FRIMLEY NHS FOUNDATION TRUST
GREEN WARD COMPETITION 2020
CASE STUDIES

CENTRE *for* SUSTAINABLE HEALTHCARE

inspire • empower • transform

INTRODUCTION

The Green Ward Competition is a clinical leadership and engagement programme for NHS Trusts wishing to improve their environmental sustainability and reduce their carbon footprint.

Dr Olivia Bush, Clinical Programme Director at the Centre for Sustainable Healthcare, has worked directly with 6 ward and unit teams across the trust (3 Frimley teams and 3 Wexham teams) to develop, run and measure projects to make their daily practice more sustainable and add value.

1. WALKING AIDS - CAN WE REDUCE DUPLICATION OF ISSUE? PHYSIOTHERAPY TEAM

TEAM MEMBERS: Anna Mughal and Catherine Ross (Acting Outpatient Physiotherapy Leads), Nicola Brown, Hannah Payne, Catherine Threlfall and Natasha Rodgers.

Aim: To reduce the waste of walking aids.

Goals & Approach:

The department set out to:

1) Reduce duplicate issuing of walking aids.

They introduced a new procedure whereby they asked patients or relatives if they had an existing or suitable walking aid at home. The created a checklist that could be used to enable relatives/carers/friends to assess if the existing walking aid was safe to use.

2) Increase returns of walking aids to healthcare settings.

The team investigated the local provision of collection points for used walking aids. They generated ideas and methods to encourage patients to return walking aids to their nearest collection point.

Background:

Reasons for choosing the project:

The team hypothesised that checking for duplication and empowering patients and relatives by providing clearer information on recycling and reusing walking aids would result in departmental carbon and cost savings.

Strategic choice of project **-** The Sustainable Development Unit identified that walking aids were among the top 20 high greenhouse gas intensity procured items for the NHS in England. The team also identified that a large number of walking aids were being used by the department.

Data collection:

Robust measurement of impact - Baseline data was collected on

- the number of patients on G5 ward requiring a walking aid.
- the number of those patients who had an existing suitable aid at home.
- the number of patients who would be suitable to have a safety checklist issued to them (i.e. had a contact who could carry out the check).

It was assumed that, prior to the project, no patients were asked if they had existing aids at home (this was an assumption based upon experience, but no data was gathered to verify this).

At the same time as gathering baseline data, checklists were handed out and assessments made on whether issuing a new walking aid was required. Data on the number of duplicate issues of walking aids saved was recorded. The costs of the 3 most commonly issued aids were used to estimate financial and carbon savings. To calculate savings over 1 year, an average hospital stay of 5.9 days was assumed to estimate demand for walking aids.

Engaged colleagues/patients – the team engaged the inpatient physiotherapy team on G5 ward through face-to-face conversations.

Steps taken to encourage reuse

- A **list was made of hospitals that will accept returned walking aids to reuse**.
- A **poster** was designed to encourage reusing or recycling walking aids (Appendix 1), which includes a box indicating the location of the nearest collection point. There are plans to spread this across the local geographical area.
- Walking aids in the physiotherapy department are routinely **labelled** with the hospital address; the team plan to change the label to include a message to ask patients to return walking aids to their nearest collection point, and have agreed new wording.
- During the course of the project the team found that labels are not affixed to walking aids in ED and no instruction is given to patients to return the aids once the patients no longer need them. They plan to engage ED staff to work towards increasing the reuse of walking aids though routine labelling and advice given to patients.

Evidence of Impact:

Results:

Overall, 27 of the 50 patients on the ward required walking aids. This was the result of a spot-check over a period of one day. On further investigation by the team:

12 of the 27 patients requiring aids had walking aids of a suitable type at home:

- 10 of these patients could have been given a checklist to assess the safety of their aids but approximately 9 (data not recorded, approximation made by staff member) of these patients had very new walking aids so the checklist was not required.
- Asking patients/relatives about existing walking aids saved the unnecessary issue of 9 walking aids.

Environmental benefit - Over 1 day the hospital saved 182kgCO_2e by not unnecessarily issuing duplicate walking aids. Assuming that this calculation is representative of daily practice, over **1 year** the forecast savings are **11,284kgCO_2e.**

Financial benefit - Over 1 day the trust saved approximately £118. Over **1 year** the forecast savings would be **£7,327**.

Social sustainability – potential to empower patients and families by providing them with information on how to check the safety of their walking aids, and how to recycle them.

Clinical outcomes – potential to help to prevent accidents and inpatient stays if patients are equipped with information on how to check the safety of their walking aids and the importance of this (this hypothesis needs testing).

2. ADDING BLOOD BACK INTO THE SYSTEM - USING BLOOD DISCARDS FROM VENESECTION FOR TRANSFUSION PURPOSES

TEAM MEMBERS: Andrew Barton (Lead Nurse) and Fiona Nadin (Clinical Nurse Specialist)

Aim: To reduce clinical waste by using blood obtained during therapeutic venesection, from patients with Genetic Haemochromatosis (GH), for transfusion.

Background:

- GH patients regularly attend the unit for therapeutic venesection (bloodletting to reduce body iron levels, which are so high in this condition that they cause organ damage). Blood obtained during therapeutic venesection is discarded, despite many of these patients fulfilling the NHS Blood and Transfusion (NHSBT) criteria for altruistic blood donation.
- The team wondered if blood obtained during routine venesection could be diverted into the transfusion service to prevent waste, in line with circular economy principles, which would increase the amounts of blood donated to the transfusion service.
- Potential benefits:
    - improve patient wellbeing due to more patients being able to 'give back' to the health service through blood donation.
    - Reducing travel; patients could undergo therapeutic venesection and donate during one visit, cutting out the need to travel to a donation centre in addition to the venesection clinic.

Approach: The feasibility of this idea was assessed by initiating conversations and relationships with key members of staff at NHSBT, as well as arranging a site visit to NHSBT to better understand the process of obtaining and processing blood donations.

Feasibility assessment:

- ***Clinical sustainability***
    - NHSBT guidelines require the use of a steel needle which does not align with FHFT guidelines of venesection, which is performed with 18-gauge cannulas to prevent extravasation injury in patients with frequent appointments.
    - Risk of blood obtained from therapeutic venesection carried out for conditions other than GH which are unsuitable for donation being accepted into the donation service due to human error.
    - GH patients generally have common blood types (A+) which is less in demand by NHSBT, so setting up a specialised service to salvage blood from this group of patients is a lower priority than it would be if GH patients tended to have rarer blood types.
- ***Environmental:*** Blood collected cannot be transported back to NHSBT in the same vehicle as blood being delivered to health services due to the risk of mixing up the processed and unprocessed blood through human error. This means a new transport batch must be set up to deliver the collected blood to NHSBT, which will increase the carbon footprint of the service.
- ***Social:*** The time required to screen and assess a patient for donation (as per NHSBT guidelines) exceeds the allocated time in clinic, reducing staffing capacity and potentially decreasing the number of available appointments. Staff would also require extra training to be accredited by NHSBT.
- ***Financial:*** There would likely be a significant investment required in IT infrastructure to align with the NHSBT system for documenting the suitability of therapeutic venesection patients for donation.

Conclusion: It became clear that **directly diverting blood from venesection to the blood transfusion service would not be feasible** currently, due to the complex infrastructure and necessarily rigorous controls set in place by NHSBT that are necessary to maintain patient safety across the NHS.

The team then discussed alternative solutions with the blood transfusion service to help to increase blood donation in this group while reducing travel.

Alternative solutions:

- **FHFT have offered to host a static NHSBT donation centre,** which could overcome some of the financial obstacles of IT investment while providing opportunities for adding GH donors to the system and reducing waste of valuable blood resources.
- The team are in the process of publishing an article, arguing standardise the types of needle used for venesection in the hospital and transfusion services; if adopted this standardisation may increase opportunities for closer integration of services in the future.

Impact of the project:

The project had social stainability benefits for patients and staff, and a potentially small, positive effect on the blood transfusion service:

- The increased knowledge of the donation system and connections made with NHSBT through visiting the blood transfusion service have been valuable in altering advice given to GH patients, which **allows them to donate more frequently than before at their local NHSBT centre**. This increases the amount of blood donated back into the system and contributes to patient satisfaction as they feel they are "giving back" and contributing to society.

- **Impact on staff: The competition has changed the perspective of staff and encouraged 'systems thinking'.**
    - *"The green ward competition has made me think more broadly about the context of sustainability in a completely different way. I have had the opportunity to think differently. It's been a good challenge to be part of [the competition] and [to] think outside of my own clinical box'.* ***Senior Sister G7***
    - *"It feels like such a waste putting [blood] in the bin but the project has really opened up my eyes to how complicated things are in this process".* ***Staff Nurse G7***

3. REDUCTION OF CO_2 UTILISATION IN ENDOSCOPY PROCEDURES

TEAM MEMBERS: Ms. Sabiha Omar (Staff nurse), Ms. Sheela Singh (Staff nurse), Ms. Richel Oliver (Matron), and Mr. Joseph Rubis (Senior Charge Nurse).

Aim: To reduce excess use of CO_2 in the Endoscopy unit.

Background:

Carbon dioxide gas is used for insufflation of the gastrointestinal tract during endoscopic procedures in the endoscopy department. On learning during the Green Ward workshop that carbon dioxide is a greenhouse gas and therefore contributes to climate change, members of staff realised that reducing the waste of carbon dioxide in the department could be an important way to reduce the department's carbon footprint.

Staff identified two potential methods of reducing CO_2 use:

1. **Lean procedures** - Changing routine practice of leaving the tap of CO_2 cylinders open in between procedures to stop litres of CO_2 gas escaping.
2. **Low carbon alternatives** - exploring the possibility of using air or water during the procedure, rather than CO_2.

Strategic choice of project:

- In order to reduce carbon emissions by 80% in line with the Climate Change Act 2008, everyone has a responsibility to act and reduce carbon emissions in the workplace.
- Reducing carbon dioxide waste in the department will reduce the departmental climate change impact i.e. carbon footprint.

Approach:

- ***Engaged colleagues/patients:***
    - The team encouraged all the staff members working in the procedures rooms to switch off CO_2 in between procedures. The whole team in the unit was included (endoscopists, technicians and nurses).
    - The team also used the daily handover meetings to remind staff about the change in procedure.
    - nursing staff worked with a hospital librarian (who is also a member of the quality improvement community and had volunteered to support the competition) to run a literature search on the evidence base for the alternatives to CO_2 use.
- ***Robust measurement of impact:***
    - The team measured the number of CO_2 cylinders used as a baseline (in August and September) and, after the changes they had introduced (in October and November). They then noted the difference in the number of CO_2 cylinders used in both timeframes as a measure of how much CO_2 was being used by the endoscopy department.
- ***Steps taken to ensure lasting change:***
    - Plan to continue to monitor amount of CO_2 used in endoscopic procedures.

Evidence of Impact:

Lean procedures

At baseline 60 cylinders were used over 2 months. After the change was implemented, only 33 cylinders were used over the same period.

- ***Environmental benefit:***
    - The carbon footprint due to CO_2 use in the department dropped from 202kgCO_2e over 2 months at baseline to 111kgCO_2 after the change, a saving of 91kgCO_2e.
    - The annual forecast saving is 546kgCO_2e.

- ***Social sustainability:***
  - The surveyed staff satisfaction in the endoscopy unit during the competition. Of 15 respondents:
    - 93% of staff thought that the green ward project was effective & beneficial to their work, the service and environment (1 person did not respond to this question).
    - 75% of staff members thought that their project contributed to their professional development.
    - 86% of staff thought they had learnt more about the reduction of carbon footprint through participating in the project.

- ***Financial benefit:***
  - There was £204.30 saving over 2 months.
  - This gives a forecast saving of £1,226 per year.

Low carbon alternatives
It was clear from the literature search and discussion with consultant colleagues that air would not be a good alternative to carbon dioxide as air is less readily absorbed into the bowel and the patients experience more discomfort when it is used. This poorer patient experience may also increase resource us (analgesia and longer length of stay).
Water is an emerging alternative in the literature and used for some endoscopic cases at St Mark's Hospital, London. Water is not suitable for all cases and is not currently the practice at Frimley Health.

4. REDUCTION OF WASTAGE OF LINEN AND CONSUMABLES IN THE INTENSIVE CARE UNIT (ICU).

TEAM MEMBERS: Anne Moore and Ruramai Chidzambwa (Practice Development Senior Sisters).

Aim: To reduce the waste of linen and consumables in the ICU.

Background: During the Green Ward Competition workshop it was identified that a key area of waste on the unit was stockpiling of linen in the bedside spaces. Nursing staff store clean consumables, including linen, in the patient's bedside cupboard just in case they are needed so that the nursing staff do not need to leave the bedside of their critically ill patient. Infection control policy requires that all bedside consumables must be disposed of when a patient is discharged, leading to waste of unused items.

Approach:
- ***Strategic choice of project:***
  - Linen and consumables use were identified as a key area of waste in ICU through staff experience.
- ***Engaged colleagues/patients:***
  - Staff ran a poster campaign from week 2 of the project and discussed the project at handovers for nursing staff and healthcare assistants throughout the rest of the project.
- ***Robust measurement of impact:***
  - Week 1: Baseline Data was gathered on the amount of linen and consumables wasted after each discharge; data collection was blinded.
  - Week 2: Data was then collected during an awareness-raising campaign.
  - Weeks 3-6: a trolley was introduced in the centre of the unit to allow nurses to access linen and consumables closer to the patient's bed space to discourage stockpiling.
  - Week 7: Data was collected after the trolley was removed (due to trolley not meeting infection control standards).
- ***Steps taken to ensure lasting change:***
  - Application for funding for a trolley that is infection-control compliant.

Evidence of Impact:

Over the 7-week project period, there was an average of 4 discharges per week recorded during the project for which data was collected. A search of the patient management database revealed 756 discharges occurred in 2019, an average of 14 discharges a week suggesting incomplete data capture during the project.

Environmental & financial benefit:
At baseline, wastage of all items had a carbon footprint of 2.51kgCO2e and cost £7.65 per discharge. Repeat washing of unused linen contributed the most to the footprint at a cost of 1.62kgCO2e and £4.89.

After awareness raising in week 2 the team achieved a **55% reduction in carbon emissions** from baseline, dropping to 1.13kgCO2e and a **48% cost reduction**, dropping to £3.94 of wastage per discharge.

After introducing and using the trolley in weeks 3-6; a further reduction was achieved; carbon emissions dropped by a further 14% to 0.97kgCO2e and the cost by a further 29% to £2.82 per discharge.

When the **trolley was removed** there were still less waste than at baseline, 44% below baseline, 1.38kgCO2e per discharge. However, wastage was more than when the trolley was in place, jumping up by 43% when compared to levels when the trolley was available. Costs when the trolley was removed were £3.92 per discharge.

Forecast over 1 year;
Assuming a trolley was reintroduced, the forecast for savings over 1-year emissions savings would be 1,161kgCO2e and cost savings would be £3,642 (not taking the capital cost of the trolley into account).

Social sustainability & Engagement:

Comments from the staff demonstrated the educational benefits of the competition in increasing both knowledge and action around sustainability at work and at home. The project also improved the working environment for staff, making it easier for them to do their job.

I enjoyed being part of the Green Ward Competition. This project has made me more aware of how I can help to reduce waste and become more eco-friendly, not only at work but also in my personal life. ***Christina Canavan, Senior Staff Nurse.***

Having the linen on a trolley saves the nurses' time and that time can be better used to care for the patients. ***Sarah Ede, Senior Sister.***

5. REDUCTION OF THE CARBON FOOTPRINT OF PAEDIATRIC RESPIRATORY CARE

TEAM MEMBERS: Claire Roome (Paediatric Registrar), Sejal Patel, (Paediatric Consultant), Ellie Russell, (Doctors' Assistant), Dierdre Race (Paediatric Pharmacist), Jacqueline Lancaster (Play Therapist), Jo Pacitto (Senior Nurse), Emma Lewis (Paediatric Senior House Officer).

Aim: To reduce the environmental impact of metered-dose inhaler (MDI) use in the paediatric department.

Background:

Strategic choice of project:

- Metered dose ("puffer") inhaler use is a significant contributor to the NHS carbon footprint.
- patients under the age of 2 with respiratory symptoms make up an estimated 80% of emergency paediatric admissions in the hospital. Doctors frequently choose to prescribe metered dose inhalers (MDIs) for young children. A 'spacer' (a device to aid delivery of the drug to the lungs) can be used to

help children who have difficulty co-ordinating breathing. Spacers can only be used with MDIs, not with the low carbon alternative, powdered dose inhalers (DPIs) that do not contain a propellant. DPIs can be used for older children.

Approach:

- ***Studying the system***

  The team created a process map of inhaler use in the acute paediatric department with the help of one of the QI team.

  Further information was gathered to help to direct the improvement effort;

  - A **staff survey** to benchmark current practice around inhaler prescribing and advice in hospital respiratory teams was carried out. Findings were;
    - 30% of doctors and nurses do not ask if a patient already has an in-date inhaler before issuing a duplicate.
    - 44% of clinical staff were unaware that inhalers contain HFC gases that have a high global warming impact.
    - The majority of clinical staff (88%) were unaware that inhalers should be disposed of at a pharmacy or at an inhaler recycling point.

  - **Types of inhaler used in the hospital and community;** the team found that the hospital uses Salamol, an inhaler that uses a lower volume of HFC propellant to deliver a dose of the drug salbutamol. One of the QI team who had agreed to help with the competition put the team in touch with the CCG pharmacist who carried out an analysis of community salbutamol prescribing as a comparison; the analysis showed that 14,348 (51%) of salbutamol inhalers prescribed in the community in one year are Ventolin, that have the highest carbon footprint of all salbutamol MDIs on the market. The local CCG prescribes a much higher proportion of MDIs (total number including the adult and paediatric population) compared to other CCGs in the country.

  - Patients were surveyed to find out the number of inhalers used at home and how they routinely dispose of them.
    - 80% of patients had an inhaler with them when visiting the hospital respiratory department (potential for continuing to use this rather than prescribing a new inhaler; however none of the patients knew how many doses were left in the inhaler).
    - None of the parents or patients knew how to correctly assess if the inhaler was empty (counting the number of doses is the only reliable method and that there are 200 doses per inhaler).
    - 80% of patients disposed of their inhalers in the domestic waste, 20% took their old inhalers to the GP. None took used inhalers to the pharmacy for disposal.

  - Inhaler technique is one of the strongest measures to reduce environmental impact; checking inhaler technique is already standard practice in the department.

- ***Changes implemented***
  - ***Patients attending acute paediatric assessment unit; 15 patients were reached.***
    - Patient education on correct method of ascertaining if an inhaler still contains drug and when to replace it.

- Patient education on correct inhaler disposal; including identifying a pharmacy where it would be most convenient for them to dispose of empty inhalers.
- Arranging for inhaler recycling points to be introduced in the hospital.

- ***Hospital Staff***
  - Poster campaign carried out to educate staff on the acute paediatric assessment unit of the environmental impact of inhalers and what action they should take to minimise this impact.
  - Awareness-raising and discussion at departmental meetings; included discussing extending the patient education project carried out in acute paediatric assessment unit to the outpatient setting and implementing the new NICE guidance for optimum inhaler choice in adults (that includes environmental elements) and whether this could be applied to paediatric patients.

- ***CCG staff***
  - Conversation with lead pharmacist at the local CCG about prescribing low volume MDIs like Salamol (contain less greenhouse gas) to match practice in the hospital. The pharmacist then implemented the following:
    - Recommending Salamol over Ventolin in **a)** the CCG newsletter **b)** an automatic alert on the prescribing system that appears whenever Ventolin is prescribed and **c)** in the new ICS COPD guideline (and in the asthma guideline when that is due to be updated)
    - Confirming which local pharmacies are part of the GSK inhaler recycling scheme and asking the communication team to publicise these. The CCG would like to extend the inhaler recycling scheme through working with other companies (Teva and Chiesi) as the GSK scheme is at capacity.
    - Planning to set local practices targets to reduce the carbon footprint of their inhaler prescribing.

Impacts (actual and potential):

Environmental & financial benefit:

8977 paediatric patients attended Wexham Park Hospital paediatrics acute assessment unit over November 2018 to November 2019. Based on staff experience an estimated 80%, 7,182 patients, will have presented with respiratory problems.

Inhaler disposal

The assumption was made that all respiratory patients use inhalers. According to the patient questionnaire results, 80% of patients using inhalers dispose of the inhalers in the general domestic waste at home, so the inhaler ends up in landfill, releasing the propellant gases.

If 30% of patients and/ or carers changed their behaviour, to dispose the inhalers at their local pharmacy (100% of those surveyed expressed a willingness to dispose of inhalers to reduce negative environmental impacts), the release of the propellant gases in landfill could be avoided. This change could save 11 tonnes CO_2e; this carbon footprint calculation is based on assumptions made in line with findings of a study carried out in primary care in Brighton. The study found that 40% of inhalers returned to pharmacies for disposal are completely empty, 18% completely full and the remaining 42% contain an average residual 35% of drug.

However, few patients use just 1 inhaler per year, so the potential saving is likely to be higher. If we assume that each patient uses 4 inhalers per year, then the savings would be a massive 44 tonnes CO_2e (note that an average UK citizen has an annual total carbon footprint of 10 tonnes CO_2e).

Inhaler prescribing

If GPs changed their prescribing patterns of salbutamol inhalers by reducing the number of Ventolin inhalers prescribed by 30% and instead prescribing Salamol this would save 363 tonnes CO_2e over 1 year. Given that each person in the UK has an average annual carbon footprint of 15 tonnesCO_2e, the saving is equivalent to the average annual carbon footprint of 24 people!

Interventions on inhaler prescribing and disposal above would be cost neutral for NHS healthcare providers and pharmacies.

Social sustainability & Engagement (quotes from patients):

'I had no idea inhalers damage the environment if just thrown away, of course I don't want that for the next generation. Now I know I'll take them back to a pharmacy'

'We all have a responsibility for the environment, and I'd like to do my bit'

Engagement:

'200 puffs are a lot – I thought the inhaler only lasted 3 months'

'I have so many inhalers lying around at home, now I'll take them to my pharmacy'

- ***Other changes made/planned:***
    - Discussion with lead clinician at tertiary respiratory centre (John Radcliffe Hospital, Oxford) to spread changes on inhaler disposal to that site; support granted.
    - Consultant paediatrician at Frimley Health agreed to discuss the environmental impact of inhalers when discussing inhaler choices with patients and their parents in clinic (possibly using the NICE decision-aid for inhaler choice).
    - Plan to run an education session for GP trainees on the environmental impact of inhalers (no date set, on waiting list for presenters).
    - The high proportion of MDIs vs DPIs prescribed in the local area in comparison with the rest of the country was discussed with the **adult** respiratory team at Wexham Park Hospital so that they could consider making a change in their practice.
    - The team plan to set up an agreement with IT and pharmacy to add an automatic message on drugs dispensed at the hospital to prompt patients to return drugs to pharmacies for safe disposal, especially MDI inhalers.

6. REDUCTION OF THE CARBON FOOTPRINT OF THE EARLY STROKE DISCHARGE SERVICE

TEAM MEMBERS: Michelle Anderson (Team Lead Physiotherapist) & Clare Watson (Physiotherapy Head of Service for Neurology and Stroke Early Supported Discharge Manager)

Aim; to reduce the carbon footprint of stroke discharges

Goal 1: To reduce the carbon footprint of the discharge process and initial Stroke ESD visit by devising a lower carbon impact transport process.

Goal 2: Reducing delays to planned discharges and wasted home visits.

Background: prior to the project the team visited patients at home post-discharge using their own cars, all of which run on petrol. The team find that they sometimes visit the patient and find that the patient is not at home, sometimes due to a delayed discharge, which means that they have a wasted journey that has financial and environmental impact as well as an impact on the team's workflow.

Strategic choice of project:
Transport is a key element of the carbon footprint of the NHS. 5% of vehicles on the road are travelling on NHS business. Journeys to and from hospital sites contribute to poor air quality in the local area, that has a negative effect on the health of the local population.

Approach:

Project 1; An electric pool car was hired from the car pool for one month and used by the 2 team technicians to carry out assessments in patient's homes. The technicians cover a greater mileage each day than the other team members so supplying the car to the technicians makes the car hire better value for money and maximises environmental benefit.

Project 2; The team surveyed how patients were getting home and patient preferences. They then worked with the ward to consider using the Stroke ESD team to transport some patients home and offer to carry out their visit at the same time with the aim of reducing the length of hospital stay and reduce wasted journeys for the Stroke ESD team. The Stroke ESD team devised a draft discharge checklist that they then refined in collaboration with the ward team and discharge nurse. They worked with their inpatient physiotherapy colleagues who are based on the ward to remind staff to use the checklist and communicate with the Stroke ESD team regarding discharges.

- ***Robust measurement of impact:***
    - A survey was completed by patients on their preferred mode of transport home and their discharge experience.
    - Data was gathered on the mileage covered in the electric car and emissions calculated during November 2019. This was compared with emissions from previous months when staff used their own, petrol-fuelled cars; these emissions were calculated from retrospective data from travel expenses claims made by staff.
    - The number of patients travelling home with the Stroke ESD team was measured.
- ***Engaged colleagues/patients:***
    - Engaged patients through a survey.
    - Worked with ward staff on a discharge checklist.
    - Engaged ward physios to flag up the potential of patients being taken home by stroke ESD.
- ***Steps taken to ensure lasting change:***
    - Business case submitted for a pool car to be bought for exclusive use of the stroke ESD team.
    - Discharge checklist in use on the stroke ward.

Evidence of Impact:

Project 1:

The impact of the use of the pool car for booked visits was calculated.

Environmental & financial benefit:

Financial:
Over the one-month project period in November 2019, £9.07 was saved from using a single electric car, with forecast annual savings of £111. The team plan to start using two cars so that each of the technicians can carry out all their visits in an electric care; the forecast savings over 1 year would then rise to £222.

Environmental:
A forecast reduction in 4,380kgCO_2e/year. If adopted at scale air pollution could be reduced and if sufficient reductions were made this would improve health of the local population.

Social sustainability & Engagement:
This project has the potential to reduce wear & tear on staff own cars (grey fleet). Staff reported feeling pleased to be able to make changes towards their service being more 'eco-friendly' and;

- Developing staff

  "Useful to have guidance from [the Centre for Sustainable Healthcare in setting up and running] the project and [this] ensured the project stayed on track."

  "Project reinforced the importance of good preparation and data collection prior to change in order to demonstrate change outcomes."

- Improving team morale

  "The whole team got behind the project and having a joint focus aided morale."

- Helped team to achieve long-term goals that fit their values

  "Exciting to be part of a project that could benefit the team and patients long-term. It has also helped to support a business case for a team pool car."

Project 2;

14 patients were surveyed on their preferences on transport home;

There was too little time between project implementation and close of the project period in December 2019 for the new discharge process to be embedded and only 1 patient was taken home from the stroke ward by the Stroke ESD team in November 2019. However, since the close of the competition more patients are being transported home using the Stroke ESD service and data on the impact of this new service is continuing to be collected.

POTENTIAL ANNUAL SAVINGS

The following table provides detail on the annual savings available to the Trust from the 2019 Green Ward Competition projects when projects are fully implemented and embedded. **These carbon and cost savings will increase if the projects are scaled up across clinical areas throughout the Trust.**

Project	Money	Carbon	Social	Clinical Outcomes
Walking Aids - Can we reduce duplication of issue?	£7,327.	11,284kgCO2e.	Empowers patients through education on how to allow aids to be reused, recycled and maintained.	Information on checking walking aid safety may reduce accidents.
Adding blood back into the system - Using blood discards from venesection for transfusion purposes	N/A	N/A	Potential increase in patient satisfaction if they can donate blood more frequently. Staff enjoyed the educational element of being involved in the competition; they developed a broader understanding of sustainability in a clinical context and thought about their service in the context of the wider system.	Potential for GH patients to donate blood more frequently.
Reduction of CO_2 emitted in Endoscopy Procedures	£1,226.	546kgCO2e.	93% of staff found the project effective and beneficial to their work.	Discussion of alternative technique using water.

Reduction in waste of linen and consumables in ITU	£3,642 (not taking the capital cost of the trolley into account).	1,161kgCO_2e	Empowered staff to think about sustainability, including how to reduce waste, in their work and home lives.	Save resources to spend elsewhere.
Reducing the carbon footprint of paediatric respiratory care	Not quantified. Likely to be cost neutral.	*Hospital* 44 tonnes CO_2e. *Community* 363 tonnes CO_2e over 1 year	Education on the environmental impact of inhalers and how to mitigate it, whilst maintaining disease control, gave patients and staff the opportunity to 'do their bit' to protect the environment and thus the health of their community.	
Reducing the carbon footprint of stroke early discharge service	£222.	4,380kgCO_2e/year. If adopted at scale air pollution could be reduced and if sufficient reductions were made this would improve health of the local population.	Potential to reduce wear & tear on staff own cars (grey fleet). Staff reported feeling pleased to be able to make changes towards their service being more 'eco-friendly'.	
Total	**£12,417**	**424.3 tonnes CO_2e**		

For every £1 invested in the programme a forecast saving of nearly £2 were made (£1.70).

The forecast annual **carbon savings** are **highly impressive,** especially as many of the changes made were relatively small and contained. **424 tonnes CO_2e saved equates to the total annual carbon footprint of 28 UK citizens**.

The social sustainability impact in these projects were mostly around allowing staff and patients the opportunity of working more in line with their values (this has known benefits for staff resilience,

satisfaction and wellbeing); and staff and patient education around a broader and 'systems thinking' approach to sustainability.

AWARDS

Congratulations to the WINNING team, the Paediatric Respiratory team, led by Claire Roome. It was a project that tackled a massive carbon hotspot in the service and was outstanding in the breadth of the project, including the team's collaboration with primary care through the CCG. This is a great example of sustainable quality improvement in practice and how to take a multi-faceted approach to reducing the impact of metered dose inhalers, that other teams will find a useful guide.

NEXT STEPS

Having run these pilot projects we encourage the **teams to build** on this initial phase, for the **Trust to spread** suitable projects to other areas (CSH can be commissioned to facilitate this) and for teams to **continue** to look at their work through a **'Sustainability Lens'**.

ACKNOWLEDGEMENTS

Thank you to every team member for all their enthusiasm, dedicated work & creativity in devising and completing their projects.

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Thank you to Ingeborg Steinbach, Carbon Consultant, The Centre for Sustainable Healthcare for her careful and highly skilled work in carbon footprinting the projects and supporting some teams in carrying out their own carbon footprinting. Carbon calculations are essential to 'triple bottom line' integrated project reporting and make plain the true cost and impacts of services to allow better, safer and more responsible decisions to be made in healthcare organisations.