GREEN TEAM COMPETITION
CENTRE FOR SUSTAINABLE HEALTHCARE

NHS Gloucestershire Managed Services

NHS Gloucestershire Hospitals NHS Foundation Trust

# Scoping for change – adopting greener practice in endoscopy in Gloucestershire, Endoscopy team


TEAM MEMBERS:

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## Background:

Global warming has cataclysmic implications for current and future generations globally. The NHS, one of the largest contributors to carbon emissions in the UK, has set an ambitious target to be carbon net zero by 2040.[1] Endoscopy is the third largest contributor to carbon emissions within the NHS due to a throughput of several million patients annually with the second largest amount of waste generated per clinical procedure.[2]

There is growing enthusiasm nationally for more sustainable practice in endoscopy. The Joint Advisory Group (JAG) on GI endoscopy recently recommended that endoscopy services should aspire to develop a green endoscopy working group and initiate at least one environmental initiative.[3] Furthermore, the British Society of Gastroenterology (BSG), JAG and Centre for Sustainable Health (CSH) recently published a joint consensus on practical measures for environmental sustainability in endoscopy.[2]

More than 9,000 endoscopic procedures are conducted across four endoscopy units in Gloucestershire annually offering huge opportunity for carbon savings. Prior to the Green Teams competition, Gloucestershire did not have a dedicated green endoscopy working group.

## Specific Aims:

1. To establish a multi-professional green endoscopy working group in Gloucestershire
2. To make at least one change to improve sustainability in endoscopy in Cheltenham General Hospital and measure its environmental (CO2e), financial and social impact.

## Methods:

A detailed process mapping exercise was initially conducted to outline the existing patient pathway in endoscopy and identify areas for change. Three broad aspects of the patient pathway were considered: pre-endoscopy, during the endoscopic procedure and post-endoscopy. A long list of potential changes were considered before a final shortlist was created and presented at the Cheltenham endoscopy governance meeting for discussion within the wider department. This helped to improve buy-in within the department and following this meeting many interested staff were invited to join the endoscopy 'green team.' Although several changes were agreed, we focus on three changes for the purpose of this report.

**1.** Pre-endoscopy: We aimed to reduce paper use/postage by offering patients the choice of an electronic copy of their pre-procedure booklet provided via email. The endoscopy bookings/administrative team were instrumental in driving this change, which once agreed was implemented immediately on 03/10/2022. The uptake of electronic leaflets compared with paper was recorded contemporaneously from 03/10/22 to 28/10/22. A 'green champion' in the bookings/administrative team was identified and this has helped to improve buy-in and bring together the wider endoscopy team. We have also contacted the leaflet printing company to negotiate ordering future leaflets printed on recycled paper without inflating cost. Prototype



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leaflets are awaited. This process also exposed some deficiencies in the patient-facing endoscopy website which we plan to revamp to enhance the electronic information available to patients, including accessibility to leaflets.

2. During endoscopic procedures: We utilise a large number of single use disposables and aimed to reduce

a) Use of single use disposable shorts, worn by patients for lower GI endoscopy (colonoscopy and flexible sigmoidoscopy). Instead of the single use shorts, we offered patients a washable patient gown to wear first-line during their lower GI endoscopy. Staff responsible for product ordering, the shorts and inkopad manufacturers and the Gloucestershire managed services team regarding the gowns were contacted. Additional patient gowns were ordered from the hospital stock for endoscopy and there was regular engagement with senior endoscopy nurses in the department and endoscopy staff at departmental meetings to reinforce the change.
b) Prophylactic inkopad use: previously an inkopad would be placed prophylactically either beneath the mouth or anus to catch any potential fluid loss. We targeted reduction of this 'just in case' practice, agreeing responsive practice such that an inkopad would be used if requested by the endoscopist or if high risk of fluid loss was anticipated. Endoscopy staff were encouraged not to use inkopads prophylactically for gastroscopy, flexible sigmoidoscopy and colonoscopy. Instead inkopads were used if deemed necessary by the endoscopy staff during a procedure (e.g. if high risk of or active fluid leakage).

Once the change in practice had been implemented, staff were asked to keep a tally of procedures where shorts or inkopads were used.

**3.** Post procedure: Patients are offered a hot or cold drink using a single use cup. We aimed to reduce single use cup use by encouraging patients to bring in their own water bottle or reusable coffee cup. Patients were asked to do this by the endoscopy bookings/administrative team when they were given information about their appointment, and we had planned to reinforce this by adapting patient leaflets. It was not possible to adapt leaflets to encourage patients to bring in their own reusable cups or water bottles during the study period. Furthermore, data collection regarding the number of cups used each day proved difficult, in part due to several different staff recording numbers of cups used on different days with different systems for recording. Furthermore, the financial, environmental and social impact was felt to be less than the other interventions and so this was not prioritised during the competition and instead represents a medium-term goal. Therefore, we have not calculated savings for cups. Interestingly some staff felt it was unfair to ask patients to bring their own reusable cup or water bottle, feeling it may increase the stress and anxiety associated with the procedure.

## Measurement:

The baseline number of endoscopic procedures performed across each of the four endoscopy units in Gloucestershire is recorded monthly. At baseline, all patients would have received a paper leaflet about their procedure, a prophylactic inkopad during flexible-sigmoidoscopy, colonoscopy or gastroscopy and a pair of single use shorts during flexible sigmoidoscopy or colonoscopy. All patients were offered a drink post-procedure which we assumed would utilise one single use cup. .

***Patient outcomes:***

Patient outcomes were not formally assessed however we obtained feedback from staff of their perception of the impact of changes on patient care

Datix reports were monitored for any comment related to the interventions made.

***Environmental sustainability:***

**1. Pre-endoscopy leaflets:** The environmental impact was estimated by calculating the carbon emissions factor per leaflet. We have calculated the paper and envelope using weights, and postage by cost. We have also included travel as the leaflets are printed by a local supplier 5.8km from the hospital. We have not taken into account the printing itself.

**2a.**

**Single use shorts.** The environmental impact was determined by weighting the material the shorts (ICE database) and first layer of packaging were made of, and applying emissions factors to each material. We also included transport (BEIS) from the manufacturer to supplier to the hospital. Waste disposal (assuming shorts are incinerated, and packaging is recycled) was calculated using emissions factors from Rizan et al (2020).

**Reusable gowns**: It was challenging obtaining accurate data regarding carbon emissions factors for the hospital gowns as the linen department were unable to provide detail regarding the lifespan or washing cost/process involved with each reusable gown. As a result a previously determined carbon emissions factor from another Trust was used. This factor assumes that the gown weighs 0.2 kg, is made of Polypropylene, gets transported to an external facility to be washed and dried, can be used 100 times and will be disposed of by waste to energy at the end of its life.

The difference was multiplied by the number of procedures performed over the study period. procurement of medical equipment with additional benefit in terms of reduced waste incineration. Assumptions were made in terms of transport methods and point of distribution.

2b. **Inkopads:** The carbon emissions factor per inkopad was determined by weighting the material and applying emissions factors to each material. Packaging was not included. The inkopads are manufactured in Sweden although the exact distribution location is unknown. Direct distribution from Stockholm, Sweden to Gloucester Royal Hospital by lorry has been assumed. Savings were extrapolated based on the number of inkopads saved (a tally chart was recorded of usage during the study period).

***Economic sustainability:***

Financial data was obtained from the staff responsible for procurement. There were no investment costs.

**1. Pre-endoscopy leaflets:** The printing and postage cost per leaflet was used to calculate the financial saving of electronic leaflet use. the environmental cost of ink and staples was not included. The distribution cost in terms of mileage to/from post sorting office to final destination was also not included

**2a. Single use shorts and gowns**: It was difficult to determine the financial impact of switching from routine use of shorts to gowns since information from the linen team was difficult to obtain (e.g. the lifespan of a reusable gown).

**2b. Inkopads:** The financial cost per inkopad was taken from Trust finance team and was used to estimate the savings in reduction of use.

***Social sustainability:***

Staff attitudes towards sustainability and the changes made in endoscopy were assessed using an electronic questionnaire. Some staff concerns about patients' dignity when gown is used was raised and so patient feedback regarding their dignity during the procedure was sought from patient feedback questionnaires. Patient experience in general was assessed in the post-procedure questionnaire.

## Results:

***Patient outcomes:***

Use of gowns and reducing inkopad use was welcomed by a number of endoscopists as having some procedural benefit as the single use shorts and inkopads were sometimes noted to gather on the colonoscope which may lead to fabric catching and needing to be ripped during the procedure, impairing insertion. This may lead to more efficient procedures.

The choice of leaflet format has made patient care more patient-centered, timely and efficient. Standards of care have continued to be maintained, evidenced by consistent patient feedback and no Datix reported related to the changes during the study period. Arguably some aspects of care are safer as patients are more likely to receive their leaflet pre-procedure in a format and language suitable for them.

***Economic and Environmental sustainability:***

The below results were collected from data obtained on our 25 day monitoring period.

1. electronic leaflet

49% of patients opted for an electronic leaflet (n=402). At this percentage uptake, the total number of paper leaflets posted each year would reduce from 16,971 to 8,655 with savings of £1,497 and 1,701 kgCO2e.

2a: replacing disposable shorts with reusable gowns

A small proportion (<5%) of patients who had undergone a procedure before requested they use the shorts again. Switching from single use shorts to reusable gown use during the study period was therefore estimated in 95% of patients undergoing colonoscopy and flexible-sigmoidoscope. On this basis 8,548 less single use shorts would be used annually leading to financial saving of £7,180.

The CO2e for one pair of shorts is 0.2834 kgCO2e. The carbon emissions saving from reduced shorts manufacture and orange waste incineration is 2,423 kgCO2e annually, again an over-estimate for the reasons outlined. The carbon footprint of one reusable gown is 0.06284 kgCO2. The carbon footprint of 8,548 reusable gowns would be 537.16 kgCO2e. This is a saving of 1,886kg CO2e.

This figure does represent an over-estimate as the cost of purchasing replacement gowns during the year and laundry cost/disposal cost for expired gowns is unclear. It is unknown whether the endoscopy budget would be responsible for this or whether these costs would be included in an existing hospital contract.

2b: Inkopads:

We are continuing to measure the number of inkopads saved from reduction in prophylactic use. From clinical experience we estimate inkopad use at 10% for OGD or flexible sigmoidoscopy and conservatively, 50% in colonoscopy. Based on this estimate, 12,735 fewer inkopads would be used each year with savings of £891 and 3,032 kgCO2e annually from reduced inkopad manufacture and incineration in orange waste bags.

**Total savings**: Overall the potential savings across all four endoscopy units if these three interventions were made would be £9,568 annually with carbon emissions savings of **6,619 kgCO2e** annually, equivalent to 19,063.9 miles driven in an average car.

***Social sustainability:***

The Green Teams Competition has provided a platform to establish a multi-disciplinary green endoscopy working group in Gloucestershire consisting of staff from the endoscopy bookings team, endoscopists, trainees, endoscopy nurses and healthcare assistants. Staff have felt involved which has helped to create buy-in for the interventions. Endoscopy staff attitudes regarding green endoscopy and the interventions made were assessed during an electronic survey of staff attitudes (n=16). 100% of staff were supportive of greener practice in endoscopy and accepted everyone had a responsibility for adapting their way of working to reduce carbon emissions.

**1. electronic leaflet:** 94% of staff either somewhat or strongly agreed with switching leaflets from paper to electronic format although concerns were raised that the electronic format may be less appropriate in some patient cohorts, hence choice should be maintained as a choice.

This change has benefits of enhancing patient choice and offering instantaneous distribution, particularly beneficial for patients undergoing an endoscopic procedure at short notice when a paper copy may not arrive via post in time, particularly during a climate of postal industrial action. Electronic leaflets arguably improved the reliability of leaflet provision and also offered a format which could be easily translated to other languages using an online translator.

Estimating 30 seconds time saved for the endoscopy bookings staff per leaflet, this would generate roughly 69 hours of time for additional activity annually. This time may mean more patients can be contacted during their working day, or there be extra opportunity to take breaks and improve wellbeing.

**2. Replacing shorts with gowns:** Switching from single use shorts to reusable gowns was more contentious with 50% disagreeing with the change, siting loss of patient dignity as a concern. This has been discussed at departmental meetings and felt to be unfounded, perhaps created in part by the marketing of shorts as 'dignity' shorts. We are aware that other services such as gynaecology and urology procedures do not use shorts. Crucially, patients have not highlighted a concern with dignity in post-procedure feedback surveys or recorded via Datix. This will be fed back to staff during departmental meetings to address concerns.

3. **Inkopads**: Ceasing the prophylactic use of inkopads was supported by 81% of endoscopy staff. Some additional staff education was needed during the study period as some staff misunderstood the intervention instead thinking inkopad use had been completely condemned. Patient feedback and Datix should continue to be monitored to ensure no issues are highlighted with the interventions made

## Conclusions:

The interventions have reduced the carbon intensity of each endoscopy procedure with additional benefits financially and more importantly by improving choice and widening information accessibility during the patient journey.

The Green teams' competition has been incredibly useful in nurturing a culture of greener practice in endoscopy in Gloucestershire and empowering the team to make positive change. Creating a working group of staff involved in each part of the patient pathway is important to create enthusiasm and maintain momentum of change. It can be frustrating when information or data is not forthcoming but important to realise that everyone is incredibly busy in the organisation but despite this most people have a willingness to help, although sometimes on differing time scales.


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The inception of the green endoscopy working group should help to create lasting change and I plan to hold quarterly meetings to discuss ideas and new interventions to make our endoscopy practice greener. Posters have been added to staff noticeboards encouraging ideas for greener practice and discussion about green endoscopy should form a part of endoscopy governance meetings. I have also promoted the Green Teams Competition to the endoscopy lead for the BSG, suggesting this could be a national competition for endoscopy units with ideas showcased at the national BSG meeting and achievements recognised. I plan to develop our results into an abstract so they can be presented at the annual BSG meeting, allowing our interventions to be showcased to other endoscopy units nationally.

## References:

1. https://www.england.nhs.uk/greenernhs/a-net-zero-nhs/ - accessed 03/01/2023
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3. https://www.thejag.org.uk/green-endoscopy - accessed 03/01/2023