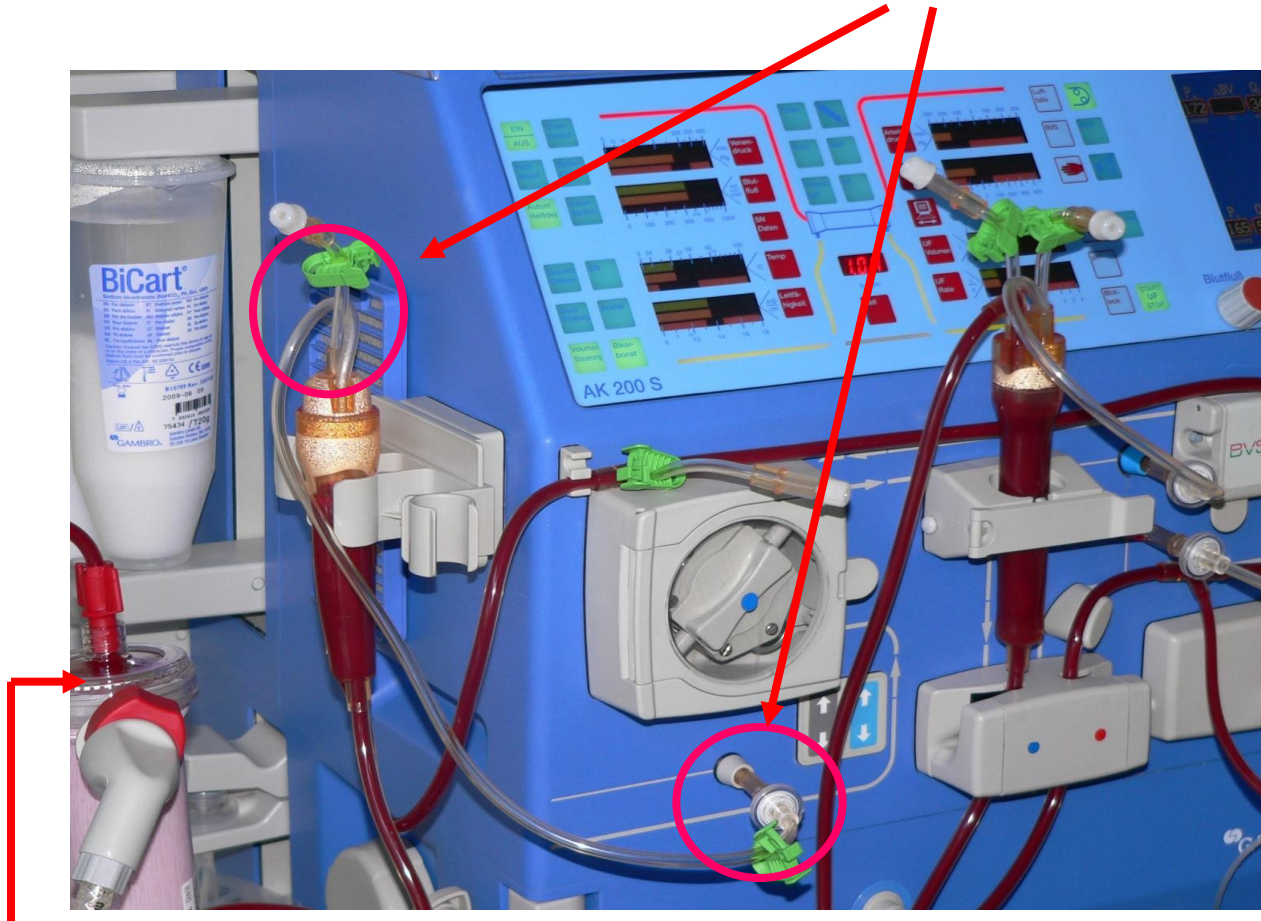


Mechanical Haemolysis and Systemic Pressure

Thomas Ryzlewicz

Measurement of the Systemic Pressure

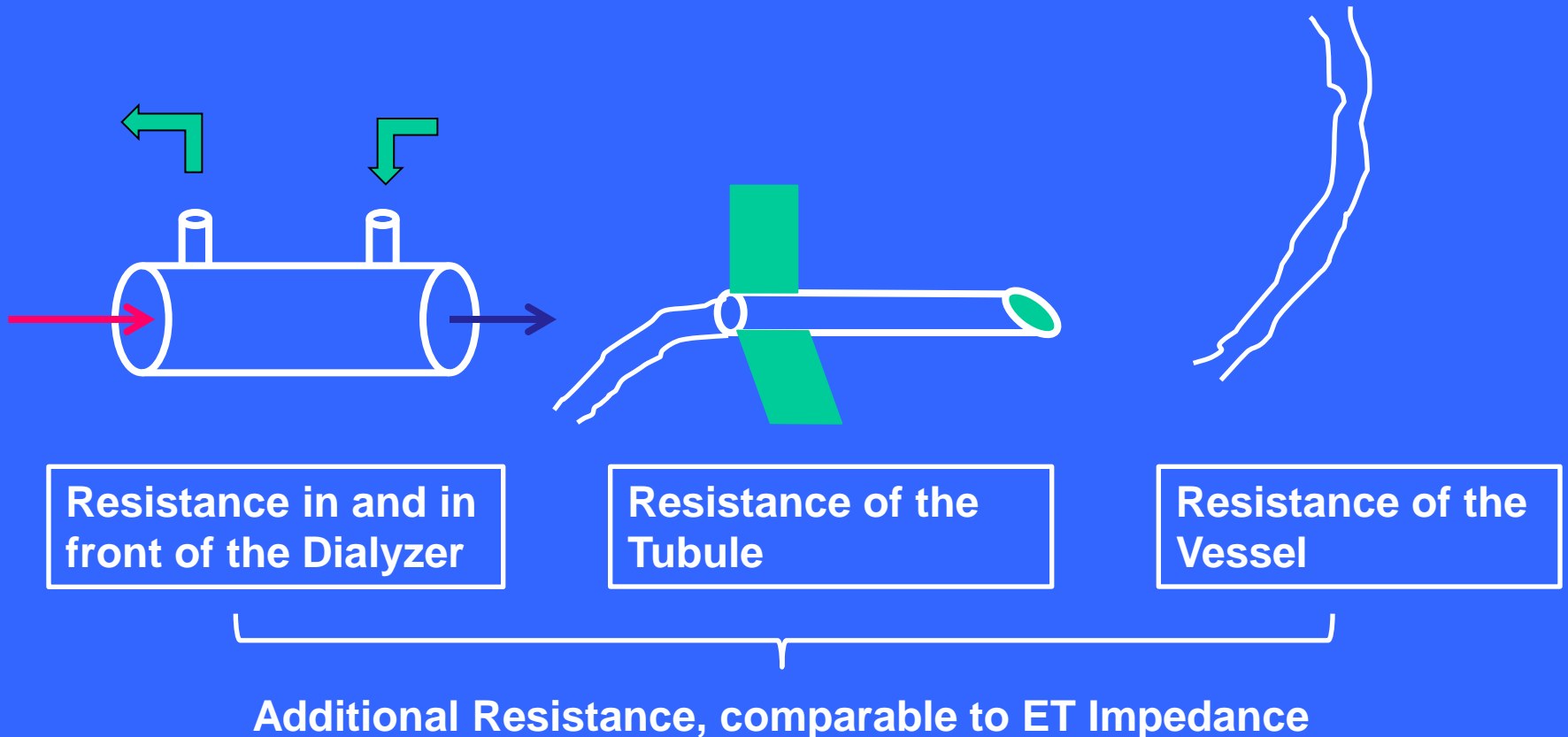


= Pressure at the Entry of the Dialyzer

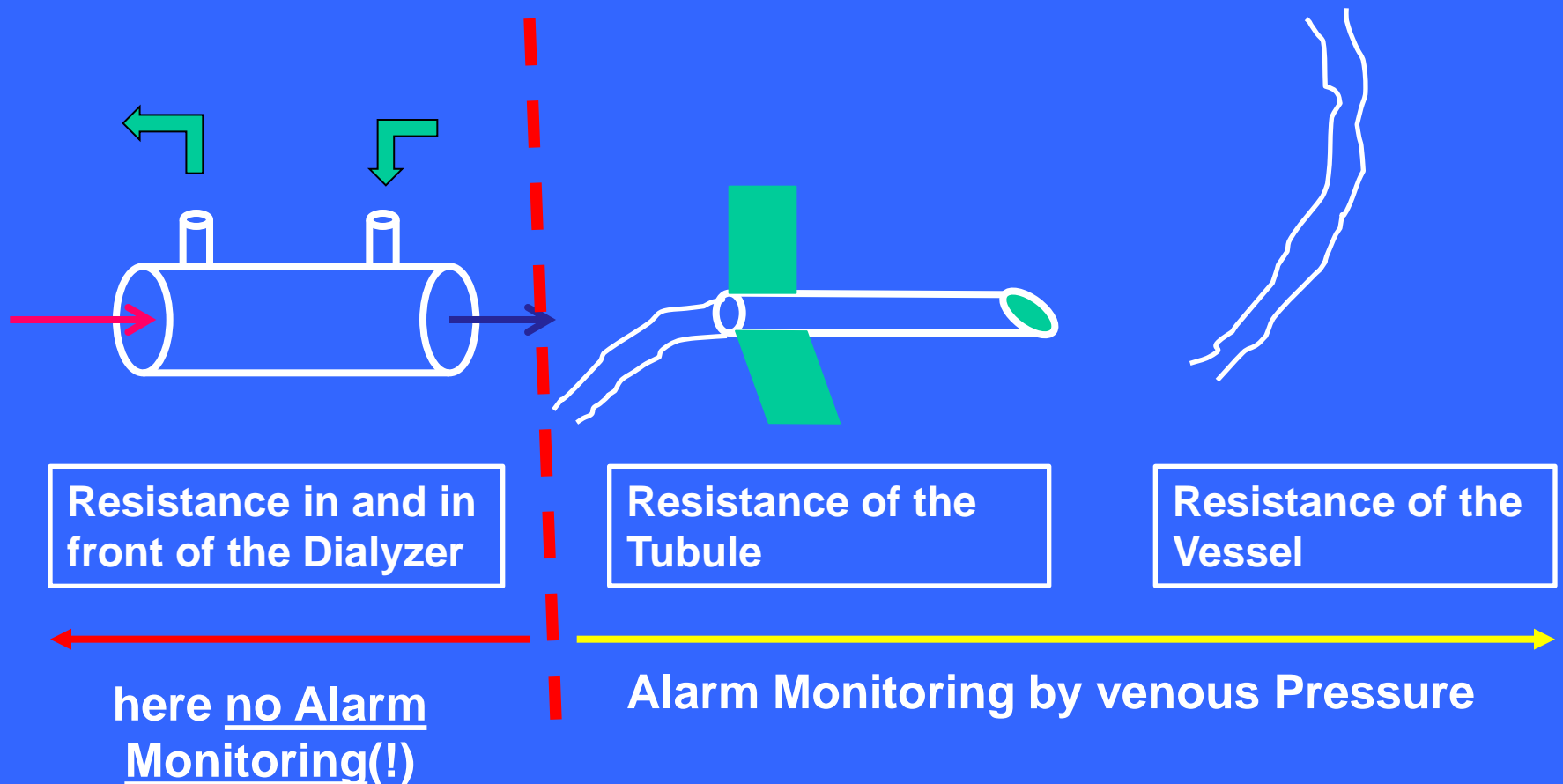
why is the Systemic Pressure Measurement simply necessary?

- to detect a critical Elevation of the mechanical Resistance early in the entire Dialysis System (Dialyzer and Bloodline)
- Condensation of Labor and Experience had developed unfavourably in nursing

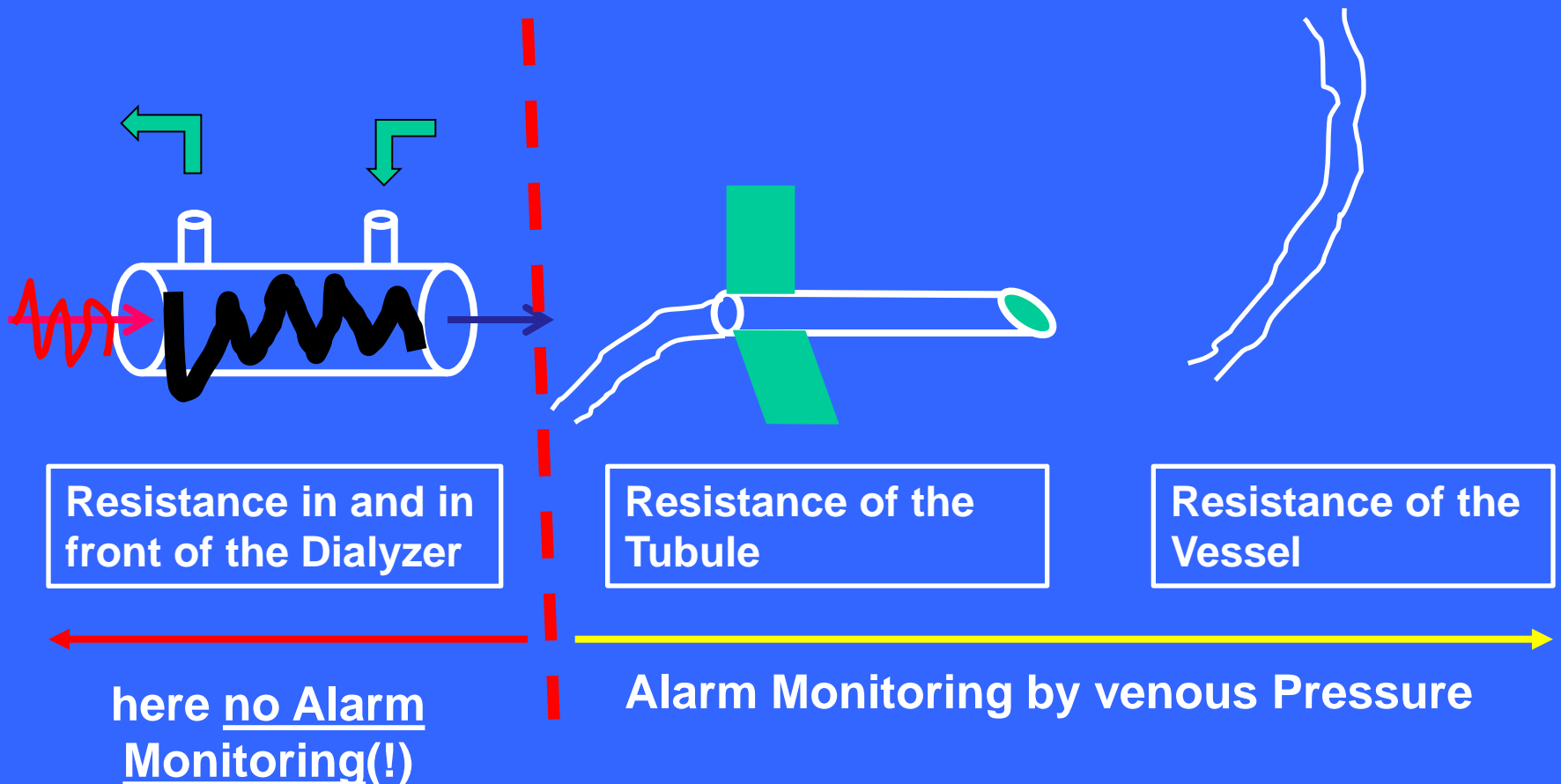
the Additional Mechanical Resistance in the Dialysis System



the Additional Mechanical Resistance in the Dialysis System

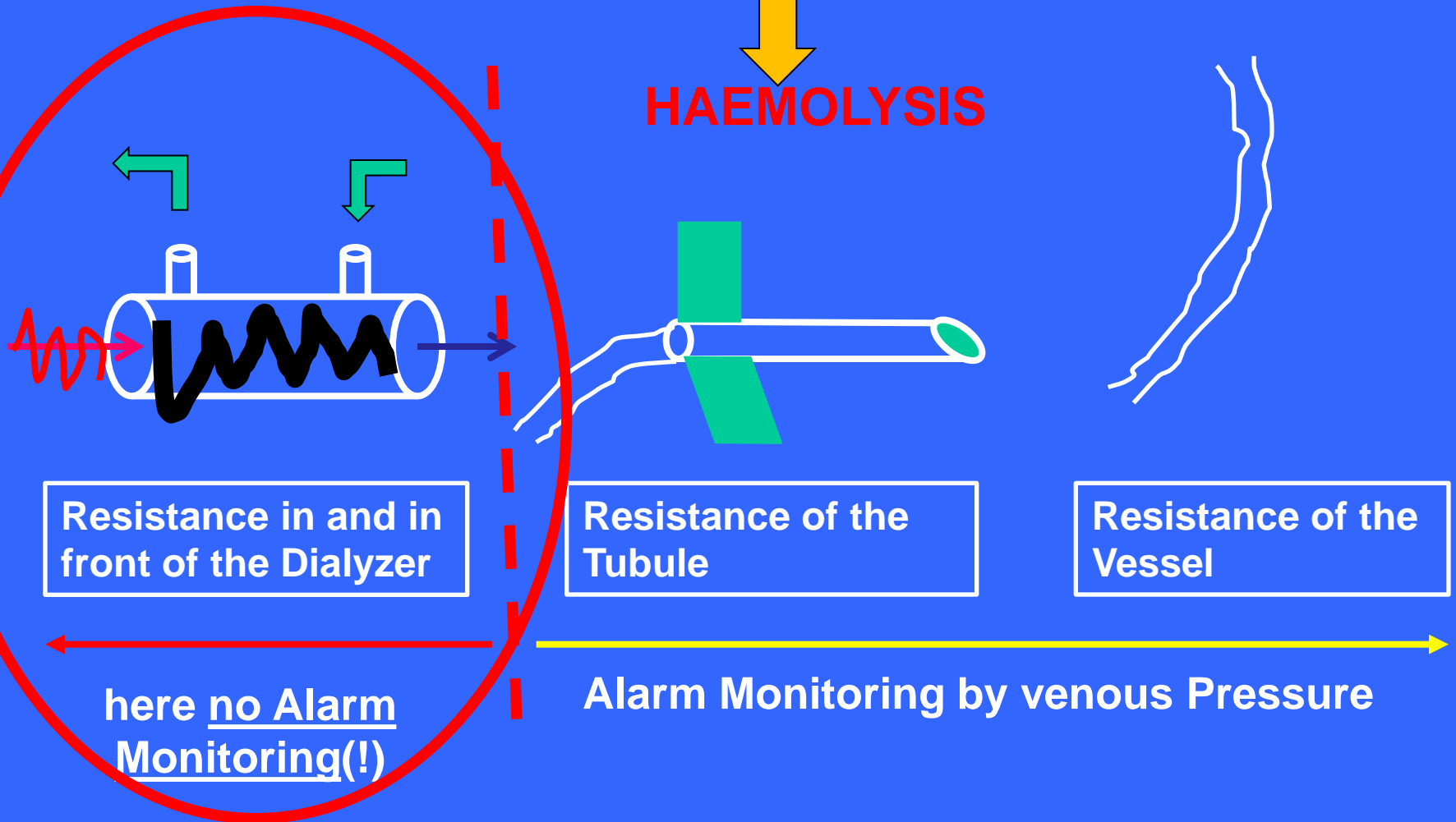


... and now the Resistance in the Dialyzer increases ...



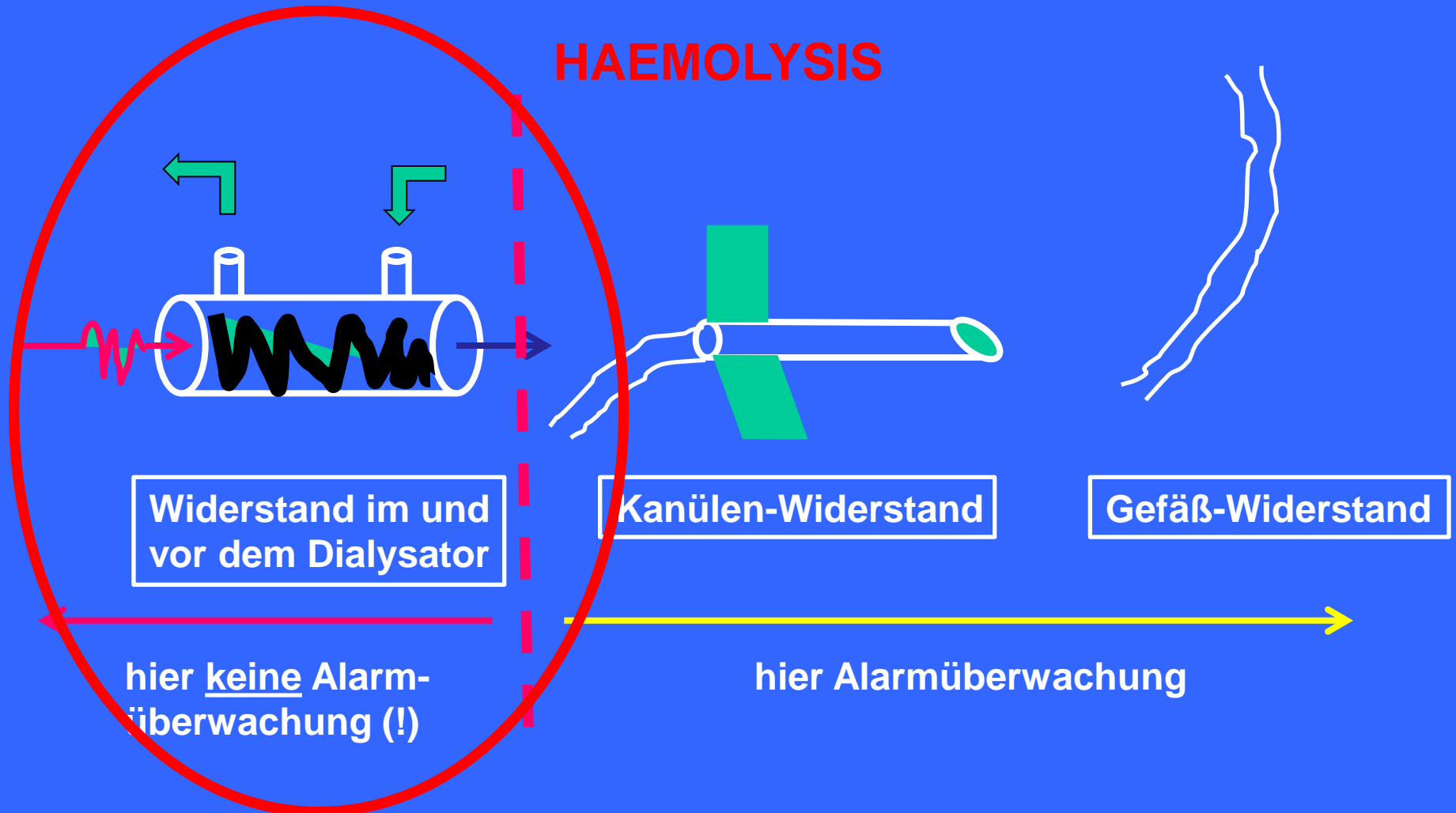
... and now the Resistance in the Dialyzer increases ...

↓
HAEMOLYSIS



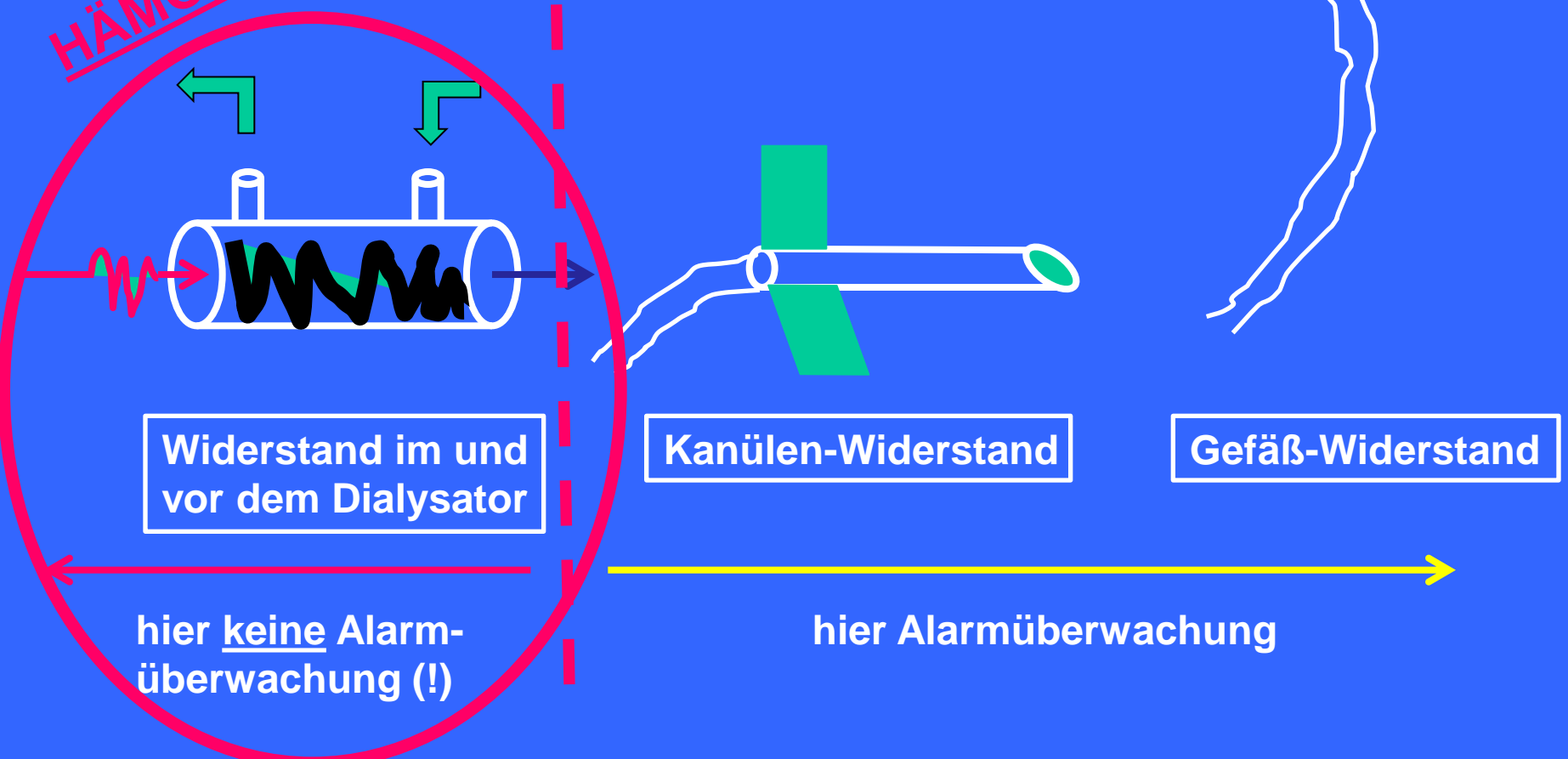
... und wenn jetzt der Widerstand
im Dialysator steigt ...

HAEMOLYSIS



... und wenn jetzt der Widerstand
im Dialysator steigt ...

HÄMOLYSE!



Widerstand im und vor dem Dialysator

Kanülen-Widerstand

Gefäß-Widerstand

hier keine Alarmüberwachung (!)

hier Alarmüberwachung

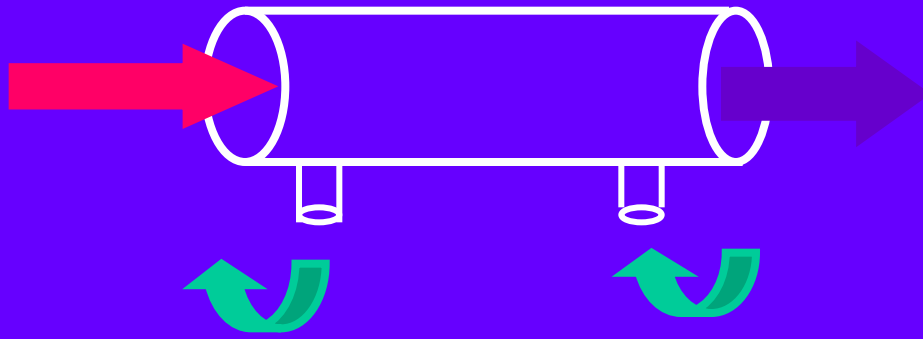
Online-HDF

Thomas Ryzlewicz

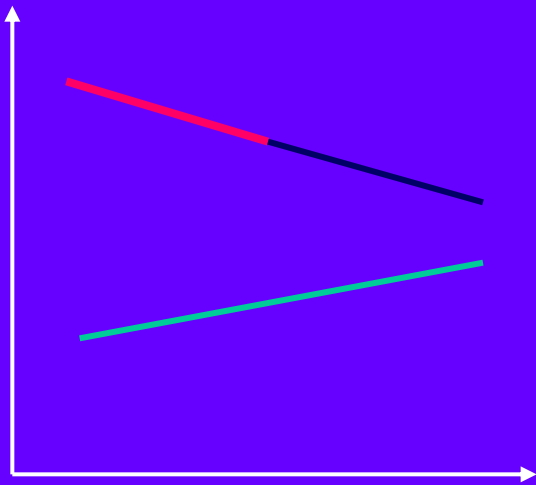


"Stanley Shaldon . . . a man with the unusual ability to be proven right in the long run in almost everything he says"

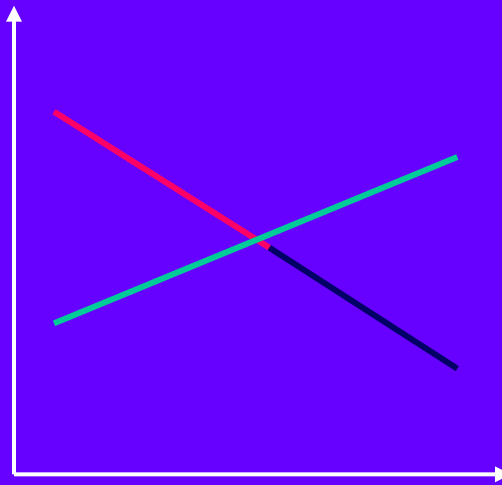
editorial NEPHRON 1981 27:1



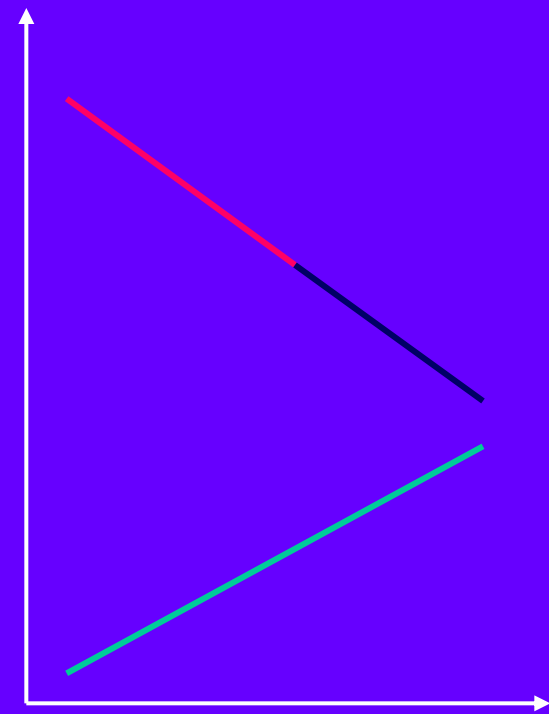
Pressures in the Dialyzer



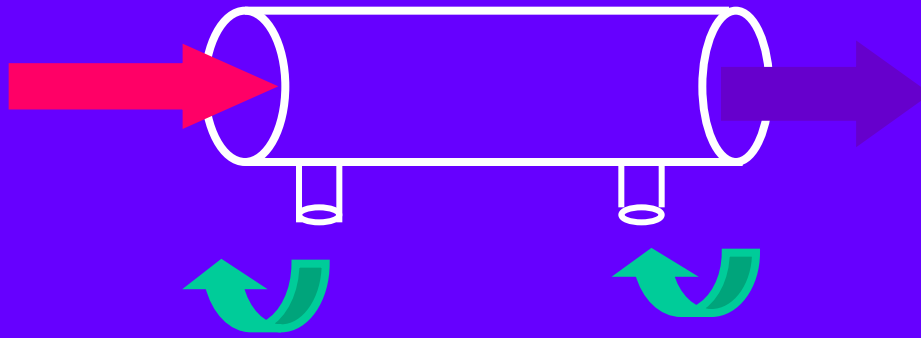
Low-flux-HD



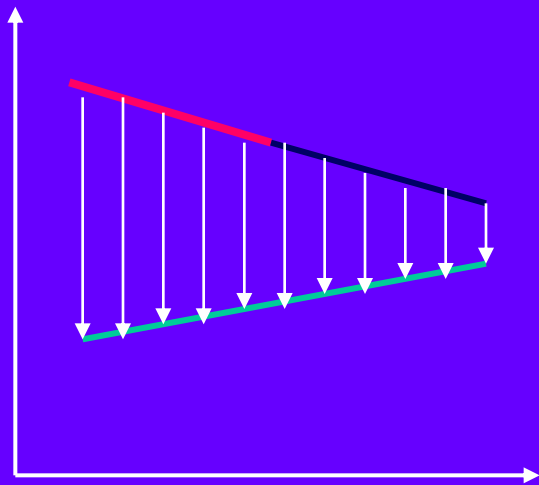
High-flux-HD



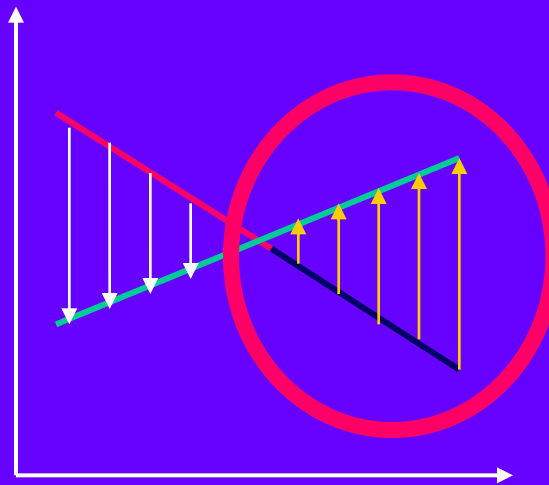
online-HDF



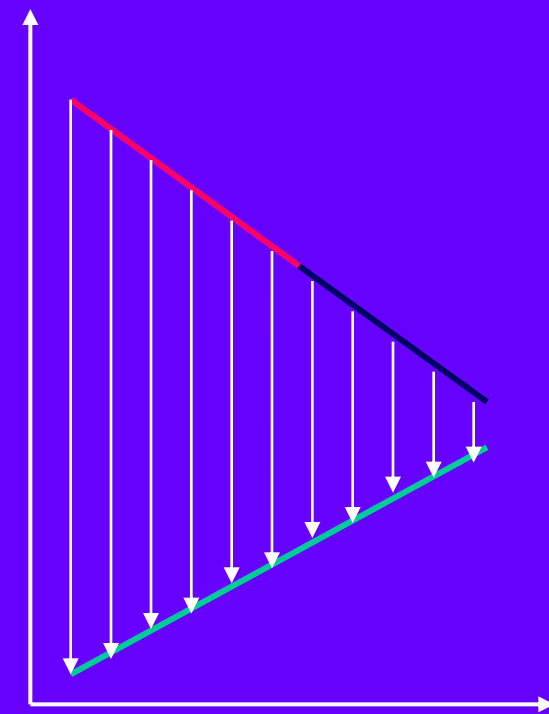
Pressures in the Dialyzer



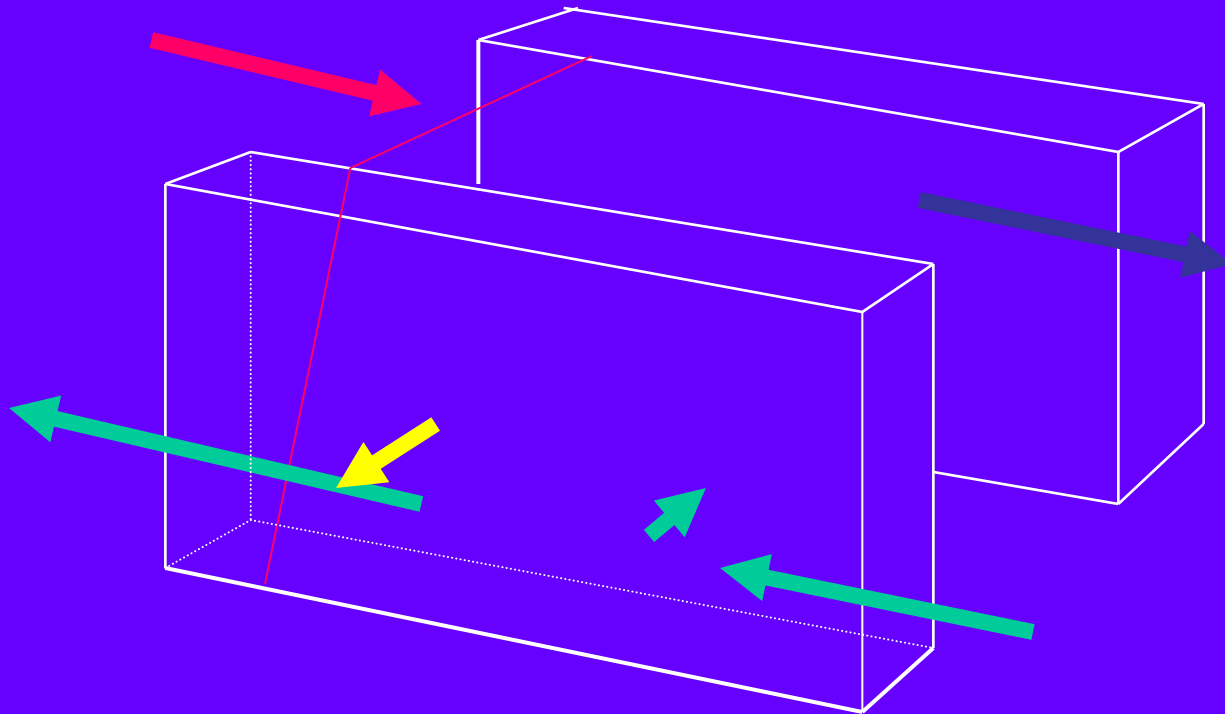
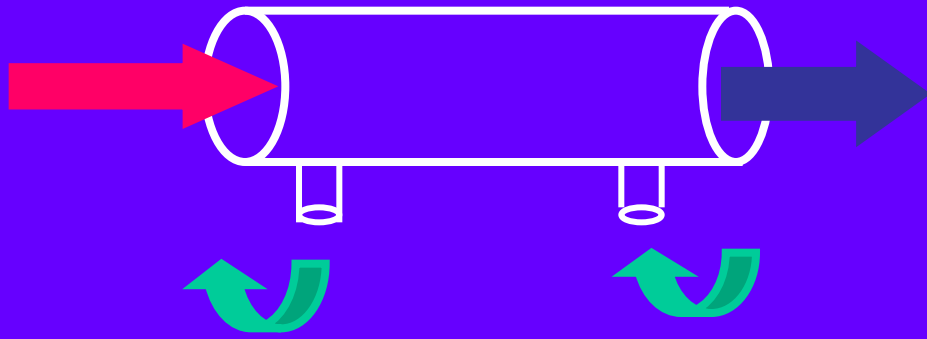
Low-flux-HD



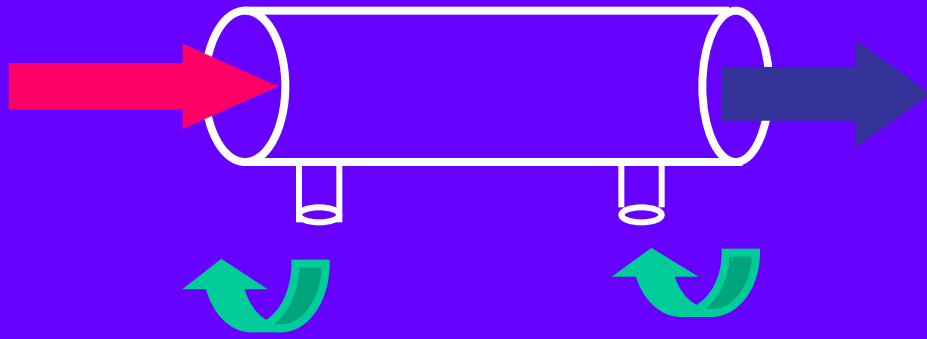
High-flux-HD



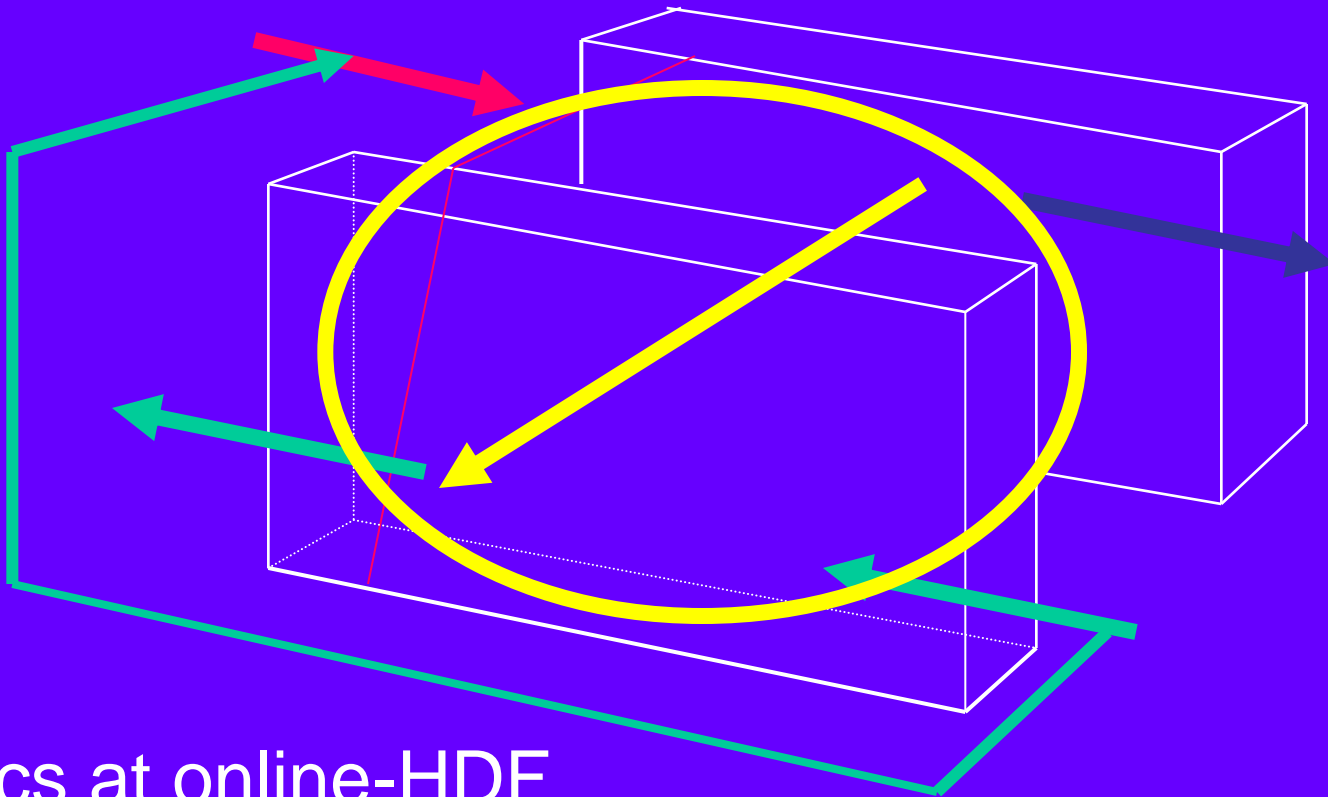
online-HDF



Hydraulics at Highflux-HD



Solvent Drag



Hydraulics at online-HDF

online-Therapie ist Herstellung von Infusionslösung!

European
Pharmacopoeia
2005 kennt online-
Herstellung von
Infusionslösung
nicht(!)

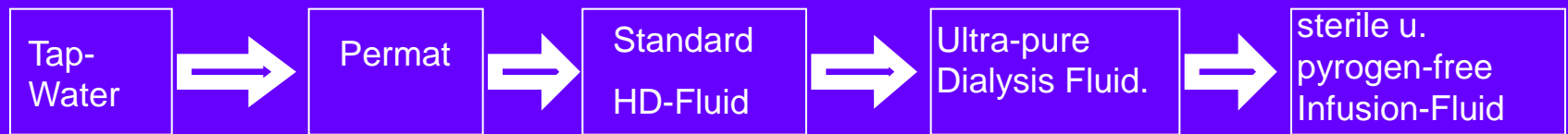
klar ist die Keimfreiheit
für
Infusionslösungen

ISO-Norm 11663
2009 Qualität von
Dialysierflüssigkeite
n und verwandten
Therapien (steril und
pyrogen-frei
(=>EU<0,03/ml)

SAL > 6 (sterility assurance
level) entspr. 10^{-8}
Keimred./ml 3 Filter
(ultra) 10^{-11} /ml

online-Therapy is Production of Infusion-Fluid!

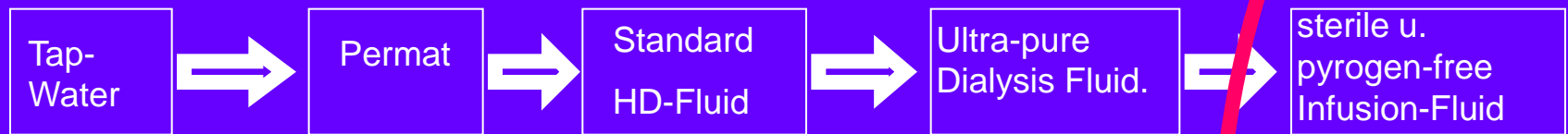
According to I.
Ledebo
ISO-Norm 11663-
2009



	Softening + Reverse- Osmosis	Konzentra- ts	Ultrafiltratio- n	Ultrafiltratio- n	
bakteriolog. Quality					
CFU/ ml	< 10 ⁻²	< 10 ²	< 10 ⁻¹		SAL > 6
EU/m l	< 0,25	< 0,50	< 0,03		< 0,03
Employment in the Dialysis	Basics for every Dialysis Fluid	Lowflux synthetic	Highflux-HD u. Low.-Vol.- HDF		online- HDF/HF Infusion-Fluid

online-Therapy is Production of Infusion-Fluid!

According to I.
Ledebo
ISO-Norm 11663-
2009



	Softening + Reverse- Osmosis	Konzentra- ts	Ultrafiltratio- n	Ultrafiltratio- n	
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Employment in the Dialysis	Basics for every Dialysis Fluid	Lowflux synthetic	Highflux-HD u. Low.-Vol.- HDF		online- HDF/HF Infusion-Fluid

online-Therapy is Production of Infusion-Fluid!

the Ultra-
System:

one step
Ultrafiltration

CFU Reduktion 10^{-5}
SAL 3

two step
Ultrafiltration

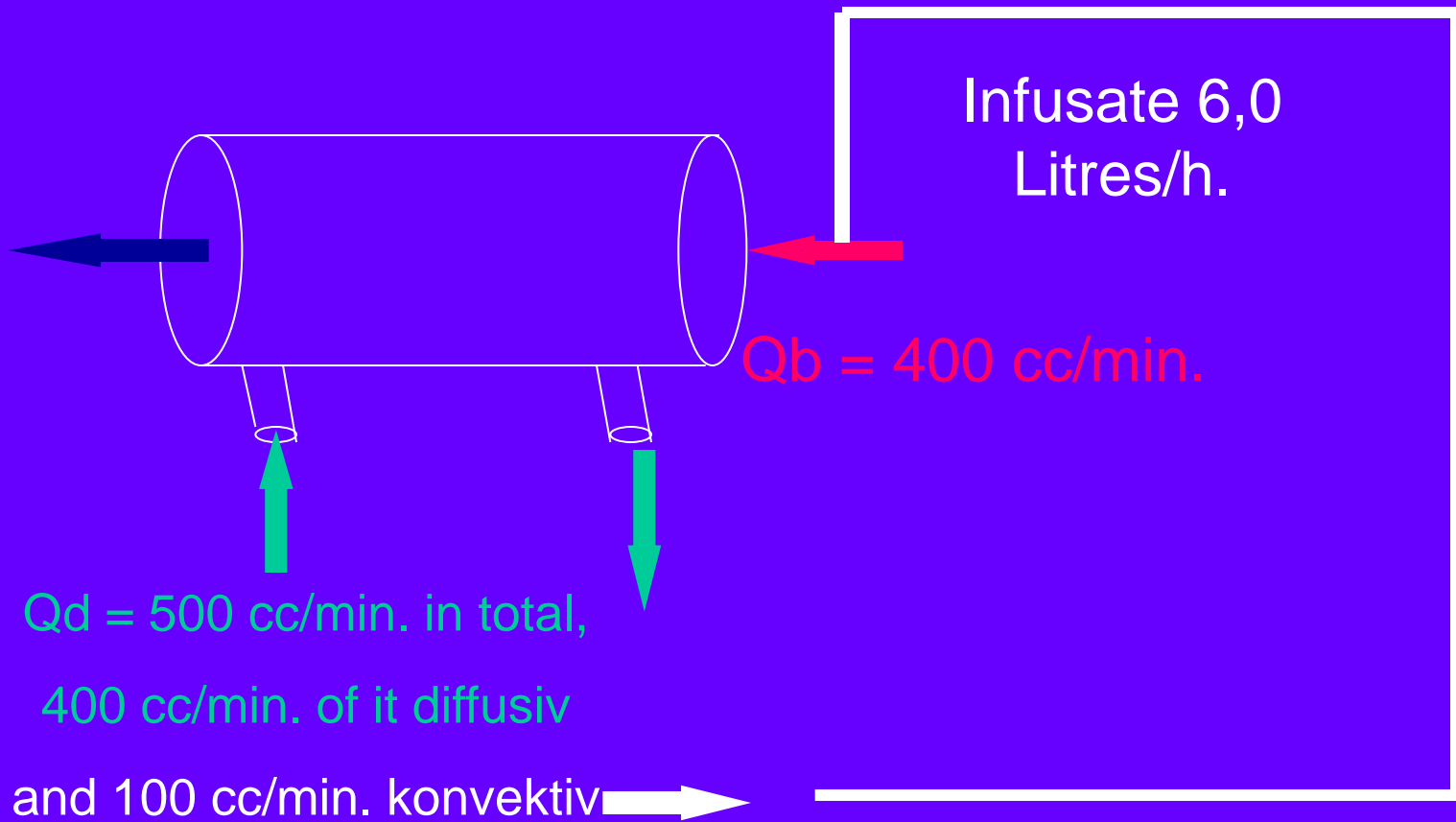
CFU Reduktion 10^{-8}
SAL 6

three step
Ultrafiltration

CFU Reduktion 10^{-11}
SAL 9

(with U-2000-Ultrafilter)

how does a HDF-Regime look like?



HDF: Prädilution or Postdilution?

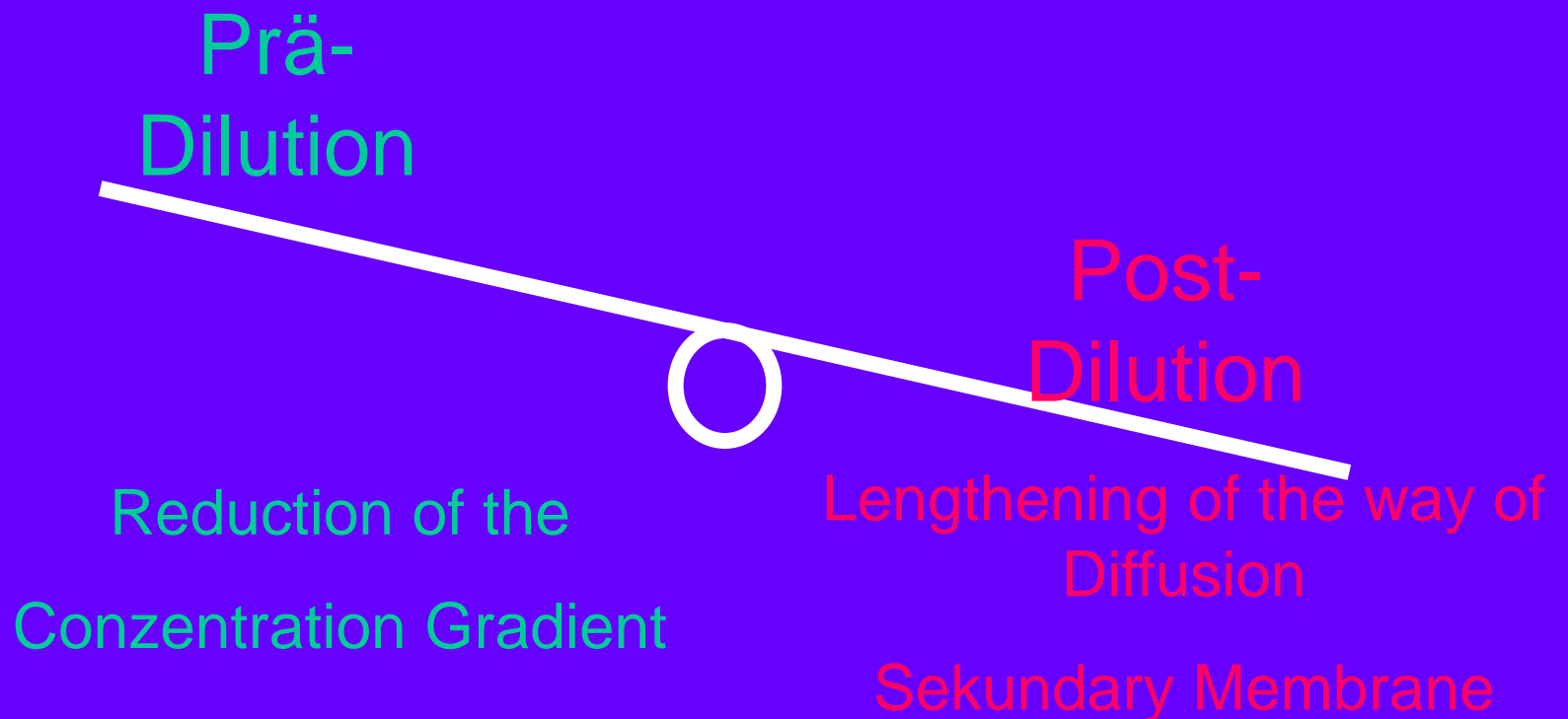


- Disadvantage:
Reduction of the
Concentration
Gradient



- Disadvantage:
Lengthening of the
distances of
Diffusion by the
packed RBC's
- Disadvantage: high
Sekundary
Membrane by
Protein

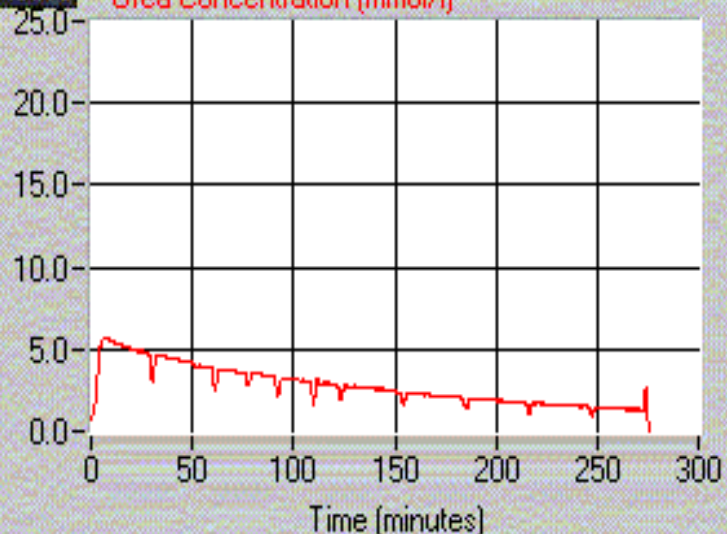
HDF: Prädilution or Postdilution?



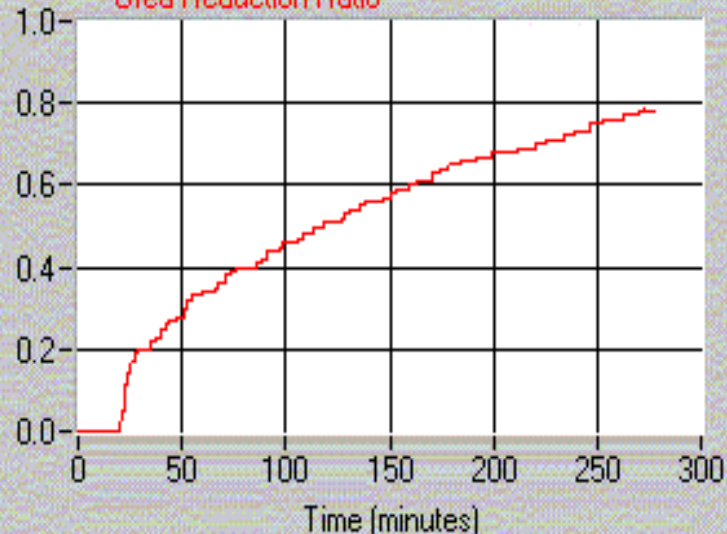
großflächige normale HD

Active

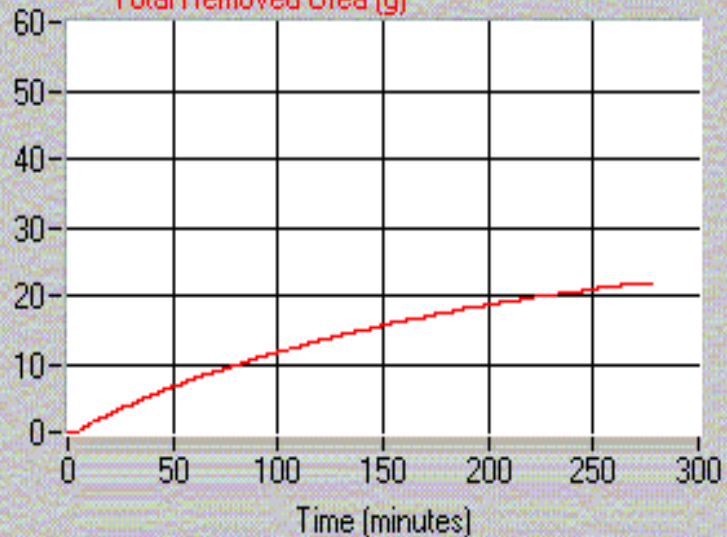
Urea Concentration (mmol/l)



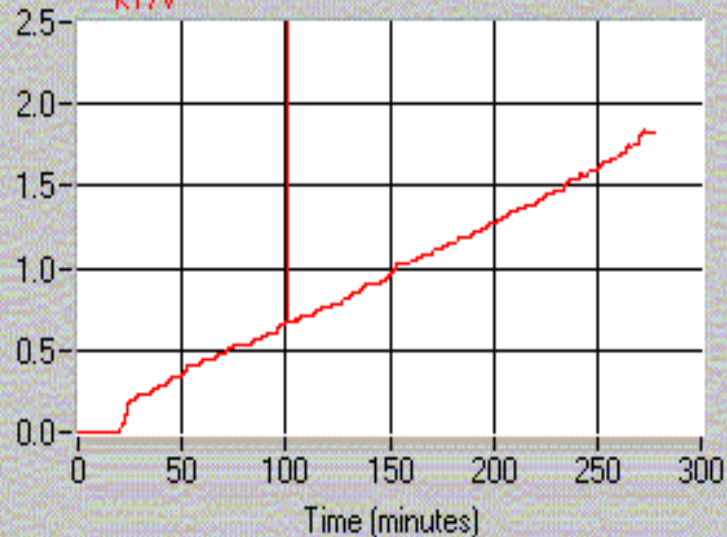
Urea Reduction Ratio

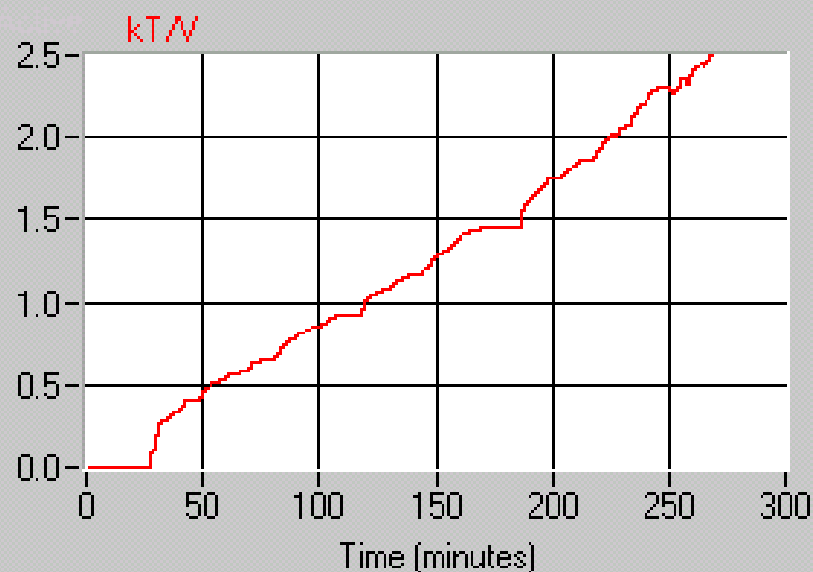
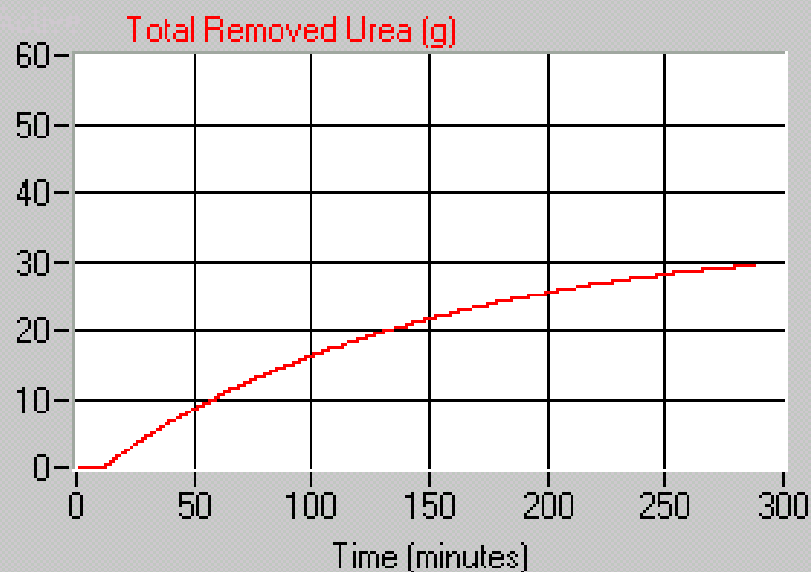
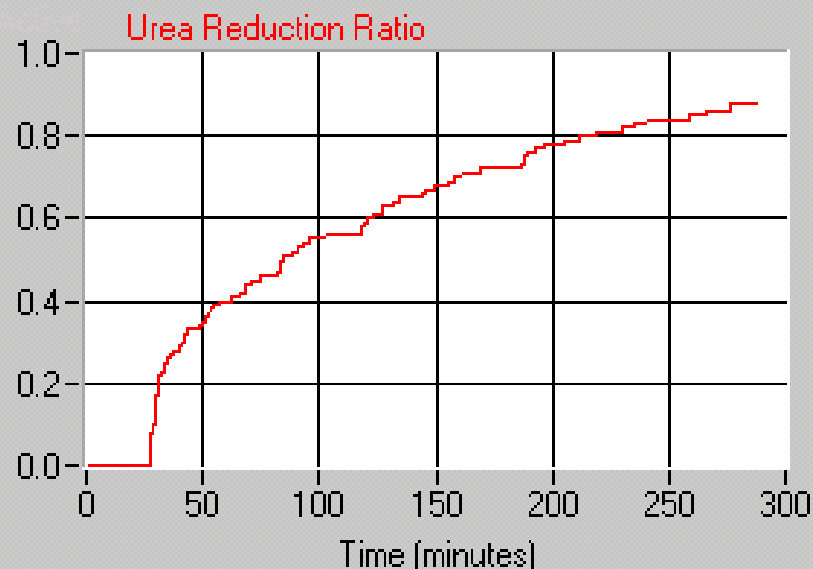
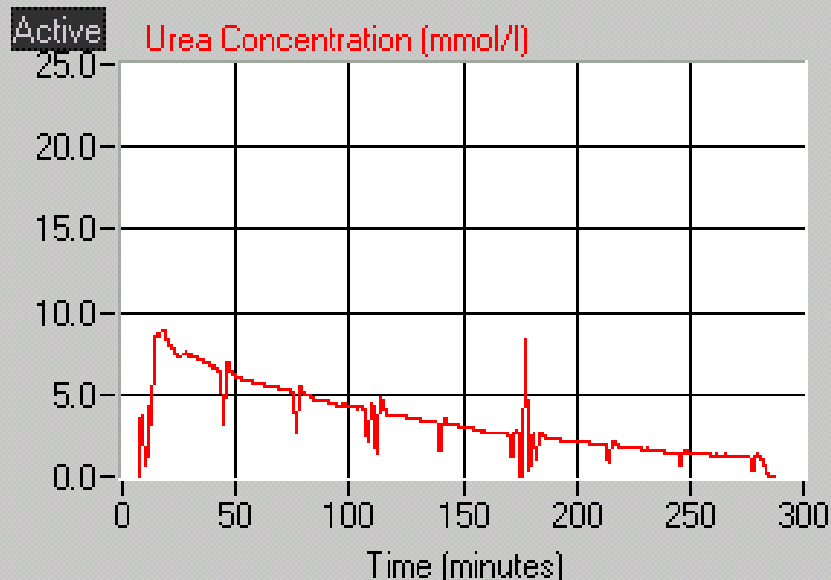


Total Removed Urea (g)



KT/V

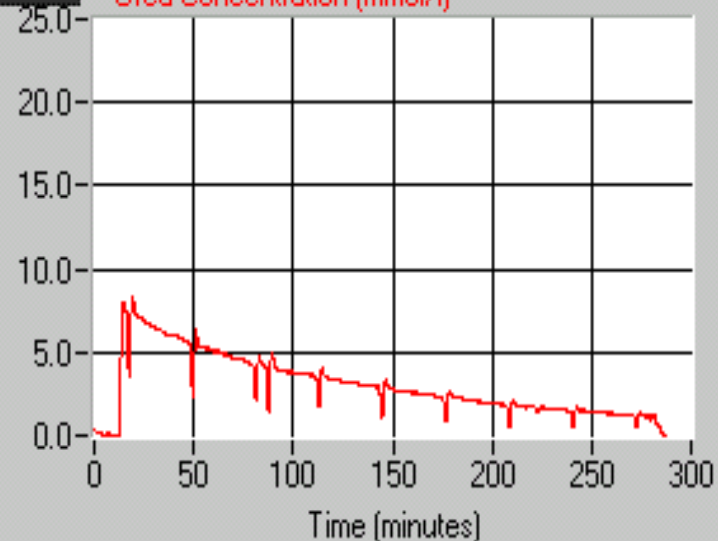




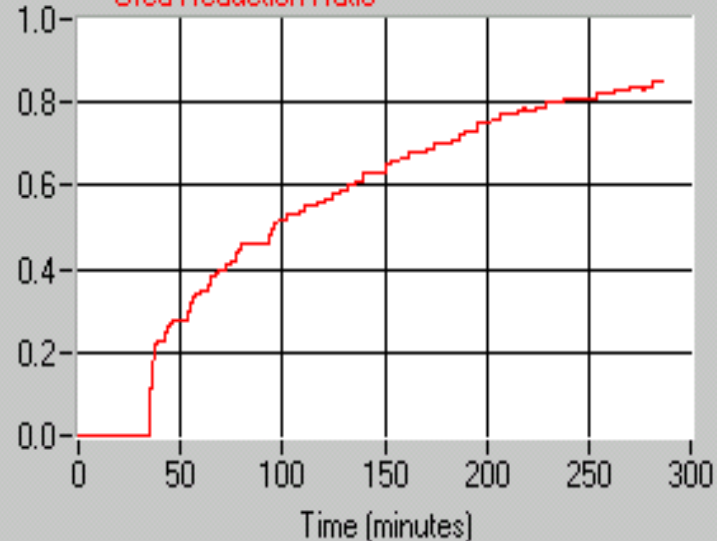
4:30 h HDF Postdilution 27 Ltr.

Active

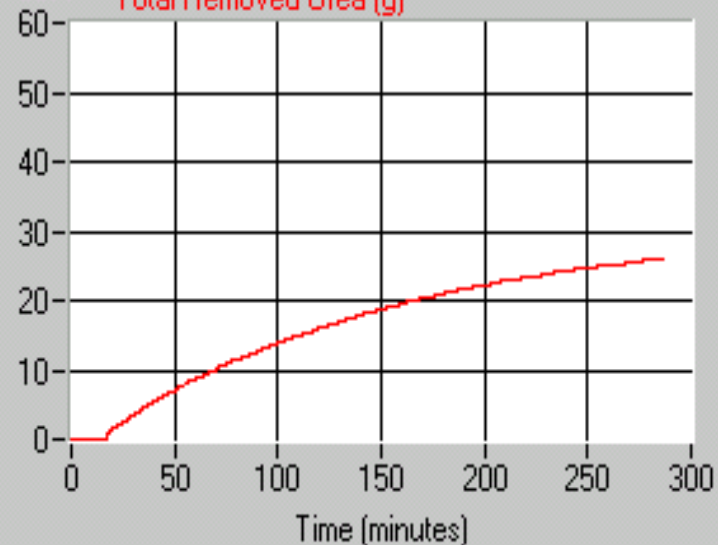
Urea Concentration (mmol/l)



Urea Reduction Ratio



Total Removed Urea (g)



kT/V

