# PLATELET RICH PLASMA

## BACKGROUND

Platelets are the small irregular shaped cells that circulate in our blood. They are continuously produced in our bone marrow and contain numerous freshly produced factors critical to many of our life processes and live about 5-9 days. They contain the factors mostly involved in formation of the clot that stops bleeding after injury, but also are involved in many aspects of wound healing. They are a natural source of a high concentration of these growth factors and hormones. Taking this one step further, Platelet Rich Plasma (PRP) is a concentrated source of platelets derived from a small sample of your blood. The growth factors and cytokines contained in PRP may be thought of as the hormones responsible for regulating a variety of cellular processes. These factors include:

- platelet-derived growth factor
- transforming growth factor beta
- fibroblast growth factor
- insulin-like growth factor 1
- insulin-like growth factor 2
- vascular endothelial growth factor
- epidermal growth factor
- Interleukin 8
- keratinocyte growth factor
- connective tissue growth factor

The collection, preparation and use of PRP is not new. It has been approved and safely used in different clinical situations as far back as the 1970's when it began use in the hospital setting. The efficacy of certain growth factors in healing various injuries and the concentrations of these growth factors found within PRP are the theoretical basis for the use of PRP in many different clinical applications. These include nerve injuries, tendinitis, osteoarthritis, cardiac muscle injury, bone repair and regeneration and oral surgery and plastic surgery. PRP has also received attention in the popular media as a result of its use in treating sports injuries in professional athletes. Plastic surgery uses include adding PRP to fat cells to enhance success of fat grafting; adding PRP to the surgical sites of facelift and nasal and eyelid surgery to accelerate healing and decrease bruising. Most recently PRP injections have been found to add volume to the face and fill wrinkles.

The platelet extraction centrifuge and system called Cascade Medical FIBRINET used for preparation of PRP was cleared by the FDA in 2002 for use by orthopedic doctors to speed tissue repair. Platelets extracted in this centrifuge have not been cleared or approved by the FDA for facial rejuvenation. However, the PRP which has been safely used thousands of times in this orthopedic setting follows a similar use in plastic surgery; it is mixed or injected into your

tissues. In all instances in all applications PRP has been found to be completely natural and not associated with any problems or complications.

## PRP IN PLASTIC SURGERY

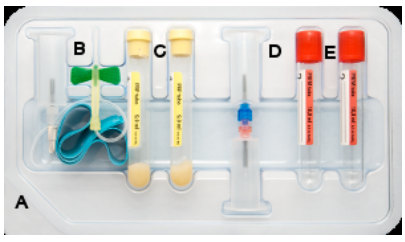
In many clinical situations including the use in plastic surgery, we take PRP to an additional step. Once collected PRP is activated by the addition of thrombin and calcium chloride which induces the release of these factors from alpha granules. This then forms a matrix which allows the slow sustained release of the growth factors. This we call Platelet Rich Fibrin Matrix (PRFM). This is then injected into the skin just beneath the dermis to fill wrinkle lines, or into the fat layer just below the dermis to add volume, like in the cheeks or midface. It has also been used to treat acne scars, enhance fat grafts and healing in facelift and rhinoplasty.

Clinical studies have found significant collagen production and new blood vessel ingrowth and formation of new fat cells (adipophylin and adipocytes); all of which are permanent. In a clinical trial PRFM injected into the nasal folds showed improvement in 14 days and this persisted for the 12 weeks of the study. No complications have been reported in its use in any of these areas. Because this is your own tissue there is no risk of allergy.

## THE PROCEDURE

The collection and injection of PRFM follows several easy steps and takes about 30 minutes in the office.

1. You will have blood drawn in the office in one small specially designed yellow tube shown below. This is just like if you were having blood sample testing.




2. Once your blood is drawn the tube is inserted into a special centrifuge in the office where the platelets are separated. This takes 6 minutes during which time your skin is cleansed and numbed.

3. The platelet portion of your blood sample is shown below as the yellow serum and it is removed and activated to form the PRFM.

4. This PRFM is injected into treatment areas with a very small needle just like any other facial filler. This takes about 15-20 minutes after which iced compresses are applied.

**WHAT TO EXPECT.**

Immediately after injection the treatment area is slightly red and this typically fades in several hours. There is usually little or no bruising. There is no pain after injections. Some mild swelling is present that subsides in several days. You will see some improvement in the treated areas and these are usually slightly "over" treated to allow for some of the liquid serum that absorbs. There is some settling of the effect in the treated areas in the first 1-2 weeks after which the result should stabilize.

The effects of the product and injection on wrinkles have been studied and shown to improve dramatically over the first 3-4 weeks, then improve slowly and become permanent up to 12 weeks.


The success of PRFM in this and other applications is due to the slow and sustained release of the platelet derived growth factors. At least the main six of these have been studied by sampling blood up to 8 days later and demonstrated slow steady and sustained release. This means that the factors are not released all at once but slowly for a continued benefit.