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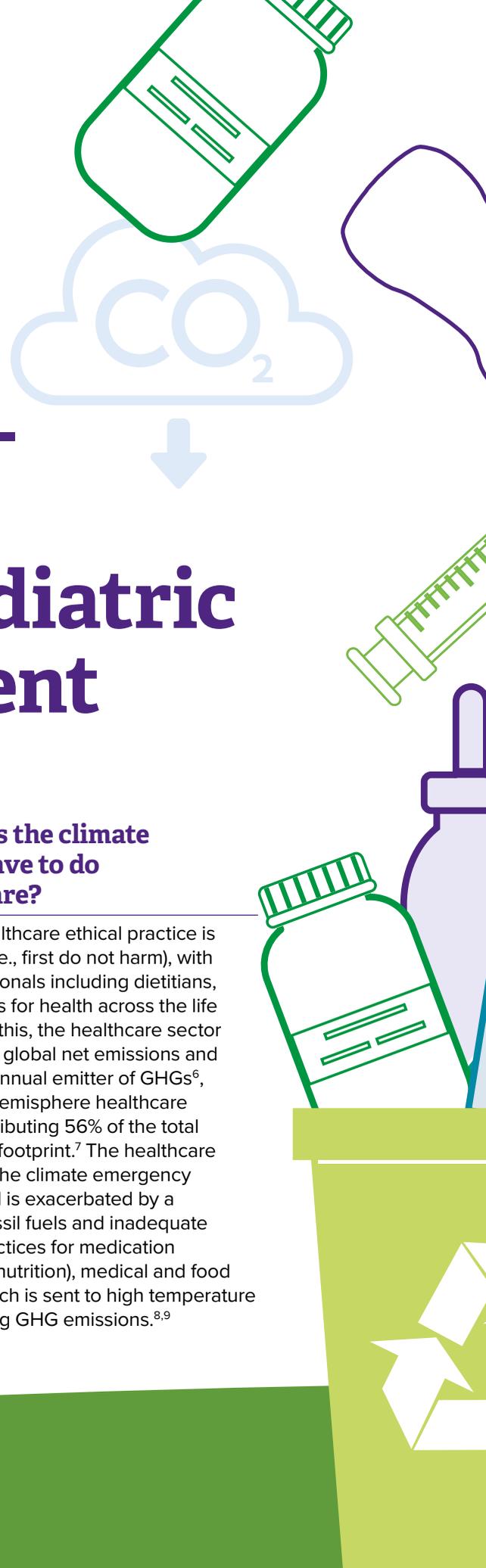
A call to action – the need for a sustainable paediatric dietetic movement

What is global warming?

Global warming is primarily caused by increased greenhouse gas (GHG) emissions.¹ The Paris Agreement (2015) a legally binding international treaty signed by 196 countries and entities, aimed to reduce GHG emissions, and global warming to below 2°C compared with pre-industrial levels. Despite this multilateral climate change process, global temperatures are expected to exceed the 1.5°C threshold by 2030 and 2°C by 2050², leaving us four summers to affect change.³ The rise in temperature is predicted to affect the most vulnerable within society including children, as they will have less resilience to rising temperatures and infectious disease. Extreme weather is also likely to lead to animal and plant extinctions, water and crop failures increasing food prices, poverty and mass displacement arising from uninhabitable land.⁴

But what does the climate emergency have to do with healthcare?

A key tenant of healthcare ethical practice is non-maleficence (i.e., first do not harm), with healthcare professionals including dietitians, acting as advocates for health across the life course.⁵ In spite of this, the healthcare sector contributes 4.4% of global net emissions and is the fifth-largest annual emitter of GHGs⁶, with the northern hemisphere healthcare organisations contributing 56% of the total healthcare climate footprint.⁷ The healthcare sectors impact on the climate emergency is multifaceted, and is exacerbated by a dependence on fossil fuels and inadequate waste disposal practices for medication (including medical nutrition), medical and food waste, much of which is sent to high temperature incineration creating GHG emissions.^{8,9}



NHS Green plan

The Health and Care Act 2022 made the Green Plan a statutory requirement (i.e., a legally binding commitment) for National Health Service (NHS) organisations, with a bold ambition to achieve a net zero target by 2040.¹⁰ Most of the NHS carbon footprint comes from scope three,¹⁰ comprising of 62% supply chain, 24% delivery of care, plus 10% staff commute and patient-visitor journeys.¹¹ Although there is considerable opportunity for impactful sustainability projects, much relies on voluntary action by organisations and individuals which may be insufficient to enable change. Legislative refinement to the plastic packaging tax (2022) would help compel change in healthcare, i.e., reviewing healthcare exemption for the so-called plastic tax as this would help to drive circularity in terms of reuse and recycling of virgin plastic and high value polyethylene terephthalate (PET), high density polyethylene (HDPE), low density polyethylene (LDPE) and propylene plastic (PP) used in medical nutrition.¹²⁻¹⁵

Dietitians have an important role to play as sustainability advocates for legislative change – we need to find our voices as we have individual and collective power as trusted nutrition healthcare professionals.¹⁶

How does sustainability make healthcare professionals (HCP) and dietitian feel?

A recent survey of paediatric intensive care unit staff, suggests HCP feel psychological distress and disempowered when it comes to effecting change within their own organisation; and that conflicts with clinical priorities making it difficult to prioritise sustainability initiatives (Verbruggen¹⁷, personal communication). Other surveys, report a high level of HCP interest in sustainability, but lack of knowledge on how to make changes within a clinical setting.¹⁸ However, all is not lost, as any type of action is better than inaction. Several systematic reviews suggest HCP, including dietitians are embracing change, but there is still a long way to go.^{8,19}

How can individual dietitians effect change?

Behaviour change is difficult²⁰, while knowledge and awareness are not the strongest drivers of change; it requires a combination of capability, opportunity and motivation (i.e., the COM-B framework).²¹ The best projects support change by providing physical opportunities to enable the change to happen (i.e., providing a recycling box for empty enteral feeding bottles).²²

In practice – how can you make a difference where you work?

Here are two small change ideas that will make a big difference. Imagine the impact if all of us took on these two actions in 2026 – imagine how much GHG emissions we could save by reusing or recycling plastic packaging, not to mention the financial savings.

1 Recycling – medical nutrition bottles and ancillaries

One of the barriers to recycling enteral, oral nutrition supplement bottles, bottle lids and other plastic components is infection control. However, there is no evidence to suggest used enteral feed bottles pose an infection control risk, especially in dry waste streams.²³ Another barrier is time and space.¹⁷ Yet within adult critical care recycling of medical nutrition bottles has been achieved, taking recycling rates from 0% to around 50%, with significant reductions in carbon emissions along with financial savings.^{23,24} Medical nutrition companies including Nutricia are developing partnerships to promote reuse and recycling.²⁵ In collaboration, Nutricia has developed a step-by-step guide for implementing a medical nutrition packaging recycling project: 25 which is summarised here in 10 steps.



The NHS is full of exciting initiatives, and as paediatric dietitians we have the potential to make a big difference

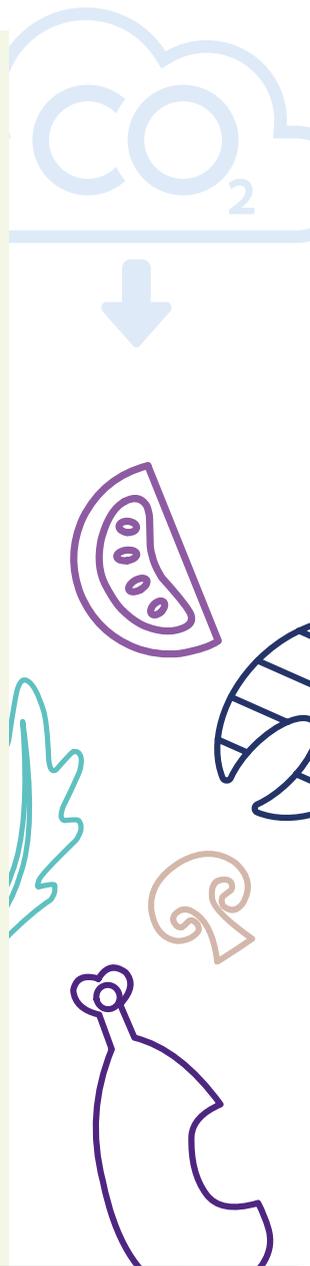


Project 1:

Ten steps to sustainable recycling

Work with the leadership team within your department, green team, medical nutrition company, ward staff, estates team, families and children.

- 1 Create your project team** – who is the lead, what support outside of the NHS do you need (i.e. waste contractor)
- 2 Agree the scope of the project** – hospital wide or patients in their own home?
- 3 Build a shared purpose** – where are you now, how will you get there?
- 4 Review data on usage** – which wards use the most product and how much is currently recycled?
- 5 Scope out areas for an initial pilot** – go big if you can
- 6 Identify champions of the project** – to remind clinical staff to recycle medical nutrition packaging i.e., single use enteral feed syringes
- 7 Ideally count how much is being recycled** – run a competition – ask your hospital charity to sponsor prizes
- 8 Report your findings** – carbon savings and financial savings
- 9 Keep learning** – ask for feedback – make changes
- 10 Inspire others** – share your findings – be generous, share your plans



12%
of the total food waste generated in the UK²⁹ is produced by 1,297 NHS hospitals and 515 private hospitals

2 Reducing waste – tackling food waste

With one in six plates of hospital food wasted²⁶, approximately 50% of the total waste generated on the ward comes from food.^{27,28} Despite the use of food and drink standards, it is estimated the 1,297 NHS hospitals and 515 private hospitals produce 12% of the total food waste generated in the UK.²⁹ This equates to 1.1 million tonnes of food waste per annum²⁹, producing 1,543 kilo tonnes of carbon dioxide emissions (CO₂e), approximately 6% of total NHS emissions per annum²⁶, with an NHS waste management cost of £230m per annum.²⁹ Although there are exciting examples of change in the UK, for example sustainable procurement for patient and staff meals, bolder changes could be made.^{30,31}



Project 2:

Plant-forward diets

There is a move for plant-based diets by default within the hospital setting, with animal protein being available on request only.³² Unfortunately many NHS hospitals have demonstrated little commitment to moving to plant-based meals, suggesting issues with implementation or barriers to change amongst staff and patients.³⁰

In paediatrics, the use of a plant-forward diet where whole-grains, fruits, vegetables, nuts and legumes (i.e., beans and lentils) are eaten in larger amounts with reduced amounts of animal protein³⁷ may be a more acceptable first step.^{9,33-35} A nurse led study reported putting these plant-based dishes at the top led to a four-fold increase in these meals being chosen.³⁶ Information sharing with housekeepers and ward staff around plant-forward or plant-based meals is also essential.³⁷⁻⁴³ This ensures frontline staff serving food can talk positively about plant-based meals.^{44,45} For example, if frontline staff convey disgust about the meals even with non-verbal cues, this may be negatively received by children and their families.⁴⁶

Practical strategies for paediatric dietitians to implement within their hospital system

Create your project team

- 1 Identify where and what food is being wasted
- 2 Using free on-line tools tracking water, carbon emissions and cost savings e.g., NHS recipe bank <https://foodplatform.england.nhs.uk> and Food Pro Cool <https://coolfoodpro.net>
- 3 Estimate packaging waste – what could be reused or recycled?

Identify changes

- 1 Advocate for plant-forward inclusive recipes – using NHS recipe bank for inspiration
- 2 Encourage “meat free Mondays” – give clear health benefits and CO₂e savings
- 3 Remove negative labels from meals i.e., vegetarian, vegan or meat free
- 4 Share changes with staff, patients and families – to prevent unintended consequences (i.e. families buying animal-protein meals)⁴⁷ or food waste increasing with plant-based dishes.⁴⁸



When did healthcare become so disposable?

Modern medicine including medical nutrition support, is wasteful; and 85% of materials are discarded rather than reused or recycled.⁴⁹ The NHS is full of exciting initiatives, and as paediatric dietitians we have the potential to make a big difference. We are known for being innovative thinkers, but we must now be bold – think big and challenge the current status quo about why items cannot be recycled or reused. Together we could start a sustainable paediatric dietetic movement – we have just four summers left so time is of the essence. 🙌



References

1. How do greenhouse gases actually warm the planet? 2022 [Online]. Available from: www.unep.org/news-and-stories/story/how-do-greenhouse-gases-actually-warm-planet
2. The Paris Agreement | UNFCCC. 2016. [Online]. Available from: <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement>
3. GOV.UK 2025 [Online]. Available from: www.gov.uk/guidance/climate-change-explained
4. Iena. CCARDESA. 2019 [Online]. Available from: www.ccardesa.org/knowledge-products/ipcc-special-report-global-warming-15-C2%BAc-summary-policymakers
5. First Do No Harm. 2020 [Online]. Available from: www.healthdesign.org/sites/default/files/First%20Do%20No%20Harm_0.pdf
6. Health Care without Harm. 2022 [Online]. Available from: https://saludsindanio.org/sites/default/files/sites/documents-files/7347/2022_AnnualReport_HCWH.pdf
7. Health care climate footprint report. 2019 [Online]. Available from: <https://global.noharm.org/resources/health-care-climate-footprint-report>
8. Rodríguez-Jiménez L et al. *J Adv Nurs*. 2023 Aug;79(8):2830–44.
9. Verbruggen SCAT et al. *Frontline Gastroenterology*. 2024 Mar 20
10. NHS G. Greener NHS. 2020 [Online]. Available from: www.england.nhs.uk/greenernhs/publication/delivering-a-net-zero-national-health-service/
11. Tennison I et al. *Lancet Planet Health*. 2021 Feb;5(2):e84–92.
12. GOV.UK. 2022 [Online]. Available from: www.gov.uk/government/publications/introduction-of-plastic-packaging-tax-from-april-2022/introduction-of-plastic-packaging-tax-2021
13. Dove A et al. *Environmental Law Review*. 2025 Mar 1;27(1):42–50.
14. Ren T et al. *Environmental Research*. 2024 May 15;249:118428.
15. Green P. [Online]. Available from: <https://blog.recycleduklimited.com/current-plastic-recycling-prices>
16. Hubbert B et al. *The Lancet Planetary Health*. 2020 Oct 1;4(10):e445–6.
17. Verbruggen SCAT et al. *BMC Healthcare*; 2025.
18. Lister HE et al. *Int J Environ Res Public Health*. 2022 Aug 16;19(16):10121.
19. Braithwaite J et al. *BMJ* 2024;387:e081284
20. Bouton ME. *Prev Med*. 2014 Nov;0:29–36.
21. Michie S et al. *Implement Sci*. 2011 Apr 23;6:42.
22. Allison AL et al. *Journal of Cleaner Production*. 2022 Dec 20;380:134860.
23. Gray P et al. *Nurs Crit Care*. 2025 Jan;30(1):61–7.
24. BAPEN. 2025 [Online]. Available from: www.bapen.org.uk/other-news/bapen-discusses-sustainability-with-dietitian-faith-toogood
25. Nutricia UK. 2024 [Online]. Available from: www.nutricia.co.uk/hcp/discover-nutricia/our-sustainability-commitments.html
26. BDA Nutrition and Hydration. 2023 [Online]. Available from: www.bda.uk.com/static/176907a2-f2d8-45bb-8213c581d3ccd7ba/06c5eefc-fa85-4472-948806c5165ed5d9/Nutrition-and-Hydration-Digest-3rd-edition.pdf
27. Alam MM et al. *Waste Manag Res*. 2008 Jun;26(3):291–6.
28. Mattoso VD, Schalch V. *Waste Manag Res*. 2001 Dec;19(6):567–72.
29. Food-surplus-and-waste-in-the-UK. 2020 [Online]. Available from: www.wrap.ngo/sites/default/files/2020-11/Food-surplus-and-waste-in-the-UK-key-facts-Jan-2020.pdf
30. Sadler I et al. *J Hum Nutr Diet*. 2025 Feb;38(1):e70019.
31. BDA. One Blue Dot. 2020 [Online]. Available from: www.bda.uk.com/resource-report/one-blue-dot.html
32. NYC Health + Hospitals. 2022 [Online]. Available from: www.nychealthandhospitals.org/pressrelease/nyc-health-hospitals-celebrates-1-2-million-plant-based-meals-served
33. Marino LV et al. *Dietetics*. 2025 Jun;4(2):18.
34. Koller A et al. *Crit Rev Food Sci Nutr*. 2024;64(33):13247–58.
35. Brits E, le Grange E. *Nutrition Reviews*. 2025 May 24;naaf070.
36. Moody SC. *British Journal of Nursing*. 2024; Vol 33:No 19.
37. Shin JK et al. *Issues Ment Health Nurs*. 2012;33(8):505–12.
38. Wang PS et al. *Int Clin Psychopharmacol*. 2014 Jul;29(4):235–8.
39. Vieweg WV et al. *Acta Psychiatr Scand*. 2004;110(1):69–72.
40. Pedersen ALW et al. *Nordic Journal of Psychiatry*. 2023 Jan 3;77(1):46–54.
41. Mills S et al. *BMJ Open*. 2024;14(3):e079406.
42. Megna JL et al. *Ann Clin Psychiatry*. 2006;18(3):163–7.
43. Faulkner GE et al. *Psychiatr Serv*. 2009;60(4):538–41.
44. Cook N et al. *Front Nutr*. 2022;9:1062619.
45. Cook N et al. *J Acad Nutr Diet*. 2023 Dec 22;S2212-2672(23)01763-X.
46. Blake H, Patterson J. *Br J Nurs*. 2015 Jan 22;24(2):108–12.
47. Russo G et al. 2025. [Online]. Available from: <http://arxiv.org/abs/2504.02899>
48. Rinninella E et al. *Nutrients*. 2023 Jan 7;15(2):310.
49. Greene J et al. *The Lancet*. 2022 Oct 15;400(10360):1298–9.

