



A GREENER ENDOSCOPY UNIT FOR ROYAL CORNWALL HOSPITAL - ENDOSCOPY TEAM

TEAM MEMBERS: Anna Betts- Deputy Sister, Nicola Rogers – Staff Nurse, Tanya Beresford – Staff Nurse, Helen Saunders – Health Care Assistant.

Aims:

1. To organize the unit and empower staff to recycle all sterile water bottles that are used on the unit daily.
2. To change the Campylobacter-like organism (CLO) test reporting system to reduce waste and low value use of admin staff time.

Background:

The endoscopy unit at Royal Cornwall Hospital has 6 endoscopy rooms, used 7 days a week (with an additional single room satellite unit at West Cornwall Hospital running 5 days a week). We have a huge turnover of both elective and emergency endoscopies. As a team and trust we are passionate about making our hospital, and environment more sustainable and have used our understanding of our contribution to harmful impacts on our environment to identify several aspects of waste that we can influence.



Methods and Approach:

Sterile water bottle recycling:

We found we were not recycling sterile water bottles used for all endoscopies, which were instead disposed of via clinical or domestic waste streams. We identified a convenient and practical location close to all endoscopy rooms to set up a recycling bin, ensuring there was one clear collection point for bottles each day. Use of a bin was cleared with infection control and the fire department, then ordered for the department. We discussed the change at morning safety huddles for one week, and laminated signs for all procedure rooms to remind staff and labelled the recycling bin point. Staff started to recycle bottles post morning procedure lists and at the end of the day. We provided regular feedback to staff on the number of bottles recycled and therefore diverted from landfill or incineration to maintain motivation to recycle.

The Campylobacter-like organism (CLO) test

The CLO test is a rapid diagnostic test for diagnosis of *Helicobacter pylori*. We spoke with the reception and booking team to better understand the CLO reporting process. CLO tests required a staff member to print the patients CLO result and then generate a letter for the GP. Two pages were printed per patient, placed in an envelope with handwritten address, before being posted to the GP. The staff member also needed to walk from a back office where they worked, to a printer and post box at a front desk. This was viewed to be extremely time consuming, inefficient and tedious task for staff, taking them away from potentially higher value duties. CLO test reporting was often deprioritised or delayed due to time restraints, high patient flow and increased staff sickness, negatively impacting patient care by delaying test results being received by GP's. This process was also financially costly for the Trust.

CLO test results also need to be recorded electronically, leading to a duplication of reporting work. With the reception and booking team we identified safe and efficient ways to change the process and improve patient care, by converting the electronic results already on our systems to a word document that could be emailed to GP practices. We sent a blanket email to all Clinical endoscopists, consultants and surgeons, asking for their thoughts on changing the way in which we report results to GP's, which was positively received.

Sterile water bottles: We kept a spreadsheet to record the average number of bottles saved per day over a 2 week audit period, and extrapolated this to number of bottles recycled per year. We weighed an empty bottle to calculate the saving from a change to the waste disposal stream, using the carbon emissions factors for waste disposal from Rizan et al (2021) and Trust waste management financial data.

CLO testing: We reviewed the number of CLO tests taken in a 3-month period. We gathered the weights and financial costs of the consumables and activity in this process including paper, envelopes, and postage. Financial data was collected from the Trust procurement team and cost for waste taken from ERIC 2019/20 site data². The GHG emissions associated with the paper was estimated using a bottom-up approach, the paper weight was multiplied by a conversion factor for recycled paper taken from the UK Gov BEIS database. The GHG emissions associated with postage was estimated using a top-down approach in which the cost of postage per letter was multiplied by a financial spend conversion factor taken from the UK GHG emissions database for consumption developed by Leeds University. The emissions attributed to the email replacement were taken from the total paper letter saving.

Results:

Sterile water bottle recycling: We calculated that we are now recycling 135 bottles per week, which would have previously been sent to either domestic or clinical waste streams.

Electronic CLO test results: We calculated that on average we were sending out 119.1 letters per month. Following the change, 0 letters were sent with a 100% switch to the electronic system.

Combined, the projects will save **921.44kg CO2e** and **£1,558.72**, equivalent to driving 2,653.9 miles in an average sized car. Our savings are summarised below;

Table 1:	Sterile water bottle recycling	Electronic CLO testing
Environmental benefit	362.548kg CO2e / year	558.89 kg CO2e / year
Financial benefit	£129.82 per year.	£119.1 / month £1428.90 / year
Clinical and Health outcomes	Recycling of bottles has no negative impact on patient care.	Improved efficiency has reduced delays in reports being sent, which may lead to faster treatment and care for patients.
Social Sustainability	Increased staff awareness on simple sustainable actions they could make	Admin staff now have increased time for higher value and more engaging work.

Barriers

Due to significant operation pressures, some staff felt that this project was not where their energy was best placed. However, working with staff individually and empowering them to see the impact of their changes has supported engagement. We now have staff enthusiastic about sustainability who are now working with us on other projects to make endoscopy as environmentally friendly as possible.

Steps to ensure lasting change and conclusion:

Moving forward, we are talking with weekend agency staff to ensure that they are aware of the recycling point. This will mean that more bottles will be recycled, increasing our savings.

While our changes have been small for the unit, they have had a massive impact. Staff are fully engaged and routinely take it upon themselves to remind one another that bottles need to be recycled. Seeing staff

engaged in making changes, wanting to improve their environment for the better has been great. Knowing that the admin staff can dedicate their time to higher value activity is also motivating to continue to identify ways we can streamline and improve our services. It is important for us to continue to encourage staff engagement, listening to ideas about ways of working so that changes we make continue to have such positive impacts for the environment, our patients and our staff.

We plan on making further changes to our unit by working with the wider multi-disciplinary team to be as sustainable as possible within endoscopy, including projects looking at streamlining referral and assessment pathways. The changes made in this project could be easily replicated in other areas of the trust. We look forward to sharing our work and outcomes with a wider team within the trust to support implementation in other areas going forward, working collaboratively for the greater good!

References

1. Rizan C, Bhutta M, Reed M, Lillywhite R. The carbon footprint of waste streams in a UK hospital. *Journal of Cleaner Production* 286 (2021) 125446.