

# Plasmat<sup>®</sup> Futura Apheresis Machine

Brief Instructions for Use SW 3.0x EN



**H.**eparin induced  
**E.**xtracorporeal  
**L.**DL  
**P.**recipitation

**B | BRAUN**  
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CE 0123

CE marking according to directive 93/42/EEC.

Technical alterations reserved.

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## 1 Preparation

### NOTICE!

These brief instructions for use are no substitute for the complete instructions for use and must only be used considering the information given in the instructions for use of the H.E.L.P. Futura set and the Plasmat<sup>®</sup> Futura.

#### Machine

1. Ensure that brakes are applied to all machine casters.
2. Ensure that the pump roller marked with a yellow point is installed in plasma/buffer pump. Interchange rollers accordingly, if necessary.
3. Switch on machine (press mains switch on rear side).
  - ↪ An automatic self test is initiated.



During automatic self test, neither the pressure transducers nor the load cell may be loaded. The piston pusher of the heparin syringe pump must be lightly pulled back and the clasp must be latched.

4. Make sure that you hear 4 different alarm signals during selftest, that you see 3 rows of figures from 0 to 9 and that LEDs on monitor flash.
  - ↪ After successful self test, the cursor goes automatically to the *END* menu item in the menu bar of the screen.
5. Press *Enter* key.
  - ↪ The start screen appears.

#### Solutions

1. Mix each of the 3 l 0.9 % H.E.L.P. NaCl bags with 1.5 ml (7500 IU) heparin solution (5000 IU/ml).
2. Prepare the 2 bags with H.E.L.P. BicEl bicarbonate solution by transferring fluid from small to large chamber. Thoroughly mix solution.
3. Mix the 4 l acetate buffer bag with 40 ml H.E.L.P. heparin solution (10,000 IU/ml). Mark prepared bag with the label provided in H.E.L.P. heparin packaging to avoid repeated injection.
4. Prepare perfusor syringe (30 ml Omnifix<sup>®</sup>) with heparin saline mixture. For example: For 20 ml heparin solution (with 1000 IU/ml) mix 4 ml heparin (5000 IU/ml) with 16 ml 0.9 % NaCl solution).

#### IV-Pole

1. Hang on IV-pole:
  - 5 l empty bag (connection to top)
  - 1 heparinized 3 l NaCl bag
  - 500 ml and 1500 ml NaCl bag.

#### Load Cell

1. Hang on load cell:
  - 3 empty bags
  - 1 heparinized 3 l NaCl bag
  - 2 bicarbonate solution bags.

**H.E.L.P. Futura Set**

1. Place plastic plate of H.E.L.P. Futura kit onto bottom support at front plate. Press plate against front and secure top seat with upper holder.
2. Retighten all connections of H.E.L.P. Futura kit.
3. Insert pump segments of ultrafiltration line and plasma/buffer line into upper pumps (plasma and buffer segment successively).



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The pump segment of the ultrafiltration line is inserted correctly as soon as the white marking of the line is on the left side of the ultrafiltration pump (arrow on the pump to the top).

Pay attention to the different color coding of the plasma and buffer line and avoid to cross the lines. The Y-piece connecting the plasma and buffer line must be located at the right side (outlet) of the plasma/buffer pump.

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4. Insert filtrate and precipitate chamber into the corresponding holders and secure them.
5. Screw on pressure transducers of plasma line (PPL), connection line, precipitate line (PPF) and filtrate line (PDF).
6. Insert plasma line coming from plasma filter into blood leak detector (BLD).
7. Firmly insert filtrate line to heparin adsorber into heparin adsorber clamp (HAK).
8. Check that venous chamber is placed in the holder at the kit.
9. Insert venous line in safety air detector (SAD) and in tubing clamp (SAK); screw on pressure transducer (PV); connect venous line to empty bag on IV-pole.
10. Connect buffer line to saline bag on load cell.
11. Connect ultrafiltration line (3-piece) to the 3 drain bags on load cell.
12. Connect reinfusion line to connection of the 1.5 l NaCl bag and fill line manually. Afterwards close clamp.
13. Insert buffer line into holder provided on load cell.

**Arterial Line**

1. Screw patient-side connection of arterial line to the 3 l NaCl bag on IV-pole.
2. Insert pump segment into blood pump.



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The pump segment of the arterial line is inserted correctly as soon as the red marking of the line is on the left side of the pump (arrow on the pump to the top).

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3. Insert arterial chamber into holder.
4. Screw pressure transducer of arterial line (PA) to connector in front of blood pump.
5. Screw pressure transducer of blood entry line (PBE) to connector behind blood pump.
6. Screw on feeder of arterial line to plasma filter inlet.
7. Connect arterial line to prepared saline bag on IV-pole.

**Heparin Syringe**

1. Screw prepared heparin syringe onto heparin line. Vent line by hand up to T-piece and insert it into heparin syringe pump.



Safety brace of the heparin perfusor must latch in!  
Avoid tilted position of the syringe!

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**Dialysate Line**

1. Insert warming bag of dialysis fluid line with blue Hansen connector pointing upward into plate warmer and close cover.



The bag must be placed flat on the heating plate. The cover of the plate warmer must be completely closed with the safety lock!

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2. Connect blue Hansen connector to upper (blue) end of dialyzer (ultrafilter).
3. Connect connections of dialysate line with bicarbonate bags.
4. Follow the line and insert pump segment into dialysate pump (DP).



The pump segment of the dialysis fluid line is inserted correctly as soon as the blue marking of the line is on the left side of the pump (arrow on the pump to the top).

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5. Open seals of bicarbonate bags.
6. Screw pressure transducer (PDI) to connector.
7. Insert feed line to plate warmer into air detector (DAD).



## 2 Priming

### Priming

1. Check again that all connections are tight, seals of all bags are open and lines are not kinked.
2. Press *Enter* key to change to priming phase.
  - ↵ The message *W18: Break seals and open all clamps !* is displayed.
3. Press *OK* key to confirm message.
4. Select *Start Priming* menu item in menu bar and press *Enter* key to start priming.
  - ↵ The message *W01: Plasma pump starts after pressurization blood side* is displayed and the blood side is filled.

### Filling the Dialyzer

1. When message *W04: Turn dialyzer (blue side down) !* is displayed, turn dialyzer and press *OK* key.



Always ensure that hose lines are not kinked!

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### Further Preparations

While the machine rinses automatically and performs various tests, the following can be prepared:

1. If not yet done, mix acetate buffer with 40 ml H.E.L.P. heparin solution.
2. Complete treatment protocol.
3. Take blood samples (e.g. cholesterol and coagulation status before and after treatment).
4. Prepare puncture instruments and initial heparin.
5. If required, set therapy parameters.

### Rinsing

When the minimum rinsing volume of 2400 ml is reached, all pumps stop and the message *W14: Rinsing completed. For further rinsing set new value !* is displayed.

1. Press *OK* key to confirm message.
  - ↵ In the menu bar, the *Therapy* item becomes active.
2. Select *Therapy* item and press *Enter* key to enter therapy mode.
  - ↵ The message *W32: Activate therapy mode ?* is displayed.
3. Press *OK* key to confirm message.
  - ↵ The screen changes to the *Therapy* screen. In the menu bar, the *Start Therapy* item becomes active. The message *W15: Connect buffer, check if seal and clamp are open !* is displayed.

### Buffer Bag

1. Remove NaCl bag from load cell.
2. Hang acetate buffer bag onto load cell and connect buffer line.

**Venous Line**

1. Connect venous line to the 3 l NaCl bag on IV-pole.
2. Remove empty rinsing bag from IV-pole.



### 3 Therapy

#### Connecting the Patient

1. Take weight and blood pressure of the patient.
2. Puncture with arterial needle, check for correct seating, fix it in place, take blood samples, rinse.
3. Puncture with venous needle, check for correct seating, fix it in place, administer initial heparin, rinse.
4. Press *OK* key to confirm message *W15: Connect buffer, check if seal and clamp are open !.*
5. Connect arterial line to patient.
6. Start blood pump (preset value is 40 ml/min).



Monitor the arterial pressure (PA) as well as the inlet pressure of the blood into the plasma filter (PBE)!

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7. When blood circuit has been filled with blood, stop blood pump.
8. Connect venous line to patient and restart blood pump.



Monitor the venous pressure (PV)! The pressure should be within the range of 30 mmHg to 60 mmHg.

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9. Circulate blood for at least 2 minutes in plasma filter until a spontaneous yellow coloring occurs in proximal part of plasma filter. In doing so adjust blood flow step by step up to a value between 60 ml/min and 120 ml/min while monitoring PA, PBE and PV.

#### CAUTION!

Risk to the patient due to hemolysis because of a high shear stress!

- To avoid hemolysis and to receive ideal plasma separation only start therapy as soon as enough plasma has been separated in the plasma compartment of the plasma filter.
- 

10. Select *Start Therapy* item in menu bar and press *Enter* key to start therapy. Enter time.

### Running the Therapy

1. Adjust plasma flow step by step while monitoring PV and PPL.

Rules for therapy to ensure a spontaneous separation of plasma:

- Blood flow should be between 80 ml/min and 120 ml/min.
- Plasma flow should be approximately 30 % of blood flow but should not exceed 35 ml/min.
- Changes of PPL and TMP must be taken into account when adjusting plasma flow!

2. Record treatment parameters in the log. Repeat recording every 30 minutes during therapy.

### **NOTICE!**

To avoid filter clotting, the anticoagulation (heparinization) should be controlled every 30 minutes using coagulation checks (ACT or PTT). The samples can be taken from the port of the arterial line.

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At the end of therapy, the machine switches automatically to the bypass mode. The message *W06: Therapy completed* is displayed.

3. Record time, treated plasma amount and therapy time in the log.
4. Press *OK* key to confirm end of therapy.  
↳ The message *W35: Activate reinfusion ?* is displayed.
5. Press *OK* key to confirm changing to reinfusion phase.

## 4 Reinfusion and Termination

### Preparation

After changing to reinfusion phase, the message *W11: 1) Connect reinfusion and buffer lines to saline solution! 2) Clamp plasma line at outlet of plasma filter! 3) Turn plasma and precipitate filters! 4) Turn heparin adsorber!* is displayed.

1. Perform indicated activities and press *OK* key to confirm.
  - ☞ The blood pump continues running with 40 ml/min. All other pumps stop.

### Plasma Reinfusion

1. Select *Start Plasma* item in menu bar and press *Enter* key.
  - ☞ The plasma reinfusion is started. The default setting of the plasma/ buffer pump for reinfusion is 30 ml/min.

### CAUTION!

Risk to the patient due to an excessively fast plasma reinfusion!

- Blood flow should be at least 10 ml/min faster than reinfusion flow to ensure an imbalance between corpuscular parts and plasma parts during reinfusion.
- Otherwise: Reduce reinfusion flow to approx. 20 ml/min and increase blood flow as much as possible (approx. 80 ml/min), so that flow rates similar to those during therapy are achieved.



If PPF and/or PDF pressure rise occurs, the reinfusion flow has to be reduced.

The blood pump speed can be adjusted independent of the reinfusion flow.

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- ☞ When a reinfusion volume of 400 ml (default setting) has been reached the machine stops the plasma-side pumps. The message *W12: Plasma reinfusion completed. For blood reinfusion stop blood pump (do not press 'OK') or for further plasma reinfusion Press 'OK' to proceed!* is displayed.



The reinfusion volume can be manually increased up to 1000 ml, if necessary.

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**Blood Reinfusion – Part 1**

1. Stop blood pump.



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As long as the blood pump is running the blood reinfusion is not active.

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2. Select *Blood Reinfusion* item from *Reinfusion Type* submenu of the menu bar and press *OK* key to confirm.

↵ The message *W21: 1) Connect art. line to saline solution bag !  
2) Connect reinfusion line to venous chamber !* is displayed.

3. Perform indicated activities and press *OK* key to confirm.

4. Take blood samples.

5. Start blood pump.

↵ After a reinfusion volume of 150 ml, the message *W41: Open plasma clamp and close venous clamp !* is displayed.

**Blood Reinfusion – Part 2**

1. Open clamp of plasma line behind plasma filter and close clamp on venous line behind plasma filter.

2. Press *OK* key to confirm message.

↵ The saline is now pressed through the membrane in order to rinse the plasma-side of the plasma filter. When a blood reinfusion volume of 300 ml (default setting) has been reached, the blood pumps stop.

3. Remove venous line from patient.

4. Take weight and blood pressure of patient.

5. Select *New Therapy* item from *Additional Functions* submenu of menu bar and press *Enter* key to confirm.

↵ The start screen appears on the monitor.

The machine can now be used for next therapy or can be switched off.

## 5 Pressure Values

| Pressure   | Working Range <sup>a</sup><br>[mmHg] | Limits <sup>b</sup><br>[mmHg]       | Function  |
|--|--------------------------------------|-------------------------------------|---|
|  |                                      |                                     | Cause of Alarm <sup>c</sup>   |
| <b>Blood-Side Pressures</b>                          |                                      |                                     |   |
| PA<br>Arterial pressure                              | -60 – +10                            | -150 – +100<br>(m = -350/+200)      | Monitors the arterial needle<br>↓ : Hypotension? Needle? In v.v. treatment congestion, muscle pump, local warmth? If necessary, reduce blood flow   |
| PBE<br>Plasma filter pre-pressure                    | +90 – +140                           | PBEref-60 –<br>PBEref+80            | Monitors the plasma filter<br>↑ : VP? Coagulation? If necessary, reduce blood and/or plasma flow, rinse plasma filter, change plasma filter<br>↓ (rare): VP? Hypotension?                             |
| PV<br>Venous pressure                                | +20 – +50                            | PVref-20 – PVref+40<br>(m = window) | Monitors the venous needle<br>Should not exceed 60 mmHg<br>↑ : Needle? Coagulation? Level in venous chamber?<br>↓ : Hypotension? Disconnection?   |
| <b>Plasma-Side Pressures</b>                         |                                      |                                     |   |
| PPL<br>Plasma pressure                               | +20 – +50                            | -10 – +200<br>(m = -20)             | Regulates the plasma flow: if the pressure sinks below the set PPL threshold, the plasma flow will be reduced<br>↓ : Coagulation? Reduce plasma flow, rinse plasma filter, change plasma filter       |
| TMP<br>Transmembrane pressure                        | +10 – +50                            | -450 – +70<br>(m = +200)            | TMP = (PBE+PV)/2-PPL applies<br>Monitors the plasma filter<br>Should not exceed 100 mmHg<br>↑ : Coagulation? If necessary, reduce blood and/or plasma flow, rinse plasma filter, change plasma filter |
| PPF<br>Precipitate filter pressure                   | +150 – +300                          | -20 – +450<br>(m = -50)             | Monitors the precipitate filter<br>Monitors the buffer bag and line<br>↑ : Air filter of precipitate filter? Precipitate filter ? PDF high? dialyzer?<br>↓ : Buffer bag? Buffer line?                 |
| PDF<br>Dialyzer pressure                             | +120 – +270                          | -50 – +350<br>(m = +350)            | Monitors the dialyzer<br>↑ : Plasma flow? Dialyzer? If necessary, reduce plasma flow, change dialyzer<br>↓ (rare): Plasma flow? Dialyzer leak?  |
| PDPA<br>Pressure drop<br>precipitate filter/adsorber | 0 – +150                             | -450 – +350<br>(m = 200)            | PDPA = PPF-PDF applies<br>Monitors the precipitate filter and the heparin adsorber<br>↑ : Precipitate filter? Heparin adsorber?   |
| PDI<br>Dialysate pressure                            | +60 – +80                            | -50 – +450                          | Monitors the dialysis fluid flow<br>↑ : Warming bag? Dialysate line? Empty bag?<br>↓ (rare): Bicarbonate bag?   |

- a. Valid for normal hematocrit, blood flow 60 - 120 ml/min and plasma flow 20 - 35 ml/min  
b. Above the limits, the max. system pressure is still 450 mmHg  
m = these parameters can be set individually by the user  
c. ↑ : = when too high  
↓ : = when too low



## 6 Filter Change

### 6.1 Changing the Plasma Filter

#### **⚠ CAUTION!**

Risk to patient due to blood clotting!

- As the blood pump is stopped, the plasma filter must be exchanged quickly to avoid blood clotting.

Materials: See key to Fig. 6-1, 1.5 ml heparin solution (5000 IU/ml)

- 1 3 l H.E.L.P. 0.9 % NaCl solution
- 2 Haemoselect L 0.5
- 3 3 x connection line
- 4 2 x collection bag

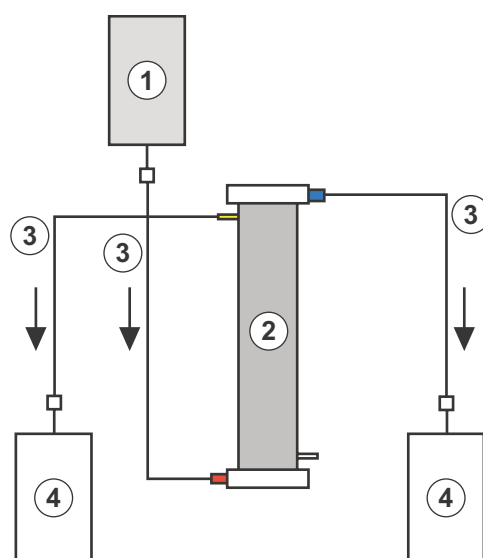


Fig. 6-1 Set-up for plasma filter rinsing

1. Mix 7500 IU heparin into the H.E.L.P. 0.9 % NaCl solution.
2. Attach a connection line to the NaCl solution, fill the line and connect it with the blood-side inlet of the filter.
3. Attach the remaining connection lines and the collection bags as shown in Fig. 6-1 with the plasma and blood side of the filter and clamp the line on the plasma side.
4. Allow the rinse solution to flow by means of gravity into the blood-side collection bag. Hold the filter so that it is filled from the bottom to the top and thoroughly vented in the process.
5. Open the plasma-side line when approx. half of the rinse solution has flown into the blood-side collection bag and clamp the blood-side line. Continue to rinse.
6. Clamp all connection lines when the remaining rinse solution has flown through (be careful that no air enters the filter!) and remove the bags.
7. Stop the blood pump, clamp the arterial and the venous plasma line, remove the old filter and then connect the new filter in the correct orientation with the lines. Close the old filter with the remaining connection lines.
8. Open blood and plasma lines and start the blood pump.



## 6.2 Changing the H.E.L.P. Precipitate Filter

Materials: See key to Fig. 6-2

- 1 3 l H.E.L.P. 0.9 % NaCl solution
- 2 H.E.L.P. precipitate filter
- 3 3 x connection line
- 4 2 x collection bag

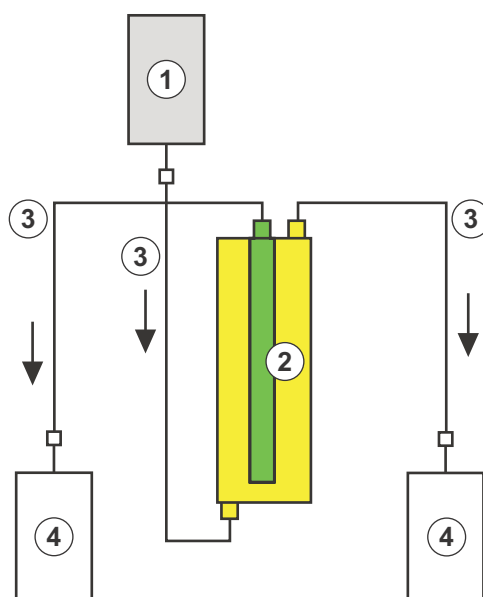


Fig. 6-2 Set-up for precipitate filter rinsing

1. Attach a connection line with the NaCl solution, fill the line and connect it with the bottom, precipitate-side filter opening.
2. Attach the remaining connection lines and the collection bags as shown in Fig. 6-2 with the upper precipitate and filtrate-side opening of the filter and clamp the line on the filtrate side.
3. Allow the rinse solution to flow by means of gravity into the precipitate-side collection bag. Hold the filter so that it is filled from the bottom to the top and thoroughly vented in the process.
4. Open the filtrate-side line when approximately half of the rinse solution has flown into the precipitate-side collection bag and clamp the precipitate-side line. Continue to rinse.
5. Clamp all connection lines when the remaining rinse solution has flown through (be careful that no air enters the filter!) and remove the bags.
6. Switch the machine to bypass mode by selecting *Stop Priming* or *Stop Therapy* in the menu bar and pressing the *Enter* key.
7. Clamp the filtrate line and the circulation line on both sides of the old precipitate filter, remove the old filter and connect the new filter in correct orientation with the lines. Close the old filter with the remaining connection lines.
8. Open circulation and filtrate lines and continue the interrupted phase by selecting *Start Priming* or *Start Therapy* in the menu bar and pressing the *Enter* key.
9. Retain the exchanged filter until the end of therapy, providing it has no leak. Connect it again in the reinfusion phase and then return the plasma. Increase the reinfusion volume accordingly.



### 6.3 Changing the H.E.L.P. Heparin Adsorber

Materials: See key to Fig. 6-3

- 1 3 l H.E.L.P. 0.9 % NaCl solution
- 2 H.E.L.P. heparin adsorber 400
- 3 2 x connection line
- 4 1 x collection bag

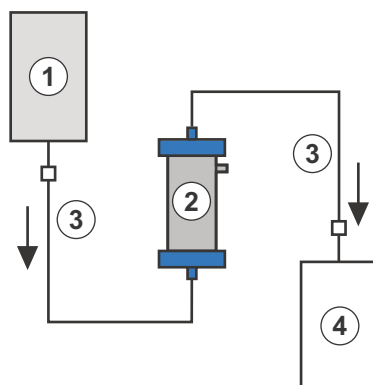


Fig. 6-3 Set-up for heparin adsorber rinsing

1. Attach a connection line with the NaCl solution, fill the line and connect it with the inlet side of the heparin adsorber.
2. Attach the second connection line and the collection bag as shown in Fig. 6-3 with outlet side of the heparin adsorber.

#### **⚠ WARNING!**

Risk to patient due to loss of heparin binding capacity!

A false flow direction and an upside-down positioning of the heparin adsorber during rinsing and treatment will cause a loss of heparin binding capacity.

- Fill and rinse the heparin adsorber according to the flow direction indicated by the red arrow at the adsorber's label.

#### **⚠ CAUTION!**

Risk to patient due to reduced heparin binding capacity!

Air residues within the capillaries of the adsorber will reduce the active surface and therefore decrease the heparin binding capacity.

- Don't rinse the saline solution too fast into the heparin adsorber to completely deaerate the capillaries and to avoid remaining air.

3. Allow the rinse solution to flow by means of gravity into the collection bag. Hold the adsorber so that it is filled from the bottom to the top and thoroughly vented in the process.

4. Clamp all connection lines when the rinse solution has flown through (be careful that no air enters the filter!) and remove the bags.

5. Switch the machine to bypass mode by selecting *Stop Priming* or *Stop Therapy* in the menu bar and pressing the *Enter* key.

6. Clamp the filtrate and the connection line on the adsorber, remove the old adsorber and connect the new adsorber in the correct orientation with the filtrate and the connection line (observe flow direction!). Connect the old adsorber with the connection lines on rinse solution and collection bag.

7. Open filtrate and connection lines and continue the interrupted phase by selecting *Start Priming* or *Start Therapy* in the menu bar and pressing the *Enter* key.

## 6.4 Changing the H.E.L.P. Ultrafilter

Materials: See key to Fig. 6-4

- 1 3 l H.E.L.P. 0.9 % NaCl solution
- 2 H.E.L.P. Ultrafilter HIPS 20
- 3 2 x connection line
- 4 1 x collection bag

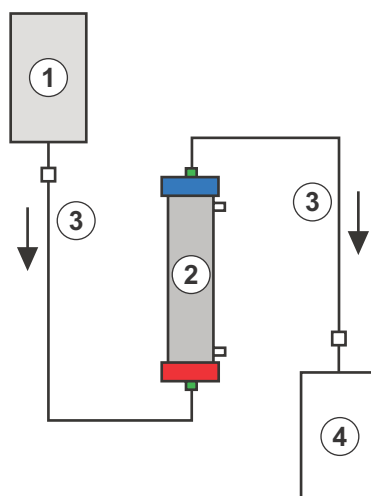


Fig. 6-4 Set-up for ultrafilter rinsing

1. Attach a connection line with the NaCl solution, fill the line and connect it with the red, plasma-side filter opening.
2. Attach the second connection line and the collection bag as shown in Fig. 6-4 with the blue, plasma-side filter opening.
3. Allow the rinse solution to flow by means of gravity into the collection bag. Hold the filter so that it is filled from the bottom to the top and thoroughly vented in the process.
4. Clamp all connection lines when approximately 1 liter rinse solution has flown through (be careful that no air enters the filter!) and remove the bags.
5. Switch the machine to bypass mode by selecting *Stop Priming* or *Stop Therapy* in the menu bar and pressing the *Enter* key.
6. Clamp the connection line and reinfusion line leading to the dialyzer, remove the old filter and connect the new filter in correct orientation to the connection and reinfusion line. Connect the old filter with the connection lines to rinse solution and collection bag.
7. Plug the Hansen connectors from the old to the new filter (hold old filter horizontally!). Observe the color marking. Insert the new filter with the blue end down into the holder.
8. Fill the dialysate side of the filter by manually turning the dialysate pump.
9. Open connection and reinfusion lines and continue the interrupted phase by selecting *Start Priming* or *Start Therapy* in the menu bar and pressing the *Enter* key.

## 7 Materials and Solutions

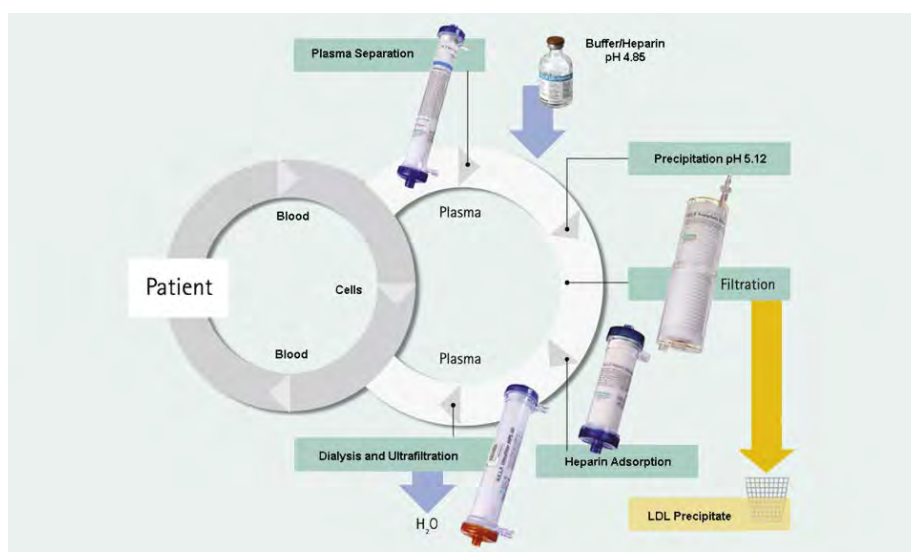


Fig. 7-1 Heparin induced Extracorporeal LDL Precipitation

### Filters and Lines

1 H.E.L.P. Futura set consisting of:

- 1 x H.E.L.P. Futura kit (base plate with attached venous line, plasma-buffer line, filtrate line, connection line, ultrafiltration line, filter venting line and reinfusion line as well as Hemoselect plasma filter, H.E.L.P. precipitate filter, H.E.L.P. heparin adsorber and H.E.L.P. ultrafilter)
- 1 x arterial line
- 1 x dialysis fluid line
- 1 x 5 l empty bag for rinse solution
- 3 x 7 l empty bags for dialysate

### Solutions

- 1 x 4 l H.E.L.P. acetate buffer (pH 4.85)
- 1 x 40 ml H.E.L.P. heparin sodium (400,000 IU)
- 2 x 3 l H.E.L.P. 0.9 % NaCl saline solution
- 2 x 5 l H.E.L.P. BicEl bicarbonate solution for plasma dialysis
- 1 x 500 ml and 1 x 1500 ml H.E.L.P. 0.9 % NaCl bag

### Miscellaneous

- Perfusor syringe 30 ml (Omnifix®) for heparin solution
- Heparin 5000 IU/ml
- Puncture needles, cannulas, swabs
- Syringes for blood samples
- Laboratory test tubings, possibly adapters
- Tourniquets, clamps
- Skin disinfectant, gloves



8 Example for a H.E.L.P. Treatment Form

|                             |                         |
|-----------------------------|-------------------------|
| <b>Patient:</b>             | <b>Treated since:</b>   |
| <b>Date:</b>                | <b>Treatment No.:</b>   |
| <b>Physician in charge:</b> | <b>Nurse in charge:</b> |

Set (batch no.) ..... BicEL (batch no.) .....  
 Acetate buffer (batch no.) ..... H.E.L.P. heparin sodium 40 ml (batch no.) .....  
 Access ..... Initial heparin ..... IU Heparin rate ..... IU/h

| Parameter Overview      |  |  |  |  |  |  |
|-------------------------|--|--|--|--|--|--|
| Therapy time [h:min]    |  |  |  |  |  |  |
| Plasma volume [ml]      |  |  |  |  |  |  |
| Patient Balance [g]     |  |  |  |  |  |  |
| Blood flow [ml/min]     |  |  |  |  |  |  |
| Plasma flow [ml/min]    |  |  |  |  |  |  |
| Dialysate flow [ml/min] |  |  |  |  |  |  |
| Heparin flow [ml/h]     |  |  |  |  |  |  |
| Heparin bolus [ml]      |  |  |  |  |  |  |
| Heparin quantity [ml]   |  |  |  |  |  |  |
| Temperature [°C]        |  |  |  |  |  |  |
| PA [mmHg]               |  |  |  |  |  |  |
| PBE [mmHg]              |  |  |  |  |  |  |
| PV [mmHg]               |  |  |  |  |  |  |
| PPL [mmHg]              |  |  |  |  |  |  |
| TMP [mmHg]              |  |  |  |  |  |  |
| PPF [mmHg]              |  |  |  |  |  |  |
| PDF [mmHg]              |  |  |  |  |  |  |
| PDPA [mmHg]             |  |  |  |  |  |  |
| PDI [mmHg]              |  |  |  |  |  |  |
| PPL Threshold [mmHg]    |  |  |  |  |  |  |
| Ratio Dial./Plasma      |  |  |  |  |  |  |

RR/Pulse before .....  
 RR/Pulse after .....  
 Weight before ..... kg  
 Weight after ..... kg  
 Weight difference ..... kg  
 Beginning ..... h:min  
 End ..... h:min  
 Therapy time..... h:min  
 Target plasma quantity ..... ml  
 Actual plasma quantity ..... ml  
 Balance reset ..... g  
 Autostop heparin ..... min  
 Heparin solution ..... IU/ml NaCl  
 Fibrinogen before ..... mg/dl  
 Fibrinogen after ..... mg/dl  
 1. ACT/aPTT ..... sec./time  
 2. ACT/aPTT ..... sec./time  
 3. ACT/aPTT ..... sec./time  
 Quick before ..... %  
 Quick after ..... %  
 INR before .....  
 INR after .....

Complaints after last therapy \_\_\_\_\_

Remarks \_\_\_\_\_

|                             |                         |
|-----------------------------|-------------------------|
| <b>Patient:</b>             | <b>Treated since:</b>   |
| <b>Date:</b>                | <b>Treatment No.:</b>   |
| <b>Physician in charge:</b> | <b>Nurse in charge:</b> |

Set (batch no.) ..... BicEL (batch no.) .....  
 Acetate buffer (batch no.) ..... H.E.L.P. heparin sodium 40 ml (batch no.) .....  
 Access ..... Initial heparin ..... IU Heparin rate ..... IU/h

RR before ..... mmHg Pulses before ..... Weight before ..... kg  
 Beginning ..... h:min Heparin solution ..... IU/ml NaCl

| Main Parameter       |  |  |  |  |  |  |  |  |  |
|----------------------|--|--|--|--|--|--|--|--|--|
| Blood flow [ml/min]  |  |  |  |  |  |  |  |  |  |
| Heparin flow [ml/h]  |  |  |  |  |  |  |  |  |  |
| PA [mmHg]            |  |  |  |  |  |  |  |  |  |
| PBE [mmHg]           |  |  |  |  |  |  |  |  |  |
| PV [mmHg]            |  |  |  |  |  |  |  |  |  |
| Plasma flow [ml/min] |  |  |  |  |  |  |  |  |  |
| Therapy time [h:min] |  |  |  |  |  |  |  |  |  |
| Plasma quantity [ml] |  |  |  |  |  |  |  |  |  |
| Patient Balance [g]  |  |  |  |  |  |  |  |  |  |
| PPL [mmHg]           |  |  |  |  |  |  |  |  |  |

End ..... h:min Plasma quantity ..... ml Therapy time ..... h:min  
 RR after ..... mmHg Pulses after ..... Weight after ..... kg

Complaints after last therapy \_\_\_\_\_

Remarks \_\_\_\_\_  
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 \_\_\_\_\_  
 \_\_\_\_\_