

Hemodialysis: Blood Leak Warning/Alarm

Site Applicability

All PHC Hemodialysis Units—In-Centre unit and Community Dialysis Units

Practice Level

Registered Nurses & Licensed Practical Nurses who have completed the required education and who provide nursing care in a PHC Renal Program hemodialysis specialty perform this protocol.

Need to Know

1. An RN, LPN or renal technician who has received appropriate training responds to a “Blood Leak Visual alarm” on the dialysis machine.
2. Blood leak alarm will activate when sensor detects blood loss of 0.5 mL/min into the dialysate at a patient hematocrit of 0.25.
3. Note the lot number of the dialyzer when blood is present in the dialyzer.
4. Notify the Nephrologist of any concerns about blood loss.
5. Replace volume with NS if required to prevent complications (i.e. if circuit discarded or blood cannot be returned)
6. Check patient’s hemoglobin next run if circuit discarded. The patient may require a blood transfusion if there has been a significant decrease in his/her Hgb due to the blood loss.
7. A mandatory disinfection of the dialysis machine is required if Blood leak test positive.
8. The HD machine is pulled out at the end of treatment and sent to BioMed. In case of Major Blood leak, The HD machine is pulled out **immediately** and HD resumed with new HD set-on a different HD machine.

Equipment and Supplies

1. Hemastix Reagent test strip (check expiry date)
2. Appropriate HD Take-off Supplies if HD lines need to be disconnected (See Below)

AV fistula/graft (AVF/AVG)	Central line
<ol style="list-style-type: none"> 1. 10 or 20 mL syringes filled with normal saline (2) 2. Clean drapes 3. Clean gloves 4. Face protection and gown 	<ol style="list-style-type: none"> 1. 20 mL syringes filled with normal saline (2) 2. Clean drapes 3. Clean gloves 4. Alcohol swabs 5. Face protection and gown

Procedure

STEPS	RATIONALE
1. Reassure patient	<ul style="list-style-type: none"> • To minimize patient anxiety, explain problem & action taken.
2. Immediately visualize dialyzer's dialysate outlet port If red cells are visible to the naked eye, treat as a major blood leak.	<ul style="list-style-type: none"> • To ascertain whether the problem is a major or minor blood leak.
3. Notify Renal Technician and BioMed Staff	<ul style="list-style-type: none"> • Renal Technician may need to do a new HD set-up • BioMed will have to service the HD machine
Machine Response <ol style="list-style-type: none"> a. Audible alarm sound-Message reads, "Blood Leak" b. Visual alarm—red screen alarm appears c. Blood pump stops d. Press Mute button e. Press Override to override alarm f. Dialysate Flow Continues as set 	
Major Blood Leak – Red Blood Cells Visible to the Naked Eye	
1. Put on personal protective equipment (gown, gloves, mask with faceshield)	
2. Stop UF and dialysate flow	
3. Stop blood pump, DO NOT return the blood. Disconnect lines from patient and discard contaminated bloodlines	<ul style="list-style-type: none"> • The blood in the circuit is not returned due to possible contamination.

STEPS	RATIONALE
4. Attach a 20 mL syringe of normal saline to the Arterial and Venous sides of the access and flush the access	<ul style="list-style-type: none"> This will keep the access patent while the machine is being prepared with a new setup.
5. Replace volume if circuit discarded	
6. Remove HD machine and perform mandatory disinfection	
7. Set up new machine for continuation of treatment if required	<ul style="list-style-type: none"> In major blood leak, HD machine should be pulled out <u>immediately</u> and be sent to BioMed for investigation. Use a different HD machine for new set-up
8. Investigate possible cause of blood leak	Possible causes of blood leak includes dropped dialyzer or inappropriate storage
Minor Blood Leak—No Visible Red Blood Cells	
1. Put on personal protective equipment (gown, gloves, mask with faceshield)	<ul style="list-style-type: none"> Donning personal protective equipment prevents potential exposure to blood
2. Press Override and blood pump start to resume treatment	
3. Place the machine on minimum UFR.	
4. Reduce blood pump speed to 150 mL/min. for 5 to 10 minutes	<ul style="list-style-type: none"> Maintains integrity of extracorporeal circuit by restarting blood pump for a period of 2 minutes. The Override key can only be used twice
5. Ensure dialysate flow is on	<ul style="list-style-type: none"> To decrease hydrostatic pressure enhancing clotting of fibers
6. Collect test strips used for testing for blood in dialysate and check expiry date	
7. Place test strip under dialysate flow, either from dialyzer or drain line	
8. Check for presence of blood by reading the test strip according to manufacturer's instructions	
A. Minor Blood Leak (Hemastix=Negative)	
1. If test strip negative, continue treatment	
2. Each time the "blood leak alarm" sounds, check the dialysate with a Hemastix.	

STEPS	RATIONALE
3. If the Hemastix continues to be negative for blood, consult Biomedical Technician, or inform renal technician to change the dialysis machine.	
4. If “blood leak alarm” continues but Hemastix=negative, Return blood to patient and resume HD with new setup	
5. Attach a 10 or 20 mL syringe of normal saline to the Arterial and Venous sides of the access and flush the access	<ul style="list-style-type: none"> This will keep the access patent while the machine is being prepared with a new setup.
6. Pull out the HD machine at the end of treatment and send to Biomed	<ul style="list-style-type: none"> BioMed will test the HD machine for equipment failure
B. Minor Blood Leak (Hemastix = Trace)	
1. Put machine in Bypass mode and return blood to the patient	
2. Attach a 10 or 20 mL syringe of normal saline to the Arterial and Venous sides of the access and flush the access	<ul style="list-style-type: none"> This will keep the access patent while the machine is being prepared with a new setup
3. Prepare a new setup and resume dialysis	
4. Pull out the HD machine at the end of treatment and send to Biomed	<ul style="list-style-type: none"> Send the HD machine to BioMed at the end of treatment for investigation
C. Minor Blood Leak (Hemastix = Moderate – Large)	
1. Clamp Arterial and Venous access and blood lines.	
2. DO NOT return blood. Disconnect blood lines from the patient	<ul style="list-style-type: none"> The remaining blood in the circuit is not returned due to possible contamination
3. Attach a 10 or 20 mL syringe of normal saline to the Arterial and Venous sides of the access and flush the access	<ul style="list-style-type: none"> This will keep the access patent while the machine is being prepared with a new setup.
4. Replace volume if circuit discarded	
5. Pull out the HD machine at the end of treatment and send to BioMed	
6. Prepare a new setup and resume dialysis	<ul style="list-style-type: none"> Send the HD machine to BioMed at the end of treatment for investigation

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Documentation

- Document on HD log sheet and Interdisciplinary Progress notes—Document event, patient's vital signs, blood loss and volume replacement, if applicable
- Document need for STAT Hemoglobin check for next HD treatment, if there is blood loss
- Complete an incident report through PSLS

Patient and Family Education

1. The blood side of the dialyzer is sterile, while the dialysate side is not. Movement of blood into the dialysate indicates a rupture of the membrane and therefore, there is a risk of contamination of the blood by microorganisms.
2. A Hemastix reagent test strip is used to measure the presence of blood in the dialysate.
3. When the blood is contaminated, it cannot be returned to the patient due to a risk of sepsis.
4. The patient's Hemoglobin will be checked before the next HD treatment to determine if a blood transfusion is required.

References

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