

Introduction: Water is the common risk factor for all patients receiving hemodialysis. Errors in water treatment affect all patients on treatment in a facility at the same time. Failure to recognize poor quality water, failure to adequately treat water contaminated with chemicals, bacteria, or toxins, or failure to recognize that treatment components are not operating effectively puts hemodialysis patients at risk of injury and death. Clinical Engineers who provide expertise to Renal Units must demonstrate not only technical knowledge and skills but must also have a clinical understanding of anatomy and physiology of the kidney, chemistry and physics of the Hemodialysis machine and their applications in the process in Hemodialysis treatments



Who is Responsible: The medical director of the dialysis unit is ultimately responsible for the water treatment system. Issues concerning the operation of the system and results of monitoring should be reported routinely to the medical director. Incorporating these reports as part of a monthly quality management meeting is an effective way to achieve and document this communication, with the understanding that some issues would need to be reported immediately. The most critical component in any water treatment system is the human one. The individuals operating the system must understand the importance of their work and how and what they do can affect patient health and safety.

Compliance with the following is essential

Standards: Compliance with ISO, European Pharmacopeia

Surveillance: Chlorine monitoring, Conductivity, Hardness

Water Testing: Monthly Microbiological, and Quarterly Chemical

PPM's Maintenance on Water plant rooms as well as dialysis machines is essential.

5008
Dialysis
Machine



Discussion: Dangers of high levels of the following in dialysis water

Aluminium dialysis encephalopathy and possible bone disease

Calcium / Magnesium hypercalcemia, Hypermagnesaemia associated with nausea, vomiting and muscular weakness.

Chlorine / Chloramine haemolysis, anemia, methemoglobinemia.

Copper nausea, chills, headache, liver damage, fatal hemolysis.

Fluoride osteomalacia, osteoporosis, and death.

Lead neurological damage

Nitrate methemoglobinemia with cyanosis hypotension and nausea

Sodium Hyponatremia noted by Hypertension, pulmonary edema, vomiting, headache, tachycardia and shortness of breath. It can be fatal

Sulphate Nausea vomiting and metabolic acidosis