

Why we do what we do

Danilo B. Concepcion, CBNT, CCHT-A, FNKF
Operations Manager
St. Joseph Hospital Renal Center
danilo.concepcion@stjoe.org
714-771-8944

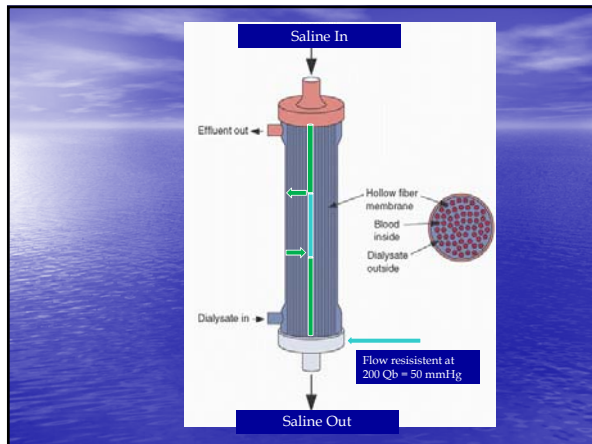
GALLUP GREAT WORKPLACE
The findings and conclusions in this presentation are those of the author and do not necessarily represent the views of St. Joseph Hospital

Center of Excellence

ST. JOSEPH HOSPITAL

Air in the extracorporeal circuit

Why prime at 150 mL/min?
Why must dialyzer ports be capped during priming?



- Rotate the dialyzer so the venous end is lower than the arterial end to fill the dialyzer compartment with dialysate.
- Assume that the dialysate compartment is completely filled with dialysate.
- Return the dialyzer to the arterial end down position.
- Recirculate the extracorporeal circuit at a blood flow rate of 300 to 400 mL/min and a dialysate flow 500 mL/min until all air has been purged from the dialyzer and bloodlines.
- During recirculation, to assist in removing air from the dialyzer, intermittently pinch and release the blood tubing between the blood pump and the dialyzer. It is recommended to gently tap the upper portion of the dialyzer to remove air even if the header area of the dialyzer looks free of air.
- Do not infuse the recirculated saline prime into the patient. Discard the recirculated saline and fill the entire extracorporeal circuit with fresh saline prior to connecting to the patient. The volume of fresh saline used to fill the extracorporeal circuit should be equal to the volume of the dialyzer and blood tubing set in use.

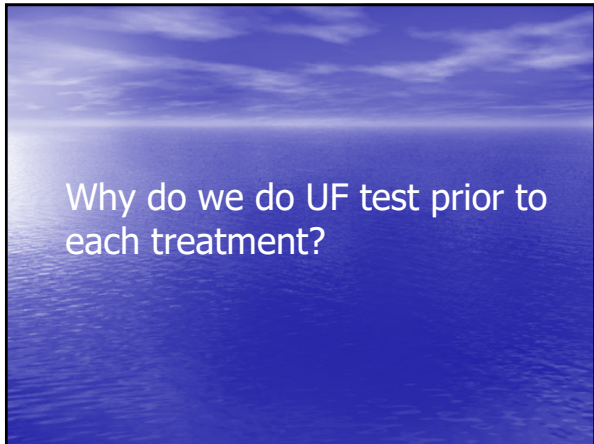
INITIATION OF DIALYSIS

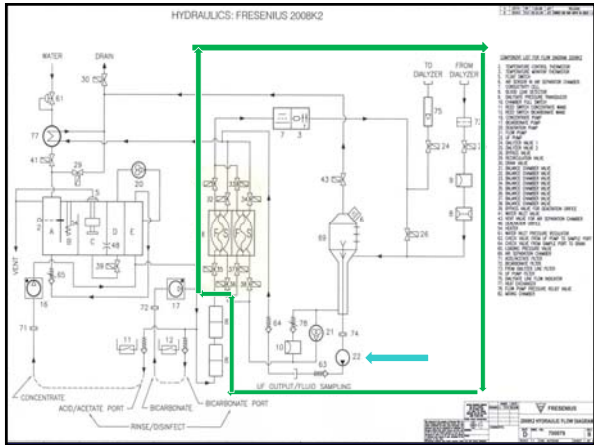
- To initiate dialysis, reduce the blood pump speed to 150 mL/min and then stop the blood pump, clamp the dialysis priming set, arterial, and venous bloodlines.
- Aseptically attach the patient ends of the bloodlines to the arterial and venous access of the patient. Open the arterial and venous mainline and vascular access clamps.
- Turn on the blood pump and slowly increase the blood pump speed to the prescribed blood flow rate. Be sure to monitor the hemodialysis machine arterial and venous blood pressures carefully during this process to note any possible flow restrictions or inappropriate pressure readings.
- Once the prescribed blood flow rate has been achieved, set the prescribed ultrafiltration rate.
- Performance testing has demonstrated that the dialyzer can be run in either the arterial end up or arterial end down position during the hemodialysis treatment. Refer to Figure 2 or 3, Hemodialysis Treatment for proper dialyzer and bloodline positioning.

DURING THE DIALYSIS TREATMENT

- If a blood leak should occur during the treatment, the operator should follow established facility procedures for a dialyzer blood leak.
- Air entering the extracorporeal circuit during dialysis is a very serious event and should be avoided. A routine check of all connections prior to initiation of dialysis and periodically throughout the dialysis treatment is recommended. Constant monitoring of the venous dip chamber with a level / air detector is required. Should air enter the venous line during the treatment, the dialysis treatment must be discontinued without returning any of the blood used with air.

Why prime at 150 mL/min?
 Why must dialyzer ports be capped during priming?







Dialyzer K_{UF} = ml/mmHg/hour
 K_{UF} = 50
TMP tolerance = 600 mmHg
 $50 \times 600 = 30000 \text{ mL} = 30.0 \text{ L} \times 2.2 = 66$
lbs.

Why is bleaching of machines necessary when heat disinfection is more convenient?



Why is conductivity measurement with an independent device performed prior to each treatment?

V250	ANSI/AAMI RD52:2004 Requirements as Adopted by Reference 42 CFR 494.40 (a) 5.6 Dialysate proportioning: <i>monitor pH/conductivity</i> It is necessary for the operator to follow the manufacturer's instructions regarding dialysate conductivity and to measure approximate pH with an independent method before starting the treatment of the next patient.
------	--



Preparing for hemodialysis

5.8.2 Monitoring the dialysate

The displayed value for conductivity is a measure of the total electrolytes only. A measurement of the pH must be performed prior to each treatment to verify that the pH is within range of 6.9-7.6. Once the machine completes the blood side self tests measure the pH using an approved test method.

Recommended therapeutic ranges

pH	6.9 - 7.6
HCO ₃ ⁻	25-38 mmol/L

[The pH required by the AAMI RD 52:2004 standard is 6.9-7.6.]

CAUTION Damage to machine due to calcium depositions at pH value >7.5 during bicarbonate dialysis!
➤ Observe the measured pH value.

! pH values may be less accurate once the machine has initiated the stand-by mode as there is no dialysate flow to the dialyzer.

! Routine laboratory analysis of the total dialysate concentration in relation to the displayed conductivity should be incorporated into the local clinic's policies and procedures.
*ANSI/AAMI RD52:2004

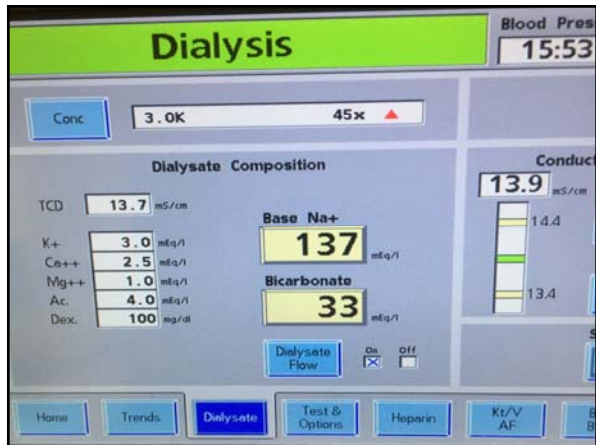
Why is it important to label and know the proportioning ratio of the dialysis machine?

Technical Incidents

- Patients electrolyte and pH at critical levels
- Change in dialysis concentrate

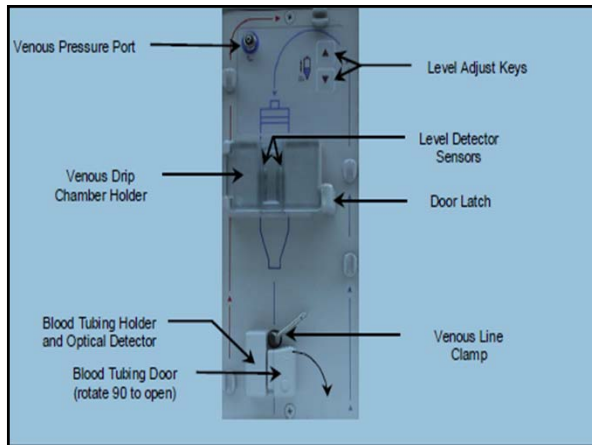
Conductivity

- □ 35x
-1:1:225:32.775
-0.9mL:1.1mL:28.01mL
- Δ 45x
-1:1.72:42.28
-0.9mL:1.17mL:28.827mL



Why is acid cleaning of dialysis machines necessary?

Why does wetting the venous chamber eliminate a level detector alarm or allow the alarm test to be completed?



Why is it critical to perform quality control on test strips and to adhere to instruction for use and regulatory requirement for Total Chlorine?

Incident

- 33 patients admitted to the hospital with anemia, one patient expired
- Strips gave false readings (non-reactive)



Incident

- Incident of clustered bacteremia in one facility
- Enterococcus casseliflavus and aerobic gram-negative bacillus

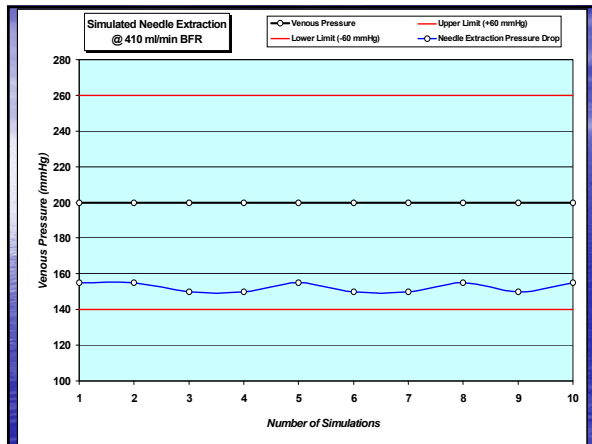
Why is a high arterial negative pressure not good for the patient treatment outcome?

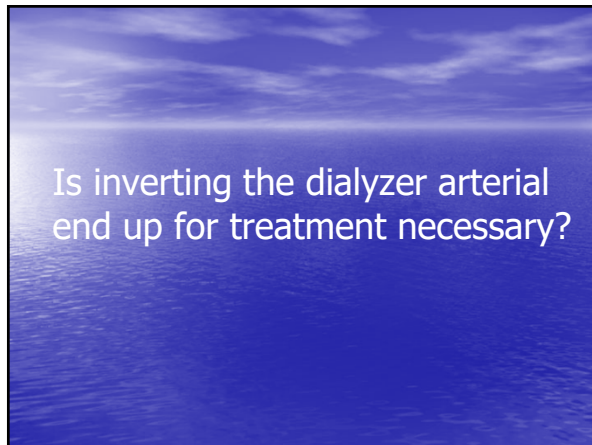
Intra-Dialysis Incidents

- Blood flow delivered is less than displayed set blood flow

Effect of Pre-Pump Arterial Pressure On Blood Flow Rate			
Qb	Pa	Qeff	A
400	-90	400	NC
400	-175	373	-6.7%
400	-250	358	-10.5%







Hollow Fiber Dialyzers NOT FOR REUSE

signed for single use physician. nurse recommended use. unknown. Generally, should only be used contamination with are provider should ious injury or death. ation of dialysis and uld be continuously membranes with an only in conjunction ation control, such in an ultrafiltration ss. In any case, the d. as using quantitative elivered. The clinical serum albumin. r or other elements ersensitivity reaction

- If the dialysate delivery system was chemically disinfected or sterilized prior to patient use, be sure to test for the absence of germicide residuals with a test intended for this application, according to the test manufacturer's instructions.

INITIATION OF DIALYSIS

- To initiate dialysis, stop the blood pump, clamp the dialysis priming set and the arterial and venous bloodlines.
- Aseptically attach the patient ends of the bloodlines to the patient's arterial and venous access. Open the arterial and venous bloodline clamps and the clamps on the patient access.
- Increase the blood pump speed slowly to the prescribed blood flow rate. Be sure to monitor the arterial and venous blood pressures carefully during this process to note any possible flow restrictions or inappropriate pressure readings.
- Once the prescribed blood flow rate has been achieved, set the prescribed ultrafiltration rate and rotate the dialyzer to the arterial end up position.

DURING THE DIALYSIS TREATMENT

- If a blood leak should occur during the treatment, the operator should follow the facility-established procedure for a dialyzer blood leak.
- Air entering the extracorporeal circuit during dialysis is a very serious event and should be avoided. A routine check of all connections prior to initiation of dialysis and periodically throughout the dialysis treatment is recommended. Constant monitoring of the venous drip chamber with a level detector is required. Should air get into the venous line during the treatment, the dialysis treatment must be discontinued without returning any of the blood mixed with air.

TERMINATION OF DIALYSIS

- When the dialysis treatment is completed, turn the blood pump off and set the UF rate to the recommended minimum. Check to see that there is enough 0.9% sterile saline solution in the bag for rinsing the blood in the extracorporeal circuit back to the patient.

