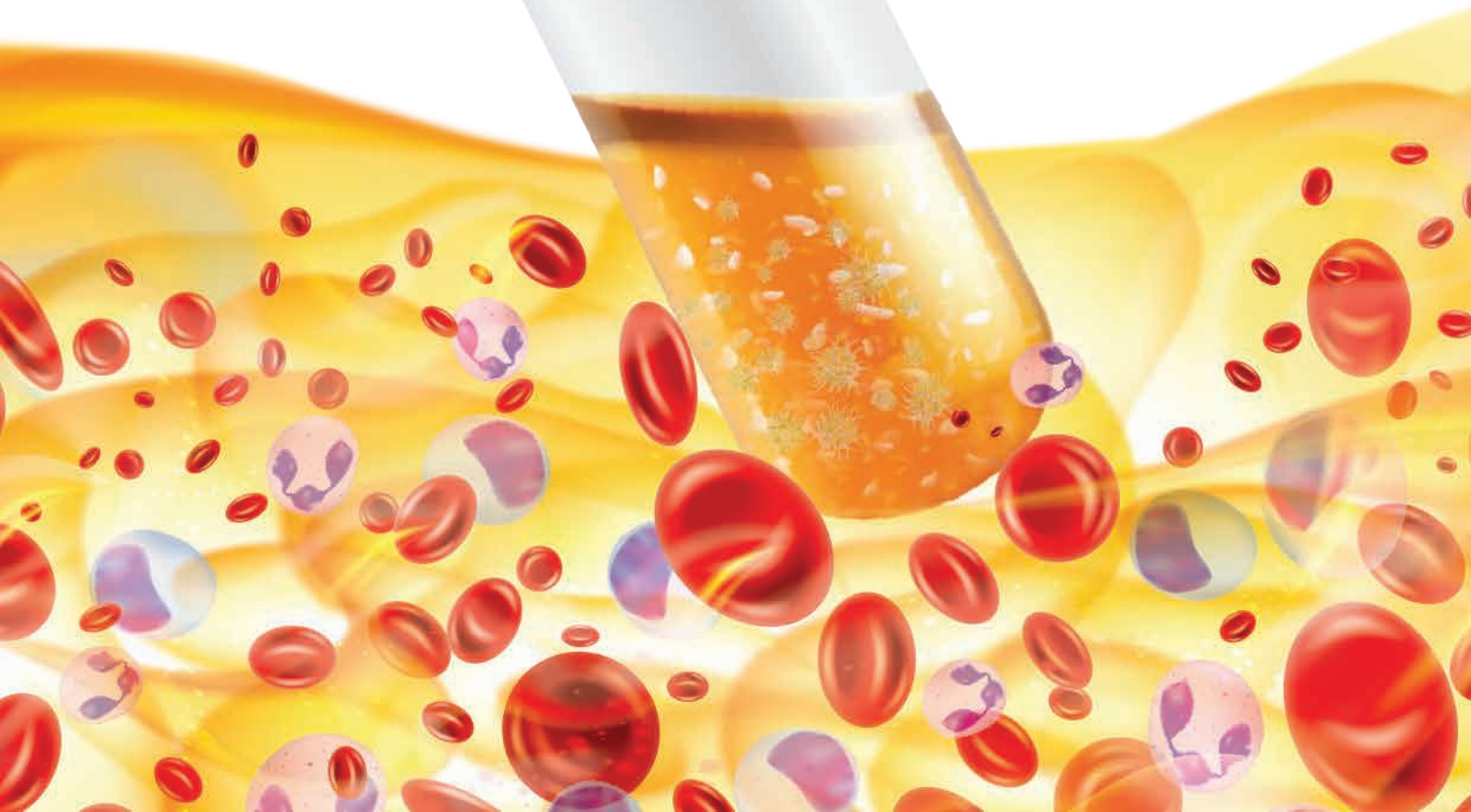


# Prizmah

Autologous Platelet Rich Plasma System

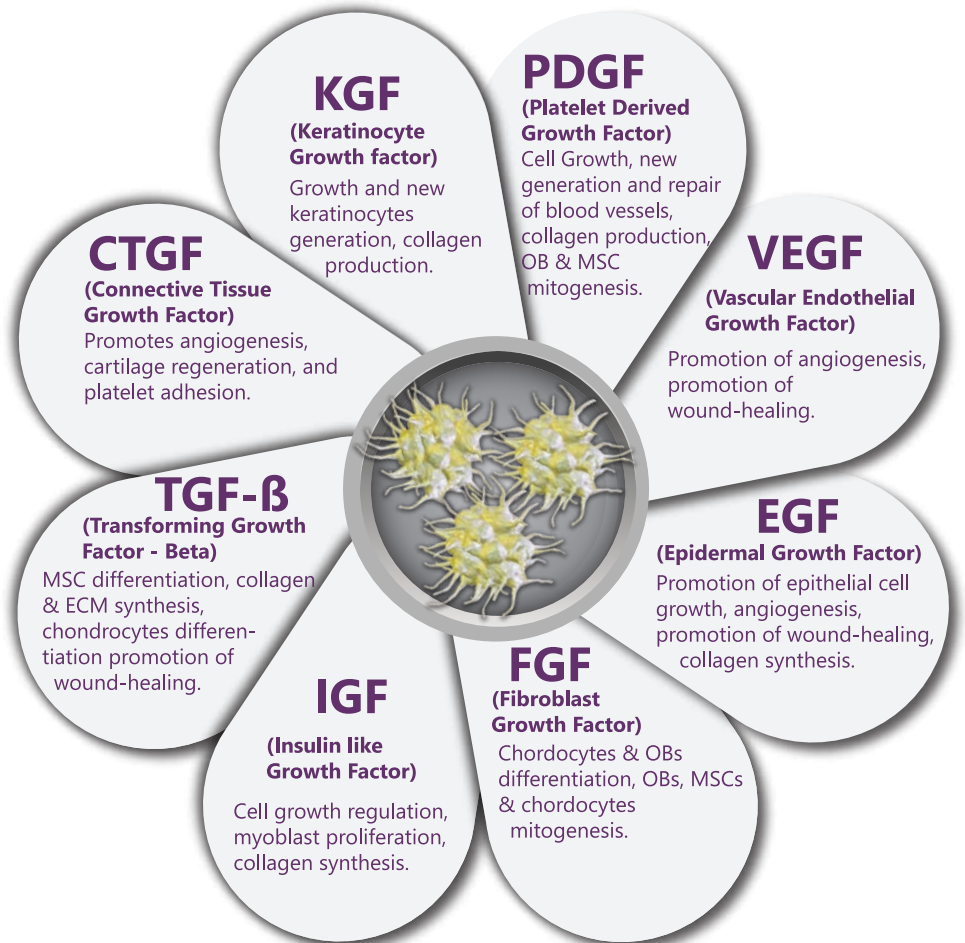
**... Heals Naturally**



Revolutionary new treatment has been discovered and is currently being accepted as a great advancement in the regenerative medicine world. The Platelet-Rich Plasma (PRP) treatment is an evolving component of different regenerative human medical procedures. Since the discovery in the 1980s, PRP is now being used in wide range of regenerative & healing medicine.



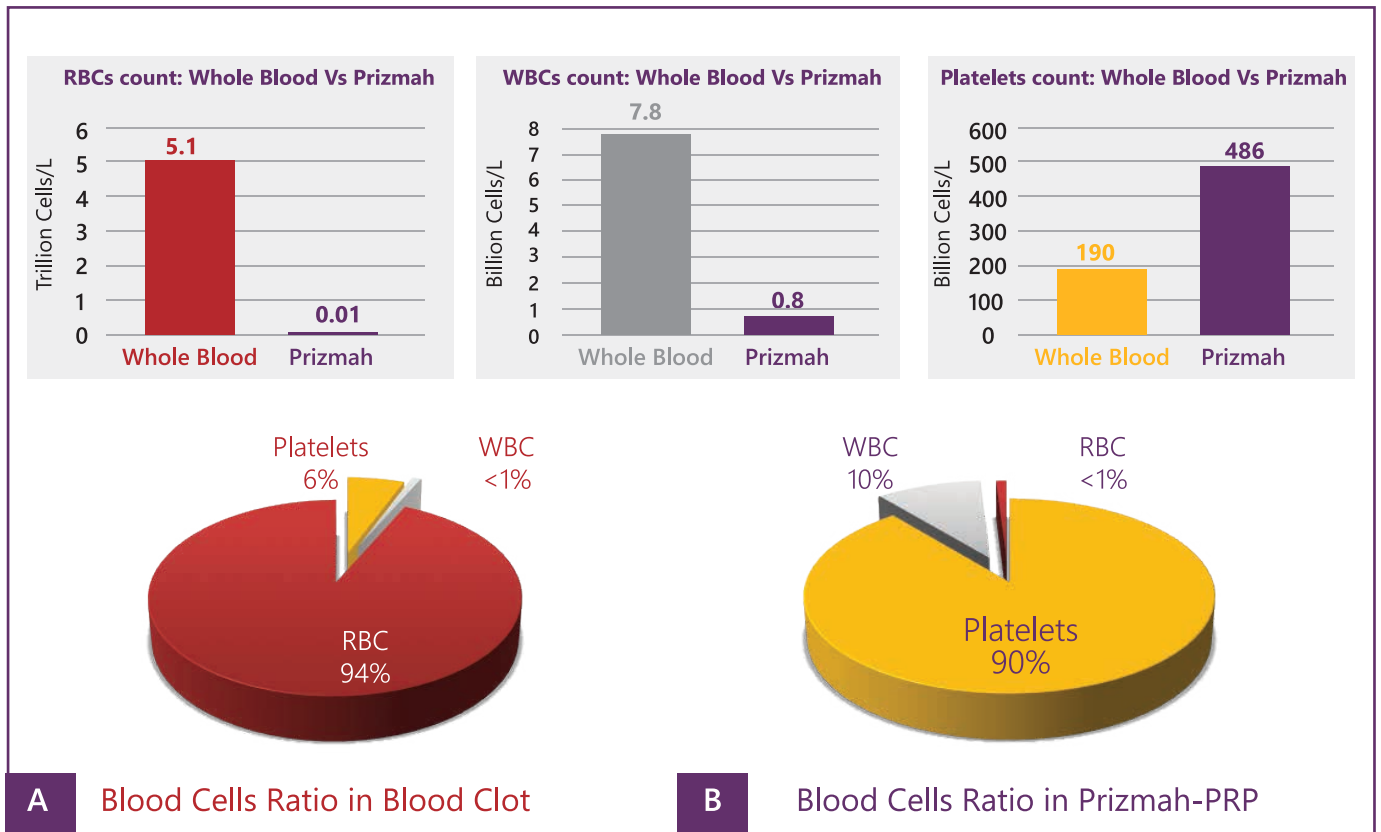
The rationale for the widespread use of PRP in multiple medical specialties resides in the fact that platelets represent an easily accessible reservoir of critical growth factors and other signaling molecules, including leukocyte derived catabolic cytokines and fibrinogen. The degranulation of platelets released growth factors and bioactive proteins from alpha granules, which are responsible for attracting macrophages and mesenchymal stem cells and may govern and regulate the tissue-healing process.



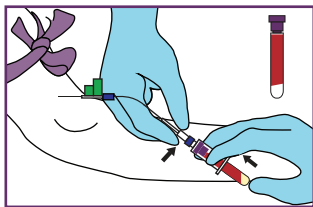
**Prizmah** is a proprietary medical device designed for the preparation of autologous platelet-rich plasma, manufactured under cGMP, EN ISO 13485 and ISO 9001 Quality System International Standards. The philosophy is to merge cutting edge technology with the body's natural ability to accelerate the regeneration of soft tissues. The key features and benefits of **Prizmah** are given below:

Features	Benefits	Features	Benefits
Technically Advanced Gel Separator	Produces pure PRP devoid of contaminating red and white blood cells. (NO NEED OF FILTRATION)	Removes 99.8% RBC	Reduces the risk of oxidation & free radicals generation, leading to inflammation, vascular injury and cell death. Which can also lead to Hemosiderin staining from iron oxide (rust).
Removes 90% WBC	Reduces the risk of inflammation, local pain & tissue damage.	Remnant of 10% WBC	Assists to fight infection and enhance anabolic effects of PRP.
Constant Platelet Concentration	Allows predictable results.	Maintain 7.4 pH of PRP	No burning pain during and after PRP injection as it is in the range of blood pH.
Biocompatible and Xeno Free Closed System	Minimises the safety concern and exposure of PRP in air, virtually eliminates the risk of contamination.	PRP Collection Tube	Allows to keep the PRP up to 4 hours, without the risk of mixing with separated cells.
0.03ml CaCl <sub>2</sub> PRP activation Tubes	Results in degranulation of platelets to sustained release of growth factors and bioactive proteins from alpha granules. It also allows the physician over 15 minutes of time to inject the PRP before it forms fibrin gel.		

### Comparison of RBCs, WBCs & Platelets between Whole Blood & Prizmah



## Prizmah Preparation Steps



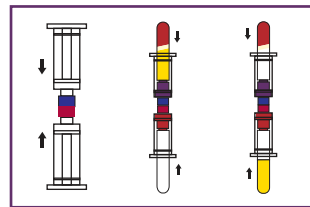
### 1 Collection

Collect the blood in PRP tube through butterfly needle; the PRP tube will take 9ml blood.



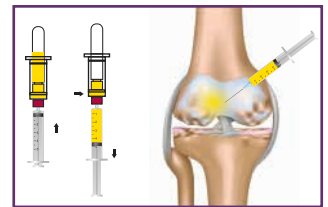
### 2 Separation

Place the PRP tube with blood in centrifuge. The platelets are separated with plasma from the rest of blood cells within 6 minutes.



### 3 Activation / Collection

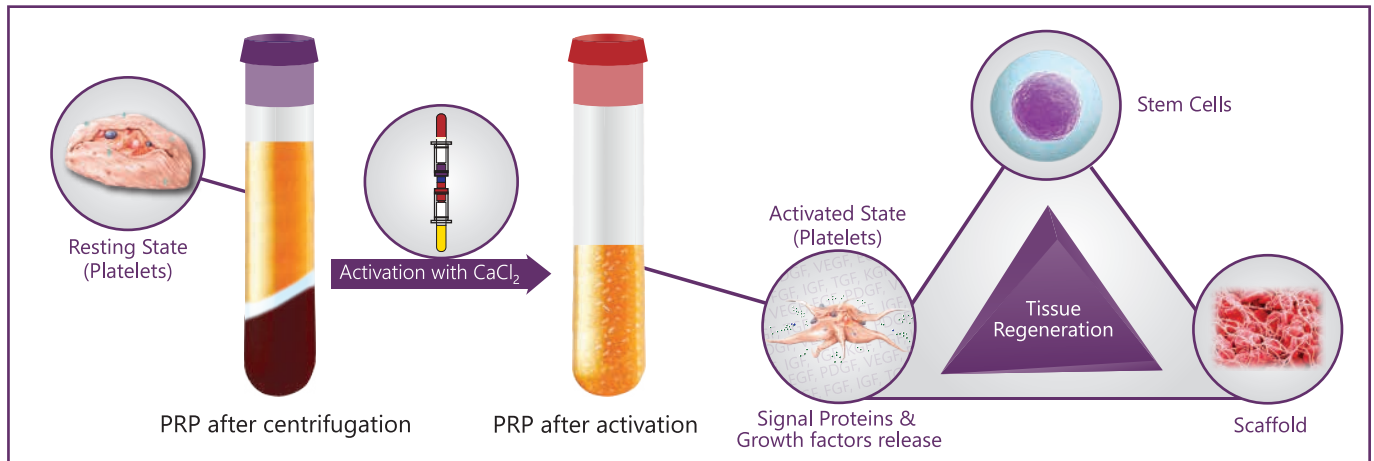
Transfer PRP into PRP collection tube or activation tube as needed through closed system transfer device.



### 4 Application

Apply on the selected areas of the wound, joints & muscles according to the protocol.

## Schematic diagram of activated PRP with mode of action



## Growth factors & proteins in Prizmah PRP

### Chemokines / Cytokines

- Interleukin
- Platelet Basic Protein
- Platelet Factor
- Chemokines Ligand 5
- Stromal Cell-derived Factor
- Chemokines Ligand 2

### Small Mole

- $\text{Ca}^{+2}$
- Adenosine Diphosphate
- Serotonin
- Epinephrine
- Histamine



### Growth Factors

- Connective Tissue Growth Factor
- Hepatocyte Growth Factor
- Insulin Like Growth Factor
- Platelet Derived Growth Factor
- Vascular Endothelial Growth Factor
- Transforming Growth Factor- $\beta$
- Fibroblast Growth Factor-2

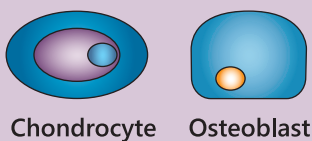
### Adhesive Proteins

- Vitamin D-binding protein
- Plasminogen
- Plasminogen Activator Inhibitor
- Thrombospondin
- Fibrinogen
- Fibronectin
- Vitronectin and  $\alpha 1$ -microglobulin

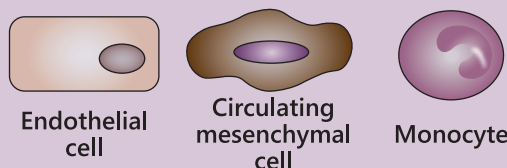
### Proteases / Antiproteases

- $\alpha$ -2-macroglobulin
- ADAMTSs
- Matrix Metalloproteinase

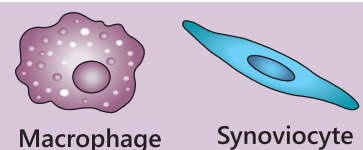
### Cartilage / bone



### Vascular



### Synovium



## Prizmah in Orthopedic . . .

Platelet-Rich Plasma (PRP) therapy is an emerging non-invasive regeneration therapy to relieve pain and promote accelerated, long-lasting healing of musculoskeletal conditions such as:

- Osteoarthritis of the knee, shoulder, hip and spine (with or without HA)
- Rotator cuff tears
- Anterior cruciate ligament (ACL) injuries
- Tennis elbow
- Ankle sprains
- Tendonitis
- Ligament sprains
- Chronic plantar fasciitis
- Musculoskeletal pain management

**RHEUMATOLOGY**  
www.rheumatology.oxfordjournals.org

The administration of a natural mixture of GFs within the joint could induce positive changes and may provide new opportunities for OA treatment.

(Rheumatology 2007;46:1769–1772)

**Clinical Orthopaedics  
and Related Research®**

The application of growth factors in the treatment of local cartilage defects as well as osteoarthritis appears promising . . .

(Clin Orthop Relat Res (2011) 469:2706–2715)

ARCHIVES OF  
**RHEUMATOLOGY**

Platelet rich plasma treatment is an effective, reliable, easily applied and low cost application in terms of pain, functional status as well as cartilage regeneration even in patients with advanced osteoarthritis.

(Arch Rheumatol 2015;30(x):i-viii)

**Clinical Medicine  
Insights: Arthritis and  
Musculoskeletal Disorders**

This study suggests that PRP injection is more efficacious than HA injection in reducing symptoms and improving quality of life and is a therapeutic option in select patients with knee OA who have not responded to conventional treatment.

(Clin Med Insight Arthritis Musculoskelet Disorder. 2015 Jan 7;8:1-8)

**Journal of  
Orthopaedic  
Surgery**

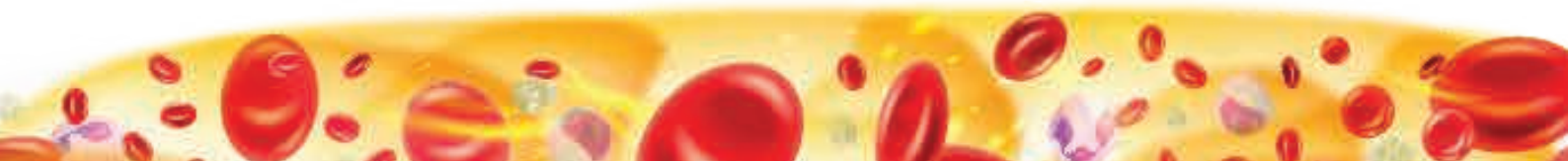
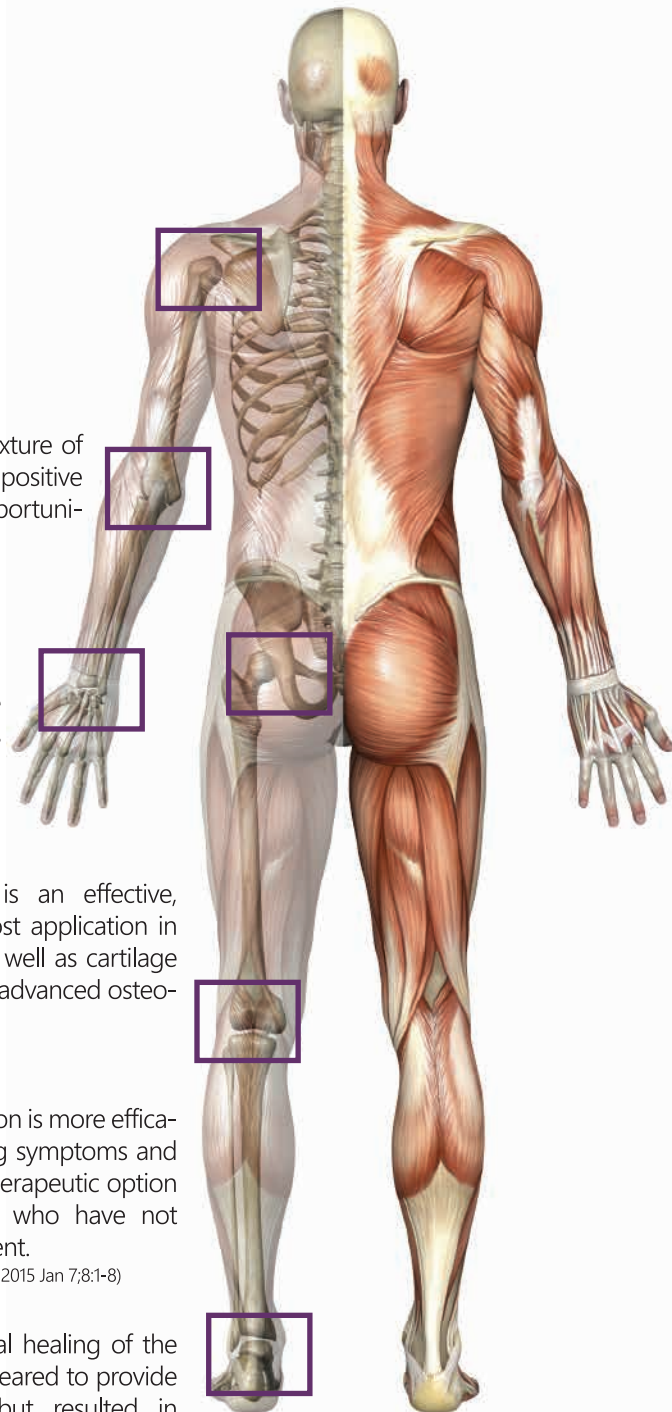
PRP appeared to enable biological healing of the lesion, whereas Corticosteroid appeared to provide short-term, symptomatic relief but resulted in tendon degeneration

(Journal of Orthopaedic Surgery 2015;23(1):1-5)

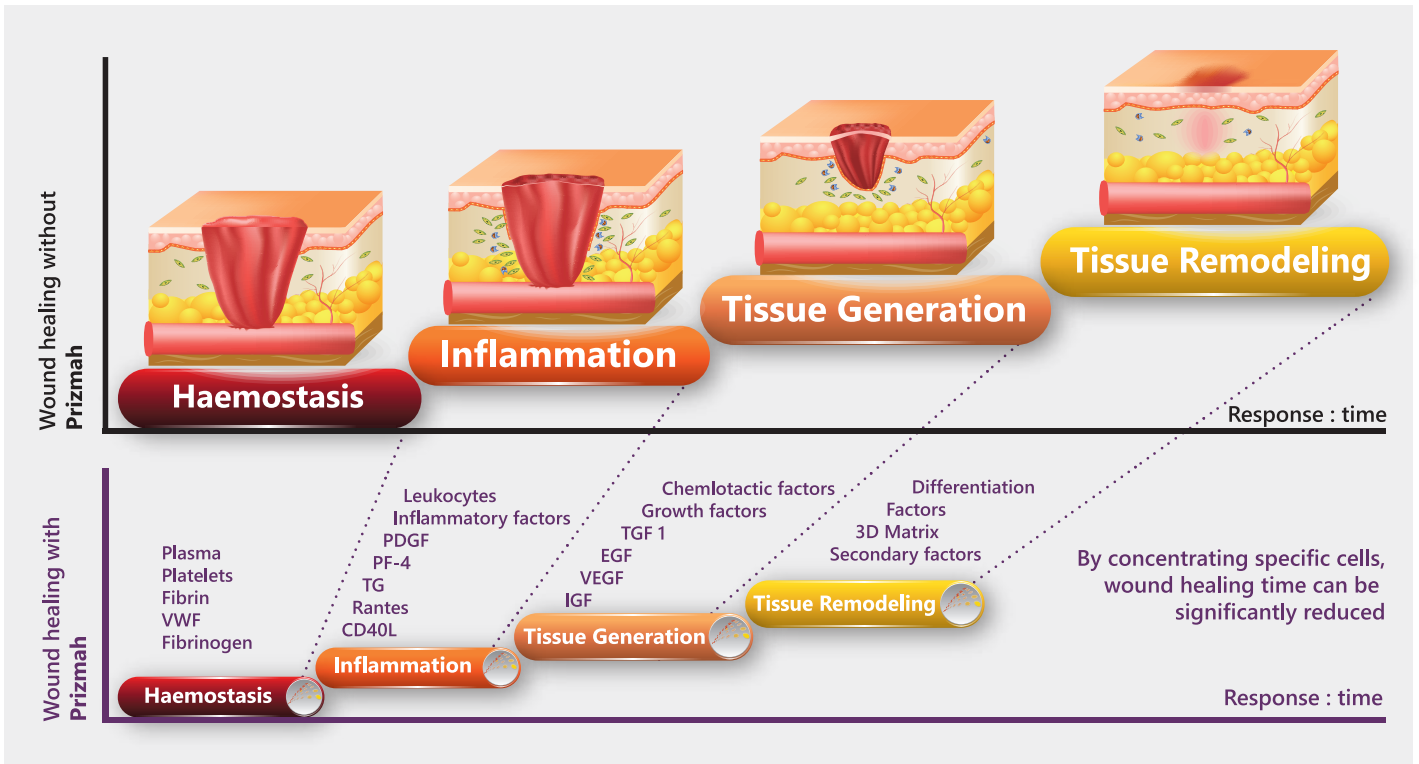
ORTHOSupersite.com  
Volume 36, Jan 2013  
**ORTHOPEDICS®**

The current results support that PRP would be a logical nonoperative addition to the armamentarium of treatment modalities for proximal hamstrings tendinopathies, specifically those that have failed traditional conservative treatment.

(Orthopedics 2013 Jan;36(1))



## Stages & Time Duration of Wound Healing

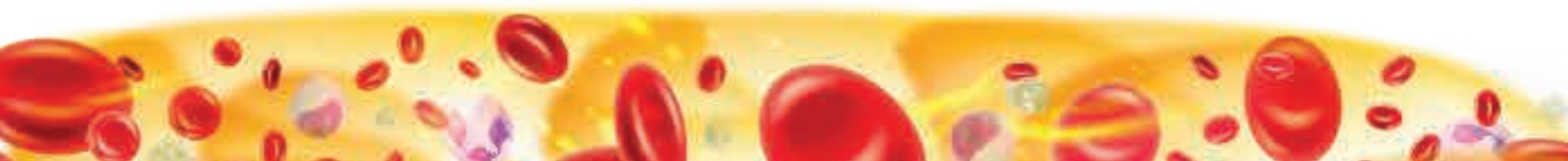
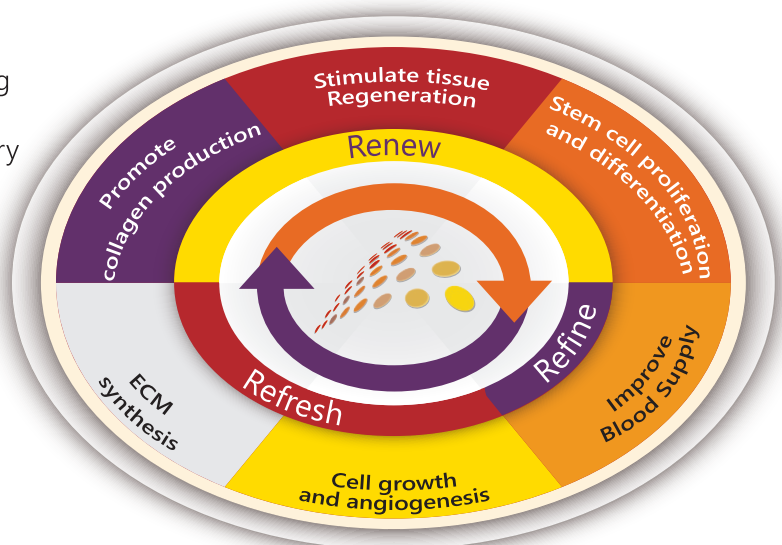


## Renew, Refine, Refresh . . . . Naturally

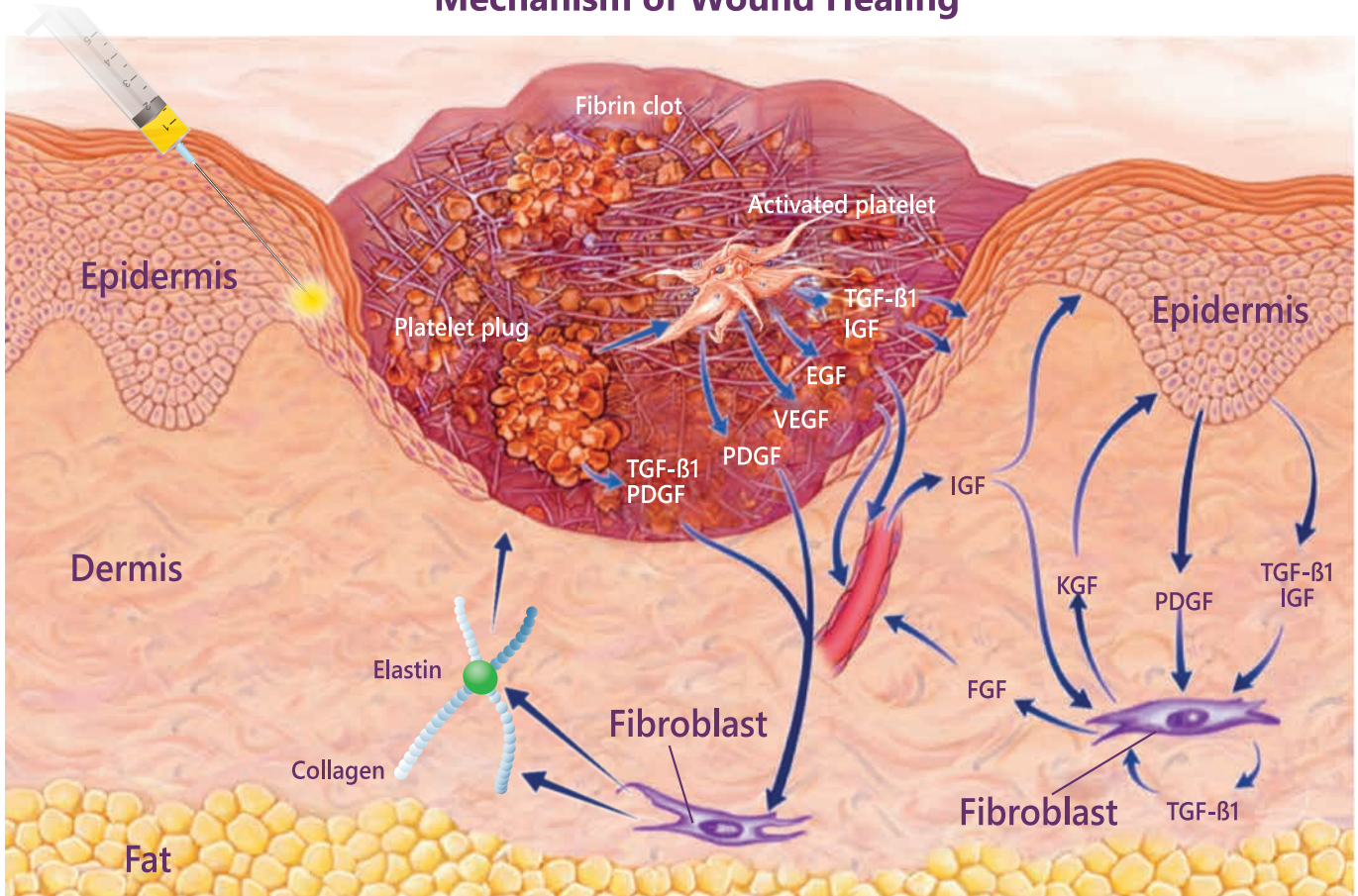
Wound healing is a complex process mediated by interacting molecular signals involving mediators and cellular events. Platelets play two important roles in wound healing, hemostasis and initiation of wound healing. Autologous growth factors from concentrated platelet suspensions have been used to treat chronic wounds for more than 25 years.

Prizmah is a bio-stimulator that is safe and heals the wound naturally. By application of Prizmah, wound healing time can be reduced significantly.

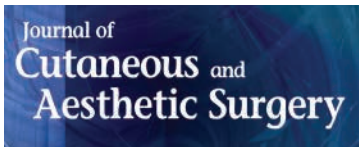
- Prizmah curbs inflammation by suppressing cytokine release, and further improve the regeneration process by promoting capillary angiogenesis and re-epithelialization.
- The collaboration of the macrophages in the healing process is also initiated when they are called into action by platelet excretion of signaling proteins
- Prizmah promotes ECM synthesis, collagen production and stem cells proliferation & differentiation.



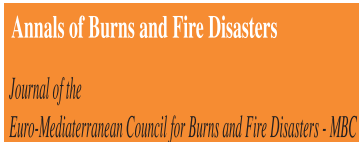
## Mechanism of Wound Healing



*Prizmah . . . Perfect for Wound Healing*



PRP is safe, simple and effective procedure in treating chronic venous ulcers.  
(J Cutan Aesthet Surg. 2013 Apr; 6(2): 97-9)



PRP can be used for the treatment of wounds of all types including burns and also of split-thickness skin graft donor sites, which are frequently used in burn management.  
(Annals of Burns and Fire Disasters - vol. XXV - n. 4 - December 2012)



This study has shown that PRP gel treatment can be a valuable and effective aid in the management of acute trauma wounds.  
(Injury. 2008.05.002)



When used with good standards of care, the majority of nonhealing diabetic foot ulcers treated with autologous platelet-rich plasma gel can be expected to heal.  
(Ostomy Wound Management 2006 Jun;52(6):68-70)



Platelet concentrates may be potentially useful in wound healing applications because they function as both a tissue sealant and a delivery system that contains a variety of mitogenic and chemotactic growth factors.  
(J Diabetes Sci Technol. 2010 Sep; 4(5): 1121-1126.)



- Exhibits technically advanced gel separator which removes almost all of the RBCs & WBCs in the PRP, thus produces pure PRP (no need of filtration).
- Offers high platelet concentration in PRP thus accelerates the healing process & reduces the pain.
- Easy to use, takes less time, requires less blood and is not user dependent like other systems.
- In Prizmah, blood and PRP are not exposed to air/oxygen during the process, i.e. Biocompatible & Xeno Free Closed System.
- The anticoagulant in Prizmah is sodium citrate which has a close to physiologic pH (7.4), thus no burning pain during & after PRP injection.
- Offers complete system of activation of PRP, results in degranulation of platelets to sustained release of growth factors and bioactive proteins from alpha-granules.
- Reduces the need of pain management medication, steroid injections or surgery etc.

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