

Arthrex ACP[®] Double Syringe

ACP – Autologous Conditioned Plasma



Arthrex[®] 

Arthrex ACP® Double Syringe

Autologous Conditioned Plasma

Arthrex ACP® Double Syringe

Made in Germany



Introduction

Autologous blood products such as blood plasma have created a growing interest for use in a number of orthopedic therapies. The healing effect of plasma is supported by growth factors released by thrombocytes. The ACP double-syringe system is used for the sterile separation of non-homogeneous liquids. This device will allow the withdrawal of blood from the human body using a commercially available cannula with Luer lock connection.

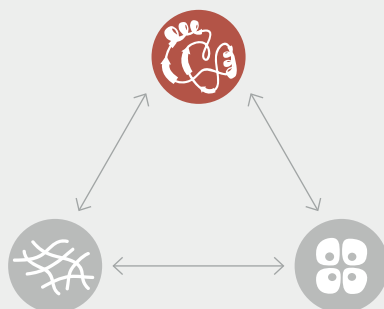
Features and Benefits


- Two-in-one – unique system for the preparation of autologous conditioned plasma
- ACP preparation with the Arthrex ACP double syringe can be performed within minutes
- The Arthrex ACP double syringe is a closed, sterile system for use in the doctor's office and operating room
- The double-syringe design allows for easy, convenient and safe handling

Arthrex ACP® Healing Triad


The Arthrex ACP healing triad comprises the cornerstones required for healing: "growth factors", "matrix", and "regenerative cells".

ACP covers the **growth factor** aspect.



 Growth factors

 Matrix

 Regenerative cells

Mechanism of Action

Using the described method with the Arthrex ACP double syringe to prepare blood, the plasma contains a platelet concentration increased by about two to three times.⁷ Outside the bloodstream, platelets become activated and release proteins, for example, growth factors. These growth factors are known to be relevant for healing in a variety of tissue types and they appear to work synergistically.^{1,2,3}

Major Effects of Growth Factors

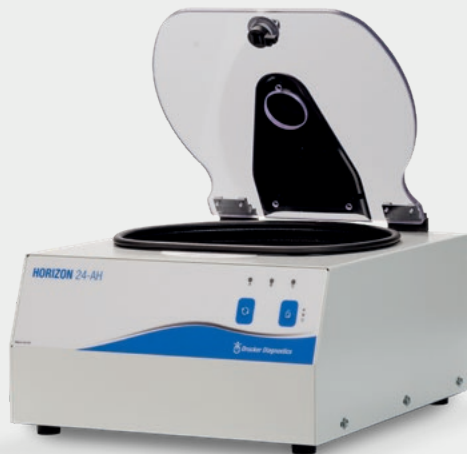
- Induced proliferation and differentiation of various cell types (e.g., osteoblasts, chondroblasts)⁴
- Improved matrix formation (e.g., collagen and proteoglycan production)
- Stimulation of angiogenesis and chemotaxis

As different studies have already shown, white blood cells are not concentrated.^{5,6,7} The supernatant should not contain red blood cells.^{7,8} A significant increase in the cell proliferation of muscle, tendon, and bone cells has been documented in vitro.⁸

Studies have confirmed the effectiveness of ACP therapy for the following indications:

- Mild to moderate osteoarthritis (grade I-III)⁹⁻¹¹
- Epicondylitis¹²
- Plantar fasciitis¹³
- Patellar tip syndrome¹⁴

Centrifuge, Cart for Centrifuge (Optional)



Centrifuge



Cart for centrifuge (optional)

Application



Accessories:

ACP double syringe, anticoagulant (optional), centrifuge



Important: Take the double syringe out of the packaging, tighten the inner syringe (turn it clockwise) (1), and then press both plungers together (2).

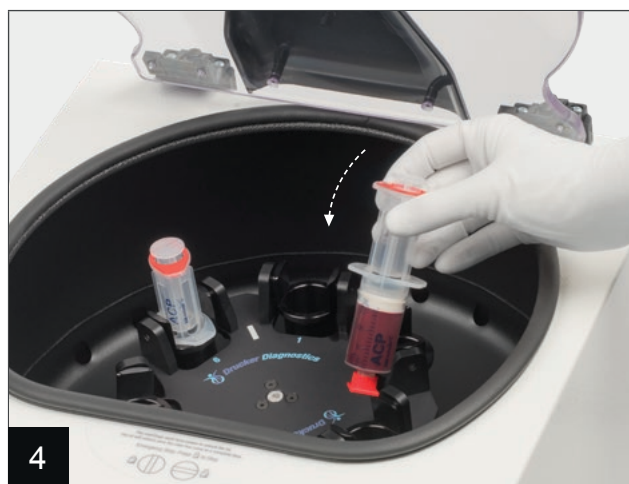
Optional: Withdraw approximately 1.5 ml anticoagulant into the syringe by drawing back only the plunger of the outer syringe that is colored red. If the ACP is injected within 30 minutes after withdrawing, the use of anticoagulant is not required.



Withdraw approx. 15ml of venous blood carefully and slowly. Once finished, seal the double syringe with the red cap.

Important: Only retract the plunger of the large syringe (red wings).

Using an anticoagulant, gently rotate the syringe in order to mix blood and anticoagulant.



Place the syringe in the centrifugation container. Place a suitable counterweight (e.g., an ACP double syringe filled with water) on the opposite side.



5
Centrifuge at 1500 rpm for five minutes (program A). Then carefully remove the double syringe.

Note: Remove the syringe, taking care to keep it in an upright position (red cap downwards) to avoid mixing.



6
In order to transfer the supernatant (ACP) from the larger outer syringe into the small inner syringe, slowly push down on the outer syringe while slowly pulling up the plunger of the small inner syringe.



7
Unscrew the small inner syringe and place a needle onto it. The ACP is ready for use at the point of care.

Optional: Transfer the ACP in a sterile cup for intraoperative usage.



Ordering Information

Product Description	Item Number
Arthrex ACP® Double-Syringe System	
Arthrex ACP® double syringe	ABS-10014
Arthrex ACP® kit serie I	ABS-10011
Drucker Centrifuge	
6-tube horizontal general purpose centrifuge (human use)	HORIZON 24-AH
Hettich Centrifuge	
Centrifuge Hettich Rotofix 32A with swing out rotor, 220 V	1206-Art
Centrifuge Hettich Rotofix 32A with swing out rotor, 110 V	1206-01-Art
Bucket for Hettich Rotofix 32A	1491
Screw cap for Hettich bucket	1492
Counterweight for centrifugation of Arthrex ACP® double syringe, 15 ml	ABS-10027
Accessories	
Cart for centrifuge, 45 cm	KU.1079.800

An anticoagulant can be ordered on request.

References

1. Borzini P, Mazzucco L: Tissue Regeneration and in Loco Administration of Platelet Derivates: Clinical Outcomes, Heterogeneous Products, and Heterogeneity of Effector Mechanisms. *Transfusion*. 2005; 45: 1759-1767.
2. Edwards D et al: Transforming Growth Factor Beta Modulates the Expression of Collagenase and Metalloproteinase Inhibitor. *The EMBO Journal*. 1987; 6(7): 1899-1904.
3. Lynch S et al: Role of Platelet-derived Growth Factor in Wound Healing: Synergistic Effects with other Growth Factors. *Proc. Natl. Acad. Sci. USA*. 1987; 84: 7696-7700.
4. Graziani F et al: The In Vitro Effect of Different PRP Concentrations on Osteoblasts and Fibroblasts. *Clin Oral Implants Res*. 2006; 17(2): 212-219.
5. Sundman E, Cole B, Fortier L: Growth Factor and Catabolic Cytokine Concentrations Are Influenced by the Cellular Composition of Platelet-Rich Plasma. *American Journal of Sports Medicine*. 2011; 39(10): 2135-2140
6. Kisiday J et al: Effects of Platelet-Rich Plasma Composition on Anabolic and Catabolic Activities in Equine Cartilage and Meniscal Explants. *Cartilage*. 2012; 3: 245-254
7. Mazzocca A et al: Platelet-rich plasma differs according to preparation method and human variability. *Journal of Bone & Joint Surgery*. 2012; 94(4): 308-316
8. Mazzocca A et al: The positive effects of different platelet-rich plasma methods on human muscle, bone, and tendon cells. *The American Journal of Sports Medicine*. 2012; 40(8): 1742-1749
9. Smith PA: Intra-articular Autologous Conditioned Plasma Injections Provide Safe and Efficacious Treatment for Knee Osteoarthritis. *The American Journal of Sports Medicine*. 2016; 44(4): 884-891
10. Cerza F et al: Comparison between hyaluronic acid and platelet-rich plasma, intra-articular infiltration in the treatment of gonarthrosis. *The American Journal of Sports Medicine*. 2012; 40(12): 2822-2827
11. Cole BJ et al: Hyaluronic Acid Versus Platelet-Rich Plasma: A Prospective, Double-Blind Randomized Controlled Trial Comparing Clinical Outcomes and Effects on Intra-articular Biology for the Treatment of Knee Osteoarthritis. *The American Journal of Sports Medicine*. 2017; 45(2): 339-346
12. Ford RD et al: A retrospective comparison of the management of recalcitrant lateral elbow tendinosis: platelet-rich plasma injections versus surgery. *Hand (N Y)*. 2015; 10(2): 285-291
- Lebiedzinski R et al: A randomized study of autologous conditioned plasma and steroid injections in the treatment of lateral epicondylitis. *International Orthopaedics*. 2015; 39(11): 2199-2203
- Opposite view:
Montalvan B et al: Inefficacy of ultrasound-guided local injections of autologous conditioned plasma for recent epicondylitis: results of a double-blind placebo-controlled randomized clinical trial with one-year follow-up. *Rheumatology*. 2016; 55(2): 279-285
13. Chew KT et al: Comparison of autologous conditioned plasma injection, extracorporeal shockwave therapy, and conventional treatment for plantar fasciitis: a randomized trial. *PM&R*. 2013; 5(12): 1035-1043
14. Zayni R et al: Platelet-rich plasma as a treatment for chronic patellar tendinopathy: comparison of a single versus two consecutive injections. *Muscles Ligaments Tendons Journal*. 2015; 5(2): 92-98

For information on the studies please contact your Arthrex representative.

This description of technique is provided as an educational tool and clinical aid to assist properly licensed medical professionals in the usage of specific Arthrex products. As part of this professional usage, the medical professionals must use their professional judgment in making any final determinations in product usage and technique. In doing so, the medical professionals should rely on their own training and experience and should conduct a thorough review of pertinent medical literature and the product's Directions For Use.

