



Managing Your Water

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Water basics

Water is one of the basic elements of the dialysis process. In fact, water makes up 97.7% of the dialysate solution used for dialysis. Your supply of water, whether from a municipal water system or from a well, includes minerals and some bacteria. Because you are exposed to large amounts of water during dialysis it is very important to keep your water clean so that your dialysis treatments are safe.

For a person without kidney disease, any contaminants in water will pass into their body through their gut before being filtered through their kidneys. As a result, such contaminants rarely pose a significant threat to their long term health. However, for people on hemodialysis the water in the dialysate solution is separated from their blood by only a membrane, so it is possible for bacteria, viruses or unwanted minerals in the water to pass through into the blood. For this reason it is important to make sure that all water used for dialysis is free of such contaminants.

Reverse osmosis machine (RO)

Reverse osmosis machines are used to filter impurities from water. The machine uses a very fine membrane (filter) with holes large enough to allow water molecules to pass through, but too small for minerals or bacteria. The result is that only pure water is pulled across the membrane.

To work properly the machine needs regular cleaning and maintenance and a certain level of water pressure.



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What is in tap water?

Minerals Many different types of minerals are found in water, including calcium and magnesium. These minerals are important for your health. However, because of the large amount of water used for dialysis, all minerals need to be removed to avoid your getting too much.

Leaves and debris You may notice at times that your water supply is cloudy or has a strange colour. Cloudy water is caused by small particles of leaves and excess minerals that sometimes enter the water supply. These particles need to be completely removed before the water is suitable for dialysis.

Chlorine Most cities add chlorine to their water supply to ensure it is safe from unwanted bacteria or viruses. For dialysis, however, it is necessary to remove chlorine from the water.

Endotoxins These are pieces of bacteria or viruses that should be removed from the water used for dialysis to help prevent infections. Endotoxins can be detected under a microscope. According to Canadian guidelines, water for dialysis should not contain more than 1.0 EU/mL (endotoxin units per millilitre of water).

Colony forming units (CFU) These are clusters of whole bacteria. Bacteria can be seen by looking at water under a microscope. Typically they attach together in long strands called colony forming units. According to Canadian guidelines, water used for dialysis must have less than 100 CFU/mL.

Water filters

The RO machine needs enough water supply and pressure to work properly. The measurement we use to determine adequate water pressure is called psi (pounds per square inch). Your RO machine typically needs between 35–80 psi to work effectively.

Pre-filters are large water filters used to prevent contaminants like leaves, particles and chlorine from forming on the RO membrane. Typically, our water supply in BC is of good quality with low levels of bacteria. However, municipal and well water can contain fine debris that must be removed before being used for dialysis.



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Chlorine is often used in municipal water, and if your water for dialysis is from this source you should use a micron filter and 3 carbon filters. For dialysis water that is supplied from a well and does not use chlorine — one or two micron filters may be enough. Ask your nurse about what pre-filters you need.



For instructions on how to change filters, how to check chlorine and how to check your RO machine for conductivity and rejection rate, see section 13 in your Gambro manual.

Water cleanliness

To ensure your water is safe for dialysis:



- Change your filters at least once a month. Also change filters if you notice a decrease in your water pressure.
- Check the RO rejection rate every dialysis treatment. Call Gambro if your rejection rate is less than _____

Collecting water samples

To ensure your reverse osmosis machine is working properly you must collect water samples every month. An explanation of how to collect water samples is in section 13 of your Gambro manual.

What does it mean if your water samples fail?

If the endotoxin count (EU/mL) or the colony forming unit (CFU) count in your water is too high (above 1.0 EU/mL or above 100 CFU) there could be a number of explanations.

1. The sample was taken incorrectly (e.g. the sample was touched)
2. The RO machine has not been disinfected properly
3. The RO machine isn't working well

Did you know: The average dialysis patient will use 360 liters of water a week. This is about 20 times the amount of water that most people drink in a week.

Because people with kidney disease cannot get rid of extra minerals and toxins, any toxins in water will accumulate in your body.



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Discussion questions

After reading this section and the Gambro manual section 13 complete the following questions and review with your training nurse.

Why do water samples need to be collected every month?

What is the lowest psi that you should allow before you change your filters?

What filters should you change?

(From section 13 of your Gambro manual)

What is a normal conductivity for your WRO? At what point should you call Gambro?

What port do you take water samples from? How much water is needed?

What is the integrated disinfection cleaning? How often do you use this disinfection? (talk to your nurse)

