

Rapid Response Report

NPSA/2008/RRR007

From reporting to learning

30 September 2008

Risks to haemodialysis patients from water supply (hydrogen peroxide)

Water quality for patients receiving haemodialysis is particularly important because of exposure to high volumes of fluid (usually over 100 litres for each treatment); thin dialysis membrane offering weaker protection than the gastrointestinal tract; and compromised renal function reducing ability to filter out toxins.

In September 2008, a trust reported a cluster of incidents to the NPSA where haemodialysis patients were re-admitted to the hospital 2-7 days after treatment with acute haemolysis (destruction of red blood cells leading to anaemia and risk of severe hyperkalaemia). One patient with a history of severe cardiac problems died and four other patients with severe symptomatic anaemia needed blood transfusion. No patients were acutely unwell at time of dialysis. Initial investigation by the trust revealed that silver stabilised hydrogen peroxide had been added the day before the treatment of these patients to the main hospital water system, which feeds the dialysis water supply, to address water quality issues including legionella. The renal unit had not been informed beforehand of this change to the water.

Review of the Reporting and Learning System (RLS) shows no related incidents reported up to 26 September 2008 in England and Wales. Clinical and published information suggests similar incidents in Scotland (four adult haemodialysis patients including one in intensive care) and Israel (nine children). All showed immediate signs of methaemoglobinaemia (oxidisation of iron in haemoglobin) at the time of dialysis, which was stopped, and all patients recovered.

Clinical staff should be alert to signs of haemolysis, which are variable and may be acute (headache, weakness, tachycardia and breathlessness) or, as in this recent case, by a cluster of patients with milder symptoms of anaemia some time after treatment. Staff should also be aware of signs of methaemoglobinaemia during dialysis where patients become cyanosed, with drop in oxygen saturation by pulse oximetry (but normal blood gas readings).

An alert issued today by DH Estates & Facilities Division [DH 2008-08] instructs organisations on steps to ensure safe water supply for all areas where haemodialysis treatment is provided. To complement this technical advice, this Report alerts clinical staff to signs of harm in patients and identifies actions for better information sharing between clinical and estates functions to prevent recurrence. Note that although in this case the causative agent appears to be silver stabilised hydrogen peroxide, alternative antibacterial additives may have a similar effect on patients at risk.

For IMMEDIATE ACTION by: Medical Directors, Renal Clinical Directors and Technical Managers, Clinical Governance Leads and Estates/Facilities Managers

Scope: Outpatient dialysis facilities; inpatient areas where dialysis provided (intensive care, renal wards, isolation areas); and satellite dialysis units in community

Date for action complete: 31 October 2008

Local organisations should ensure that:

- This RRR is circulated to all clinical staff involved in the care of patients receiving haemodialysis so that they can be alert to clinical signs and symptoms.
- Working groups and decisions on future changes to water supply include appropriate clinical input, with active engagement of renal technicians.
- The Medical Director is aware of water supply feeds to dialysis patients, any chemicals added to the water supply, timetable for disinfection and action to implement DH Estates & Facilities Alert 2008-08.
- Clinical staff continue to report incidents, including serious near misses, through local systems and upload these promptly to the RLS to share learning of urgent risks.

The NPSA has informed: NHS organisations, the independent sector, commissioners, regulators and professional bodies. **Queries about this report to:** rrr@npsa.nhs.uk or 020 7927 9890. Non-clinical technical queries to mb-defects&failures@dh.gsi.gov.uk