

# Green Nephrology Awards 2012

## East Kent Hospitals: 44:1 Haemodialysis Concentrate Solution

During haemodialysis, creation of the dialysate fluid requires a concentrated acidic solution of known constituents to be drawn into the machine. This solution is diluted with a set volume of purified water from a reverse osmosis unit to achieve the correct concentration. Our Trust had previously used cans of acidic concentrate which require a 34:1 ratio of dilution, i.e. 1 part concentrate to 34 parts water. This 34:1 solution is supplied in a 6 litre can. The same final composition can also be achieved using an alternative acidic solution with a concentration of 44:1 after some minor technical adjustments to the dialysis machine. This 44:1 solution can be supplied in a 4.7 litre can. After discussions with the manufacturer BBraun, the Trust requested to switch four of the most commonly used solutions to a 44:1 concentration for the same cost.

### Benefits to environmental sustainability

#### Reduction in greenhouse gas emissions from road transport

The concentrate is manufactured and transported by road from Glandorf, Germany to Sheffield and from Sheffield to Kent. An estimate of the carbon savings from transporting smaller volumes can be made as follows:

Reduction of concentrate used per treatment = 6 to 4.7 litre can = 1.3 litres  
Reduction of concentrate used daily in the Trust = 200 x 1.3 litres = 260 litres  
Reduction of concentrate used annually = 260 x 312 days = 81,120 litres  
Thus approximate weight each year = 81.1 tonnes

Glandorf to Sheffield = 960 km  
Sheffield to Canterbury = 374 km  
Total distance = 1334 km

Approximate annual reduction in greenhouse gas emissions from road freight:  
= 0.14993 \* x 81.1 (tonnes) x 1334(km)  
= 16,220 kg CO<sub>2</sub>e / year  
= **16.22 tonnes CO<sub>2</sub>e / year**

\* 2012 Guidelines to Defra/DECC's GHG Conversion Factors for Company Reporting (Annex 7, Table 7e)

*"I think it is important to stress how a simple change can significantly ease the environmental burden from transporting dialysis consumables"*

Fraser Campbell, Renal Technician

### Details of implementation

The renal technicians decided to explore the possibility of changing to 44:1 concentrate to reduce the environmental impact of dialysis. As the four most commonly used solutions were not available in the smaller container, the manufacturers were approached to develop specific solutions in the required size container and to provide advice on the minor technical changes needed to the dialysis machines.

The dialysis machines' settings were adjusted accordingly by the Trust renal technicians to allow safe operation with the higher concentrations of solution.

Switching to the 44:1 concentrate is a relatively easy process at negligible cost and can reduce transport and storage without the need to procure and maintain a central acid delivery system.



The new 4.7 litre can of 44:1 concentrate (right) shown alongside an old 6 litre can of 34:1.

### Additional benefits

#### Storage and manual handling

A pallet holds 128 cans of 44:1 concentrate compared to 90 cans of the larger 34:1 concentrate can thus reducing the number of pallet movements and optimising storage area in the renal unit.

Using a 4.7 litre can rather than a 6 litre can will also mean a reduction in manual handling effort for the renal unit staff transporting the concentrate solution from the store to machine.



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Fraser Campbell, Renal Technician  
East Kent Hospitals University NHS Foundation Trust  
frasercampbell@nhs.net

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