

Green Nephrology Awards 2012

Bradford Renal Unit: Central Delivery of Acid for Haemodialysis

The installation of storage tanks and associated piping allows the supply of acid for dialysis in bulk load through fortnightly/monthly deliveries. This acid is then distributed to all dialysis machines via a piped loop system with outlets at each dialysis station. This replaces the use of 6 litre plastic cans of dialysate acid solution through weekly orders, avoiding the wastage of approximately 50,000 litres of acid per year and eliminating 4.2 tonnes of used cans from the clinical waste stream.

Benefits to environmental sustainability

Reduced Acid Wastage

Using 6 litre cans, on average 2.14 litres of acid was wasted per dialysis session - over 50,000 litres/year.

At £0.38/litre, the new system has saved £19,372/year on reduced acid wastage. Multiplying this cost saving by an emissions factor for pharmaceuticals produces an estimate of carbon savings from avoided supply chain activities:

$$19,372 \times 0.43^* = \mathbf{8,330 \text{ kg CO}_2\text{e per year}}$$

Reduction in packaging waste

29540 empty canisters were disposed of in 2008, each weighing 142.6 grams, amounting to 4.2 tonnes/year of plastic waste. The carbon savings from avoiding disposal of this waste via the clinical waste stream can be estimated at:

$$4.2 \times 1,057^{**} = \mathbf{4,439 \text{ kg CO}_2\text{e per year}}$$

* emissions factor for pharmaceuticals, Annex 13, 2012 Guidelines to Defra / DECC's GHG Conversion Factors for Company Reporting

** life-cycle GHG conversion factor for incineration of hard plastics, Table 9d, 2011 Guidelines to Defra / DECC's GHG Conversion Factors for Company Reporting



“A year on and the use of a centralised acid delivery system has reduce the wastage of acid by 28% in both volume and cost terms. This reduction in acid usage and associated waste equates to a saving of £19,892.”

Brett Thompson, Senior Renal Technologist

Financial benefits

Investment: £40,000 for storage tanks and piping + £3,900 for enabling works = £43,900.

Savings: £19,372 per year from reduced acid wastage + £3,700 from reduced waste disposal = **£23,072 per year**

Return on investment at 5 years:

$$\frac{\text{total saving to date} - \text{total cost to date}}{\text{total cost to date}} \times 100 = \mathbf{163\%}$$

Details of implementation

The new two-acid, two-loop system was installed in 2011, at a cost of £40,000. This comprises a 7000 litre storage tank for the main acid solution, a 4000 litre tank for the low calcium solution, and a pressurised loop to deliver the acid to the dialysis machines. The Trust also paid an additional £3,900 for enabling works – a bund system connected to an outside drain, in case of leakage.

Investment costs were covered from the capital replacement budget, with 20% of savings returning to the renal department under the Trust's Cost Improvement Programme.

The tanks are large and heavy. We were fortunate to find suitable storage space by relocating the stores of peritoneal dialysis fluid. A bund was created to contain any potential leakage, connected to an outside drain.



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