



INTRODUCTION

- Cefuroxime is routinely used for caesarean section (CS) surgical prophylaxis, typically reconstituted with 15mls of sterile water before administration with intravenous Metronidazole.
- This process requires multiple consumables – a 20 ml syringe, blunt fill/filter needle and sterile water vial - contributing to both cost and environmental burden.
- Evidence demonstrates that Cefuroxime sodium remains chemically stable when reconstituted with metronidazole, with a t90 of 36 hours at 25 °C. ⁽¹⁾ The admixture was also stable with respect to metronidazole.
- This supports the feasibility of direct reconstitution using double-ended transfer spikes, which would eliminate the need for sterile water, syringe, and needles.



METHODOLGY

Study Design:

Departmental survey was conducted at Queen Charlotte’s and Chelsea Hospital (QCCH) in 2025, involving 16 respondents (9 consultants, 7 registrars).

Survey explored:

- Current reconstitution practices
- Clinician comfort with direct mixing of Cefuroxime and Metronidazole
- Willingness to adopt double-ended spikes for reconstitution.

Analyses Performed:

- Cost analysis
- Environmental footprint analysis



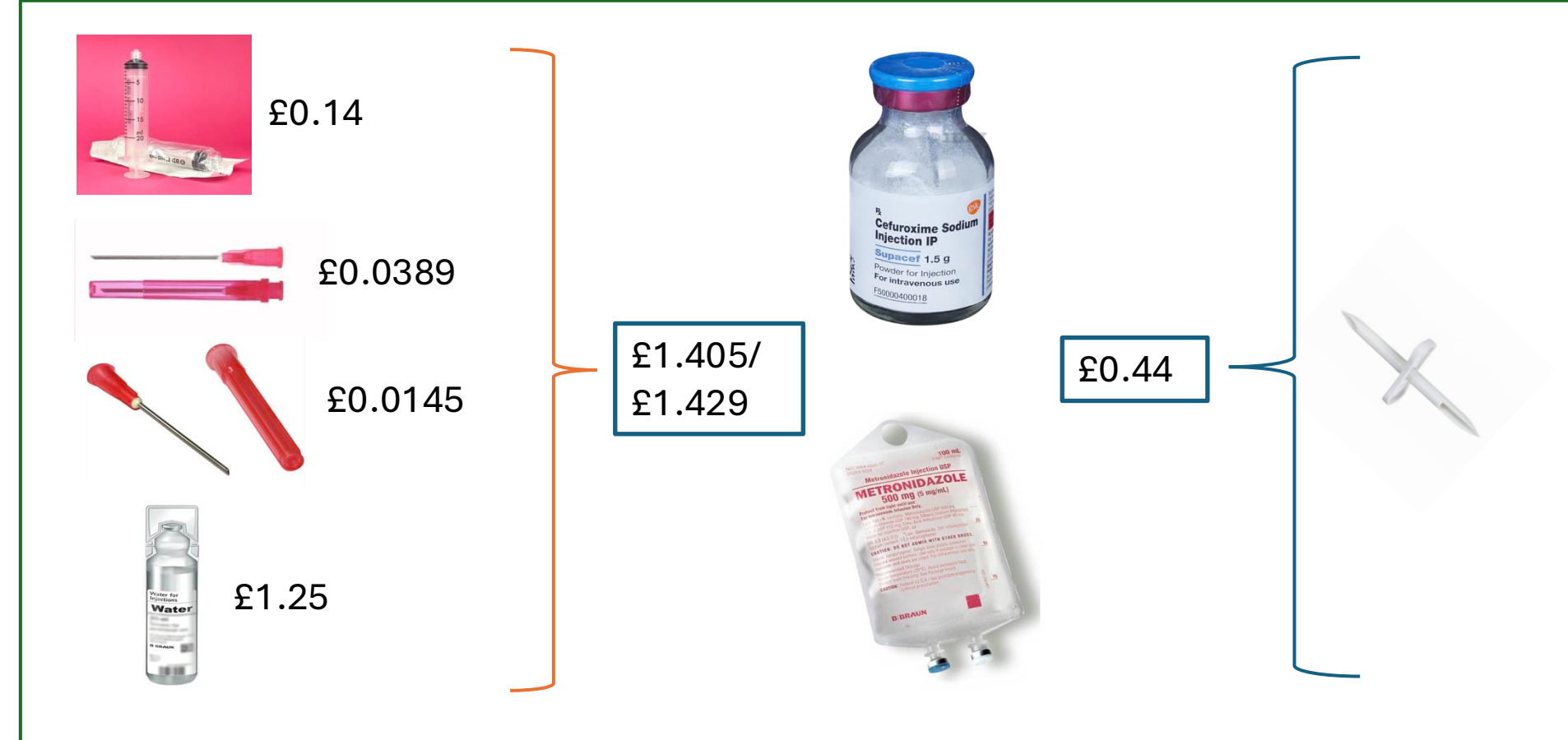
RESULTS

Survey responses revealed varied current practices, with 43.6% using sterile water, 31.3% siphoning Metronidazole for reconstitution, 25.1% reconstituting with sterile water and directly administering it via a 3-way tap without mixing with metronidazole.

12/16
Comfortable with direct reconstitution

75%
Willing to adopt double-ended spikes

Cost Analysis

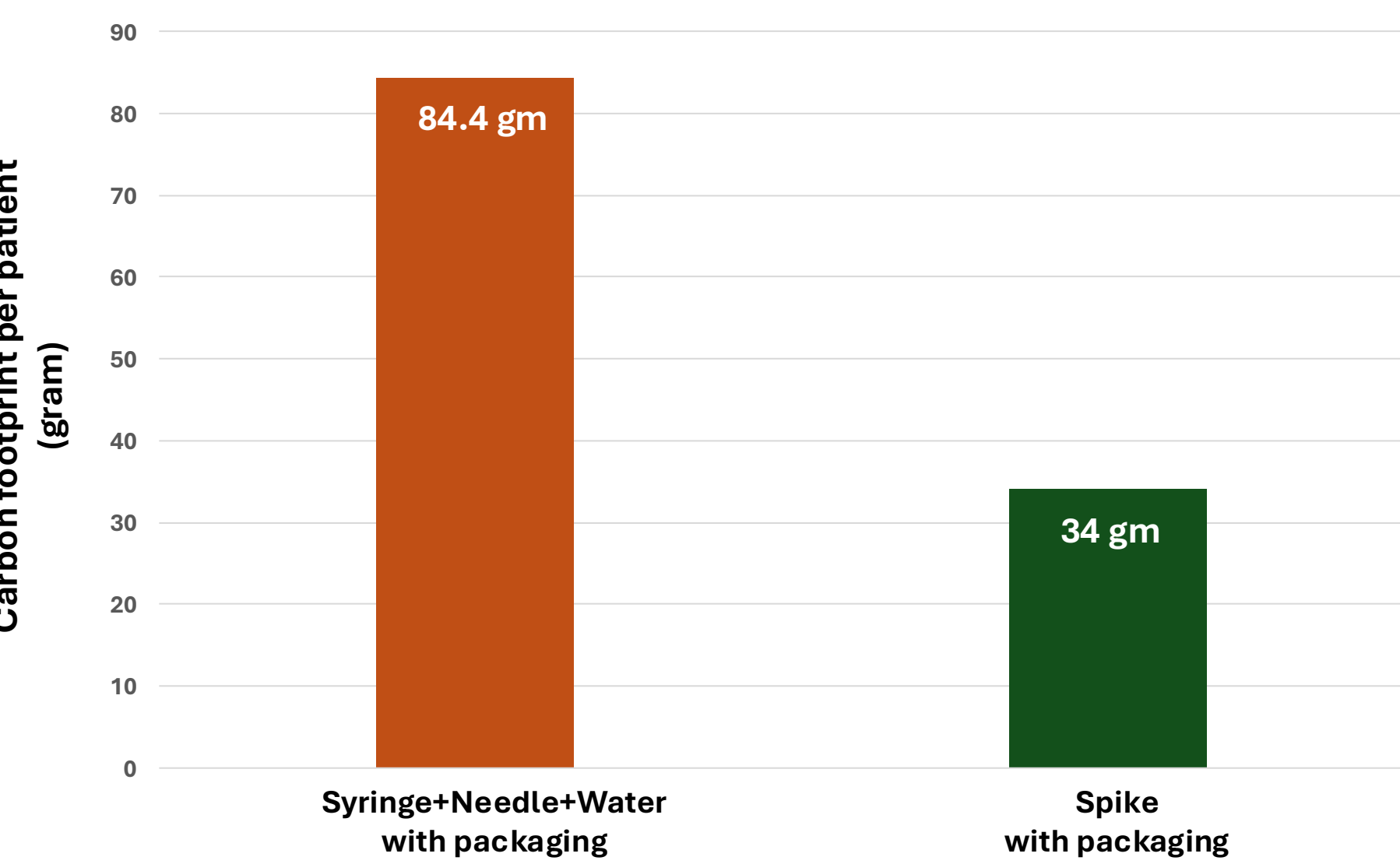


Cost saving per patient=£0.965/0.99

£2,670 – £2,750
Potential annual savings

across 2,774 CS procedures at QCCH (2025)

Environmental Impact



60% Reduction
in carbon footprint per patient

34g vs 84.4g CO₂e per patient

(Spikes vs Syringe-needle-water method)



DISCUSSION

This QIP demonstrates that direct reconstitution of Cefuroxime with Metronidazole using double-ended spikes is a clinically acceptable, cost-effective, and environmentally sustainable alternative to usual practice

Cost-Savings: While modest per patient, the scale meaningfully across the 2,774 CS procedures annually across 2025 yielded potential £2,670-£2750 in savings over the year. These figures are conservative; if double-ended spikes are also adopted by midwifery colleagues for Cefuroxime-Metronidazole administration in labouring women, the true savings would be considerably greater.

Environmental Impact: The NHS committed to net zero carbon emissions by 2040, requiring all departments to reduce their environmental impact. ⁽²⁾ Replacing the syringe, needle and sterile water with a single spike reduces per-patient carbon footprint by 60%. Across 2,774 procedures, this equates to approximately 140 kg CO₂e avoided annually – a tangible contribution to NHS sustainability targets.

Conclusion: Adoption of double-ended spikes for direct Cefuroxime-Metronidazole reconstitution could reduce consumable use and waste, deliver meaningful annual savings, and contribute to institutional sustainability goals.



LIMITATIONS

Small sample size (16 respondents from a single department) and survey-based design.



REFERENCES

- Barnes AR. Chemical stabilities of cefuroxime sodium and metronidazole in an admixture for intravenous infusion. J Clin Pharm Ther. 1990;15(3):187-96.
- NHS England. Delivering a ‘net zero’ National Health Service. London: NHS England; 2020