UNIVERSITY HOSPITALS DORSET
GREEN WARD COMPETITION 2020
CASE STUDIES

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HEALTHCARE
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INTRODUCTION

The Green Ward Competition is a clinical 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 ward and unit teams at Bournemouth Hospital to develop, run and measure projects to make their daily practice more sustainable and add value.

This year 6 teams, from a wide range of disciplines across Bournemouth Hospital completed the Green Ward Competition.

COMPETITION ENTRIES

1. WHO NEEDS SPRAY ANYWAY? - RECOVERY TEAM

TEAM MEMBERS: Helen Spencer Jones (Staff Nurse), Emily Young (Deputy Sister), Sharon Clyde (Assistant Recovery Practitioner).and Joao Fontes (Staff Nurse).

Aim: To reduce the usage of ethyl chloride spray for testing spinal/epidural blocks in RBH Recovery from baseline use (4 cans per week in recovery) to 1 can or fewer by using an alternative that has a lower environmental impact.

Background: The staff were asked to stop using ethyl chloride spray in recovery and try 'cold sticks' (solid stainless-steel sticks with handles that can be reused and kept in the fridge) for testing spinal/epidural blocks, recording their findings at each use on a tool designed by the Green Recovery Team.

Approach:

- ***Strategic choice of project*** - Data gathered by the Sustainable Development Unit demonstrated that pharmaceuticals are the greatest contributor to the carbon footprint of procurement. Cans are not recycled but disposed in the domestic waste stream. The use of spinal and epidural anaesthesia is high as the trust is a centre for elective orthopaedic surgery. Spinal anaesthesia is commonly used for high risk patients in major gynaecological surgery. The cans are costly at £17.94 per can, with the added cost of disposal. There is a carbon footprint for manufacturing, transport (1,440 km by truck), and disposal. The spray takes 1 to 2 months to break down. If released into the environment it is acutely toxic to birds, animals and aquatic life and affects the growth rate of plants.
- ***Robust measurement of impact*** - Accurate baseline data was collected showing that 4 cans were used in recovery and 2 per week in Derwent. 72 audit forms were collected in Main Recovery and the Derwent Recovery over the course of our trial, 69 for spinals and 3 for epidurals. Staff judged that the use of the sticks gave a satisfactory and accurate block level that did not need rechecking with the spray in all but 2 of the 72 instances. In one instance the blocks had been out of the fridge for a long time and warmed up, in a second the staff member judged that the spray more accurately assessed the level of the block.
- ***Engaged colleagues/patients*** - the Acute Pain Team and a senior anaesthetist were contacted for feedback on the project idea. Infection Control were contacted for guidance on how to clean and store the sticks. Information was cascaded to all staff at key meetings and via emails. Data was reviewed on a weekly basis, to understand staff and patient opinion on their experience of using the sticks, to help ensure that staff were completing forms reliably and accurately and that clinical care was not being compromised. A poster campaign was run which encouraged the use of cold spray where appropriate and the filling out of the audit sheets.
- ***Steps taken to ensure lasting change*** - The team aim to introduce the change to all theatres, the Anaesthetic Directorate and all hospital wards that use the spray. The team have been liaising with Dr Isabel Smith, a Consultant Anaesthetist and Clinical Lead for Transformation; she is very interested in promoting sustainability and is helping to engage the Senior Anaesthetic Team. A reliable supplier for the metal sticks has been found. The team continue to liaise with Infection Control to ensure items meet the standards regulations and are putting together a business case supported by their matron.

Evidence of Impact:

Environmental benefit	The 6 cans per week baseline was responsible for 5,341kgCO2e. After initiation of the project 5.2 cans were saved over the 2 units per week, which equated to 270 cans per year. The cool metal sticks were cleaned by wipes between patients. The emissions produced by the 0.8 cans used per week and the wipes were 729kgCO2e, that gives an overall saving of 4,613kgCO2e over 1 year (cool metal sticks were already property of the department so carbon footprint not taken into account). If the project was spread to 8 surgical wards the hospital could save 36 tonnes CO2e (-13.76kgCo2 for procurement of 20 metal sticks for the hospital)
Social sustainability: Impact on relationships and networks for patients, staff and the wider community	This project may build stronger links between the department and their local medical instruments company and lead to NHS money being spent locally, supporting the local economy, rather than at a distance. Participating in the project built social capital and relationships both within the green recovery team and between departments.
Financial benefit	Overall annual saving of £4,827 for the new method. If this project was spread to all 8 surgical wards of the hospital could save £37,413 (taking into account, the cost of purchase of 20 sticks).
Clinical outcomes	Ethyl chloride has a number of adverse effects associated with use including being a liver and kidney toxin, risk of fatal coma with respiratory or cardiac arrest and risk of frost bite. The reduction in usage of the spray lowers the risk of these adverse events for both patients and staff members carrying out the procedure. The metal sticks were effective at assessing blocks, and the patients seemed to 'jump' a lot less when sticks were used in comparison with the spray, suggesting a better patient experience. No patients expressed any problems with or dislike of the sticks. It was difficult to gather more data on the patients experience with the sticks as many of them have no prior experience of ethyl chloride spray that they can recall or were very drowsy on waking that is was not possible to gain permission to use their name in results.

2. REDUCING WASTE OF OUTPATIENT APPOINTMENTS IN THE EYE UNIT

TEAM MEMBERS: Kate Bush (Consultant Ophthalmologist) Henrietta Holmes-Smith (Deputy Head Orthoptist) and Charlotte Smith (Junior Orthoptist)

Background: The team had a hunch that there were a large number of appointments being wasted in the department.

Strategic choice: Outpatient appointments have a high carbon footprint and it is a strategic priority in the NHS to minimise the waste of outpatient services including preventing non-attendance at appointments[1] and making sure that appointments are only offered if they add value[2] are key practice and policy areas.

Goal: To reduce the number of wasted appointments in eye outpatients and to reduce negative environmental, economic and social impacts whilst maintaining good clinical care.

Approach:

- ***Studying the system:*** Staff were successfully engaged though having face-to-face communication with all staff prior to the start of the project and the presence of a Green Ward team member in all clinics to aid continued motivation.

  At baseline data was collected over two weeks from 14/10/2019 – 25/10/2019 within the paediatric ophthalmology unit.

  Eligible episodes were where a child 'was not brought' (WNB) or adult 'did not attend' (DNA), a patient was booked into the incorrect clinic or cancelled on the day of their appointment.

- ***Results of baseline data collection***: A total of 306 patients had booked appointments in the Paediatric Ophthalmology Unit over the 2 weeks of data collection and of those 29 patients (9.5%) were identified that met the criteria. For each reason missed appointments were designated as 'avoidable' or 'unavoidable' to help to inform the design of the improvement effort.
- ***Reasons for wasted appointments****:* Patients cancelling on the day of their appointment too late for other patients to be booked in, 12 WNB/DNA, and 7 were incorrectly booked.

[1] https://improvement.nhs.uk/documents/2108/reducing-dna.pdf

[2] https://www.nuffieldtrust.org.uk/research/rethinking-outpatient-services-learning-from-an-interactive-workshop

A grand total 23 appointments (7.5%) were avoidably wasted and 6 (2%) were unavoidably wasted.

Over 1 year, based upon this data a forecast total of 7,956 appointments would be booked, of which **597 would be avoidably wasted**.

Environmental benefit	If avoidably wasted appointments could be reduced by 50% the carbon footprint could be reduced by; 32.60 kgCO2e for travel to hospital appointments 7,208 kgCO2e per year for wasted appointments.
Social sustainability: Impact on relationships and networks for patients, staff and the wider community	Staff: fitting extra patients in to already busy clinics may increase pressure on clinicians, 2-3 minutes of clinician staff time calling WNBs (4 in the 2 weeks of data collection) and perhaps 5 minutes of admin staff time rebooking WNBs/cancellations for each patient. Wasted appointments may have a positive impact of giving clinicians time to carry out other tasks. Patients: often need to miss school or work to attend appointments so if they are booked in unnecessarily that can be highly disruptive for them. 1 patient who had a wasted journey was driven to the hospital by her partner, wasting their time, though with no impact on employment.
Financial benefit	The hospital has a block contract for eye outpatients so wasted appointments result in loss of productivity and capacity, increasing waiting times rather than resulting in direct financial loss. However, a financial value is assigned to appointments. It was calculated that avoidably wasted appointments cost £1,409 in the 2-week period. Over a year this would amount to £36,634. If 50% of wasted appointments could be saved this could amount to a forecast £18,317 in savings. Financial cost to patients in parking charges on avoidably wasted journeys was £3.55 over 2 weeks; forecast as £92.30 over 1 year
Clinical outcomes	Whilst no specific poor clinical outcomes were identified it is possible that delayed appointments can lead to delays in treatment for what can be vision threatening conditions in children. Other ocular conditions can cause symptoms such as eye pain, irritation and double vision. All of these can be corrected with appropriately timed investigation and treatment so anything that delays this can be clinically significant and effect a patient's quality of life.

Designing the improvement effort

The baseline data was interrogated in more detail to reveal the reasons for the wasted appointments. Improvements were chosen to address the more frequent, avoidable problems identified that were within the sphere of influence of the team.

Issue	**Number of slots affected**	**Likely reason**	**Intervention implemented**
Patients booked into the wrong eye clinic	2	A high number of different clinics with corresponding abbreviations that clinicians use; these differ from the clinic codes used by administration staff to book clinics on the IT system.	Revised front sheet for clinicians to indicate which clinic the patient should be seen in; this will use clinic codes rather than abbreviations making it easier for the administration staff to know which clinic to book and reduce errors.
Duplicate bookings	2	Current booking protocol (in place to prevent duplicate bookings) not being followed by all administration staff.	Liaise with administration team lead to help insure that all admin staff check for existing appointments as part of the booking process.
Patients cancelling on day	6	Send effective reminders with request to let hospital know if they cannot attend.	Change to clinic letters to reiterate importance of cancelling clinic with advance notice if possible and reminder of pressure on clinics. Planning to implement text reminder service to all clinics (currently only letter or telephone reminders).
Patients tried to cancel but unable do so.	2	Test of booking lines could be carried out (e.g. to check if patients can get through easily).	Awaiting action.
Patient moved away or discharged	2	Is there a particularly mobile population?	Consider mechanism for keeping up to date with patient details and follow up plans. Awaiting action.

The actions above would address 15 of the 23 avoidably wasted appointments. 2 interventions were implemented during the project addressing the cause of 4 of the 23 avoidably wasted appointments. Data on the impact of these interventions is not yet available. However, if the interventions were 50% effective

then wastage of 2 appointments/week would be saved, **104 appointments per year**. We can therefore **forecast annual savings of 2,396kgCO2e and £6,812**. As the numbers are very small it is difficult to forecast with accuracy; more data is needed.

The greatest problem was patients cancelling on the day.

A text message reminder service introduced at Barts Health[3] that used messaging around the financial cost of missed appointment on the health service (although the appointments were more expensive than those in the eye department) reduced missed appointments by 23%. If this effect was replicated in Bournemouth Hospital then 137 fewer appointments would be wasted with the potential to reduce the waiting list and reduce carbon intensity (using resources more efficiently). As a consequence of fewer missed appointments, clinicians might need time scheduled elsewhere for management/clerical tasks that they fit in when patients do not arrive. The forecast savings if this reduction was achieved would be **826.62kgCO2e** (3 appointments/week are avoidably wasted, 156 per year, of which 23% is 35.88 appointments per year). The cost savings would depend upon the type of appointments saved.

Qualitative data from staff gathered using a structured survey revealed themes of:

- ***Learning:***
  - about their service through carrying out the project; including that the problem they had with wasted appointments was not as bad as the team thought before they gathered the data!
  - Carbon footprinting skills applied to healthcare to allow environmental impacts to be measured.
  - Understanding of what sustainable healthcare looks like in their department.
- ***Change:***
  - Taking small steps towards changing the service was easier than anticipated.
- ***Job satisfaction:***
  - Enjoyment of the process of the competition and working on an improvement project.
  - Glad to be able to make their service even better.
  - Enthusiasm for carrying out more improvement projects in the future.
- ***Team building:***
  - The clinical teams approached the administration team to work together on this project and collaborated effectively, discovering common goals. Prior to the project the clinical and administration teams did not work together. The clinician team overcame their initial concern that raising the issue of wasted appointments could be seen as a criticism of the administration team, but they handled the conversations well and relationships were improved.

Quotes from staff about the experience of being involved in the Green Ward Competition

'I was very enthusiastic about this project from the beginning but was not prepared for what I would learn about our system here. I was pleasantly surprised that we found some potentially easy solutions or at least relatively simple things to implement. I have learnt how to calculate a carbon emission. I feel more enthusiastic about doing further projects in future.' **Kate Bush, Consultant Ophthalmologist.**

'I was positive about taking part in the project from the start and was pleased that the proposed problem regarding wasted appointments was not as bad we had initially thought. It was also great that…we…

[3] https://www.gov.uk/government/publications/reducing-missed-hospital-appointments-using-text-messages/a-zero-cost-way-to-reduce-missed-hospital-appointments

managed to put some solutions together to make it even better. I enjoyed the process, learning more about sustainability, its impact and how we [can apply sustainable healthcare principles to the] ophthalmology services.' **Henrietta Holmes-Smith, Deputy Head Orthoptist**

'I really enjoyed taking part in this project and found the results very interesting. I was surprised by the amount of different ways sustainability can be improved within our ophthalmology service. Initially, I didn't consider the greater impact of incorrectly booked and missed appointments. '**Charlotte Smith, Orthoptist**

3. REDUCING WASTE IN THE PROCESS OF LAB WATER DISTILLATION

TEAM MEMBERS: Stephanie Barnes (Biomedical Scientist), Hisan Taaj (Trainee Biomedical Scientist), Milarose Condino (Senior Medical Laboratory Assistant)

Background: The 'still', used to produce distilled water for use in laboratory processes, is left on during the whole of the working day. Once 1 litre of distilled water has been produced and the tank is full, water is wasted down the drain.

Goal: reduce the volume of waste water produced.

Approach:

- ***Studying the System***
  - Potential savings of water and electricity were calculated if the still was turned off after sufficient water had been distilled for lab use during the working day.
- ***Designing the improvement effort***
  - The lab has a small, tight-knit team, many of whom had attended the Green Ward Competition workshop, so it was straight-forward to engage the team. The team were updated at the daily lab meetings.
  - Visual checks were performed routinely throughout the day and the still was switched off when it was full. An alarm was used to alert the team to turn the still off, once the initial results had been obtained to show how long it took for the still to fill to capacity.

Results: The team found that over each day of 7.5 hours they could turn the still off for between 1.1 and 4.6 hours, depending upon their requirements. Every hour that the still is idling 60L of water is wasted, if the still is full. It was a surprise to the team that the most carbon-intense savings were the savings in electricity rather than water.

Environmental benefit	A forecast 2,266 kgCO2e could be saved per year This was mainly due to a reduction in electricity consumption of 36%, 7031 kWh, producing 2,222kgCO2e. The carbon savings due to reduced water use would be 44kgCO2e. This is a 36% (3245 litres). The unit can be turned off for an extra 54 hours a month a reduction of 36% (54 hours).
Social sustainability: benefit to patients, staff and community	"Whilst we have focused our project on reducing the waste with distilled water, the competition as a whole has made the whole team more aware on how we can improve sustainability in all aspects of the laboratory." **Hisan Taaj – Biomedical Scientist** "This project has highlighted the areas of potential waste outside of merely recycling. We have raised with our governance managers ideas to highlight sustainability within pathology. We are also more aware of sustainability projects with our manufacturers and partners [after the workshop the team contacted their main manufacturers and partners to ask how the manufacturers could help to make the lab more sustainable]." **Stephanie Barnes – Biomedical Scientist**
Financial benefit	A forecast savings of £1,121 per year. The largest contributing factor to the savings was the savings in electricity, which was £1,010. Water savings were £111. If the residual water was reused as grey-water a further £197 could be saved per year from the still (although there would be savings from other processes in the lab and more broadly in the hospital, such as the dialysis unit).
Clinical outcomes	Not applicable.

What steps have been taken to ensure lasting change?

The procedure will become part of a standard operating procedure (SOP), which all staff follow.

4. LEAN USE OF BASIC PACKS IN INTERVENTIONAL RADIOLOGY

TEAM MEMBERS: Jessica Ailes (Radiography Department Assistant Manager), Tracy Sargeant (Radiography Department Assistant – RDA), Maggie Lavell (RDA), Magdalena Gabrycka (RDA), Katy Legg (Radiographer).

Aim: To reduce the waste of unused items in basic packs in the radiology department to reduce the environmental impact, financial cost and give staff the opportunity to act in line with their values on sustainability.

Background: The largest contribution to the carbon footprint for procurement of the NHS is the use of medical instruments. The radiology team carry out a large number of procedures each day and for many procedures use a basic procedure pack. The team noticed that often a large proportion of the items in the pack are not used and are then disposed of.

Approach:

- **Studying the System**

  The team reviewed each procedure and the pack use

  They identified procedures where the basic pack use could be potentially eliminated:

  - When only a gallipot is used from the pack.
  - Prostate biopsies where a drape is supplied with the biopsy needle and is sufficient for equipment to be kept on. It is a clean not a sterile procedure so further sterile drapes are not needed and none of the rest of the equipment is needed. Non-sterile gloves can be used for this procedure.
  - They also identified options for putting unused items to an alternative use.

Item	Alternative use
Tray	Use to keep sharps together on trolley, or keep equipment together
Swabs	Use for procedure instead of giving a different size
Gloves	RDA use for procedures where it is required to wear gloves e.g. neck FNA's. All other procedures, put in communal glove box and use for cleaning, probe cleaning etc.
Hand towel	Put in communal box for use as a hand towel.
Orange bag	Give to the wards? For bed bins/disposal of incontinence pads etc.
Table cover	Use for note writing

- Engaging the team was challenging because the department is large. The team engaged staff in face-to-face discussions, added the project to the agenda at staff meetings and emailed staff.
- The change of using a separate gallipot where this was the only item from the pack used, rather than the basic pack, was agreed and implemented over 1 month in November 2019.
- Items that were unused after a basic pack was opened were used for alternative purposes where possible. Data was not collected on this aspect of the project.

- Some radiologists wished to continue using the basic pack for prostate biopsy procedures so data was collected on the potential saving but the change has not yet been implemented and remains an ongoing discussion in the department.
- The items contained in the current procedure pack were recorded. To allow carbon footprinting and financial costs to be calculated data was gathered on the materials of the contents and packaging of the pack, the weight of each item/packaging, waste streams for each item and the cost of the total procedure pack.

Results:

154 procedures were carried out over 1 month for which basic packs were used.

30 packs were saved during the month. Savings were calculated taking costs of disposal into account and substitution of gallipots.

69 packs used when taking prostate biopsies were identified as an area of potential saving.

Environmental benefit	Carbon savings per month are 3.2 kgCO2e, forecast per year 38kgCO2e. Carbon savings if the basic pack was eliminated for the prostate biopsies would be a potential extra, including waste disposal, of 60.89kgCO2e annually.
Social sustainability; benefit to patients, staff and community	No change to patient care. Staff can see how small changes can make a difference.
Financial benefit	Cost savings were £7.80 per month and a forecast £94 per year An extra £179 per year would be saved if basic pack use was eliminated for prostate biopsies (use of non-sterile gloves not accounted for).
Clinical outcomes	Maintaining current clinical standards.

Other conclusions:

For procedures that just require a drape the carbon emissions are x3 and cost is 1.6 higher for a single drape than if a basic pack is used. Therefore, it would be better to open a basic pack and either waste it or put the items to alternative use. This shows how carbon footprinting and data analysis helps to make decisions about resource use and that results can be surprising.

What steps have been taken to ensure lasting change?

Written guidance in the department on the equipment needed for each procedure has been updated to reflect the changes introduced in this project. The **department trolley trainers** have also been updated to ensure that new-starters receive the correct guidance.

5. REDUCING WASTE IN PHARMACY AND ACTION ON INHALER DISPOSAL

TEAM MEMBERS: Michelle Kirkland (Medicines Management & Accredited Technician) and Katie Kendall (Pharmacy Technician).

The pharmacy team carried out 2 projects:

1. Inhaler recycling

Background: At the Green Ward competition workshop the team learnt about how the propellant contained in metered dose inhalers (MDIs) is a greenhouse gas and if inhalers are not incinerated or recycled the propellant escapes into the atmosphere contributing to climate change. Pharmacists counsel patients on inhaler technique and so would be well-placed to advise patients on safe inhaler disposal.

Aim: hospital pharmacists to advise patients on returning their MDIs to a pharmacy most convenient to them, either to be incinerated or preferably recycled.

Method & approach:

- **Baseline:** The team asked 20 patients how they disposed of their inhalers. 18 of the 20 patients disposed of their inhalers in their domestic waste, 1 disposed of their inhalers in the domestic recycling bin (which is inappropriate so the load of recycling could be wasted). Only 1 patient correctly returned their used inhalers to a pharmacy.
- **Change:** The team explained the environmental impact of disposing of inhalers unsafely and advised patients to return their inhalers to their pharmacy if they didn't already do so. Following on from the explanation the team asked the patients 2 questions:

  1. Would they now consider returning their empty inhalers?

  2. Would they now consider returning their empty inhaler to a pharmacy that recycled?

- **Results:** 100% of patients encountered said they would now return their empty inhalers to a pharmacy and 80% said they would find a pharmacy that would recycle their empty inhalers. From these results the following savings were estimated:

Environmental benefit	The calculations were made assuming that each patient had Chronic Obstructive Pulmonary Disease and was using salbutamol at a rate of 2 inhalers per year and 9 beclomethasone inhalers per year. Assumptions were made on how full the inhalers were on disposal, based upon previous studies, and that both inhalers were MDIs. Forecast saving of 683kgCO_2e for 19 patients, 36kgCO_2e per patient over 1 year, which is similar to the carbon footprint of 10 litres of petrol. The effect is likely to be larger as the team will see many more patients than 20 and the team also encouraged the technicians, other pharmacists and community team to have similar conversations (see below)
Social sustainability: benefit to patients, staff and community	Cultural change within the department. Staff acting in line with their values, that include sustainability.
Financial benefit	None
Clinical outcomes	None

Spreading and embedding change:

- The team engaged their colleague, the Respiratory Pharmacist, who spoke with the respiratory ward team to speak to their patients about the importance of correct disposal of MDIs.
- The team compiled a leaflet that, once it is approved by the governance committee, pharmacists and technicians can give to patients who use inhalers to explain the importance of returning their inhaler to a pharmacy. This can be given out at dispensary.
- The team presented their findings at both the pharmacists' and technicians' departmental meetings with a request to start advising patients to returning their inhalers to pharmacy.
- The team spoke with the Dorset Adult Integrated Respiratory who have agreed to advise their patients about correct MDI disposal.
- Plan to produce posters about inhaler disposal.

2. Reducing medicines waste of ward stock returned to pharmacy

Background:

'Dose units' are incomplete sets of medications, often strips of medicines. These can be wasted if strips of low value foil-wrapped medicines have been cut in such a way that the date of expiry is not visible when issued to the wards; when they are returned to pharmacy these are wasted due to the lack of expiry date (methods of salvaging higher value medicines are already in place but the team thought that that significant savings could still be made if lower value medicines could be reused).

Those dose units that do have a visible expiry dates can be reused but were often not promptly re-shelved so risked going out of date and being wasted.

Our Goals are:

1) **to reduce the number of unusable dose units generated in pharmacy and issued to wards.**
2) **to increase the reusing of medicines on the ward by promptly reallocating suitable dose units that have been returned to pharmacy to other wards.**
3) **to regularly redistribute stock from the 'returns shelves' and discard any out of date medicines promptly.**

Goal 1; to reduce the number of unusable dose units generated in pharmacy and issued to wards.

Approach:

- **Baseline:** A spot check on a single day of the medicines returned to pharmacy was carried out to see 1) how many dose units were wasted due to lack of expiry date 2) the amount of medicines that could be reused and returned to the wards if processed rapidly (ie ward stock items).
- **Results:** There was a waste of 2.4 kg of lower value medicines in a single spot check on one day due to dose units not having expiry dates on them. If this were representative of a typical weekday then this waste would equate to 624kgCO_2 and £14,717 over 1 year.
- **Change introduced:** Dispensary pharmacists were asked at a departmental meeting to supplying whole strips of drugs rather than odd dose units.
- **Potential savings:** If by cutting the dose units differently this waste could be reduced by 30%, then the savings would be a total of £4,415 over 1 year.

  The carbon footprint of the medicines wasted due to lack of expiry date on dose units plus disposal was 2929kgCO_2e over 1 year. If 30% of this waste was prevented then the forecast saving would be 879kgCO_2e over 1 year.

Goal 2; to increase the reusing of medicines on the ward by promptly reallocating suitable dose units that have been returned to pharmacy to other wards.

The monetary value of medicines returned to pharmacy that could be redistributed to the ward easily (ward stock medicines) was £45/day

- **Change**: Medicines that were ward stock that were returned to pharmacy were immediately returned to pharmacy stores rather than being shelved on the 'returns shelves' in main pharmacy, as they were more likely to be quickly returned to the wards from pharmacy stores.
- **Results:** Since it is unlikely that all the medicines redistributed are used and that they would all have been wasted prior to the new system we have opted to assume that the true figure of savings is 30% less. We therefore predict that over 1 year there would be a saving of £8,267.

Redistribution of medicines; for 100% redistribution of medicines that are ward stock 1933kgCO2e is the forecast annual saving; if 70% of ward stock medicines are redistributed and used assuming that all these medicines were wasted prior to the new system 1353kgCO2e are the forecast savings over 1 year (disposal not included; incomplete data on weight of this group of medicines).

Goal 3; to regularly redistribute stock from the 'returns shelves' and discard any out of date medicines promptly.

A rota was introduced to check all drugs returned, to ensure that all medicines on the returns shelf were checked in rotation, frequently and regularly. The impact of this element of the project was not quantified.

Environmental benefit	2,232kgCO2e (2 tonnes) over 1 year.
Social sustainability: benefit to patients, staff and community	Cultural change within the department and staff development: DM (Senior Assistant Technical Officer): **'Liked being involved** with the Green Ward competition, could **see the value of more sustainable healthcare.'** Katie Kendall (Pharmacy Pre-registration Technician): **'I have learnt a lot**…**and am keen to carry on with the work** to make changes for the better.'
Financial benefit	£12,683 over 1 year
Clinical outcomes	Not applicable.

Embedding

Plan to amend the standard operating procedure (SOP) to make sure that only whole dose units that have an expiry date are issued to wards.

Potential annual savings

The following table provides detail on the potential 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
Who needs spray anyway? Theatres Recovery Team	£4,827 for the new method. Could save £37,413 if spread to 8 surgical wards.	4,613kgCO2e over 1 year. Could save 36 tonnes CO2e if spread to 8 surgical wards.	Stronger links between the department and their local medical instruments company Could lead to NHS money being spent locally, supporting the local economy. Participating in the project built social capital and relationships both within the team and between departments.	Ethyl chloride has a number of adverse effects associated with use. The reduction in usage of the spray lowers the risk of these adverse events for both patients and staff members carrying out the procedure. Better patient experience as patients were less likely to 'jump' in shock when sticks were used.
Reducing waste of outpatient appointments in the eye unit – Paediatric Opthalmology team	£18,317	7,208 kgCO2e	Team building, increased job satisfaction, staff empowerment, staff education, increased interdisciplinary collaboration.	
Reducing energy use in immunology labs - lab team	£1,121	2,266 kgCO2e	Staff education and increased collaboration.	Clinical standards unchanged
Radiology; judicious use of basic packs used in interventional radiology – ultrasound team	£94	38 kgCO2e	Staff empowerment, staff education	Clinical standards unchanged
Surveying inhaler disposal in inpatients – Pharmacy team	Data unavailable	36 kgCO2e per patient, per inhaler (potential for much greater savings depending upon the number of patients who engage.	Staff education	Clinical standards unchanged

Reducing medicines waste through creating suitable dose units – Pharmacy team	£4,415	879 kgCO2e	As above	Clinical standards unchanged
Redistribution of medicines – pharmacy team	£8,267	1353 kgCO2e	As above	Clinical standards unchanged
Total	**£37,042** of which £18,725 are cash-generating savings.	**16,393** kgCO2e		

AWARDS

The winner of this year's award was the Theatres Recovery Team for their excellent 'Who needs spray anyway' project. Congratulations to Emily Young and Helen Spencer-Jones who led on this project.

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'**; CSH encourages you to carry out further sustainability projects in the future.

ACKNOWLEDGEMENTS

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

Thank you to Laura Dale, previous Sustainability Manager, who commissioned the competition and got the project off to a good start.

Thank you to Stuart Lane, current Sustainability & Energy Officer, who has risen to the challenge of partnering with CSH to run the competition part way through the project and made time during a difficult period to support the judging and awards. We look forward to continuing to work with you.