

In-Centre Haemodialysis at Newcastle upon Tyne Hospital

Care Pathway Case Study



The Newcastle upon
Tyne Hospitals

NHS Foundation Trust



**Sustainable
Healthcare
Coalition**

A Care Pathway Environmental Assessment of In-Centre Haemodialysis at The Newcastle upon Tyne Hospitals NHS Foundation Trust

Organisation	Newcastle upon Tyne Hospitals NHS Foundation Trust (NUTH)
Organisation website	https://www.newcastle-hospitals.nhs.uk/
Contact details	info@shcoalition.org
Completion date	May 2022
Assurance	Internal assurance
Supporting information	ERM Project Report 0369174, 8 April 2022
Conformance with 2012 Greenhouse Gas Protocol Pharmaceutical and Care Pathways: Guidance on Appraising Sustainability (“the Guidance”) ¹	Adheres to the principles of the Guidance ¹
Care pathway description	In-centre haemodialysis at NUTH Freeman Hospital
Environmental issues appraised	Global warming potential (IPCC, CO ₂ eq., 100-year) Water consumption (m ³) Waste generation (kg)

Conclusions

This assessment aimed to provide the first step in a roadmap towards delivery of a carbon net-zero renal care pathway at NUTH. The environmental impacts associated with provision of in-centre haemodialysis (ICHHD) at Freeman Hospital during 2019 have been calculated, and a greater understanding of the impact ‘hotspots’ – the activity modules with large contributions to the total impacts – has been achieved.

The following key findings can be drawn from this ICHHD care pathway assessment:

- The total GHG impact of providing 38,425 sessions of ICHHD at the Freeman Hospital in 2019 is estimated to be 833,132 kg CO₂ eq. and can be expressed as 21.7 kg CO₂ eq. per dialysis session;
- Assuming that each patient receives an average of three dialysis sessions per week, the total annual GHG impact per patient is estimated to be 3,382 kg CO₂ eq. per patient; and
- Projecting these GHG emission figures gives a potential total GHG impact of 82.8 ktes CO₂ eq. for the provision of ICHHD to the 24,500 patients in the UK² and 6.7 Mtes across the estimated 2 million³ HD patients globally.

Introduction

The Green Nephrology Group at NUTH has developed a roadmap with the aim of minimising the environmental impact incurred across NUTH’s Renal Services.

The aims of the project were to:

- Undertake a comprehensive evaluation of the environmental impacts of haemodialysis (HD) delivery within Renal Services in NUTH Freeman Hospital;
- Identify common metrics and opportunities for reduction that can be deployed at NUTH Freeman Hospital and will be recognised by industry and the renal community alike; and

- Facilitate the development of a more sustainable care pathway for End-Stage Kidney Disease (ESKD).

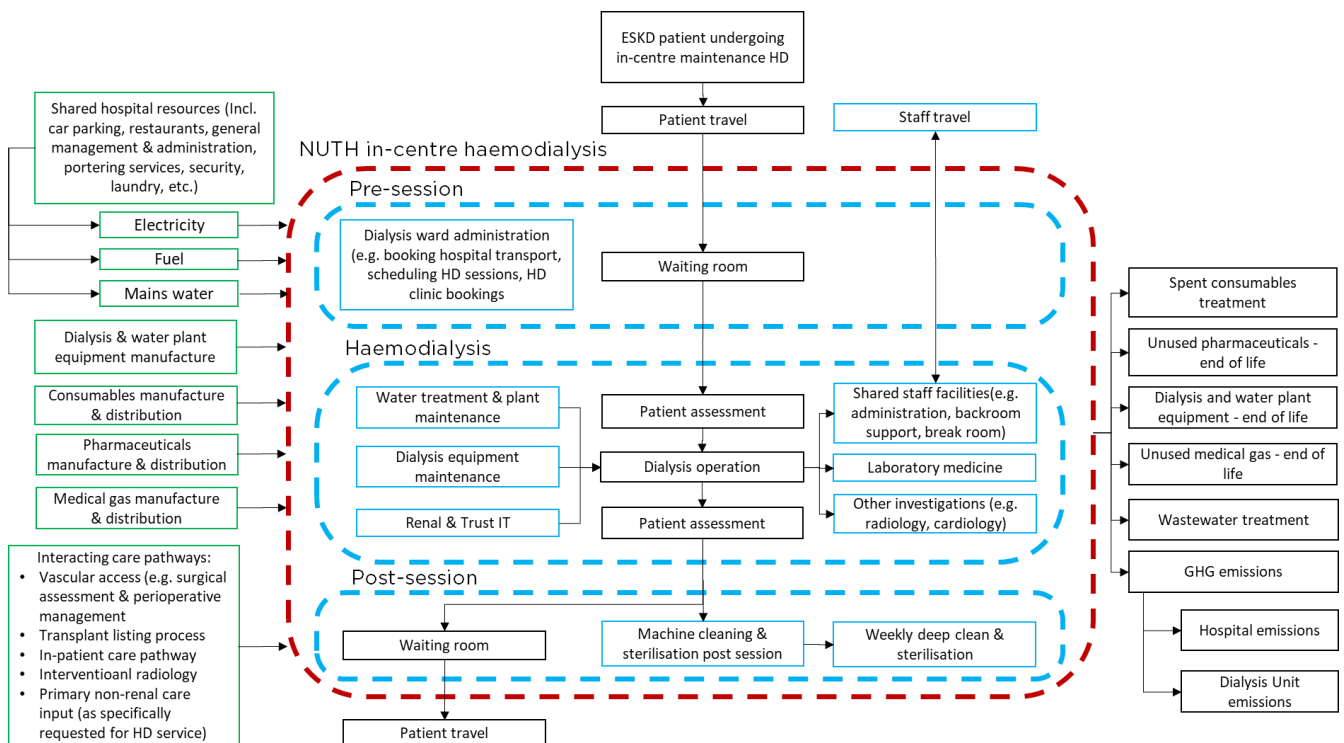
It is hoped that the findings of this assessment will help support Renal Services and its suppliers in delivering the following NHS targets⁴:

- “For the emissions that the NHS control directly (the NHS Carbon Footprint), we will reach net zero by 2040, with an ambition to reach an 80% reduction by 2028 to 2032;
- For the emissions the NHS can influence (our NHS Carbon Footprint Plus), we will reach net zero by 2045, with an ambition to reach an 80% reduction by 2036 to 2039.”

Scope

This appraisal considers the environmental impacts of NUTH Renal Services in-centre haemodialysis (ICHD) provision at Ward 31, Freeman Hospital through calendar year 2019. The greenhouse gas (GHG) emissions, referred to as the carbon footprint; the total amounts of freshwater used; and wastes generated have been investigated. The unit of analysis for this appraisal is the whole centre. Patient and HD session statistics for the period allow per patient.year and per session intensity measures to be derived.

Figure 1 NUTH In-centre haemodialysis renal care pathway map



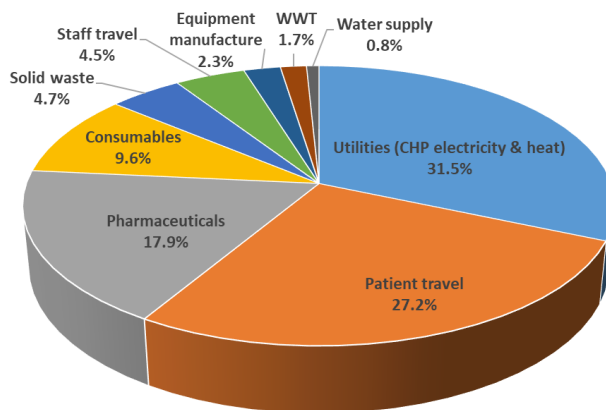
Greenhouse gases

The total greenhouse gas (GHG) emissions for ICHD at NUTH are calculated to be **833,132 kg CO₂ eq.** over the year 2019. There was a total of **38,425 dialysis sessions** in 2019, which equates to a **GHG emissions impact of 21.7 kg CO₂ eq. per session.**

These total GHG emissions are broken down into the relative contributions from the different care pathway activities in Figure 2.

The results show a varied distribution, with no single activity dominating the total GHG

Figure 2 Total ICHD GHG emissions, by activity (% of total)



impacts of the ICHD care pathway. The largest contributions come from utilities, patient travel, pharmaceuticals, and consumables with contributions of 32%, 27%, 18%, and 10% respectively.

The activities modelled can be grouped together more broadly to give a higher level understanding of the GHG hotspots within the care pathway:

- Utilities (electricity and heat from combined heat and power (CHP) plant, water supply), ~32%;
- Travel (patient and staff), ~32%;
- Materials used (pharmaceuticals, consumables, equipment), ~30%; and
- Waste treatment (solid waste, waste water treatment), ~6%.

Recommendations

The following recommendations could be explored to help to reduce the environmental impacts associated with providing ICHD care:

- **Working with suppliers on sustainability-focused product innovations.** The manufacture, packaging, and distribution of the pharmaceuticals, consumables, and equipment used to provide ICHD makes a significant contribution (at 30%) to the total GHG impacts.
- **Increasing efficiency and reducing energy consumption of water purification plant and dialysis machines.**
- **Reducing the carbon intensity of energy use.**
- **Reducing transport emissions and associated impacts.**
- **Incorporation of a bulk, centralised haemodialysis acid concentrate (HAC) delivery system.**
- **Extending the assessment to address the wider care pathway and kidney disease prevention.**

Acknowledgements

This assessment has been delivered by ERM Limited as a collaborative project between The Newcastle upon Tyne Hospitals NHS Foundation Trust (NUTH) and the Sustainable Healthcare Coalition (SHC). The SHC comprises a range of organisations within the healthcare sector, including pharmaceutical and medical device companies, trade bodies, procurement, government organisations and other stakeholders. The SHC operates with the aim of facilitating the journey towards good health and wellbeing on a finite planet, through open-minded collaboration across public and private healthcare.

¹ <https://shcoalition.org/sustainable-care-pathways-guidance/>

² <https://renal.org/audit-research/annual-report/>

³ <https://doi.org/10.1038/ki.2011.368>

⁴ <https://www.england.nhs.uk/greenernhs/a-net-zero-nhs/>