multiFiltratePRO

HEALTHCARE PROFESSIONALS

Convenient handling, easing daily routines

A perfect fit for every team

• CRRT with integrated Ci-Ca® anticoagulation – safe and efficient

Allows therapy diversity with Therapeutic Plasma Exchange and sepsis therapy

multi**Filtrate**PRO

ABOUT US

Key features | Ci-Ca | Therapeutic plasma exchange | Convenient handling

• Ci-Ca® CVVHD EMiC®2 • Ci-Ca® CVVHD AV1000S • Ci-Ca® postCVVHDF multiFiltratePRO

acute therapy options

Ergonomic design

application

integrated Ci-Ca®

anticoagulation

66

Key features

Sepsis therapy

Conventional heparin CRRT

Therapeutic Plasma Exchange (TPE)

- Large screen enables display of comprehensive information, e.g. therapy information or potential reasons in case of alarms • The touch screen monitor has enhanced readability from various angles 4-wheel chassis with 2-stage locking system allows turning on the spot
- Intuitive step-by-step instructions for relevant handling situations

fluid removal rates; this supports hemodynamic stability ⁴

[It] enabled an effective treatment of acute renal failure and

excellent control on the acid-base status as well on the

systemic ionised calcium in combination with negligible

Infused volumes of citrate and calcium solutions are automatically balanced with the filtrate pump

The citrate infusion continues for a reliable, limited period of time throughout bag changes (dialysate, substituate,

Dedicated hardware components for citrate anticoagulation

If the blood flow is changed, the device automatically adjusts the citrate pump

If the filtrate flow is changed, the calcium pump is adjusted accordingly

filtrate). This helps to avoid an early coagulation of the system.

• Ci-Ca® avoids downtime, thus the delivered CRRT-dose is in accordance with

To ease handling in the ICU, fluid heaters are fully integrated into the device "Care-Mode" to prevent unnecessary alarms and to save time: temporarily **Easy treatment** decreased blood flow, stopped balancing system and extended pressure limits during patient care

the prescription ⁴

- High capacity scales reduce the number of bag changes and thus user interactions
- Regional Ci-Ca® citrate anticoagulation to minimize the risk of bleeding complications 1,2,3 • Long effective treatment times allow for efficient fluid removal via low hourly Comprehensive
- Integrated Ci-Ca® citrate anticoagulation Statement on the Ci-Ca® protocol:
- Intelligent software support

Coupling of all active pumps through a single user interface:

clotting issues.²

- Ci-Ca® protocol included in the software
- Supports the user with expert information and features For routine adjustments of the Ci-Ca® therapy, information from the protocol can easily be retrieved on the screen

In case of certain values set outside the standard range, the multiFiltratePRO

makes the user aware of potentially risky clinical situations

Clear allocation of functionality

Dedicated pumps for citrate and calcium keep the syringe pump available for heparin application if needed during Ci-Ca® therapy. Separate level detectors and drip counters enable timely detection of empty bags, preventing air being transported

period of time. This helps to avoid early coagulation of the system

downstream and enabling a smooth continuation of the treatment. During bag

changes (dialysate, substituate, filtrate) the citrate infusion continues for a reliable

Therapeutic plasma exchange

TPE supported by multiFiltratePRO

Therapeutic plasma exchange is a well-established extracorporeal blood purification

As described by Reeves et al., "the therapeutic effects of TPE could include the

Indications for TPE cover selected diagnoses from different specialities:⁵

removal of pathological substances from the blood, such as monoclonal paraproteins

and autoantibodies, as well as the replacement of deficient plasma components when

In contrast to separation via centrifugation, multiFiltratePRO separates the plasma

multi**Filtrate**PRO TPE - Benefits at a glance

Pressure display, exchanged volume and target plasma volume, treatment time, flow

Placed on the upper scale tray, the substitution fluid holder allows for easy bottle and

The multiFiltratePRO features a plasma to blood ratio ramp-up procedure to provide

adjustment of the desired plasma to blood

The easy-to-read touch screen monitor allows recognition of key information even from a distance. Rotation around

the horizontal and vertical axes enables adjustment for different-sized users and to different relative positions of the

ratio follows a ramp-up procedure.

for a smooth start of the plasma separation and stable filtration conditions 7 while

saving the user time, see figure 1: Plasma to blood ratio ramp-up.

from the blood cells via membrane plasma separation (MPS).

 Neurology Hematology Rheumatology Nephrology

plasma is used as a replacement fluid." 5

technique.

- Easy set-up Touchscreen-based interface guides the nurse through the entire setup, rinsing and priming.
- Integrated automated plasma volume calculation The patient's plasma volume and the respective plasma exchange volume can be calculated by the plasma calculator of the multiFiltratePRO according to Sprenger et al. ⁶

Key information on the screen

rates and pressure history.

Substitution fluid holder

bag handling at eye-level.

Two integrated substitution fluid heater bags Two integrated substitution fluid heater bags gently warm the substitution solution to curtail the cooling of the patient. Automated ramp-up of plasma separation

Plasma to blood ratio

Time

Phase 1 Phase 2 **Blood circulation** Plasma to blood ratio ramp-up The patient's blood circulates When starting the plasma separation, the

automatically to allow the

on the membrane of the

plasma filter.

formation of a thin protein layer

Figure 1: Plasma to blood ratio ramp-up

Convenient handling

Large and adjustable monitor

multiFiltratePRO monitor

Advanced graphic user interface

Treatment

Dialysate

2000

Citrate dose

Heparin

Cica

Substituate

1000

Ca dose

Net UF rate

10

Heparin

device and user.

CVVHDF

Post

· ()

-25 300

OFF 1.7 Treatment Balancing 0.30 02:09 ressure / alarm history Next operator action Dialysate bag change Ca bag change Citrate bag change Pre-F Ca bag change Substituate bag change 45 750 TREATMENT PARAMETERS TREATMENT PREPARATION multiFiltratePRO interface Easy application of CRRT Device-supported set-up process

multiFiltratePRO blood pump: Fitting the pump positioners automatically triggers the insertion of

the pump segment. The corresponding pressure domes open and guide the correct installation of the tubing. Multiple automated tests accompany the set-up process, keeping the user on the right

therapy setups

injury.

¹ KDIGO Clinical Practice Guideline for Acute Kidney Injury. Kidney International Supplements 2012. 2:1-138

⁵ Reeves HM et al. The mechanisms of action of plasma exchange. Br J Haematol 2014;164(3):342-51.

² Morgera S et al., A safe citrate anticoagulation protocol with variable treatment efficacy and excellent control of the acid-base status. Critical Care Medicine 2009.

³ Morgera S et al., Metabolic complications during regional citrate anticoagulation in continuous venovenous hemodialysis: single-center experience. Nephron Clinical

⁴ Kalb R et al., Regional citrate anticoagulation for high volume continuous venovenous hemodialysis in surgical patients with high bleeding risk. Therapeutic Apheresis

Healthcare Professionals

⁶ Sprenger KB et al. Nomograms for the prediction of patient's plasma volume in plasma exchange therapy from height, weight, and hematocrit. J Clin Apher

⁷ Malchesky PS. Membrane processes for plasma separation and plasma fractionation: guiding principles for clinical use. Therap Apher 2001;5(4):270–282.

track. As a result, the number of handling steps is reduced.

Related content

37:2018-24

Practice 2004. 97:c131-6

1987;3(3):185-90.

and Dialysis 2013. 17:202-12

Patients & Families

© Fresenius Medical Care Limited

- The time until the next expected user action is displayed in the status bar at the top right of the screen. In addition, a list of further upcoming user interactions can be retrieved on the screen. Both help to optimize work processes in the ICU. The "Care Button" switches the multiFiltratePRO into care-mode, by decreasing the

€

- Continuous renal replacement > Different options as standard therapies for acute kidney

Filtrate bag change

Blood flow

Long intervals between bag changes 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 Change of filtrate bags Change of dialysate bags Change of citrate bag Change of calcium bag Timetable of bag changes for Ci-Ca® CVVHD therapy (standard settings, dialysate flow 2 L/h)

multiFiltratePRO with large-scale capacity: The scales for fresh CRRT fluid and for filtrate can

one bag change is typically sufficient per 8h nursing shift.

hold up to 20 L fluid each, resulting in long time intervals between bag changes. For these scales,

The multiFiltratePRO includes a graphic user interface that monitors and displays all

blood flow, stopping the balancing system and extending the pressure limits. This will

prevent unnecessary alarms when moving the patient or manipulating the catheter.

relevant set-up and treatment data. The integrated alarm system helps to quickly

determine the urgency as well as the root cause of alarms.

Ð

- Contact



- Patients & Families overview Dialysis center finder Kidney disease Treatment options for kidney disease (CKD) Services from Fresenius Medical Care
 - Healthcare Professionals overview HighVolumeHDF Hemodialysis overview Pediatric dialysis overview
- A successful series-produced model Go to our media center >

Media Center

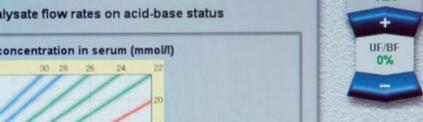
HighVolume HDF video

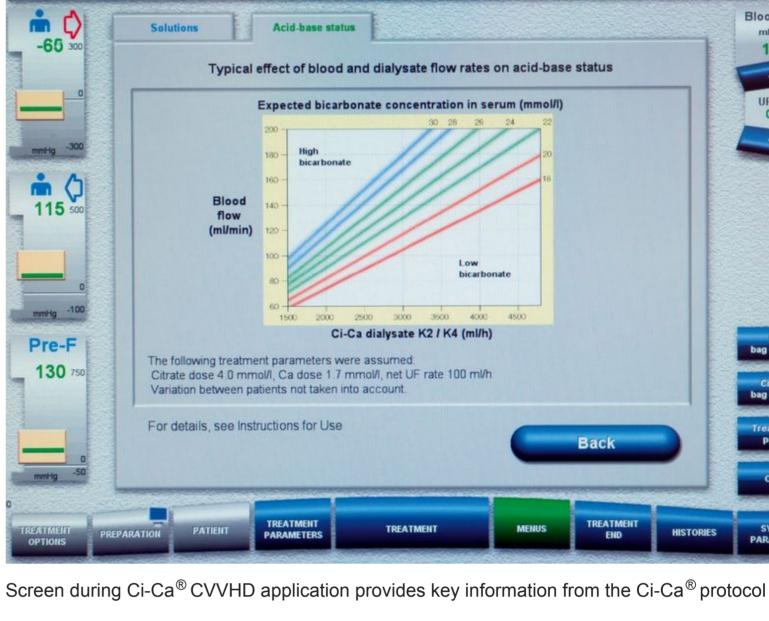
St. Wendel Plant video

Imprint Sitemap









Menus

CVVHD

ale



4. Two serial heater bags

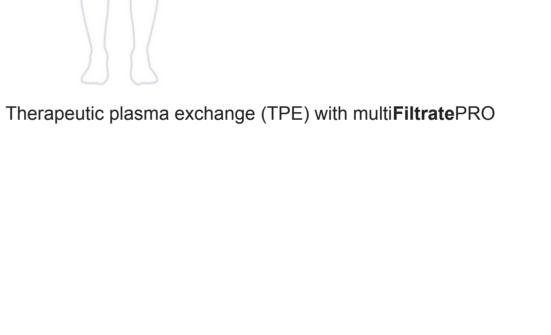
allow the warming of the substitution fluid

through the plasma

is separated into the

3. Substitution fluid adjusted to the patient's

needs (e.g. albumin,



5. Blood is returned

to the patient

Phase 3

ratio is reached

Desired plasma to blood