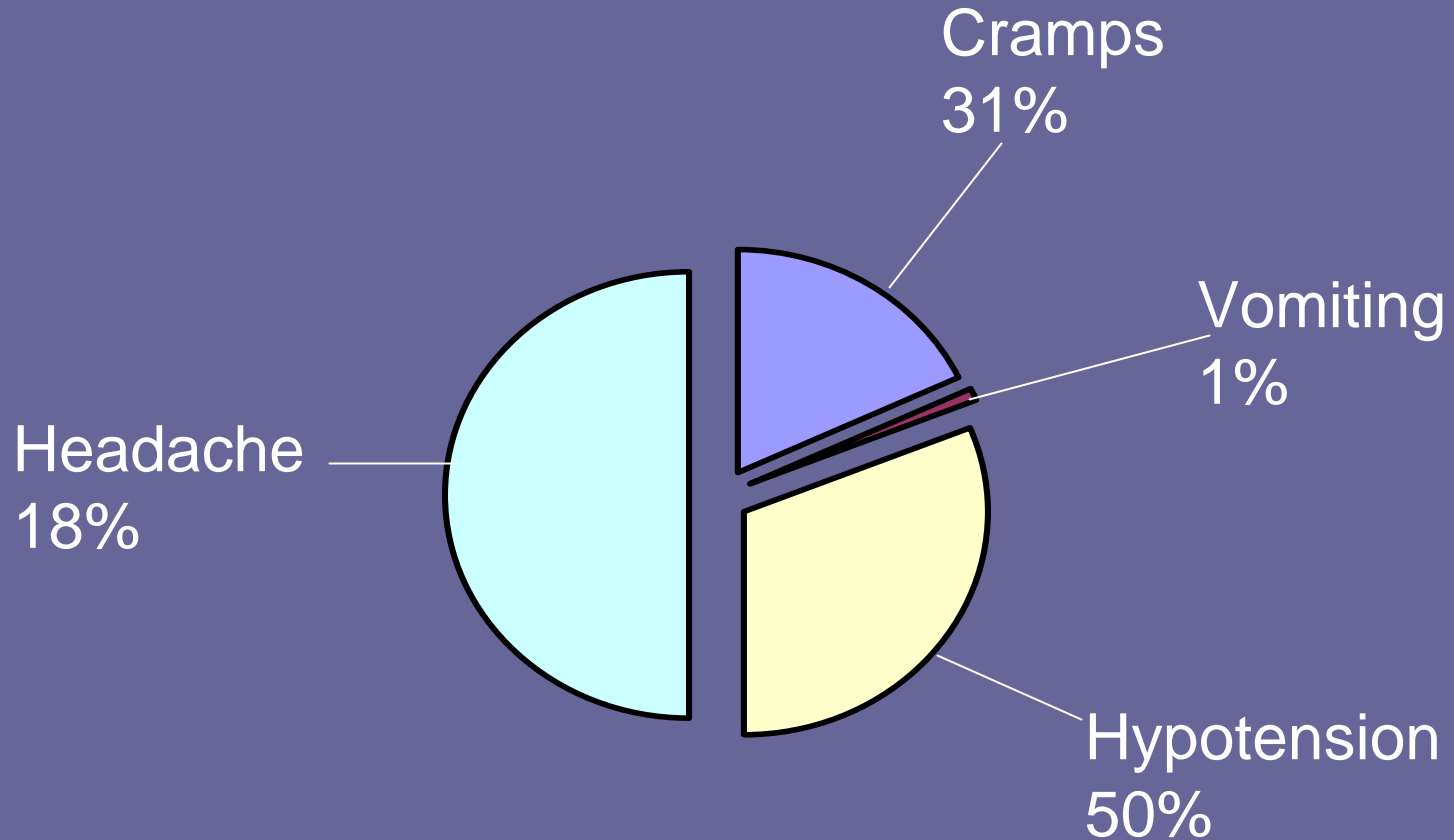


Hemocontrol

Management of Intradialytic Hypotension

Dialysis Complications



Nephrologische Praxen Rostock
1998-1999 Dialysis n=6,508

Potential Causes of Hypotension

- Intravascular volume depletion
- Lack of vasoconstriction
- Cardiac factors

Prevention of Hypotension

- No BP medication pre dialysis
- Profile ultrafiltration
- Profile sodium
- Evaluation of dry weight
- Isolated or sequential ultrafiltration
- Blood volume monitoring – critical value
- Volume expanders – albumin

Treatment of Hypotension

- Decrease the UF rate
- Decrease the total weight loss
- Extend the treatment
- Cooler dialysis
- Medication: Amatine
- Volume expanders: Albumin

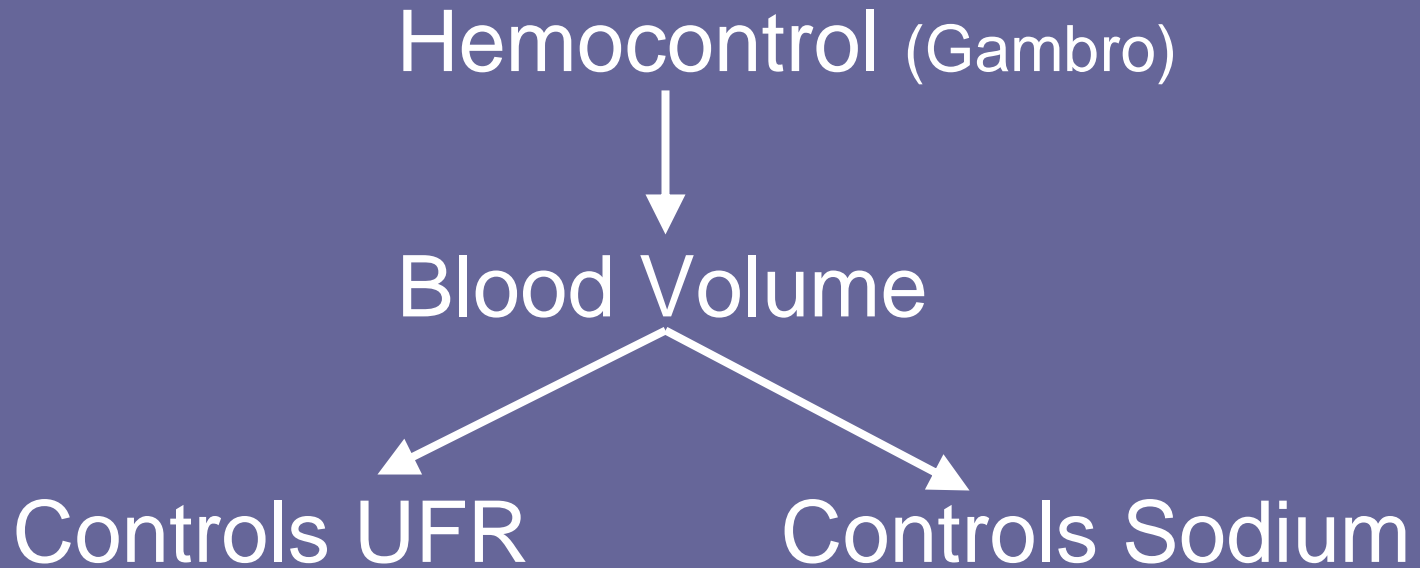
Unconventional Options

- Daily dialysis
- *Physio Dialysis*: Hemocontrol
- Convective therapy: Hemofiltration
Hemodiafiltration

Why Physio Biofeedback?

- Non invasive
- More physiological - Biofeedback
- No added cost
- Easy to use: intuitive

What Is Biofeedback?



What Is The Difference?

Technical Prescription

Dialysis prescription is determined and entered into the machine based on the patient's previous dialysis treatment.

The UFR and CD are not profiled or profiled.

Profiles are limited by the time intervals

Clinical Prescription

Dialysis UF and CD is controlled **every few minutes** by the limits and targets programmed into the controller (Integra).

The limits and targets (UF, BV, CD, BV/TWL ratio) are calculated using the averages of 8 to 10 treatments.

The Open Loop Concept In HD

Open-Loop Block Diagram



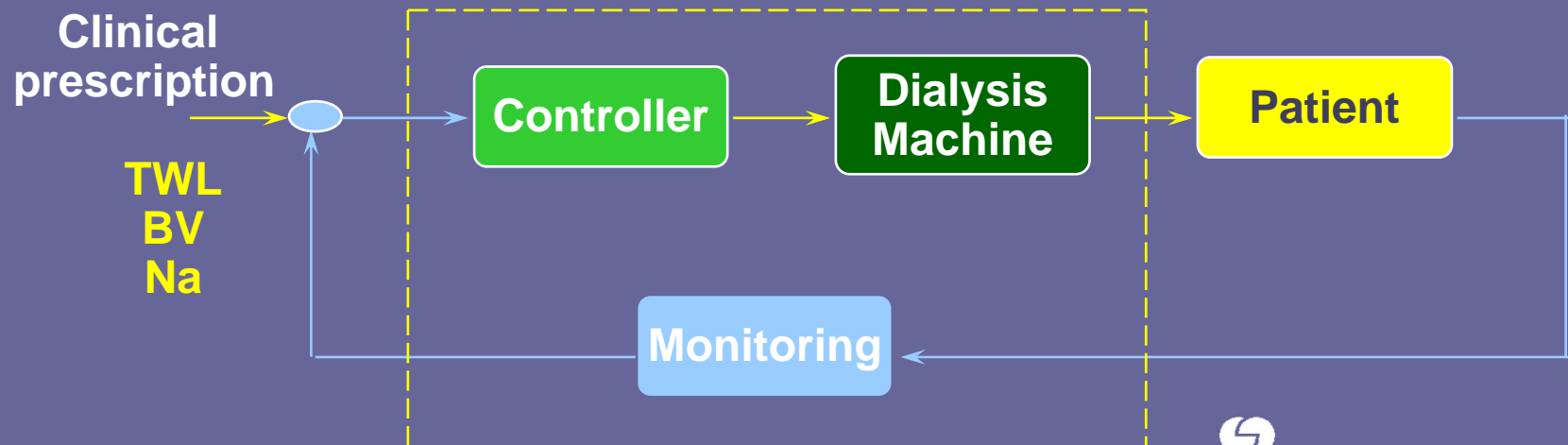
This is similar to a pilot flying at night without radar assistance.
Route, weather conditions ?

The situation is exactly the same for dialysis patients. The nurses know the patients very well but some of the pt's symptoms may force them to deviate from the prescribed prescription.

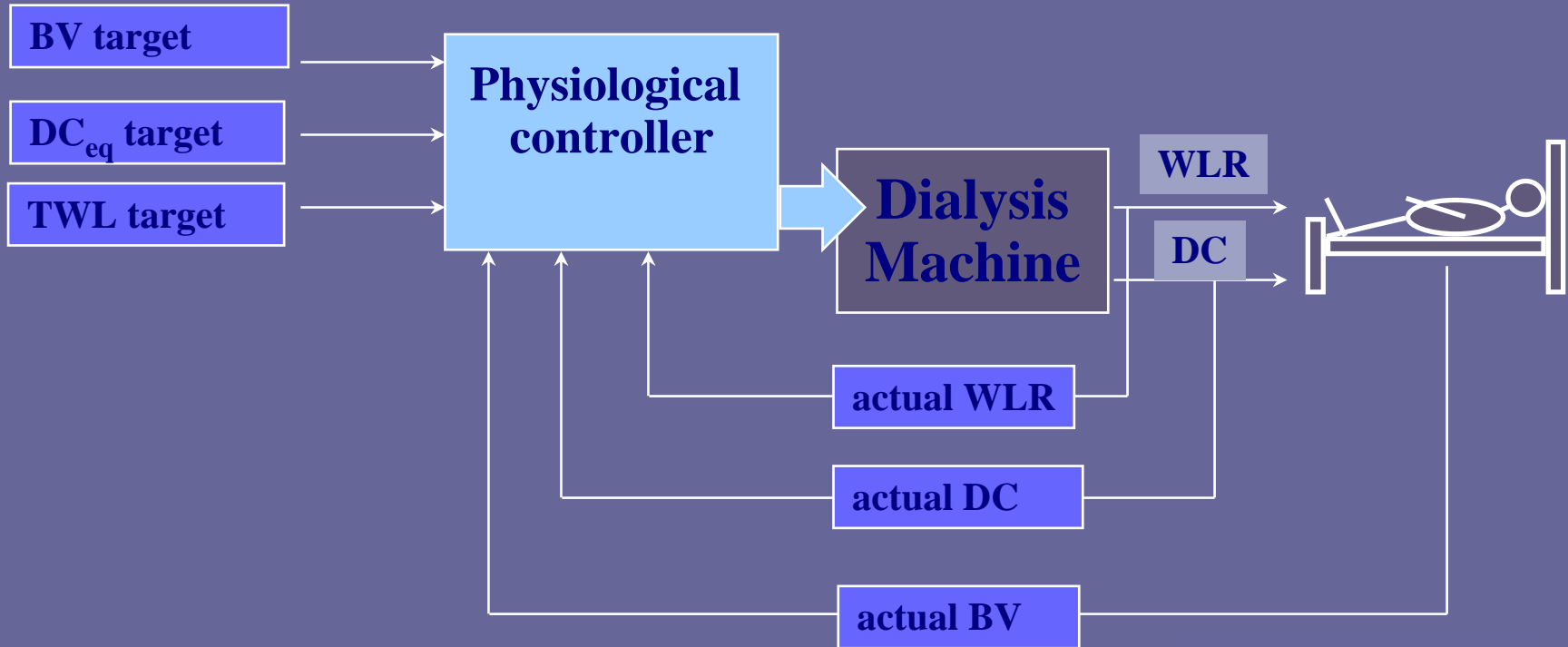
The Biofeedback Concept

Closed-Loop Block Diagram

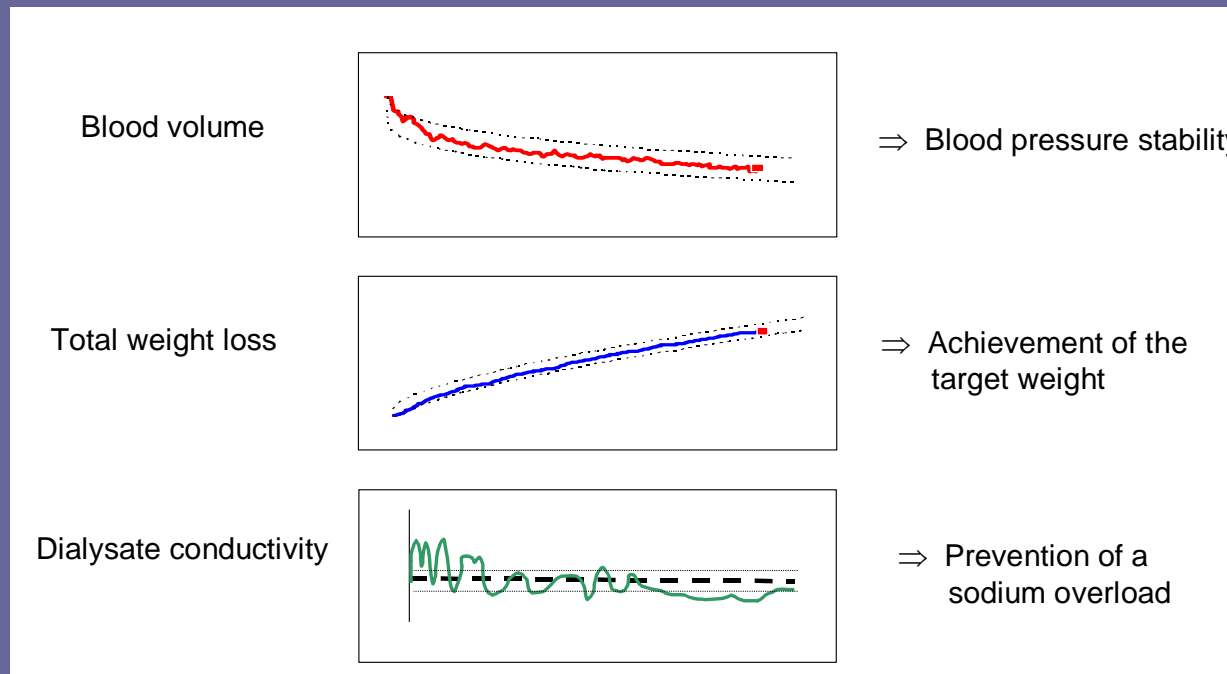
The PHYSIO biofeedback system now provides radar-like information. It will continuously inform the nurse about the pt's current situation, compare it to the set target and, if necessary, adjust the parameters.



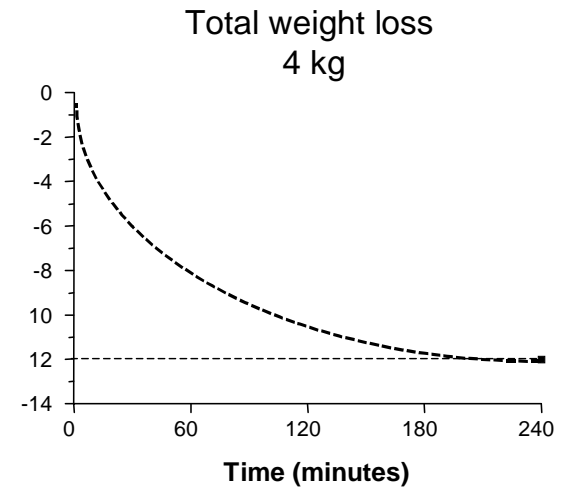
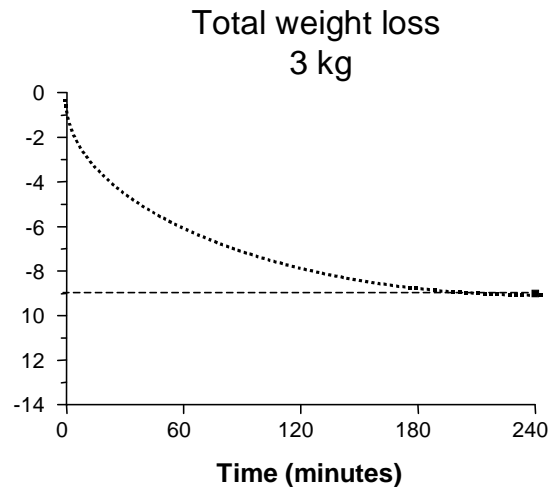
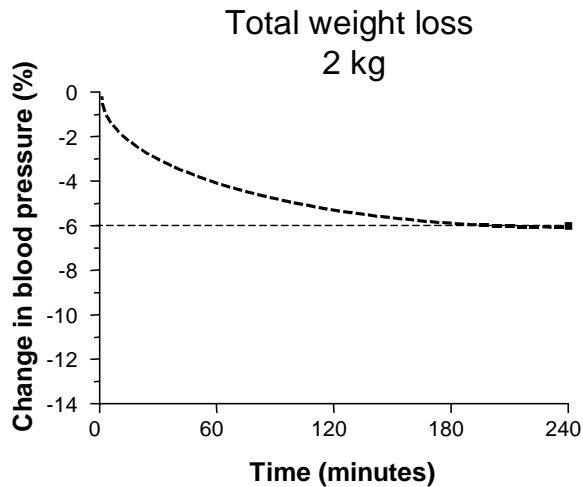
Physiological controller for 3 different goals.



Goals of Hemocontrol™



Ideal curve varies with TWL



Patient Selection

- Hemodynamically unstable: hypotension or cardiac failure
- Over hydration
- Diabetic
- Frequent cramps
- Hypertension

Pre Assessment Monitoring

Monitor BV and TWL for 6 to 10
treatments and calculate the
TWL/BV ratio

[Assessment form](#)

HC Parameters

- Targets: clinical prescription
- Tolerances
- Limits

1st Step: Targets

- *TWL (varies each treatment)
- Final CD
- Final BV: determined by pre-assessment period , where the mean ratio for BV/TWL is calculated.

When the *TWL is entered into the dialysis machine, the final BV is displayed.

2nd Step: Prescription Limits

Safety limits defined by the nurse

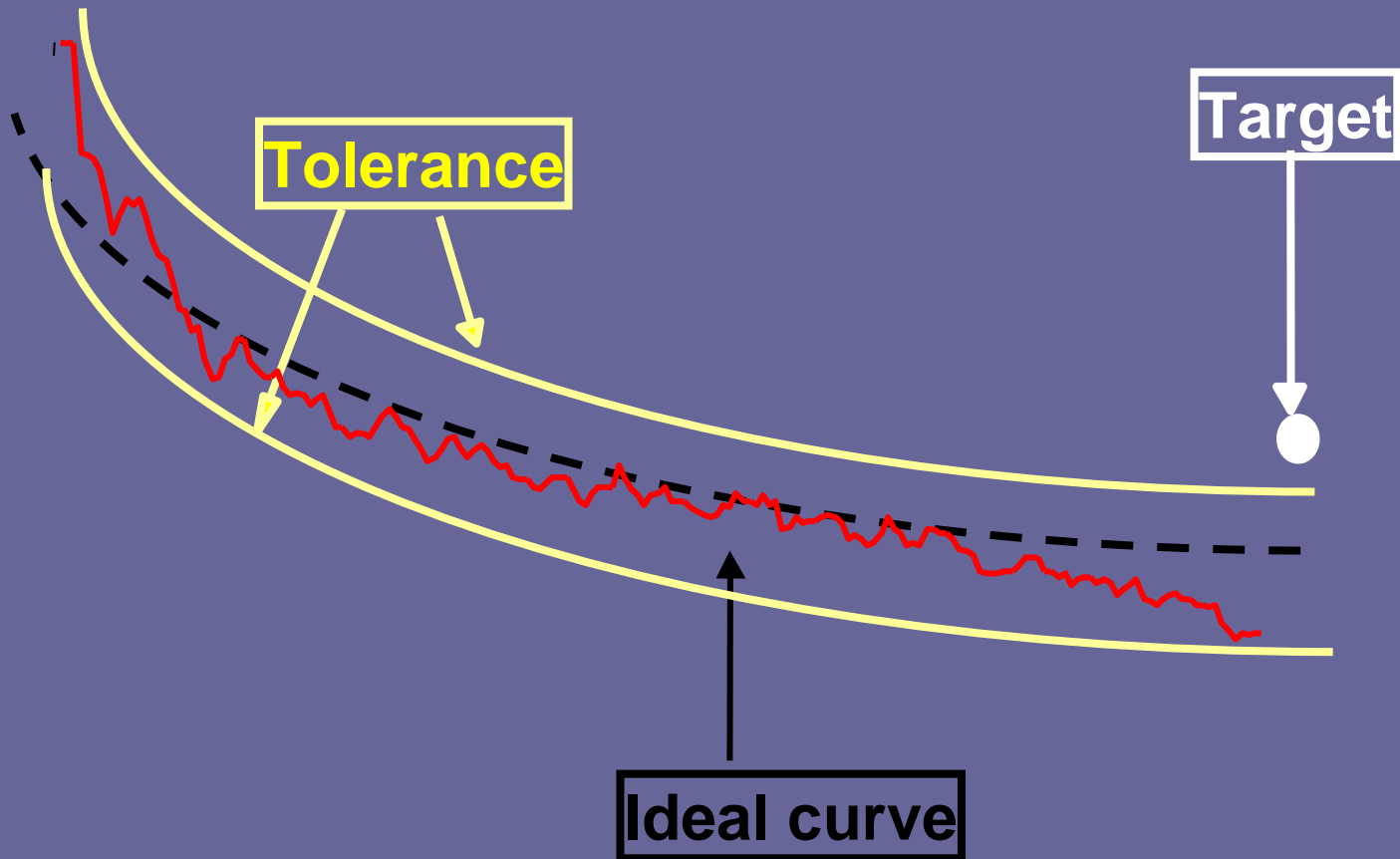
- Sodium limits: maximum and minimum based on the final CD
- Maximum UFR

3rd Step: Set Tolerances

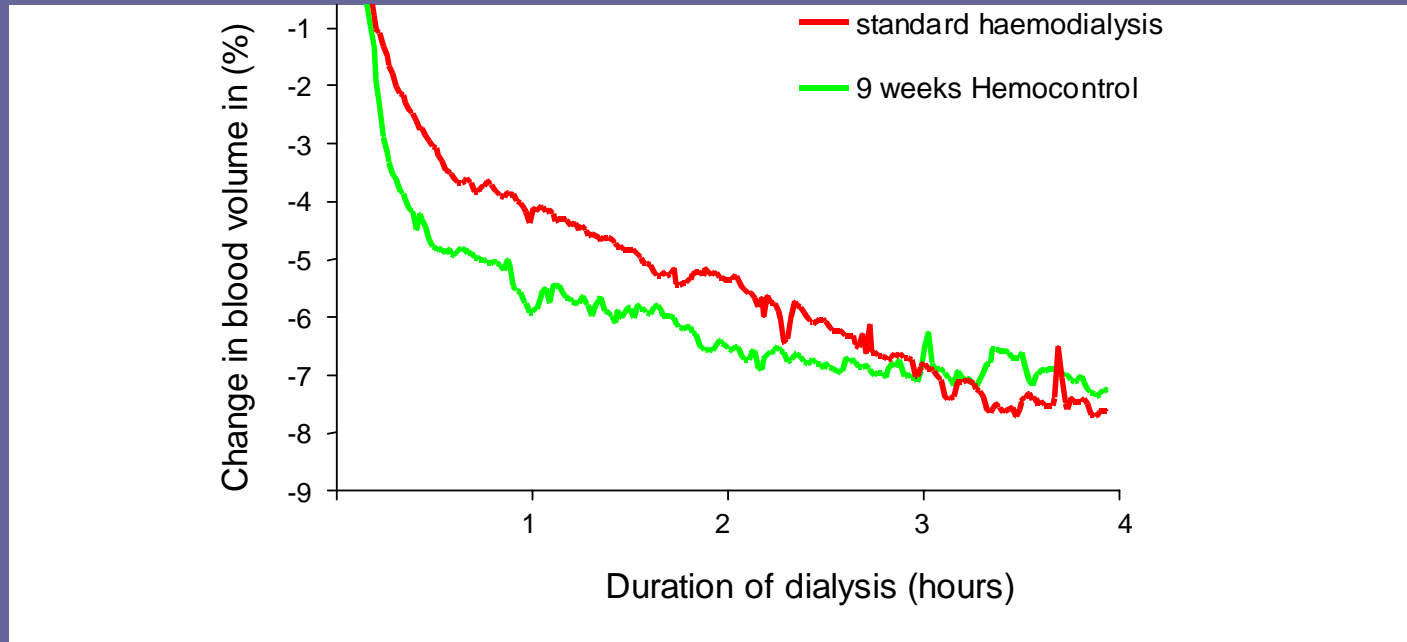
- Total weight to be removed: +/- 300 gms
- BV: +/- 3%
- CD: +/- 3mS/cm

Tolerances

Target & Tolerances



Standard HD vs. Hemocontrol

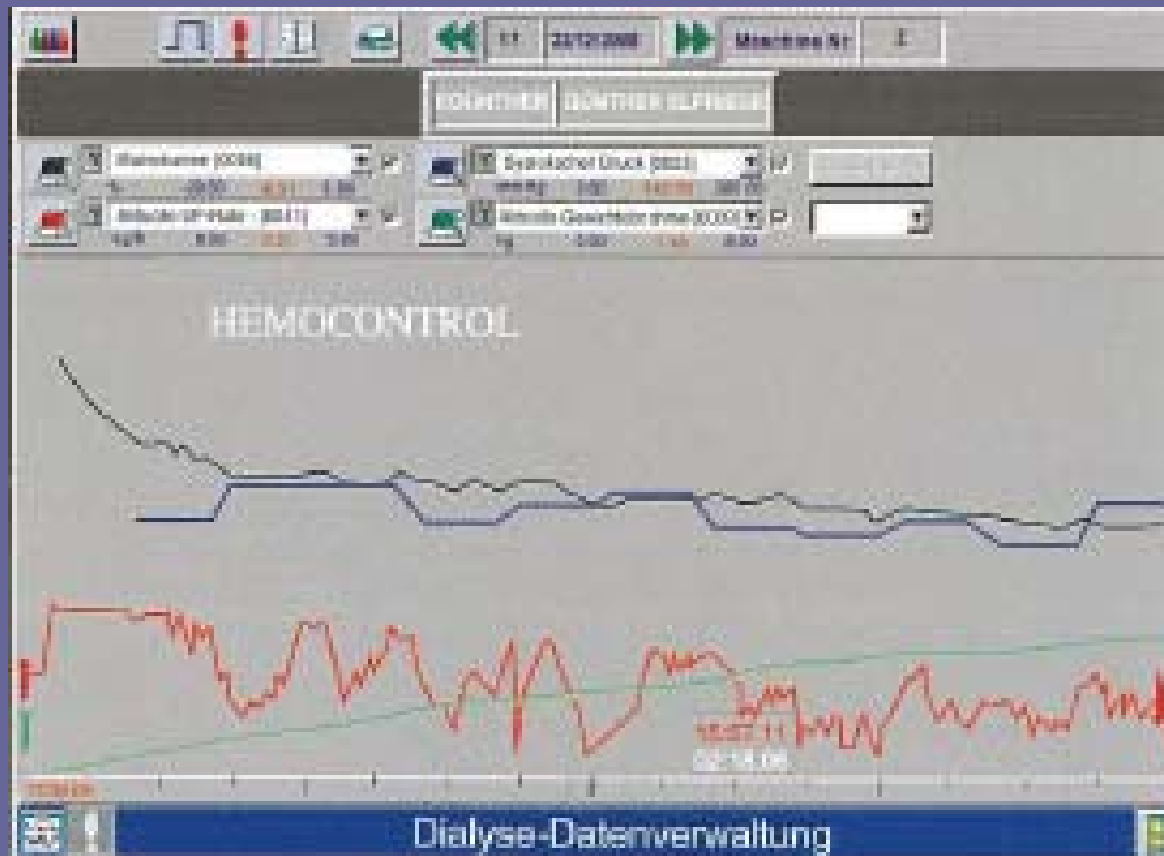


The blood volume decreases more sharply during the first hour with Hemocontrol than during standard haemodialysis. While the blood volume in the second half of the dialysis is relatively stable.

Standard HD



Hemocontrol



Advantages

- Reduction of intradialytic morbid events
- Improved well being post dialysis
- Dialysis efficacy
- Dry weight adjustment
- Better control of hypertension

Statistics

Scarborough Hospital	30
Toronto East General	10
Alliston	20
Collingwood	3
North Bay	30
Thunder Bay	30
Renfrew	30
Huntsville	6
London	10
	<hr/>
	169

How does HC affect you?

Education

- Theoretical background
- How to manage alarms
- Decrease in intradialytic complications
- Less need for nursing intervention
- Re-assessment of patient: q3month

How does HC affect the patient?

- Inform the patient
- Changes in dry weight
- Monitor their sense of well being
- Decrease in BP stabilizing meds

Hemocontrol

- Improves the well being of the patient
- Makes daily routine interesting
- Decrease in nursing interventions
- Free time for better care and communication with patient

Assessment



Patient name: Susan Smith

A	B	C	D	E	F
Dialysis	Date	BV at time of Symptoms/or final %	TWL	Ratio BV/TWL	Symptoms
Nr.		%	kg	%/kg	Yes/No
1	1/15/2001	-12	4.00	-3.0	Yes
2	1/17/2001	-10	3.00	-3.3	No
3	1/19/2001	-9	3.50	-2.6	No
4	1/21/2001	-10	4.00	-2.5	No
5	1/23/2001	-13	5.00	-2.6	Yes
6	1/25/2001	-14	4.00	-3.5	No

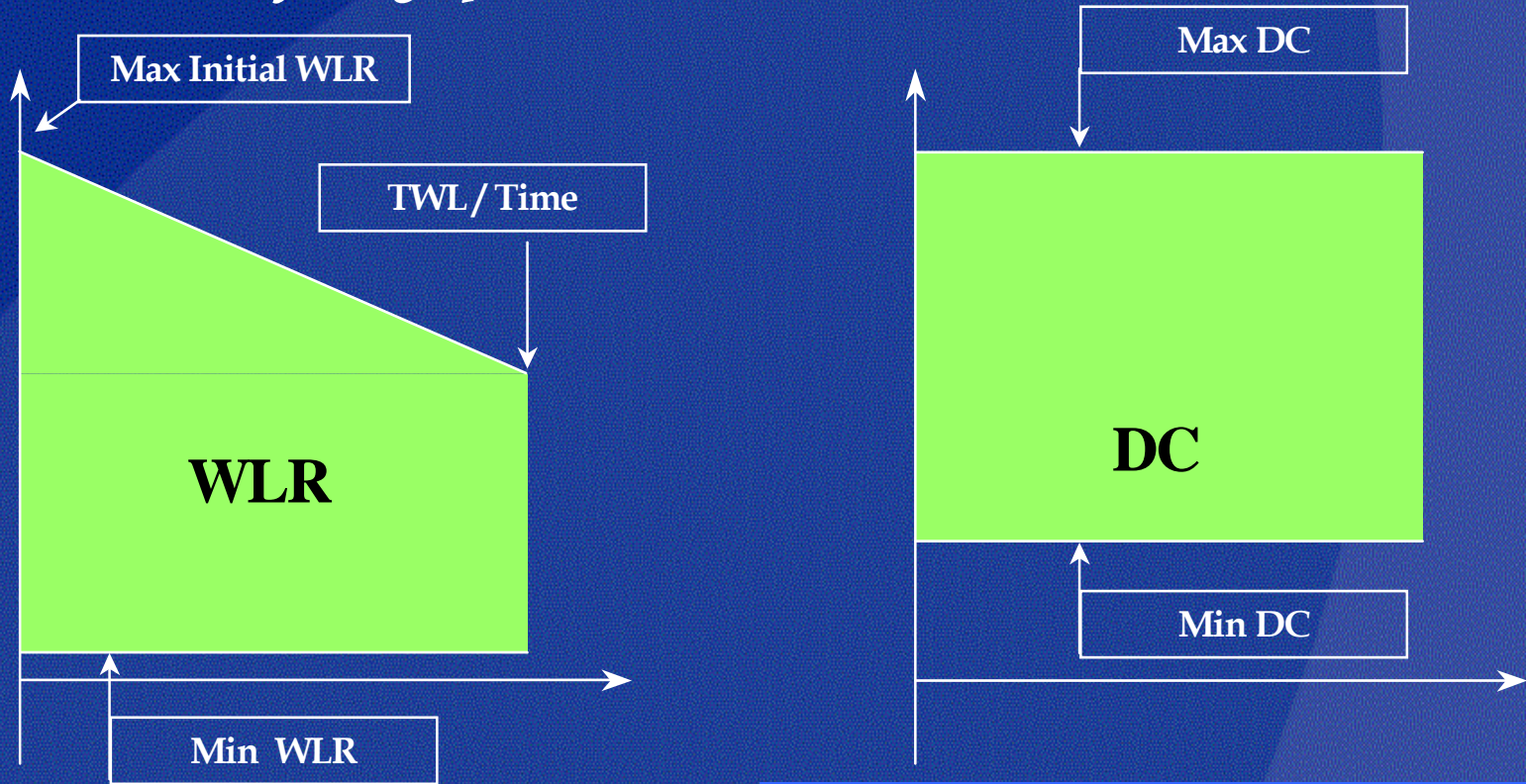
Add all values in columns & divide by the number of entries. Insert result below

Average BV/TWL	-2.9	G
Safety BV/TWL	Multiply Value in Average BV/TWL by 0.8 (80%) and enter value	-2.3

H This value will be entered on Integra

Limits

Safety parameters : Limits

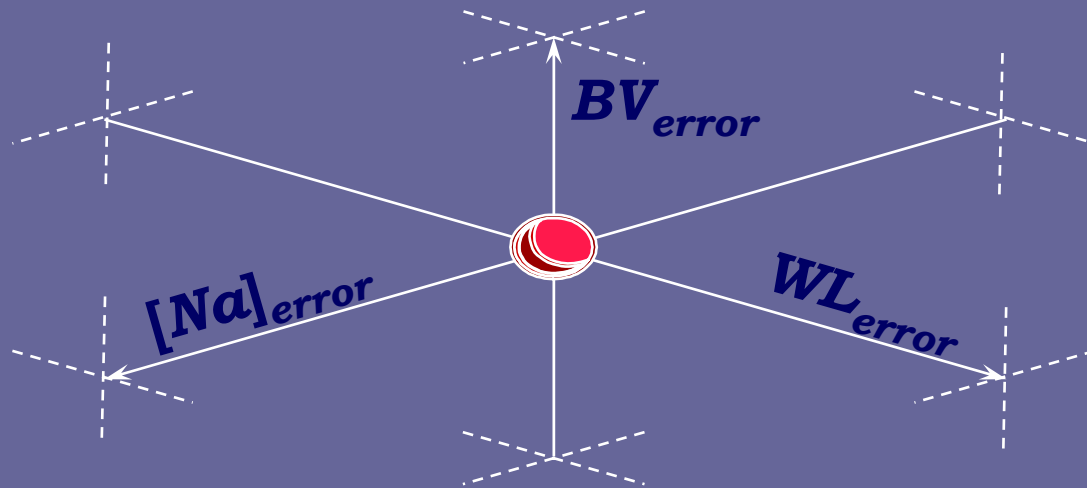


WLR max. = average WLR x 1.8

Cond. max. = (Final Cond.) + 1.5 mS/cm

Cond. min. = (Final Cond.) - 0.5 mS/cm

Preset Machine Tolerances



- **Tolerance BV:** $\pm 3 \%$
- **Tolerance TWL:** $\pm 300 \text{ gr.}$
- **Tolerance Cond. (Na):** $\pm 0,3 \text{ mS/cm}$