytes
- Catabolic effects on protein levels, chondrocyte viability, and gross cartilage morphology

Hyaluronic acid compared with corticosteroid injections for the treatment of osteoarthritis of the knee: a randomized control trail

Alireza Askari¹, Tahereh Gholami², Mohammad Mehdi NaghiZadeh³, Mojtaba Farjam⁴, Seyed Amin Kouhpayeh^{5*} and Zahra Shahabfard⁶

- 140 patients with knee osteoarthritis, who were followed for 3 months, were randomized to receive intraarticular injection of either hyaluronic acid or corticosteroid.
- Knee Osteoarthritis Outcome Score (KOOS), and VAS
- the most important difference between the two intervention groups is the duration of effectiveness. HA is suggested to be superior in the duration of pain relief when compared to CS.
- We can propose that HA can be administered every 6 months intra-articular for knee joint OA. Therefore, when CS has to be injected every 2 months, it will be more convenient to use HA.

Regenerative Medicine

- The process of replacing, repairing and regenerating cells, tissues and/or organs to restore normal function
- Capitalizes on the body's natural regenerative mechanisms to heal previously irreparable tissues
- Current estimates indicate that 1 out of 3 Americans could benefit from some type of regenerative procedure

- Harris DT, et al. (2007). *"The potential of cord blood stem cells for use in regenerative medicine"*. *Expert Opin. Biol. Ther.* 7 (9): 1311–1322

Regenerative for Knee

- OA
- Meniscus
- MCL/LCL, ACL/PCL

Professional Athletes Promoted PRP



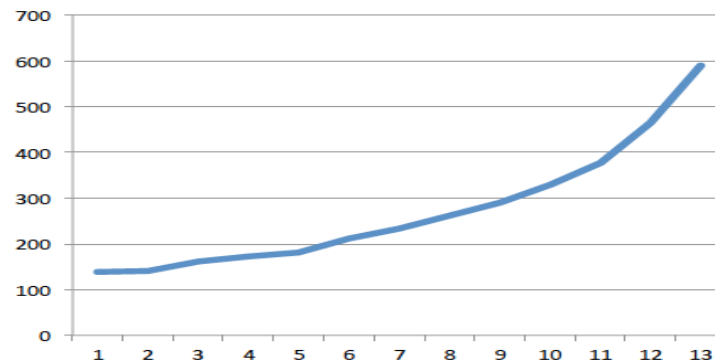
PRP - studies

History of Platelet-Rich Plasma

**Dramatic Rise in PRP References in the last decade
Over 7000 total references**

573 new PubMed references in 2013 alone

PubMed Platelet Rich Plasma References per
Year 2000-2013



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Options for Regeneration

To provide a cell line and provide the growth factors

- Platelet Rich Plasma (PRP)
- Bone Marrow Concentrate (BMAC)
- SVF-(stromal vascular fraction) – Adipose tissue
- Amniotic Tissue/Cord Blood Stem Cells

Concept of the Regenerative therapy

- The structures with inherently poor blood supply
 - Tendons, ligaments, meniscus, joints, discs
- As degeneration progresses, nutrients diffusion decreases
 - If there is injury – healing process is delayed
- Stem Cells provides cell line multiplications
- The PRP provides growth factors for healing

Concept of the Regenerative Therapy

