

DEPARTMENT: ANCILLARY DIVISION		POLICY NUMBER: DPOTMH-MPP-HEMO-P003-(02)	
TITLE/DESCRIPTION: WATER TREATMENT FOR HEMODIALYSIS UNIT			
EFFECTIVE DATE: May 15, 2025	REVISION DUE: May 14, 2028	REPLACES NUMBER: DPOTMH-MPP-HEMO-P003-(01)	NO. OF PAGES: 1 of 14
APPLIES TO: Hemodialysis Unit Engineering Department, Infection Prevention and Control Unit		POLICY TYPE: Multi Disciplinary	

PURPOSE:

1. To ensure that the Reverse Osmosis System's Membrane is free from contamination of pollutants such colloids, biofilms and biological matter and to prevent serious damage to the system.
2. To ensure the optimum performance of the system is maintained.
3. To ensure a safe, reliable, and efficient system.
4. To ensure safe water to be used for hemodialysis.

DEFINITIONS:

Reverse osmosis – is a filtration method that removes many types of large molecules and ions from solutions by applying pressure to the solution when it is on one side of a selective membrane. The result is that the solute is retained on the pressurized side of the membrane and the pure solvent is allowed to pass to the other side.

Purified water – water free from contaminants such as chemicals, organic matter, bacteria or bacterial fragments and is ready to use in a hemodialysis machine.

Raw Water- water that has not been treated in any way.

Product water – purified water that underwent reverse osmosis treatment.

Point-of-use water – water that is close proximity to or approaching the dialysis equipment.

UVC (ultraviolet-C radiation) – used as a disinfectant in a water system that eliminates microbiological contaminants (germs, bacteria, and viruses).

DOH A.O. 2013-0003 – discusses the Implementing Guidelines in the Analysis, Monitoring and Maintenance of Water used in Dialysis Facilities Pursuant to Administrative Order No. 2012- 0001 Known as "New Rules and Regulations Governing the Licensure and Regulation of Dialysis Facilities in the Philippines"

Total Dissolved Solids (TDS) – refers to the measures of all dissolved mineral salts metals and other inorganic substances present in a given volume of water.



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RESPONSIBILITY:
Hemodialysis Technicians, Maintenance and Engineering Personnel, Safety and Pollution Control Officer, Infection Prevention and Control Unit, Hemodialysis Supervisors

POLICY:

1. Approved water treatment and cleaning procedure shall always be followed.
2. The Hemodialysis Unit shall use the Product Water from four (4) reverse osmosis water treatment systems (RO1, RO2, RO3, and RO4) and two (2) water distribution systems (Line A [Red] and Line B [Yellow]).
3. Only authorized maintenance and hemodialysis personnel shall be allowed to clean and operate the water treatment system and the water distribution system.
4. Maintenance and Engineering Personnel shall disinfect the reverse osmosis system once a week, preferably every Saturday night. Adjustment in the schedule shall be communicated accordingly. Maintenance and Engineering Personnel shall change the membrane for the reverse osmosis system every three (3) months or earlier as determined by a consistent TDS reading of greater than 10PPM.
5. As an internal preventive measure, a weekly bacteriological test shall be conducted a day following the weekly disinfection.
6. Hemodialysis Technicians shall change both filters for the Red Riser Tank and Yellow Riser Tank every month, these are located in the Hemodialysis Unit.
7. Bacteriological Test of the raw water, product water, and the point-of-use water shall be done every month. Failed water result parameters based on DOH AO 2013-0003 and Association for the Advancement of Medical Instrumentation (AAMI) standards shall require the water treatment system and/or the water distribution system involved to cease operation until the issue is identified and resolved.





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8. Physical and Chemical Test of the point-of-use water shall be done every six (6) months. Failed water result parameters based on DOH AO 2013-0003 and AAMI standards shall require the water treatment system and/or the water distribution system involved to cease operation until the issue is identified and resolved.
9. The Dialysis Unit Head, together with the Hemodialysis Supervisors, Safety and Pollution Control Officer, Infection Prevention and Control Unit, shall ensure that the Bacteriological Test and the Physical and Chemical Test are compliant to the DOH AO 2013-0003 and AAMI standards.
10. Infection and Prevention Control Personnel shall see to it that procedure such as manner of cleaning, frequency, collection, TDS reading, and logbook are observed and monitored.



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PROCEDURE (SOP):

WATER TREATMENT FOR HEMODIALYSIS UNIT

1. Hemodialysis Technician ensures the integrity of the water system in the unit.
2. Raw water undergoes the following process:
 - 2.1. Raw water(chlorinated deep-well water) is stored in Raw Water Tanks: A, B, and C will undergo reverse osmosis procedure that makes the underground water into product water (purified water) ready for use in Hemodialysis Unit.
 - 2.2. The raw water will then enter the pre-treatment stage of the process.
 - a) Suspended solids will be eliminated through the multimedia tank.
 - b) Activated carbon tank will filter out the chlorine present in the water.
 - c) Water softener tank removes any contaminants that makes the water hard.
 - d) A 5 micron fiber filter is used to remove sediments as small as 5 microns.
 - e) Particles smaller than 5 microns will be filtered out through the 1 micron fiber filter.
 - f) After this stage the water is stored in a soft water tank.
3. Maintenance and Engineering Personnel disinfects the reverse osmosis system once a week, preferably every Saturday night. Write in the log book the details of the disinfection (name of performing personnel, date and time performed).
4. Hemodialysis Technicians changes both filters for the Red Riser Tank and the Yellow Riser Tank located in the Hemodialysis Unit every month. Document the details of the filter change.
5. Maintenance and Engineering Personnel changes the membrane for the reverse osmosis system every three (3) months or earlier as determined by a consistent TDS reading of greater than 10PPM. Document the performed procedure.
6. The Safety Pollution Control Officer and the Hemodialysis Supervisor ensure that all paramenters are checked and procedures are consistently followed according to the set schedule.

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ANALYSIS, MONITORING AND MAINTENANCE OF WATER USED IN HEMODIALYSIS

- The point-person, or his/her representative, from every unit concerned shall supervise their staff in the sampling and collection of water samples for analyses.
 - Safety and Pollution Control Unit
 - Infection Prevention and Control
 - Infection Control Microbiology Section Laboratory
 - Hemodialysis Unit
 - For the Hemodialysis Unit, the additional samples shall be collected and tested by DOH Accredited Laboratory.
 - **Raw water**
 - One sample: Water tank (A, B, or C)
 - One sample: Raw water sampling point
 - **Product water**
 - One sample: Either of the RO System (1, 2, 3, or 4)
 - One sample: Either of the storage tanks (Riser A and Riser B)
 - **Point of use**
 - One sample: Main Hemodialysis Unit
 - Two samples: New HD Units (Wing 1 and Wing 2)
 - To ensure impartial results, the above-mentioned water samples shall be sent to DOH accredited laboratory for dialysis water analysis independent from the Dr. Pablo O. Torre Memorial Hospital's laboratory.
 - Pursuant to DOH Administrative Order 2013-0003, the bacterial limit shall be as follows:
 - HPC less than 200 CFU/ml (pour plate technique)
 - Fecal Coliform less than 1.1 MPN/100ml
 - If the results higher than the compliance of DOH under A.O 2013-0003, Please refer to policy on *Corrective Measures for Exceeding AAMI Water Quality Standards in HDC Operations DPOTMH-(MPP-HEMO-P007)*
1. Prepare materials needed for the collection of water samples. Water for microbial testing will be contained in a sterile bottle properly marked and labeled with the following information:
 - 1.1. Name/location of sample point

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- 1.2. Date of collection
- 1.3. Time of collection
- 1.4. Sampling point classification (raw water, product water, or point of use)
2. Ensure that all parties (sections/ departments) involved must be present every scheduled water sampling.
3. Water samples shall be collected at three (3) points, namely:
 - 3.1. Raw water: water before it enters any part of the water treatment system
 - 3.2. Product water: water drawn from a sample point immediately after the RO system
 - 3.3. Point of use: water drawn at a point within close proximity approaching the dialysis equipment.
4. Any hose attached to the sampling points should be removed.
5. The sampling points shall be disinfected with 70% isopropyl alcohol using a sterile gauze. Bleach or other disinfectant solutions should not be used.
6. Rinse the sampling points for at least 5 minutes at normal pressure and flow rate before drawing the samples.
7. Samples shall be collected using a 'clean catch' technique to minimize potential contamination of the sample which may lead to false positive results.
8. The sample volume collected should be 5ml to 1000ml depending on the test to be run and/or specified by the laboratory who will perform the test.
9. The water samples are sent to the laboratory for testing.
10. In the event when test results exceed the limits, the following shall be the contingency actions:
 - 10.1. The concerned water facility shall be temporarily isolated from use until the repeat test of the failing parameter complies with the standards.
 - 10.2. A water treatment system/ water distribution system independent from the one with the failing parameter/s shall be used alternatively, unless otherwise contraindicated.



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- 10.3. The Safety and Pollution Control Officer, Infection Prevention and Control Unit, Microbiology Section – Laboratory Department and Hemodialysis Unit shall convene if the result exceeds the limits.
- 10.4. Review the procedures in the water system to isolate the potential problem and corrective measure shall be undertaken in the area of the suspected cause.
- 10.5. Re-sampling and re-testing shall be conducted of the affected parameter once the issue has been resolved.
11. Patients will be transferred for Hemodialysis Treatment. *(Please refer to Contingency Plan/SPP Policy)*






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WORK INSTRUCTION:	
WATER TREATMENT FOR HEMODIALYSIS UNIT	
KEY TASKS	PERSON RESPONSIBLE
1. Ensures the integrity of the water system in the unit.	Hemodialysis Technician
2. Disinfects the reverse osmosis system once a week, preferably every Saturday night.	Maintenance and Engineering Personnel
3. Documents in the log book the details of the disinfection (name of performing personnel, date and time performed).	
4. Changes both filters for the Red Riser Tank and the Yellow Riser Tank located in the Hemodialysis Unit every month.	Hemodialysis Technician
5. Documents the details of the filter change.	
6. Changes the membrane for the reverse osmosis system every three (3) months or earlier as determined by a consistent TDS reading of greater than 10PPM.	Maintenance and Engineering Personnel
7. Ensures that all parameters are checked and procedures are consistently followed according to the set schedule.	Hemodialysis Supervisor
	

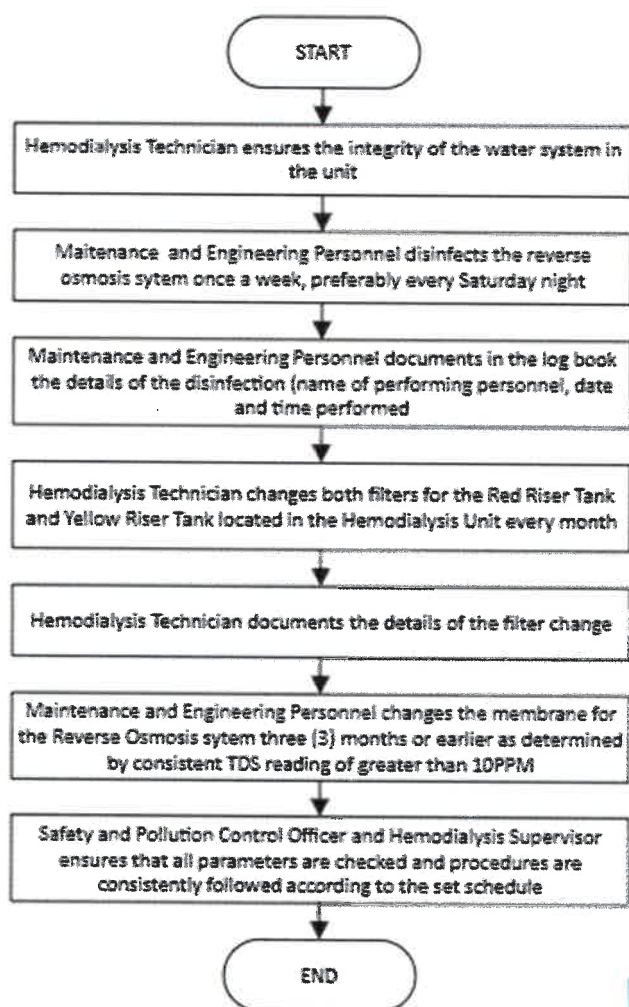
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ANALYSIS, MONITORING AND MAINTENANCE OF WATER USED IN HEMODIALYSIS	
KEY TASKS	PERSON RESPONSIBLE
1. Prepares the materials needed for the collection of water samples.	Hemodialysis Staff
2. Ensure that all parties (sections/ departments) involved must be present every scheduled water sampling	Hemodialysis Supervisors
3. Identifies the 3 points where the water samples will be collected.	Maintenance and Engineering Personnel
4. Removes any hose attached to the sampling points	
5. Disinfects the sampling points with 70% isopropyl alcohol using a sterile gauze.	Laboratory Personnel
6. Rinses the sampling points for at least 5 minutes at normal pressure and flow rate before drawing the samples.	Safety and Pollution Control Officer
7. Collects samples using a 'clean catch' technique to minimize potential contamination of the sample. The sample volume should be 5 ml to 1000 ml depending on the test to be run	Laboratory Personnel
8. Sends the water samples to the performing laboratory.	Safety and Pollution Control Officer
9. Document the results.	Laboratory Personnel
10. Stops Operation of HD Unit.	Hemodialysis Head
11. Conducts a meeting to review the procedures in the water system to isolate the potential problem and discuss the corrective measures to be taken.	Maintenance and Engineering Personnel, IPCU, Safety and Pollution Control Officer
12. Conducts re-sampling and re-testing once the issue has been resolved.	All participating departments
	

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WORK FLOW:

WATER TREATMENT FOR HEMODIALYSIS UNIT





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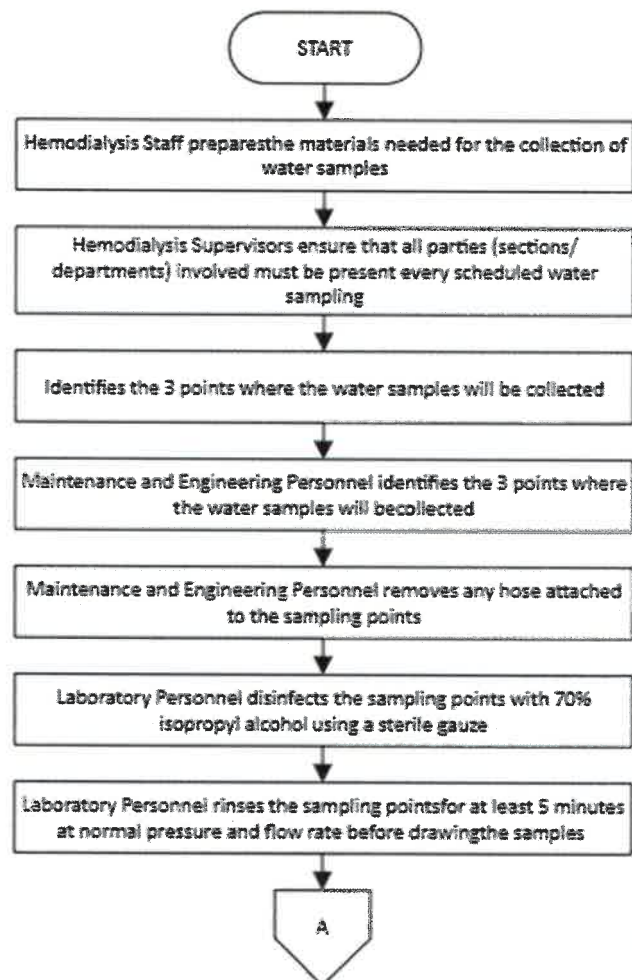
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ANALYSIS, MONITORING AND MAINTENANCE OF WATER USED IN HEMODIALYSIS



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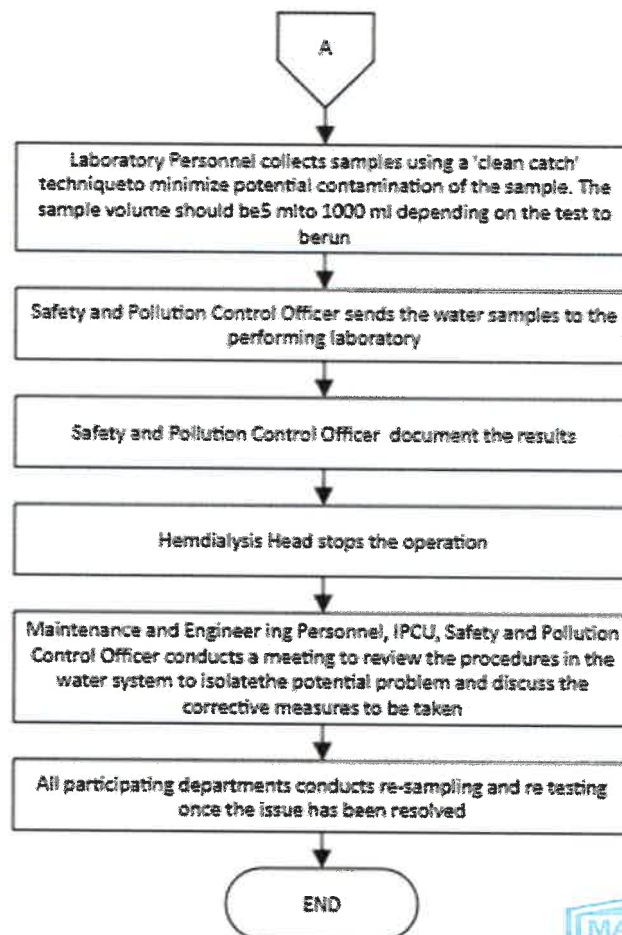
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FORMS:N/A

EQUIPMENT:N/A

REFERENCES:

1. DOH Administrative Order 2012-0001: New Rules and Regulations Governing the Licensure and Regulation of Dialysis Facilities in the Philippines.
2. DOH Administrative Order 2013-0003: Implementing Guidelines in the Analysis, Monitoring and Maintenance of Water used in Dialysis Facilities Pursuant to Administrative Order No. 2012-0001
3. ANSI/AAMI/ISO 23500-1:2019: Preparation and quality management of fluids for hemodialysis and related therapies,
4. Water Treatment for Hemodialysis, QP-07 Hemodialysis Policy and Procedure Manual
5. Implementing Guidelines in the Analysis, Monitoring and Maintenance of Water Used in Dialysis Facilities Pursuant to Administrative Order No. 2012-0001 known as "New Rules and Regulations Governing the Licensure and Regulation of Dialysis Facilities in the Philippines. DOH Administrative Order 2013-0003. Manila, Philippines: Department of Health, 2013.
6. New Rules and Regulations Governing the Licensure and Regulation of Dialysis Facilities in the Philippines. DOH Administrative Order 2012-0001. Manila, Philippines: Department of Health, 2012.
7. Preparation and quality management of fluids for haemodialysis and related therapies. ANSI/AAMI/ISO 23500-1:2019. Arlington, VA: Association for the Advancement of Medical Instrumentation, 2020.





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