Midlands Kidney Network - Benefits of Central Delivery Systems (CDS) for In-Centre Haemodialysis

Waste benefits:

- Most units will use a 6L canister per treatment which is not fully utilised, the remainder is then poured down the drain and plastic disposed of as clinical waste as it cannot be recycled. Based on analysis across several clinics the average acid concentrate consumption when using a CDS system is 3.86 litres per treatment = saving of 2.14 Litres per treatment.
- If a clinic does 300 treatments week (15,600 annually) that's approximately 33,384 litres of concentrate wasted a year. At 50p a litre that's a £16,692 annually being poured down the drain (quite literally).
- Each canister equates to 143g of plastic waste. 15,600 annual sessions x 143g = 2.2308 tonnes of plastic to landfill.

Waste disposal benefits (Central Delivery of Acid for Haemodialysis | Mapping Greener Healthcare (sustainablehealthcare.org.uk):

- Empty canisters weighed approx. 143 grams and are disposed of via the clinical waste stream at a cost of £500 per ton. This amounted to an annual cost of approximately £2,363 per year.
    - 29,540 empty canisters were previously disposed of per year (in 2008), each weighing 142.6 grams, amounting to 4.2 tonnes of plastic waste per year. The carbon savings from avoiding disposal of this waste via the clinical waste stream can be estimated at:4.2 x 1,833 (life-cycle GHG emissions factor for incineration)* = **7,699 kg CO2e**
- ** DEFRA emissions factors for incineration do not specifically account for clinical waste, which is commonly undertaken at higher temperatures. To reflect the increased emissions that are likely to result from the incineration of clinical waste, the highest available emissions factor for incineration was applied (Table 9d, 2011 Guidelines to Defra / DECC's GHG Conversion Factors for Company Reporting)*
- Combined savings = 16.03 tonnes CO2e per year

Financial benefits utilising: Central Delivery of Acid for Haemodialysis | Mapping Greener Healthcare (sustainablehealthcare.org.uk)

- Investment: £40,000 for storage tanks and piping; £3,900 for enabling works. Total: £43,900.
- Actual savings: £19,372 per year from reduced acid wastage; £3,700 from reduced waste disposal. Total: £23,072 per year.
- *Return on investment at 5 years:*
- ((Total saving to date - total cost to date) / (total cost to date)) * 100
- ((£23,072 * 5 - £43,900)/£43,900) * 100 = **163%**

- Also, given that 6L cannisters require storage space, along with procurements of canisters, unloading these from the transport to the warehouse, then to the storage area in the renal departments which are usually restocked 3 times a week that this is all labour intensive and more likely a cost saving nearer £30,000.

Staff benefits:

- Given that most cannister have 6 litres of concentrate in; there is a manual handling risk for clinicians moving these from storage to machine and back again for each patient.
- According to the Health and Safety Executive (HSE) report Work-related musculoskeletal disorders statistics in Great Britain, 2023 (hse.gov.uk), 473,000 of workers suffer from MSK symptoms.
- Therefore, removing the need to move heavy cannisters reduces the risk of MSK related conditions/symptoms and could contribute in a reduction in staff sickness.
- There is a significant amount of time saved due to staff not having to move cannisters around and pour them away. In one unit it was calculated that the time spent doing this per year equated to the cost of one band 5 whole time equivalent nurse.

In November 2023 the Sustainable Health Care group carried out a project to review the benefits of setting up a Central Acid Delivery system in Dialysis units which offers triple bottom line benefits: Carbon footprint reduction opportunity and waste minimisation; Financial savings through acid wastage reduction and improved employee wellbeing/productivity which provides an impact calculator for your own unit.

The links to this project are (where you can also calculate the costs for your own unit)-

Sustainability Impact Calculator for installing Central Acid Delivery System | Sustainable Healthcare Networks Hub

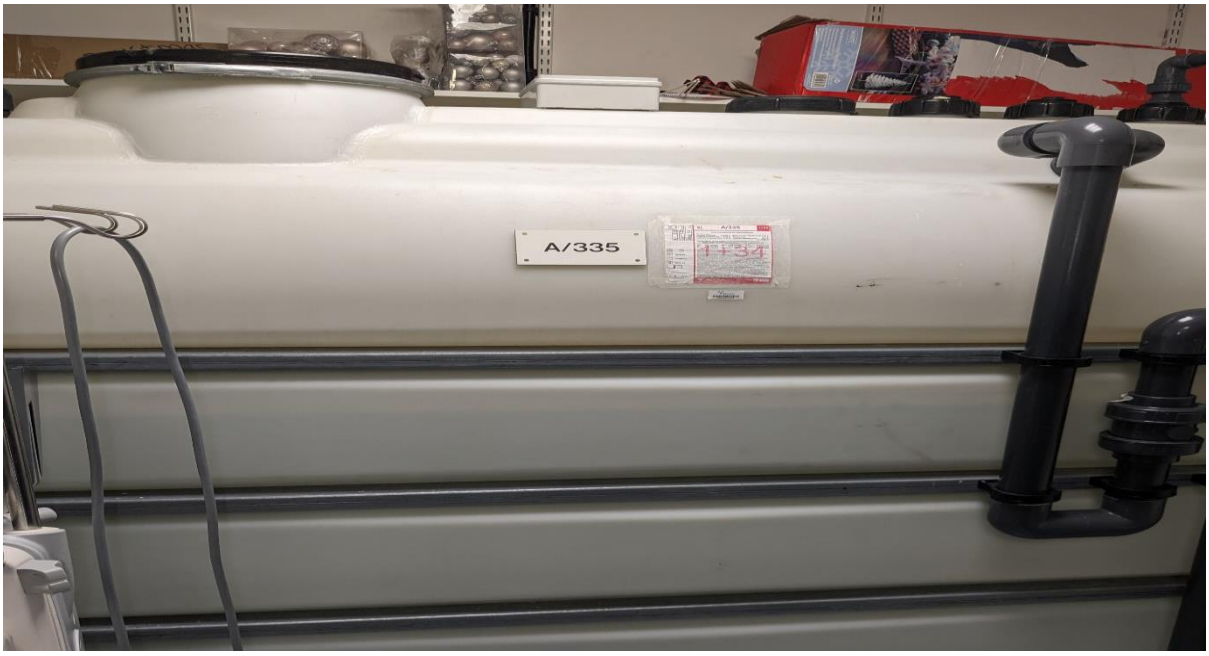
Sustainability Impact Calculator - Central Acid Delivery GM v2.2.xlsx

Below is the CDS set up at Dudley Russell Halls hospital; you will notice the 3 circuits of variant dialysis solutions – the CDS is routed above ceiling void space and then comes down to bedspace to patients in the void space between the walls, you will notice all pipes & fluid ID are all colour coded red, white and blue.




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CDS 08
CDS 08







Thank you for reading and any further comments or questions then please contact: Alastair Tallis (Midlands Renal ODN Project Manager) at Alastair.Tallis@uhcw.nhs.uk