

The background of the slide is a photograph of a hospital room, overlaid with a semi-transparent green filter. In the foreground, a metal gurney with a white mattress is visible. In the background, there is a hospital bed with white linens, a bedside table, and a window with patterned curtains. A large, semi-transparent sign with the word 'HOSPITAL' and a white cross symbol is positioned in the upper right area of the image.

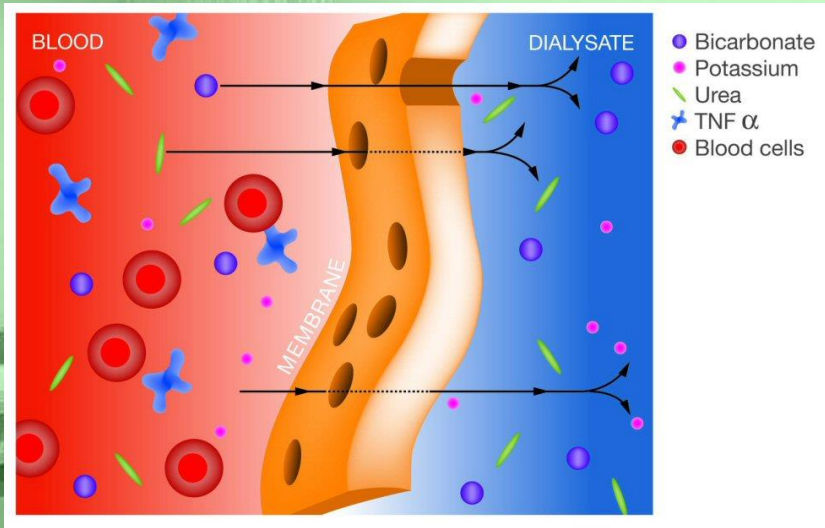
# Continuous renal replacement therapy (CRRT)

Olga Suková

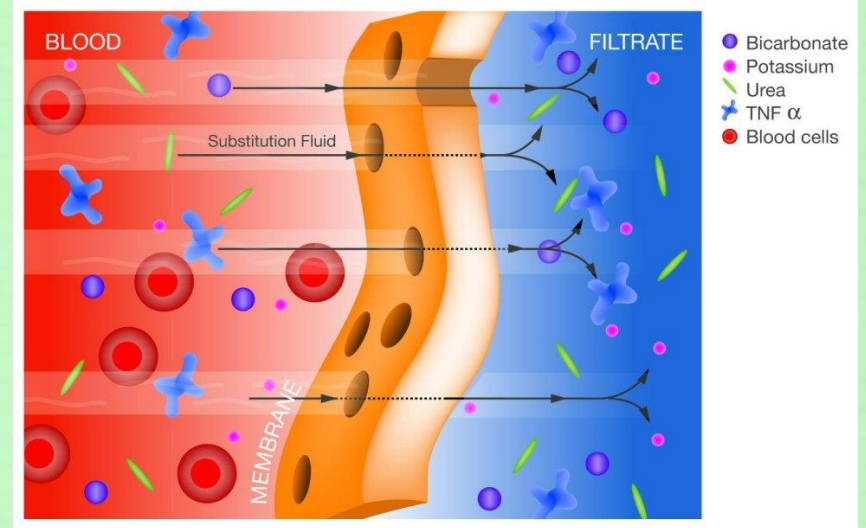
**MultifiltratePRO Ci-Ca (Fresenius)**  
**Aquarius (Baxter)**  
**OMNI (BBraun)**

18. 11. 2020

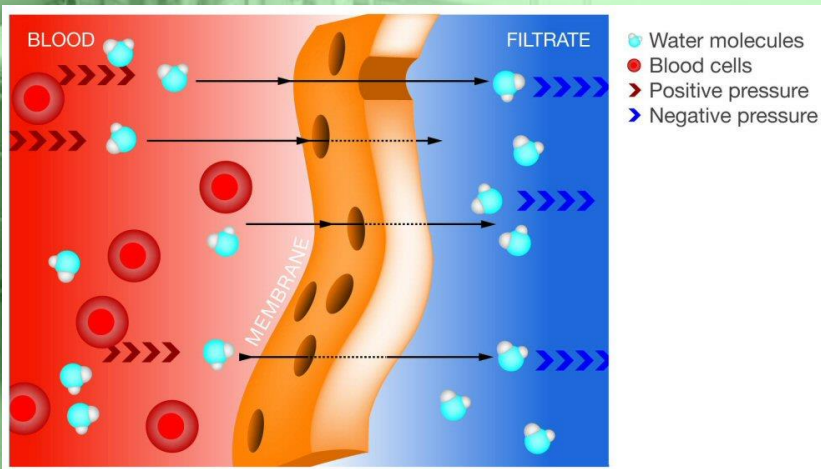
## Difúze → dialýza



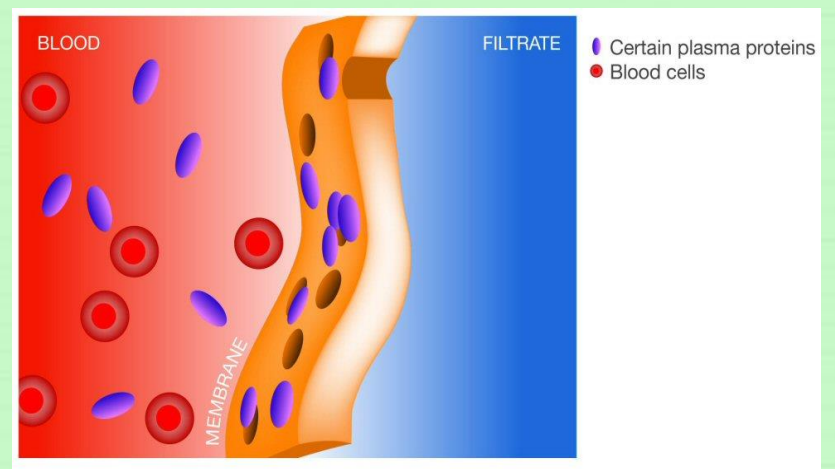
## Konvekce → filtrace



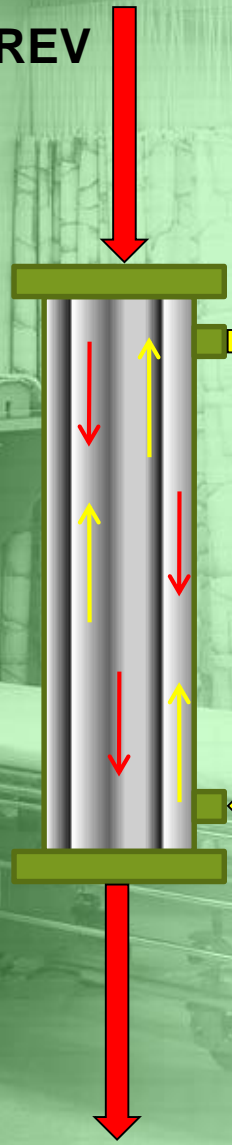
## Ultrafiltrace



## Adsorbce



KREV



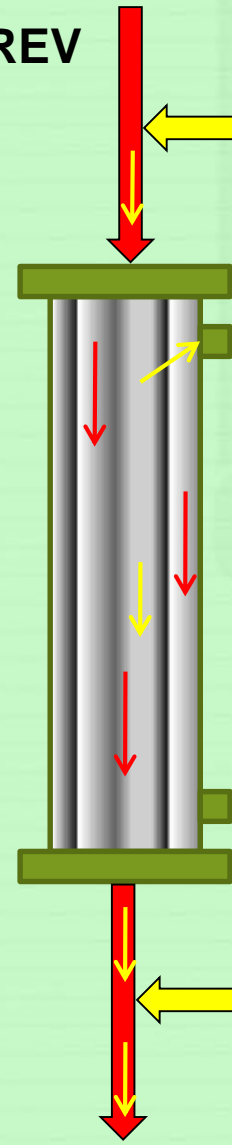
POUŽITÝ

DIALYZAČNÍ  
ROZTOK

ČERSTVÝ

(HEMO) DIALÝZA

KREV



PREDILUCE

FILTRÁT

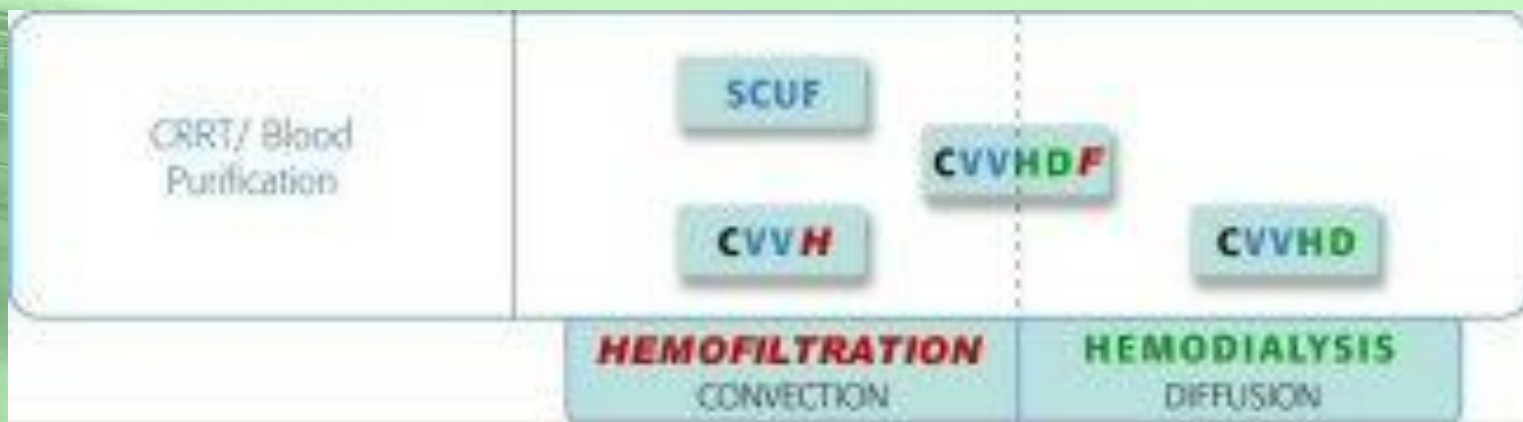
SUBSTITUČNÍ  
ROZTOK

POSTDILUCE

(HEMO) FILTRACE

# Princip metod

- dialýza
- filtrace (prediluce, postdiluce)
- hemodiafiltrace
- SCUF
- SLED

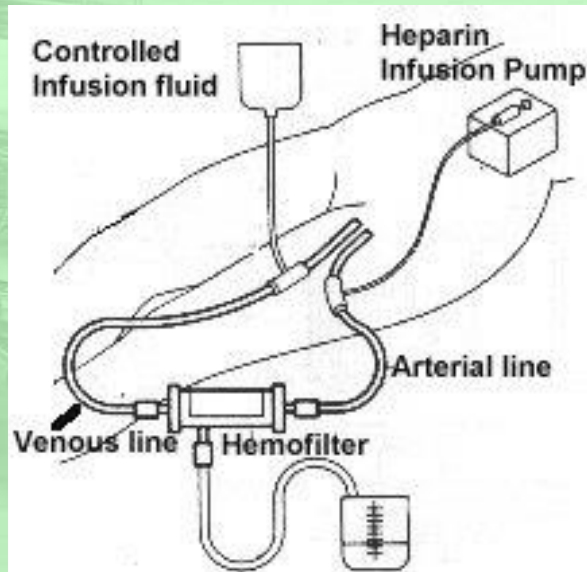




# Kontinuální metody

dříve

- CAVHD
- CAVH
- CAVHDF
- CVVHD
- CVVH
- CVVHDF



# Indikace eliminačních metod

- urea nad 30 mmol/l
- kreat nad 400 – 700 mmol/l (?)
- K nad 6,5 mmol/l
- Na nad 140 mmol/l
- Ca nad 4 mmol/l
- stav ABR
- hypervolémie
- klinické projevy urémie
- intoxikace (?!)
- měst. srdeční selhání
- plicní edém
- sepse a MODS
- intoxikace
- hepatorenální sy
- rhabdomyolýza
- hypo -, hypertermie



## Indications for specific renal replacement therapies

Therapeutical goal	Hemodynamics*	Preferred therapy
Fluid removal	Stable Unstable	Intermittent isolated UF Slow continuous UF
Urea clearance	Stable Unstable	Intermittent hemodialysis CRRT: CVVH, CVVHD, CVVHDF
Severe hyperkalemia	Stable/Unstable	Intermittent hemodialysis
Severe metabolic acidosis	Stable Unstable	Intermittent hemodialysis CRRT
Severe hyperphosphatemia	Stable/Unstable	CRRT
Brain edema	Unstable	CRRT

\* In general, stable pts are those not requiring vasopressors

## Advantages

## Disadvantages

IHD

- short duration
- less anticoagulation -> less bleeding
- better in high K+
- optional bicarbonate dialysate production
- less labour intensive

- technically difficult
- requires trained personnel
- requires a fresh water supply
- requires hygienic removal of effluent
- cardiovascular instability
- more electrolyte disequilibrium

CRRT

- haemodynamic stability compared to IHD (however not translated into reduced mortality)
- easy to operate
- familiarity
- superior solute and volume control
- adequate nutritional support possible

- urea clearance limited by exchange volume and interruptions
- requires anticoagulation
- mobilization of patients difficult
- sterile haemofiltration fluid -> cost ++
- requires anticoagulation
- no as good in hyperK+ as IHD
- hypothermia
- manipulation of dialysate and replacement bags -> infection

SLED

- easy to perform
- flexible timing for treatments
- 12 hour or overnight treatments
- increased patient mobility and access
- procedural simplicity
- small molecule clearance comparable to IHD and CRRT
- cardiovascular stability comparable to CRRT
- ICU very accepting of SLED (in studies)
- no anticoagulation required (air free tubing)
- composition of dialysate easily modified
- effective in hyperkalaemia
- no mortality difference when compared to CRRT
- able to use SLEDD-F = sustained low efficiency daily diafiltration -> removal of middle sized molecules in SIRS
- in RRT for toxins it reduces rebound intoxication after ceasing of RRT
- no bag handling -> decreased infection risk
- cheaper than CRRT

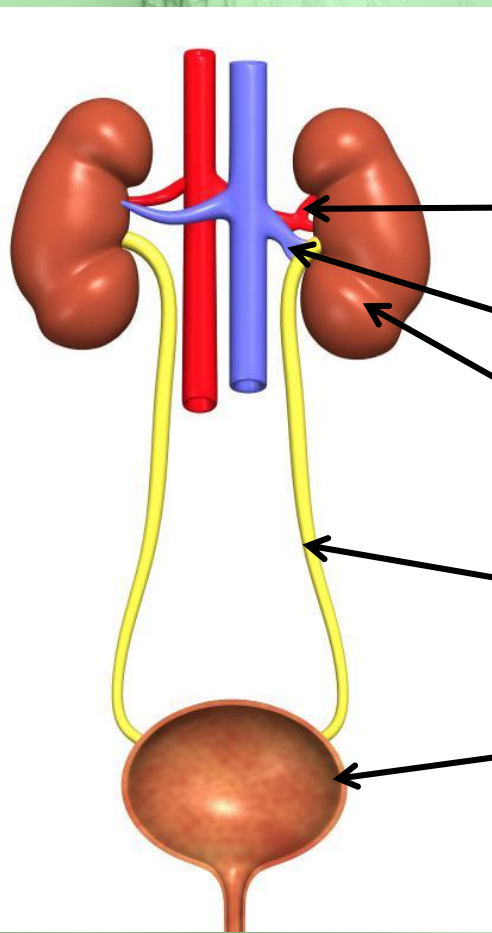
- clinical unfamiliarity
- hypophosphataemia
- unknown effects on PK of drugs
- hypothermia



# Příprava k eliminaci

- pacient
- cévní přístup
- přístroj (protokol)





Renální tepna = Přívodná linka

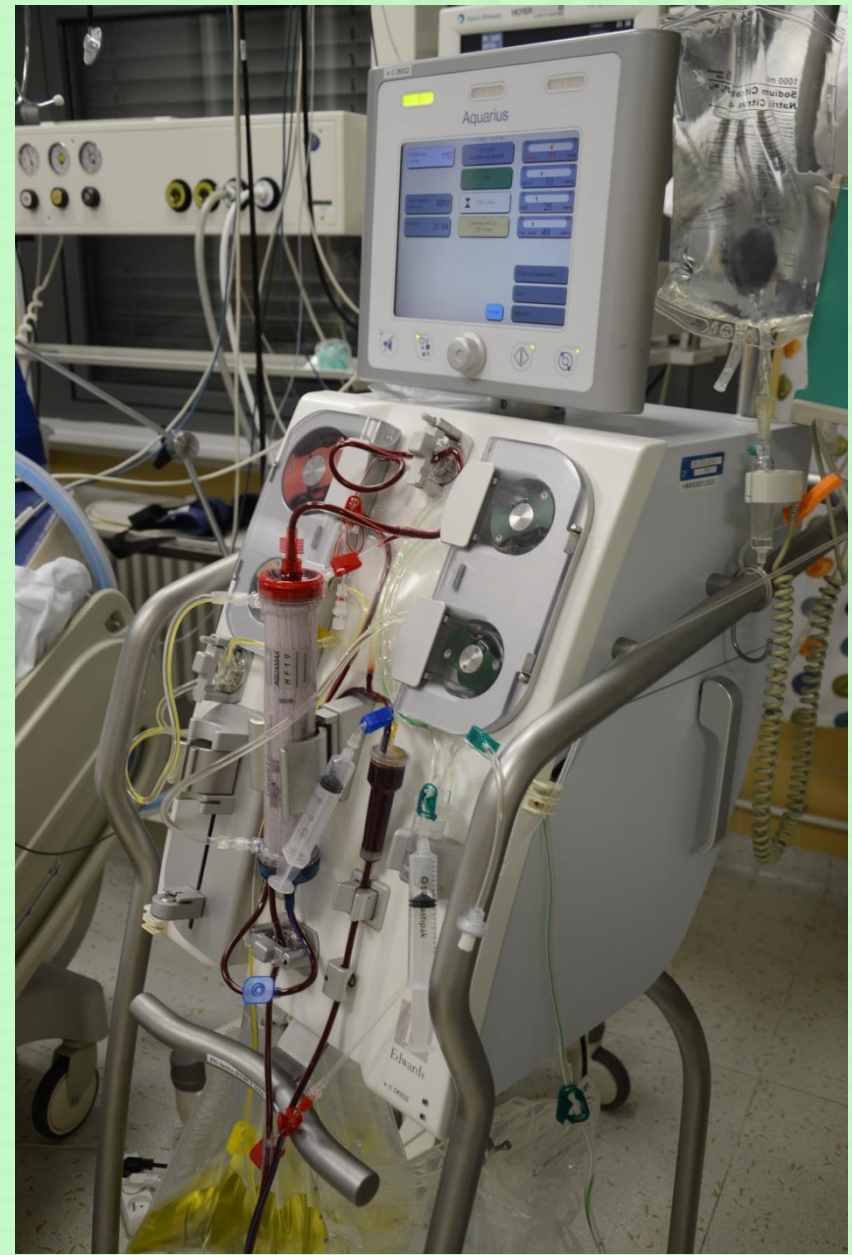
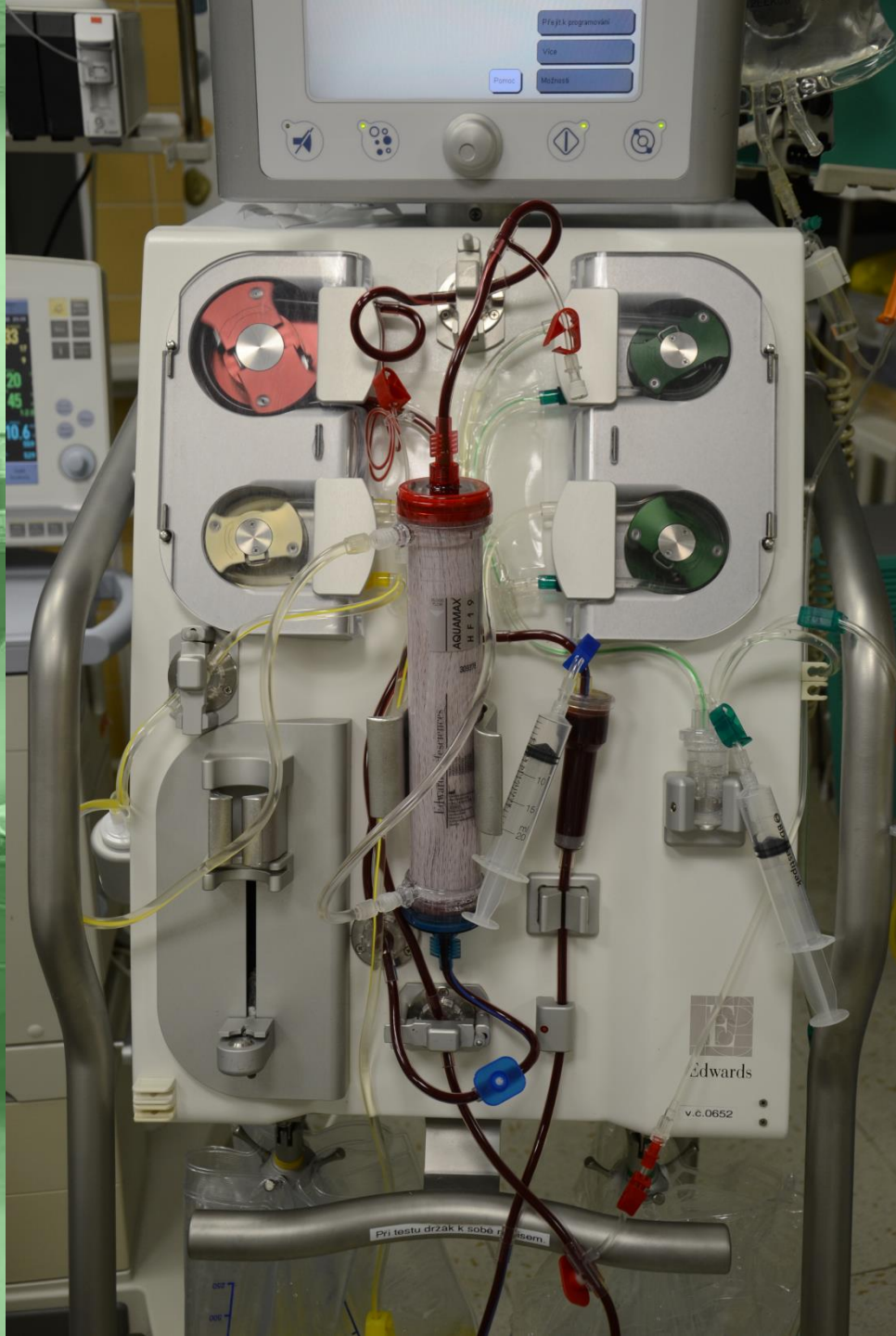
Renální žíla = Odvodná linka

Ledvina = Dialyzátor

Ureter = Odpadní linka

M. měchýř = Sběrný vak







# Péče o pacienta

- subjektivní obtíže
- vitální funkce + stav vědomí
- stav přístupu (končetiny)
- laboratorní vyšetření
- oddialyzované léky...
- účinnost antikoagulace
- dokumentace



# Péče o přístroj

- kontrola nastavení (s ordinací)
- kontrola setu
- monitorace tlaků
- výměna vaků
- dokumentace
- recirkulace, životnost filtru

v.č.0652

# Aquarius

3. 1. 2012 21:26:05

Průtok krve  
ml/min **150**

CVVHD  
Aqualine pro dospělé

-110 90  
Přístup **-12** mmHg

Léčba

10 110  
Návrat **51** mmHg

Ztráta kapaliny  
celkem ml **3910**

⌘ 2:13 h.min

-30 185  
TMP **12** mmHg

Dialyzát  
l **31.56**

Výměna vaků za:  
3:25 h.min

-50 450  
Tlak. spád **34** mmHg

Přejít k programování

Více

Pomoc

Možnosti





v.č.0652

# Aquarius

3. 1. 2012 21:27:43

Průtok krve  
ml/min

150

CVVHD  
Aqualine pro dospělé

Léčba

Ztráta kapaliny  
celkem ml

3900

2:11 h.min

Dialyzát  
I

31.66

Výměna vaků za:  
3:26 h.min

Přístup -300 mmHg

Návrat 25 mmHg

TMP 9 mmHg

Tlak. spád 26 mmHg

Nizký tlak přístupu

Pomoc

Přejít k programování

Více

Možnosti



# Péče po eliminaci

- pacient
- cévní přístup
- přístroj
- dokumentace





# MultiFiltrate (PRO)





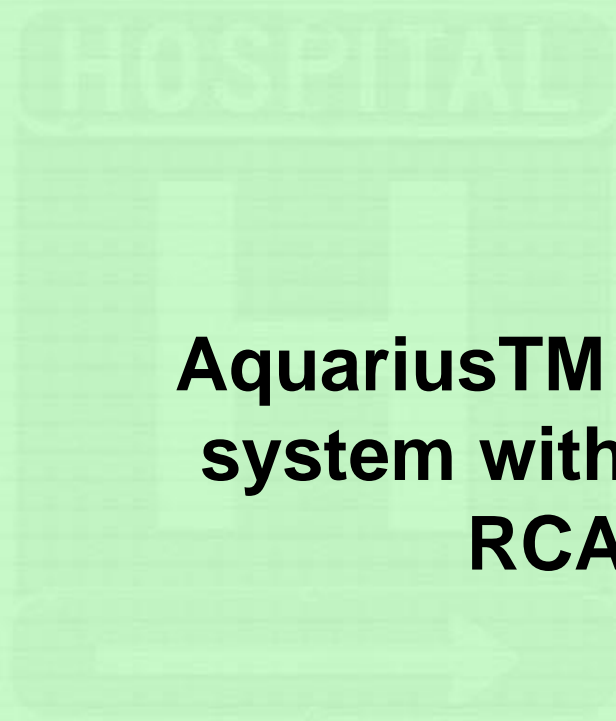


**OMNI**





**Aquarius™  
system with  
RCA**





**Multifiltrate**



**Prismaflex**



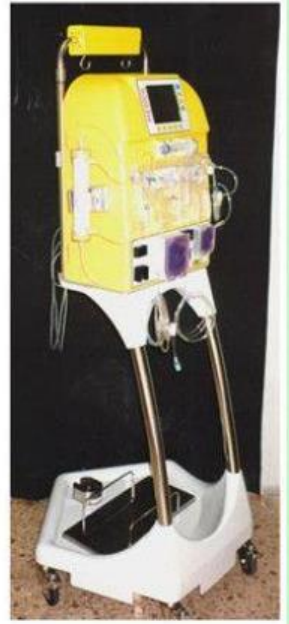
**Diapact CRRT**



**Acquarius**



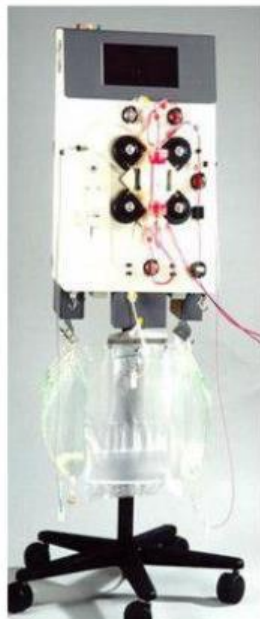
**Equa-Smart**



**BM25**



**Prisma**



**HF 400**



**Hygeia plus**



**Performer LR**



