



PRACTICAL WAYS TO OPTIMISE DIALYSIS MACHINE DISINFECTION SCHEDULES

Australian and New Zealand
Society of Nephrology

Practical ways to optimise dialysis machine disinfection schedules

Disinfection of dialysis machines requires heat, water, and cleaning product. Minimising unnecessary disinfections will reduce power, water, and product requirements, thereby reducing the environmental impact of haemodialysis and saving money.

Types of machine disinfections:

- Heat disinfection without acid
- Heat disinfection with acid
- Alkaline disinfection: cold water bleach disinfection (chemical disinfection) or hot water sodium carbonate disinfection

Dialysis machines must undergo heat disinfection between every treatment, and a minimum disinfection frequency for unused machines is also recommended. Heat disinfection with acid reduces scale building up within the machine and is recommended at least daily following machine use. Alkaline disinfection degrades the machine and may be recommended in addition to heat disinfections.

There are several ways of scheduling disinfections:

- Manual disinfections require staff to select the desired disinfection type and commence the disinfection
- Automated disinfections can be selected to occur following completion of every dialysis treatment
- Automated disinfections can be scheduled to occur at a certain time each day with the aim of avoiding excessive time passing between disinfections of unused machines. These can be scheduled during the day or as an integrated disinfection overnight. An integrated disinfection uses the hot water for disinfection of the plumbing loop to also flush through the dialysis machines; this is an efficient way of disinfecting many machines and the only way to disinfect the inlet line connecting the machine to the plumbing loop

If a machine is in use for dialysis at the time of an automated scheduled disinfection, it will skip this disinfection.

ANZSN acknowledges the Traditional Custodians of Country throughout Australia, recognises their unique cultural and spiritual relationships to the land, waters and seas and their immense contributions to society, and pays respects to Ancestors and Elders, past and present. ANZSN acknowledges and respects iwi and hapū as tangata whenua of Aotearoa and is committed to upholding the principles of Te Tiriti o Waitangi (the Treaty of Waitangi). To read our statement on Indigenous Health [click here](#).

CASE STUDY 1



Case 1

A dialysis unit use Fresenius 5008 dialysis machines. These machines require heat disinfection with citric acid between every treatment and no machine should be used for dialysis if >72 hours has passed since the last disinfection.(1) The in-centre dialysis units operate 1-2 treatment shifts each day Monday-Saturday, treating approximately 100 haemodialysis patients across the service.

The 5008 dialysis machines were automated to complete a heat disinfection with citric acid at the conclusion of every treatment and all machines (including all used and spare machines) were automated to complete a scheduled disinfection at 5:30 am Monday-Saturday. This daily scheduled disinfection prevented an excessive period passing between disinfection and use of any machine not used for dialysis in the prior 24 hours. This schedule resulted in many dialysis machines completing two disinfections between use - once after the last treatment of the day and again the following morning.

Intervention and results

By moving the automated scheduled disinfection Tuesday-Saturday to occur during the morning treatment shift, only unused machines now undergo this daily disinfection. This has reduced the number of disinfections completed each week by 25% across the health service and has reduced the number of disinfections completed each year by greater than 8000, saving > 160,000 L of water, 6.4 Mwh of power, and 720L of citric acid solution (saving \$2,400 in product).

CASE STUDY 2



Case 2

A dialysis unit in Australia uses Fresenius 4008 dialysis machines for home haemodialysis patients. These machines require heat disinfection with citric acid between every treatment and no machine should be used for dialysis if >72 hours has passed since the last disinfection.⁽²⁾ Patients were instructed to disinfect their machines before and after every treatment, resulting in the machines unnecessarily being disinfected twice between treatments.

Intervention and results

In appropriate patients with stable water quality, patients were instructed to disinfect their machines before treatment if they had had a long break since the last treatment (>1 day break) and after every treatment. For patients dialysing three times each week, this will reduce the disinfections completed by 30%, cutting the number of disinfections completed each year from 312 to 208, with important reductions in water, power, citric acid product, and patient time consumed.

Conclusion

It's important for dialysis units to be aware of the manufacturer recommendations regarding disinfection of the specific dialysis machine in use to be able to assess the suitability of the schedule in place. Simple changes can result in significant water, power, product, and cost savings. There is no benefit to patient safety in completing redundant disinfections.

References

1. Fresenius Medical Care. 5008 Haemodialysis system operating instructions. Software version 3.52, 5th Edition, September 2006.
2. Fresenius Medical Care. 4008S Haemodialysis machine operating instructions. Software version 4.1, 11th Edition, February 2001.