

# boost autologous blood transfusion options



CE 0425  
[www.hemoclear.com](http://www.hemoclear.com)

 **HemoClear**  
Platelet-rich autologous blood

## The background

Annually 100 million donor blood transfusions take place worldwide. Despite broad applicability, donor transfusion is still associated with high total costs (€ 430 to € 975 per treatment) and health risks resulting in medical complications, longer recovery time, or increased mortality.

Patient Blood Management represents a set of patient-centered strategies aimed at minimizing donor blood use and improving patient outcomes. Part of these strategies is collecting and giving back to the same patient the blood lost during surgery, a procedure referred to as cell salvage or autologous transfusion. The prerequisite for autologous blood is that it is "washed" before given back to the patient; valuable blood cells are retained while harmful contaminants are washed away. Cell salvage is used to a limited extent in Africa due to its high resource use.

**The HemoClear blood system is the first out-of-the-box solution for cell salvage. HemoClear recovers safe and high-quality autologous platelet-rich red blood cells from patients' shed blood. The simple sterile and closed filter procedure takes only 30 minutes and can be performed by anyone in any healthcare setting.**

## Autologous blood transfusion

The reinfusion of blood or blood components to the same individual from whom they were taken. There are two main kinds of autologous blood transfusion: patients' blood can be donated and stored for later return to them, or more commonly used, shed blood can be collected during and after surgery or trauma to be given back to the patient immediately.

## Cell recovery or cell salvage

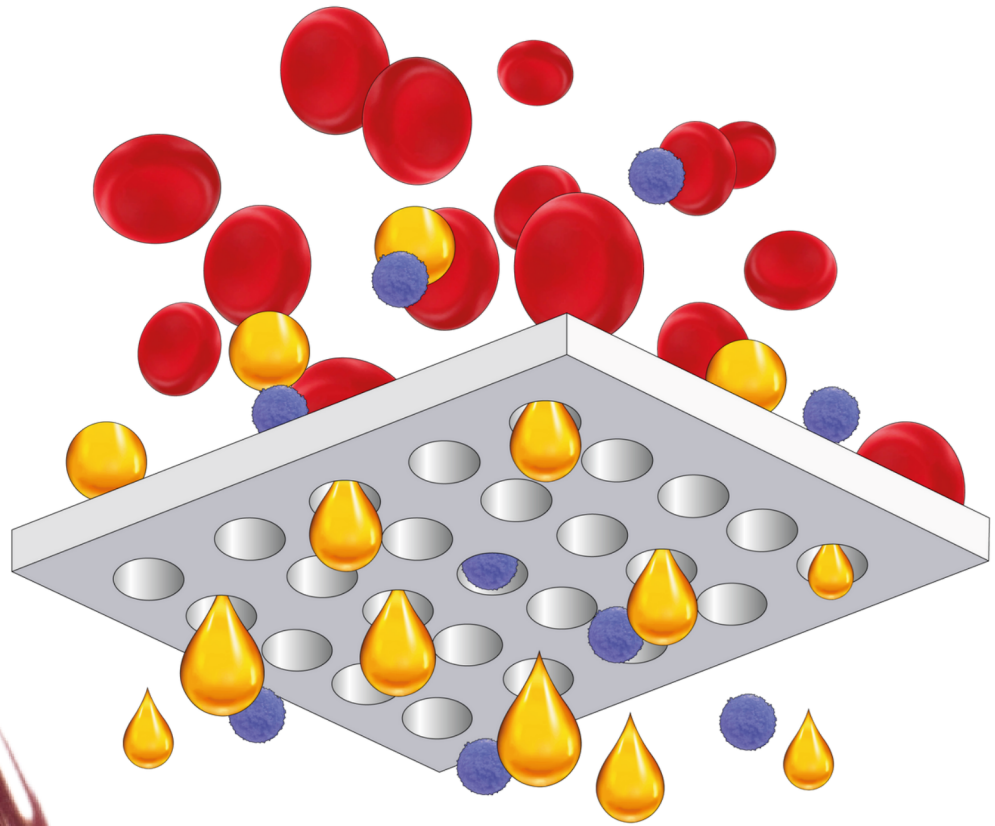
A form of autologous blood transfusion in which a patient's shed blood is collected during or after surgery and given back to them. In order to safely reinfuse the shed blood, it is usually firstly processed by a cell salvage device, that washes out the substances that are harmful to the patient.

# Introducing the first micro-filtration cell salvage solution

High-quality  
transfusion blood

Platelet-rich  
autologous blood

Full washing  
procedure



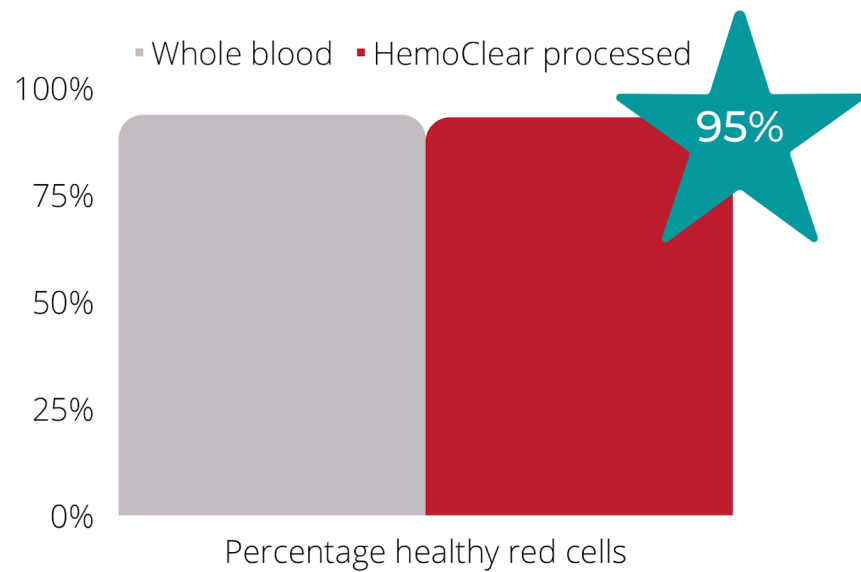
30 minutes  
bed-side procedure

No equipment  
or electricity  
needed

No extensive  
training  
Needed

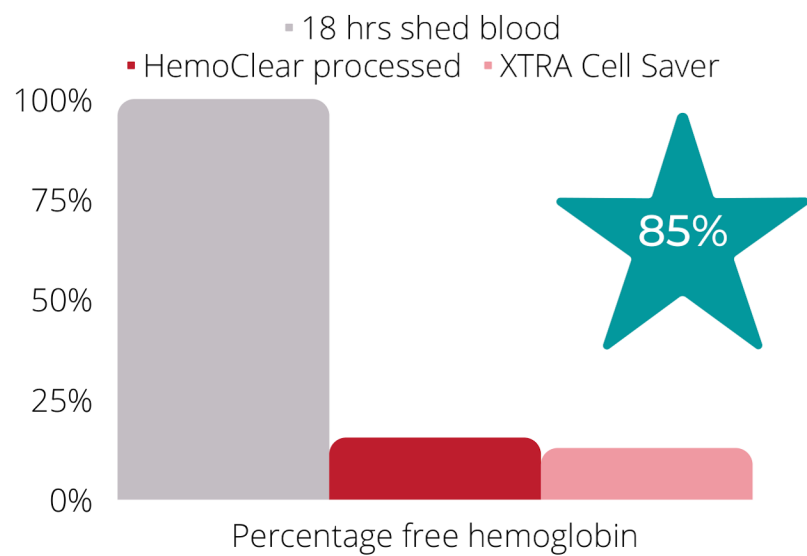
 **HemoClear**  
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## Recuperates healthy red blood cells<sup>1</sup>



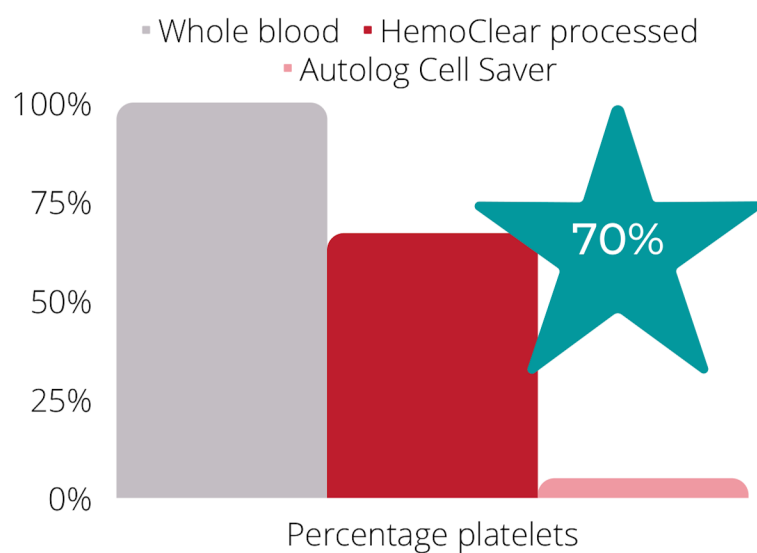
RBC morphology was determined after fixation of the cells and using a light microscope, RBCs were visually analysed and described as either well-shaped discocytes (smooth biconcave discs without defined spicules) or echinocytes (crenated cells with defined spicules, including spherocytes).

## Eliminates non-cellular components<sup>2</sup>



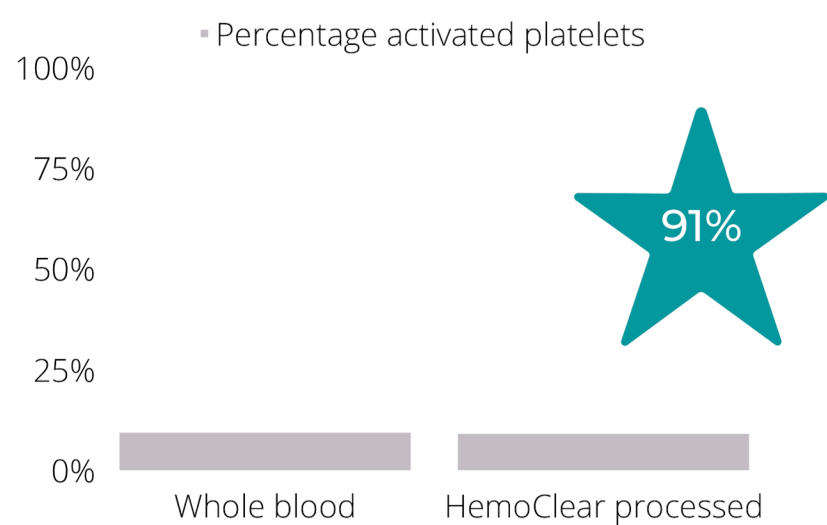
Free hemoglobin was equally washed out by the two devices to a mean level of less than 15% of the total baseline load. Total loads of complement C3, complement C4, and D-dimer were reduced by over 15-fold after the HemoClear washing procedure.

## Salvage functioning platelets<sup>1</sup>



The washing procedure yielded platelets of at least  $68 \pm 10\%$ . Washing by one filtration round, two consecutive rounds or the entire washing protocol did not significantly increase haemolysis.

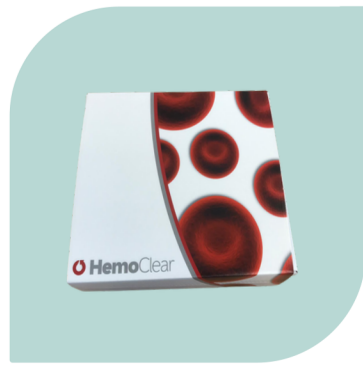
## Filtration does not activate platelets<sup>1</sup>



Immediately after separation of the WB, activation of the platelets was measured by percentage CD62P display. Platelet function was assessed using TEG. Parameters indicate that separation has minimal influence on platelet functionality.



## Product information



### HemoClear Kit - HCO1K

- Blood filter
- 2 blood bags
- 1 waste bag
- 3 extension lines

Minimum quantity: 10 kits



### Cardiotomy collection reservoir -CR00002

- Blood collection under suction
- Internal 37 micron coarse filter
- Includes transfer tube from reservoir to blood bag

Minimum quantity: 6 reservoirs

## Order

Online: [www.hemoclear.com](http://www.hemoclear.com)  
Phone: +31 (0) 38 303 26 30  
Mail: [info@hemoclear.com](mailto:info@hemoclear.com)

## Product demonstration

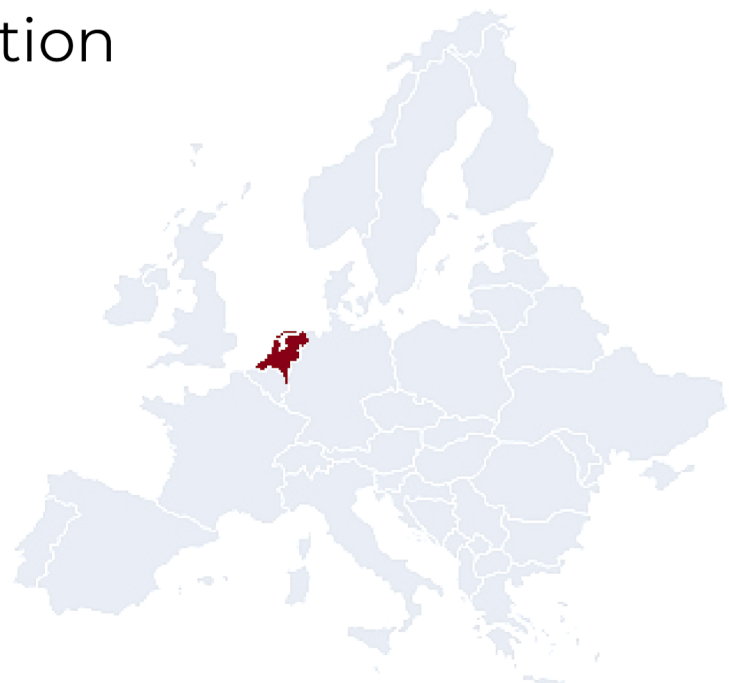
Are you interested but not yet ready to order, or did you order, and would you feel more comfortable if we demonstrate how to use the filter?

Let us know at [demo@hemoclear.com](mailto:demo@hemoclear.com) or call us at +31 (0) 38 303 26 30

## Contact information

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## An In Vitro Pilot Study Comparing the Novel HemoClear Gravity-Driven Microfiltration Cell Salvage System with the Conventional Centrifugal XTRA™ Autotransfusion Device

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### Abstract

**Background.** In 2013, the World Health Organization reported a shortage of 17 million red blood cell units, a number that remains growing. Acts to relieve this shortage have primarily focused on allogeneic blood collection. Nevertheless, autologous transfusion can partially alleviate the current pressure and dependence on blood banking systems. To achieve this, current gold standard autotransfusion devices should be complemented with widely available, cost-efficient, and time-efficient devices. The novel HemoClear cell salvage device (HemoClear BV, Zwolle, Netherlands), a gravity-driven microfilter, potentially is widely employable. We evaluated its performance in the cardiac postoperative setting compared to the centrifugal XTRA device. **Methods.** In a split-unit study (n= 18), shed blood collected 18 hours after cardiothoracic surgery was divided into two equal volumes. One-half was processed by the XTRA paired set-up, equal washing volumes were used for both methods. Washing effectivity and cellular recovery were determined by <sup>TM</sup> device and the other with the HemoClear blood separation system. In this measuring of complete blood count, free hemoglobin, complement C3, complement C4, and D-dimer in both concentrate as filtrate. Also, processing times and volumes were evaluated. **Results.** The HemoClear and XTRA <sup>TM</sup> devices showed equal effectiveness in concentrating erythrocytes and leucocytes. Both methods reduced complement C3, complement C4, and D-dimer by  $\geq 90\%$ . The centrifugal device reduced solutes more significantly by up to 99%. Free hemoglobin load was reduced to 12.9% and 15.5% by the XTRA red blood cells comparably to the conventional centrifugal XTRA<sup>TM</sup> and HemoClear, respectively. **Conclusion.** The HemoClear device effectively produced washed concentrated <sup>TM</sup> autotransfusion device. Although the centrifugal XTRA<sup>TM</sup> device achieved a significantly higher reduction in contaminants, the HemoClear device achieved acceptable blood quality and seems promising in settings where gold standard cell savers are unaffordable or unpractical.

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## Recovery of platelet-rich red blood cells and acquisition of convalescent plasma with a novel gravity-driven blood separation device

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### Abstract

**Objectives:** Our objectives were to determine the separation characteristics and blood product quality of a gravity-driven microfiltration blood separation system (HemoClear, The Netherlands). **Background:** A range of centrifugal blood separation devices, including intraoperative cell salvage devices (cell savers) and apheresis machines, are available to assist in preparing both allogenic and autologous blood products. These devices are expensive to operate and require extensive training. **Methods and Materials:** Nine whole blood units were collected under standard conditions and analysed for haematological parameters, thromboelastographic properties, platelet morphology and activation, and red blood cell (RBC) deformability and morphology. Three whole blood units were separated by means of the HemoClear device, into a liquid and cellular component. The cellular component was diluted with SAGM and cold stored for 14 days. To simulate cell salvage six whole blood units were diluted with isotonic saline, followed by multiple HemoClear separation rounds. **Results:** The recovery of both RBCs ( $100 \pm 1.6\%$ ) and white blood cells ( $99 \pm 4.5\%$ ) after undiluted filtration were very high, while platelet recovery was high ( $83 \pm 3.0\%$ ). During the filtration, and cold storage after filtration storage both the non-deformable RBC fraction and the RBC maximum elongation remained stable. Parameters of thromboelastography indicated that platelets remain functional after filtration and after 7 days of cold storage. In the cell salvage simulation the total protein load in the cellular fraction was reduced by  $65 \pm 4.1\%$  after one washing round and  $84 \pm 1.9\%$  after two consecutive washing rounds. **Conclusion:** The novel blood filter studied effectively separates whole blood into diluted plasma and platelet-rich RBCs. Moreover, the device effectively washed diluted whole blood, driving over 80% of proteins to the liquid component.

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