



PRP Precision

- Customize platelet-rich plasma formulations.
- Advanced engineering delivers reproducible results.
- Fast, simple one-button automation.
- Closed system for clinic and OR.

Different clinical requirements demand different volumes of platelet-rich plasma (PRP) and platelet-poor plasma (PPP), along with varying concentrations of platelets, leukocytes, and erythrocytes in the final PRP preparation.

The Angel® Whole Blood Separation System is the *only* system with adjustable volume and concentration settings, so clinicians can customize indication-specific PRP formulations.

angel
WHOLE BLOOD SEPARATION

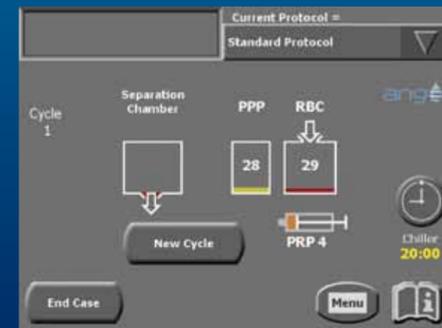


Each pre-connected sterile disposable processes 180ml of whole blood.

PRP Precision

Angel continuous process monitoring

Windows®-based touch screen dashboard monitors volumes of all blood components - PRP, PPP, RBC - throughout every step of the process cycle.



For an on-site demonstration of the Angel® Whole Blood Separation System or for more technical information, contact yourangel@cytomedix.com, call 866.CYTOMED (866.298.6633), or visit www.cytomedix.com.



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The Cytomedix Angel® Whole Blood Separation System is intended to be used at the patient's point-of-care for the safe and rapid preparation of platelet-poor plasma and platelet-rich plasma from a sample of whole blood. The plasma and concentrated platelets produced can be used for diagnostic tests. The platelet-rich plasma can also be mixed with autograft and/or allograft bone prior to application to an orthopedic site as deemed necessary by the clinical use requirements.



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WHOLE BLOOD SEPARATION

PRP Precision

Angel® is the only system that lets clinicians customize concentrations of platelet-rich plasma: 1-18x baseline



Precision separation

High-specificity 3ST light sensor technology and automated valve switching mechanics are hallmarks of the Angel® precision separation process. Results: Angel produces a high yield of PRP and PPP for any whole blood volume between 40-180ml.



3ST separation process

Our unique 3 sensor technology (3ST) accurately separates blood components using cell-specific absorption of light to increase cellular yields. Absorption of 930nm light detects erythrocytes, absorption of 470nm light detects platelets and leukocytes, and the 1300nm wavelength corrects for ambient light and detects presence of air bubbles.

Advantages of 3ST automation:

- No syringe switching.
- No manual harvesting of PRP.
- Delivers PRP, PPP, and RBCs into separate sterile compartments.
- Consistent results facilitate optimal clinical outcomes.



Automated, closed system



One-button automation

With one-button automation, clinicians enter the blood volume to be processed and press the touch screen "start" button to operate in fully automatic mode.

More experienced clinicians may create customized spin protocols to suit different procedures and patient populations.

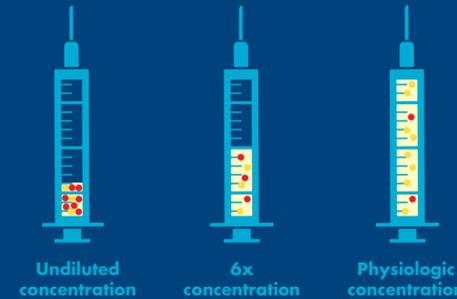
Maintenance-free advantage

- Self-diagnostics performed prior to and during processing to ensure reproducible results.
- Software-driven maintenance and service programming to reduce operator costs.

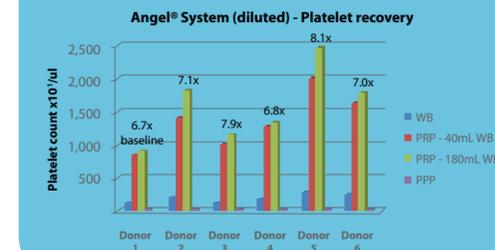
Portability

- Data export and print options may be used to archive procedural and patient data.
- Compact design makes the system easy to move from one clinical setting to another: OR, hospital, outpatient clinic, or physician's office.

Operator controls platelet concentration



Platelet recovery results using the Angel Standard PPP Dilution Protocol*



*Data on file

High yields, reproducible results

The Angel fully engineered software program precisely controls blood component separation to produce a consistently high percentage of functional platelets.

Angel System advantage: High percentage of functional platelets*

	Whole Blood (60ml), PRP* (diluted to 6ml)	
N=5 unique donors	%Platelet Aggregation ADP Activation	%Platelet Aggregation Collagen Activation
Mean+S.D.	97.4+0.7	93.2%+2.7

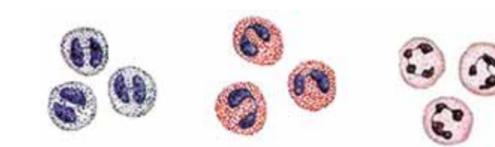
*Data on file.

Proprietary dual-spin algorithms automatically adjust the Angel separation parameters to deliver reproducible platelet yields at any whole blood volume between 40-180ml.

Broad range of platelet concentrations

Angel produces a highly concentrated PRP sample using a 7% hematocrit setting (≥1.8x baseline). Following the Standard PPP Dilution Protocol, the Angel delivers a PRP preparation containing concentrated platelets approximately 6x baseline. Custom protocols offer clinicians a broad range of indication-specific options with a user-defined range of platelet and granulocyte concentrations.

Broad range of hematocrit settings



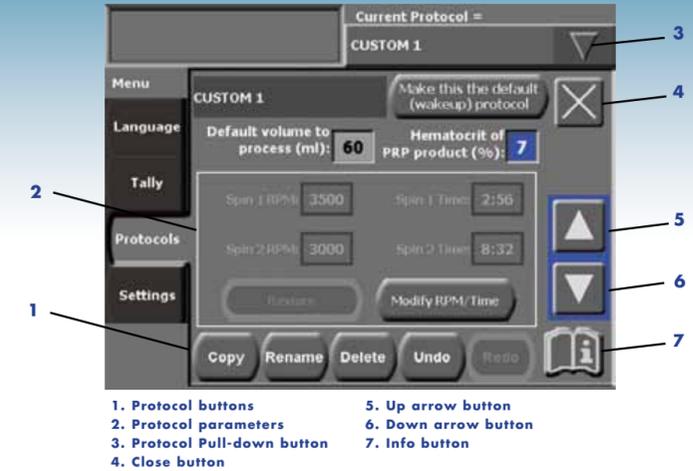
Granulocytes

Angel hematocrit setting	Reduction in granulocyte count
7%	80%

The 7% hematocrit setting (Angel Standard Protocol) delivers an 80% reduction in the granulocyte count in the final PRP. Further decreases and increases in granulocytes can be achieved by adjusting the Angel hematocrit settings between 0-25%.

Patient and indication-specific protocol options

"Protocol" tab of the menu screen



1. Protocol buttons
2. Protocol parameters
3. Protocol Pull-down button
4. Close button
5. Up arrow button
6. Down arrow button
7. Info button

Angel procedural customization options:

Adjustable PRP Volume

Adjustable starting blood volume means you can produce between 1-20ml PRP per cycle to meet different procedural needs.

Using the Standard Dilution Protocol, the Angel System consistently delivers PRP volumes equivalent to 10% starting blood volume (i.e., 4ml PRP from 40cc of whole blood or 12ml PRP from 120cc of whole blood, etc.).

Adjustable Blood Volume

Angel automatically recalibrates centrifugal spin time and speed according to starting blood volumes between 40-180ml.

Adjustable PPP Volume

Angel produces a large volume of PPP containing a low concentration of free hemoglobin.

Adjustable % Hematocrit

The Angel Standard Dilution Protocol specifies a 7% hematocrit setting that can be adjusted up to 25% or down to 0% using the simple touch screen dashboard.

Adjustable Leukocyte Concentration

Using the % Hematocrit setting, the Angel operator has the flexibility to produce PRP with a wide range of percentage of leukocytes.¹

Adjustable Platelet Concentration

The unique PRP syringe collection design and 3ST valve switching technology allows the operator to produce a PRP syringe containing concentrated platelets ranging from 1-1.8x the starting blood sample.²

1. Certain leukocyte populations such as granulocytes have densities that overlap that of red blood cells while others reside in the buffy-coat fraction that floats on the red cell pack.

2. Refer to the Angel PRP Dilution Guide to achieve the desired final platelet concentration. Available on request.