Arthrex ACP®
Double-Syringe System

Autologous Conditioned Plasma

Arthrex®

Arthrex ACP® Double-Syringe System

Features and Benefits

- The ACP (autologous conditioned plasma) system allows for rapid and efficient concentration of platelets and growth factors from autologous blood, for use at the treatment site
- The unique double-syringe design allows for convenient and safe handling, as the whole preparation process takes place in a closed system
- The ACP system is more affordable, is easier to use, and has a quicker procedure time when compared to other conventional PRP devices[1]

White blood cells, specifically neutrophils, are not concentrated within the ACP system. These cells can have a detrimental effect on the healing process due to release of degradative proteins and reactive oxygen species.[2,3]

Product Description	Item Number
ACP double-syringe w/ cap	ABS-**10010S**
Series I ACP blood draw kit	ABS-**10011**
Series I ACP blood draw kit w/ ACD-A	ABS-**10011T**
Series II ACP blood draw kit	ABS-**10012**
Horizon 24 centrifuge, full kit	**00389-129-000K**
Centrifuge bucket	**03-1-0001-0097K**
Bucket spacer	**03-1-0001-0098K**
Counterbalance	ABS-**10027**
ACP cart	ABS-**10100**

Centrifuge and ACP Blood Draw Kit

ACP Cart
and Centrifuge

ACP Double-Syringe

Kit Components

The Series I ACP® Blood Draw Kit contains one syringe along with everything needed for a standard blood draw: tourniquet, alcohol pad for the draw site, butterfly needle for drawing blood, gauze sponge and bandage for post-draw, and patient labels for the double syringe.

The Series II ACP Blood Draw Kit contains two syringes and the same blood draw equipment found in the Series I Kit, along with a few added features: hypodermic needles for drawing ACD-A, a 3-way stopcock for attachment of both syringes when drawing blood, a side-pinch clamp if the user prefers to draw one syringe at a time, 40 mL cups for containment of ACP on a sterile field, and a female-to-female luer connector if the user prefers to combine the ACP collected within the two inner syringes into one larger syringe.

The Arthrex ACP Kit With ACD-A contains one syringe and the same blood draw equipment found in both the Series I Kit and Series II Kit, along with anticoagulant citrate dextrose solution (ACD-A).

ACP Series I Kit Components (ABS-**10011**)

Product Description	Quantity
Double syringe	1
Double-syringe Luer cap	1
Tourniquet, disposable, latex-free	1
Alcohol pad	1
Angel wing infusion set, 19 ga	1
Gauze sponge, 2 in × 2 in	1
Band-Aid®, latex-free	1
Patient label	2

ACP Series II Kit Components (ABS-**10012**)

Product Description	Quantity
Double syringe	2
Double-syringe Luer cap	2
Tourniquet, disposable, latex-free	1
Alcohol pad	1
Angel wing infusion set, 19 ga	1
Gauze sponge, 2 in × 2 in	1
Band-Aid, latex-free	1
Patient label	4
Hypodermic needle, 20 ga, 1.5 in	2
3-way stopcock	1
Side-pinch clamp	1
40 mL cup	2
Female-to-female Luer connector	1

ACP Series I Kit With ACD-A Components (ABS-**10011T**)

Product Description	Quantity
Double Syringe	1
Double-Syringe Luer Cap	1
Vial ACD-A, 30 mL	1
Tourniquet, disposable, latex-free	1
Alcohol Pad	1
Angel Wing Infusion Set, 19 ga	1
Gauze Sponge, 2 in × 2 in	1
Band-Aid, latex-free	1

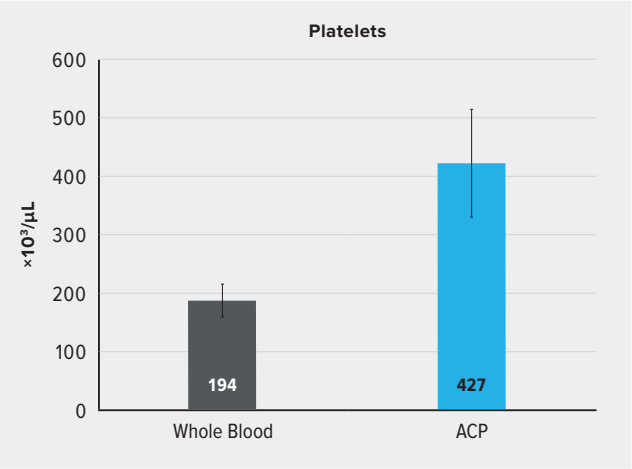
Mechanism of Action

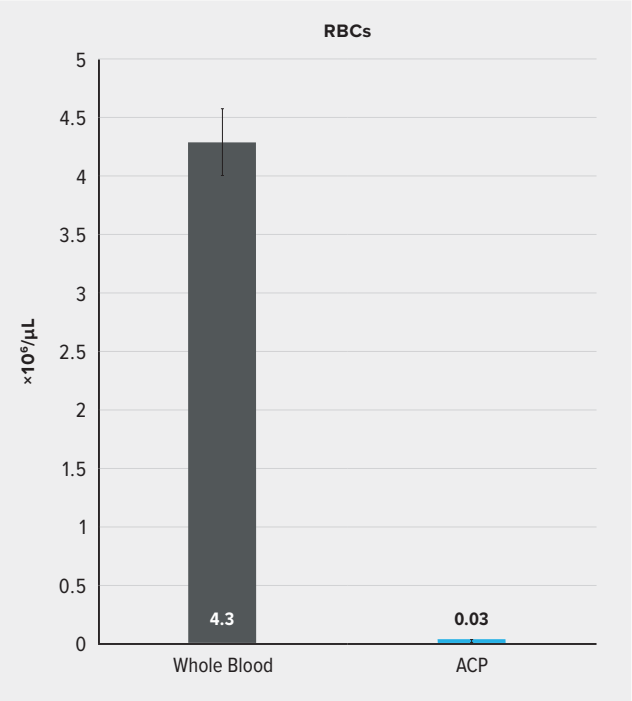
Outside the bloodstream, platelets become activated and release proliferative and morphogenic proteins. These proteins appear to work synergistically to invoke the following benefits[4-6]:

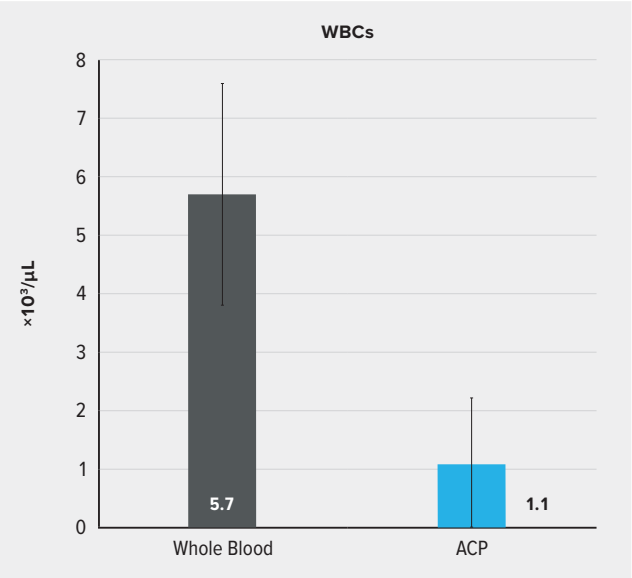
- Induce proliferation and differentiation of various cell types (eg, progenitor cells, osteoblasts, epidermal cells)
- Enhance/modulate production of collagen, proteoglycans, and tissue inhibitor of metalloproteinases (TIMP)
- Stimulate angiogenesis and chemotaxis

In order to evaluate the differences between ACP and whole blood, ACP was prepared from the venous blood of 20 healthy donors and the concentrations of platelets, red blood cells (RBCs), and white blood cells (WBCs) were measured with a standard complete blood cell count. We found the density of platelets to be more than twice as high in the ACP versus whole blood.[7] From the same report, there was an average reduction of 80% WBCs (specifically 99.9% reduction of neutrophils) and 99.4% RBCs.

In order to determine the effect ACP has on particular cell lines, in vitro culture work was done with human tenocytes, osteoblasts, and myocytes. Peripheral blood was obtained from 8 donors and proliferation of the cell lines was measured for the following 5 culture groups: (1) negative control, cells cultured with 2% or 5% fetal bovine serum (FBS); (2) positive/proliferative control, cells cultured with 10% or 15% FBS; (3) whole blood; (4) a buffy coat-based PRP system containing 7× platelet concentration and 4× WBC concentration; and (5) ACP. An ANOVA statistical analysis was completed to compare the different culture groups. ACP resulted in an increase in proliferation that was statistically significant (P <.05) over the negative control, positive control, and whole blood culture groups for each of the 3 cell lines. ACP-induced proliferation was also statistically greater than the buffy coat–based PRP culture group for the osteoblast and myocyte cell lines. ACP was not statistically different from the buffy coat PRP for tenoctyes, but it did approach significance and had an increased proliferative mean.[8]

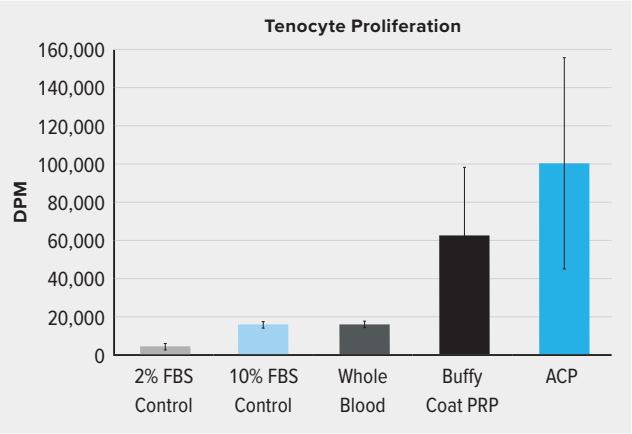


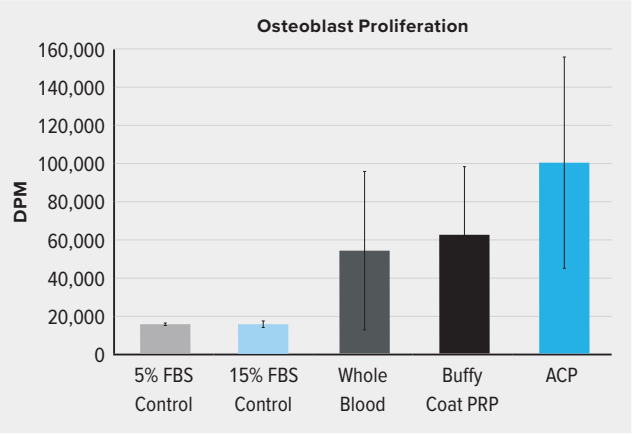


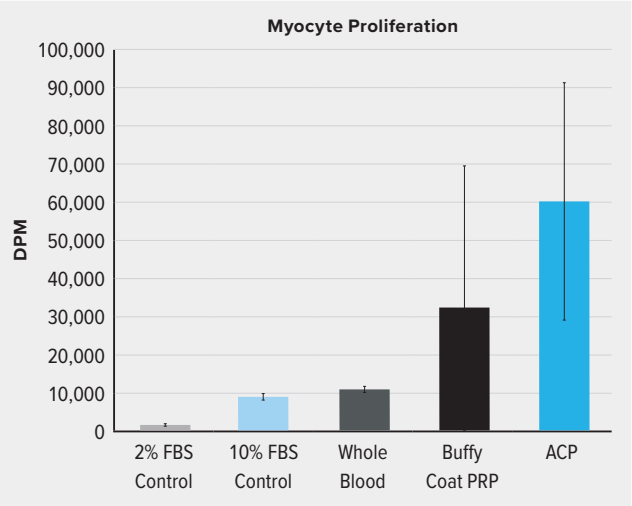


	Arthrex ACP® System	Other PRP Systems
Volume of patient blood drawn	16 mL	60-120 mL
Is anticoagulant (ACD-A) required?	No	Yes
Centrifugation steps	1×	1-2×
Centrifugation time	5 minutes	15-30 minutes
Does it concentrate RBCs and WBCs?	No: reduces	Yes: concentrates
Can it be clotted prior to surgical delivery?	Yes	Yes

The increased proliferation for ACP versus the other 4 groups could be caused by a number of factors. There may be a cellular dose response indicating that only a certain level of growth factors released from platelets are needed to elicit maximum proliferation. After reaching this proposed threshold, additional concentrating of platelets and growth factors may cause a paradoxical inhibitory effect on cell proliferation.[9,10] The inclusion of WBCs within a PRP product may prevent maximal growth potential due to release of degradative enzymes and reactive oxygen species.[2,3] Overall, this in vitro study demonstrates that ACP is the ideal PRP for cellular proliferation when compared to a buffy coat-based PRP.







Directions for Use

1

Prior to withdrawing ACD-A, prime the outer and inner syringes by pulling each plunger completely back and forward. Withdraw approximately 1.5 mL ACD-A into the syringe.

Note: If ACP is going to be used within 30 minutes of blood withdrawal, the use of ACD-A is not required.

2

Slowly withdraw by pulling back on the red wings. Fill the syringe to a maximum of 15 cc of venous blood at a rate of 1 cc every 2 seconds and seal the syringe with the red cap. The 19-gauge butterfly needle found in the Series I and Series II Kits is recommended to draw the blood.

3

Gently rotate the syringe to mix the blood and the ACD-A. Place the syringe into one bucket and an appropriate-size counterbalance in the opposite bucket.

4

Run the centrifuge at 1500 rpm for 5 minutes. Remove the syringe, taking care to keep it in an upright position to avoid mixing the plasma and red blood cells.

5

In order to transfer 4-7 mL of ACP from the larger outer syringe into the small inner syringe, slowly push down on the syringe‘s red wings.

6

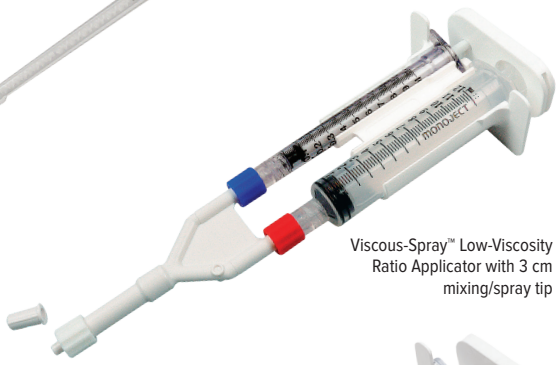
Unscrew the small inner syringe. The ACP is ready for use at the point of care. The ACP can also be transferred into a sterile cup on the sterile field and transferred into a 10 mL syringe for use. The ACP should be used within 4 hours after the blood draw when ACD-A is used.

Viscous Delivery Systems

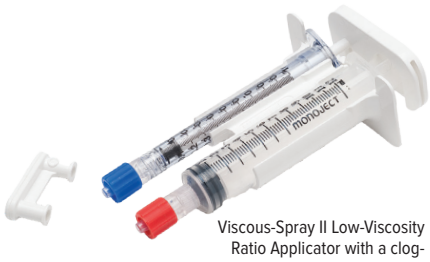
- Use to facilitate mixing and delivery
- Quick and simple to attach/detach
- Easy to fill—no need to disassemble
- 11:1 ratio allowing homologous mixture of two fluids
- Use to provide a low- or high-viscosity fluid
- ACP/PRP can be mixed with allograft or autograft prior to application to an orthopedic surgical site as a spray, gel, or clot
- Extra long, blunt, fenestrated, and beveled delivery needles

Product Description	Item Number
Viscous-gel high-viscosity	ABS-**10050**
Viscous-spray low-viscosity	ABS-**10051**
Viscous-spray II low-viscosity	ABS-**10052**

Viscous-Gel™ High-Viscosity Ratio Applicator with 10 cm mixing tip



Viscous-Spray™ Low-Viscosity Ratio Applicator with 3 cm mixing/spray tip



Viscous-Spray II Low-Viscosity Ratio Applicator with a clog-resistant mixing/spray tip

BioXpress™ Graft Delivery Device

The BioXpress graft delivery device is designed for targeted delivery of hydrated allograft, autograft, or synthetic bone graft materials to an orthopedic surgical site, while maximizing material utilization.

Product Description	Item Number
Blunt tip cannula, 10 cm **(a)**	ABS-**10053-10**
Angled tip cannula, 10 cm **(b)**	ABS-**10053-10-45**
Blunt tip cannula, 15 cm	ABS-**10053-15**
Angled tip cannula, 15 cm	ABS-**10053-15-45**

BioXpress™

References

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The Double-Syringe (ACP) System is used to facilitate the safe and rapid preparation of autologous platelet-rich-plasma (PRP) from a small sample of blood at the patient's point of care. The PRP can be mixed with autograft and allograft bone prior to application to an orthopedic surgical site as deemed necessary by the clinical use requirements.

Notes

Notes

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 professional must use their professional judgment in making any final determinations in product usage and technique. In doing so, the medical professional 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. Postoperative management is patient-specific and dependent on the treating professional's assessment. Individual results will vary and not all patients will experience the same postoperative activity level or outcomes.

Arthrex manufacturer, authorized representative, and importer information (Arthrex eIFUs)

US patent information

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