Royal Devon and Exeter NHS Foundation Trust

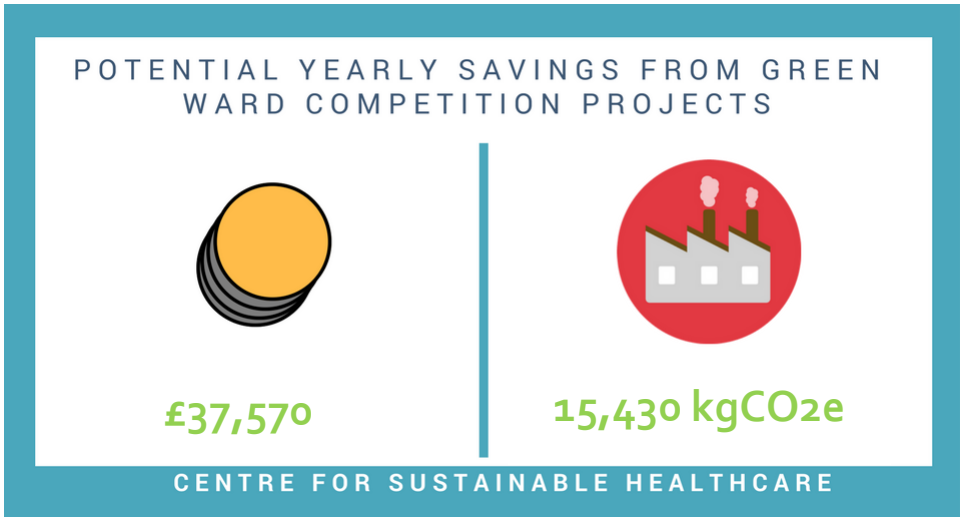
ROYAL DEVON & EXETER
GREEN TEAM COMPETITION
CASE STUDIES AND IMPACT REPORT 2018

CENTRE *for* SUSTAINABLE HEALTHCARE

inspire • empower • transform

GREEN TEAM COMPETITION:

ROYAL DEVON & EXETER



[1]

[1] Trees absorb 2kg of Carbon Dioxide: Forestry Commission. Mitigation: Planting More Trees. https://www.forestry.gov.uk/pdf/6_planting_more_trees.pdf/$FILE/6_planting_more_trees.pdf

[2] The distance a car can drive for a certain amount of carbon emissions is based on the 'UK Government GHG Conversion Factors for Company Reporting 2018', https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2018

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COMPETITION BACKGROUND

Climate change is having far reaching consequences for planetary health, including within the United Kingdom, and is accepted as one of the greatest threats to the health of global populations in the future (Lancet, 2009). Whilst healthcare systems have a key part to play in maintaining the health of populations in the face of the threat of climate change, the delivery of healthcare is also itself contributing to climate change. The NHS is the largest public sector contributor of carbon emissions; when taken together with social care and public health, these services contribute over one third of total public sector emissions (Defra research ENV12 – UK Carbon footprint, 2012).

In addition to climate change, the integrity of our environment, on which we depend, is threatened by pollution (air pollution, plastics, chemical pollution), water scarcity, soil degradation, deforestation and loss of biodiversity. The NHS also contributes to this impoverishment of the environment.

Given the constitutional commitment of the NHS to improve the health and wellbeing of the populations it serves, there is a clear duty of NHS organisations to reduce carbon emissions and contribute to improving environmental integrity. The Climate Change Act 20083 requires a reduction in emissions of 80% by 2050 based on a 1990 baseline, supported by reductions of 34% by 2020 and 50% by 2025. An ambitious aspiration for the health and care system is to achieve a 34% reduction in carbon dioxide equivalent emissions by 2020, in line with the national targets (NHS, Public Health and Social Care Carbon Footprint 2012).

Carbon reduction policies to date for the NHS have largely focussed on reducing building energy use, travel and procurement of goods and services. The greatest proportion (59%) of the carbon footprint is derived from procurement of which the highest contributors are medicine use and medical equipment (Reducing the Use of Natural Resources in Health and Social Care, Sustainable Development Unit, 2018). How do we reduce the carbon footprint due to procurement of these goods? Part of the answer will be decisions taken centrally. However, clinicians are using these resources in their daily practice and operating and designing systems that drive staff behaviour, so effecting how these resources are used. This intimate knowledge of the use of clinical resources, along with their clinical knowledge, means that the perspective of clinicians is vital when making the carefully nuanced decisions on how to maintain or improve clinical care whilst reducing environmental, social and financial cost. Clinical staff carrying out their daily work in a way that is environmentally sustainable has the potential to make a significant contribution to reaching the carbon reduction targets for the NHS and social care.

The Centre for Sustainable Healthcare (CSH) offers clinical staff in healthcare organizations the opportunity to examine their workplace culture and systems and run projects to improve the sustainability, quality & efficiency of the care that they deliver. Projects are devised with the aim of changing daily work practices to reduce the carbon footprint; increase the health & wellbeing of patients, staff & the community and make cost savings (the 'triple bottom line' definition of 'value' in healthcare). Running the competition in a Trust also builds a community of clinical staff who are empowered, enthused and equipped to further improve their services in the future and share best practice, guided by the concepts of the triple bottom line and sustainable healthcare.

Luke Mitchell, Energy & Sustainability Manager at the Royal Devon & Exeter NHS Foundation Trust (RD&E), commissioned CSH to give clinical teams at RD&E the opportunity to enter the competition and so contribute to sustainable clinical practice in the Trust.

The Green Ward Competition launched on NHS Sustainability Day in March 2017 at RD&E. Selected teams were booked into workshops run by Ben Whittaker, an experienced occupational therapist with a special interest in sustainability, working for the Centre for Sustainable Healthcare (CSH). The workshops started with Ben explaining the links between health of populations and health of the environment and the urgent need for clinical teams to take action. In the second half of the workshops, teams were given time and space to think about how their service was run, consider areas where services could be improved and devise projects for assessing the system and testing out their innovative ideas that it was hoped would enhance the value of the services, in all aspects of the 'triple bottom line'.

Green Ward Competition Workshop with the Renal Unit team, RD&E

Projects were run over 8-12 weeks, supported by Louis Pilard, the Clinical Programme Manager at CSH and Luke Mitchell. In November 2018, as part of the competition judging, members of the senior leadership team visited the teams in their clinical areas to view the project posters and speak to the teams directly about their projects. Teams were selected for a prize or commendation. The winning team was presented with £500 to re-invest in a sustainability project in their department.

Case studies of all the entries are included in this report with details of carbon savings, financial savings and water conservation.

> *'This was a great initiative which prompted staff from all parts of the Trust to rise to the challenge of doing things differently resulting in benefits to patient care, improved efficiency, reduction in waste and cost savings. The support provided by the Centre for Sustainable Healthcare was essential in giving our 'Green Teams' the confidence to be creative, to overcome challenges and become catalysts for change. A very worthwhile and rewarding experience for all involved and we are now looking forward to the next steps in spreading the improvements to the wider organisation.'*
>
> *Chris Tidman, Chief Financial Officer*

Following on from the competition, Dr Olivia Bush, Clinical Programme Lead at CSH, will be facilitating the 'spread' of the excellent pilot projects at RD&E in collaboration with Luke Mitchell and the project management team at RD&E. CSH will be focussing on spreading the projects that particularly require the specialist mix of clinical and sustainability skills that CSH offers and, where possible, sharing this good practice nationally. A separate report will be written on the outcome of the 'spread' phase of the Green Ward Competition.

COMPETITION ENTRIES

5 teams submitted competition entries.

1. REDUCING UNNECCESSARY CANNULATION – EMERGENCY DEPARTMENT

TEAM MEMBERS: Cassie Worth, Suzie Faulkner & George Page.

HIGHLY COMMENDED

Goal: To reduce unnecessary cannulation in the emergency department (ED).

Background: before the project was carried out, inserting a cannula for a patient arriving in the emergency department was considered 'routine' care. Once a cannula is inserted the policy was for all cannula to be fitted with a Bionector, for infection control purposes.

However, staff noticed when reviewing patients that many cannulae were inserted and not used or were used inappropriately (e.g. intravenous fluids or drugs used when the patient was able to drink and take oral medications). It was suspected that practice of inserting a cannula 'routinely' led to significant waste in terms of clinician time, waste of equipment required for cannulation, inappropriate use of intravenous fluids and medicines and unnecessary discomfort for patients. It was also noted that, where cannulae were likely to be short term, such as in theatres or the resus section of ED then Bionectors were not mandated, but in the main ED it was still expected that patients should have Bionectors attached to cannulae even though cannulation is often only required short term in ED.

Approach: The ED team planned to carry out an audit to test the hypothesis that a significant number of cannulations were unnecessary.

ED consultants raised awareness of the audit prior and during the audit at the thrice-daily team handovers and with a poster campaign (posters put up around the department and on equipment trolleys where the cannula-insertion kit was kept). For 1 week doctors and nurses inserting cannulae recorded information on the patient's main clinical problem on admission, the intended indication for insertion, number of attempts at insertion (i.e. number of cannulae used), whether the cannula was used in ED and what the cannula was used for. The

proforma for recording data was handed out at handover and was available on equipment trolleys. A collection tray for completed proformas was placed in ED. After the initial audit the results were presented. Informal (at handover) and formal (presentation) education was carried out on correct use of cannulae including raising awareness of a revised policy for ED, agreed with the infection control team, that if a cannula is likely only to be required short term then a Bionector did not need to be attached.

After a round of education the consultants stopped mentioning the changes and the audit was then repeated 1 month later, again over 1 week, to see if the project and education had been effective and if any changes had been embedded.

Results and Discussion:

Social/Health benefits:

The total number of patients cannulated dropped from 143 in the first audit to 58 on re-audit, a 59% reduction (assuming that the number of patients admitted to ED and that reporting was similar in the two weeks when the data was collected).

The percentage of patients who had cannulae inserted but whose cannuale were not used in ED (deemed an inappropriate insertion) decreased from 64 to 19 on re-audit, a 70% reduction. As this percentage exceeds the 59% reduction in patients cannulated due to clinicians deciding not to cannulate patients without a robust rationale, this would suggest that a greater percentage of the cannulae that are inserted are used therapeutically.

Overall, we can conclude that there is a significant increase in appropriate cannulation.

The reduction in cannulation has benefits for patients in:

- reducing pain and discomfort for no therapeutic benefit.
- reducing physical restriction: having a cannula in situ can be physically awkward for a patient when washing, toileting and intravenous interventions impede mobility.
- encouraging use of the oral route for fluids and medications. Without intravenous access patients may be encouraged to drink rather than maintain their fluid requirement with intravenous fluids, which is better for health.
- Infection control: one of the ways of reducing cannula infections is by not inserting cannulae unnecessarily in the first place.

'The project has brought about real cultural and behavioural changes in the department'

'Now that we have participated in the Green Ward Competition many clinicians are approaching me with ideas for other sustainability projects. We have a long list!'

Dr Cassie Worth

Emergency Medicine Consultant

The large reduction the number of cannula inserted unnecessarily also meant that a substantial amount of staff time was saved. Using oral, rather than intravenous fluids and medications also potentially has time savings for staff.

Environmental & Cost benefits:

In addition to the 59% drop in the total number of cannulae used from 178 to 73 (N.B. more than 1 attempt at insertion was made for some patients) there was a 66% reduction in the number of cannulae not used and a 79% reduction in patients fitted with a Bionector not used.

This reduction in inappropriate cannulae insertions resulted in a reduction in the weight of physical waste generated.

At each cannulation the following kit is required: alcohol wipe, disposable tourniquet, cannula, cannula dressing, gauze, blood bottle adapter, 10ml saline ampoule, 10ml syringe, Bionector and packaging. The total weight of the kit is 62g. The cost of equipment and clinical waste disposal, together with the weight of the equipment, reference carbon conversion factors for medical/surgical equipment and incineration of clinical waste was used to calculate environmental and cost benefits of this project.

The overall reduction in carbon footprint was 162 kgCO2e over one week, which would save 8,403 over one year.

The overall cost reductions, including purchasing and waste disposal, were £535 over one week, which would save £27,830 over one year.

There could be some extra potential savings if the number of un-used cannulae were further reduced. If the number of unused cannulae was reduced to zero (though this will not happen as 100% efficiency will not be achieved and there may be some cases where insertion was an appropriate contingency measure but was not required) then there would be a further £115 cost savings and 34kgCO2e in one week.

The lead consultant reported that even carrying out the initial phase of the audit had resulted in clinicians thinking more carefully about their practice and changing their behaviour, so the savings may have been even greater.

Suggestions for future iterations of the project:

Other data that could be collected are:

- whether cannulae were used to take blood (if a cannula was not used then the use of usual blood-taking kit should be taken into account in calculations).
- time taken for cannulation, including time taken to gather equipment, wash hands etc (to generate average time saved).
- Number of patients admitted to ED during the time of the audit.
- Patient narratives on the experience of cannulation.

Other projects:

The ED team have also switched from polystyrene to paper cups, from plastic spoons to re-usable metal spoons and introduced recycling bins in the department. The switch to metal spoons is likely to result in significant savings, as the following case study will show.

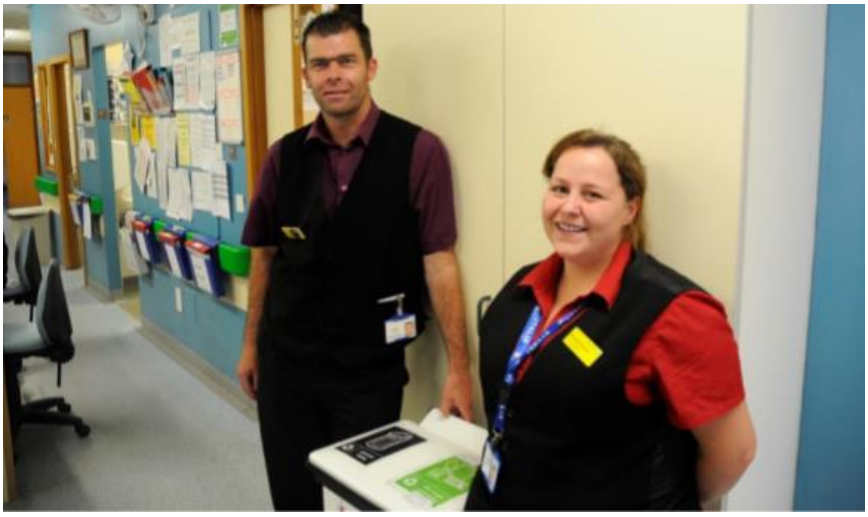
Next steps:

This project has been selected for the concept to be spread to other areas of the hospital.

2. REDUCE DISPOSABES ON ABBEY, OTTER AND DART WARDS – HOUSEKEEPING TEAM

TEAM MEMBERS: Kevin Brown, Mary Drinkwater, Amanda Lawrence, Michelle Penna & Jason Maddocks.

OVERALL WINNERS



The housekeeping team carried out 2 projects on Otter ward and have since spread changes to Abbey and Dart wards.

Project 1:

Goal: To replace plastic teaspoons with reusable metal spoons.

Background:

On the 24-bedded ward around 100 plastic spoons are used each day for three meals for patients & hot drinks for patients and staff. The housekeeping team suggested reducing waste by introducing metal spoons.

Approach:

Buy metal teaspoons and stop buying plastic teaspoons.

Results:

The cost of water and electricity used to run the dishwasher, the carbon conversion factors for the materials used to make the spoons and the cost of the waste recycling, together with the weight of the two types of teaspoons was used to calculate environmental and cost benefits of this project.

Cost savings: Over 1 year the cost savings would be £245 for a single ward and has the potential to save £7338 if this change was made successfully on 30 wards. These figures include costs of dishwasher use (energy and water) and a waste of 10% of spoons due to damage. If spoons were retained in the ward, then savings would increase year on year.

Environmental savings:

42 kgCO_2e were saved by this change.

Social savings: demonstrating good stewardship of resources and including environmental impact into decision-making about housekeeping in a healthcare setting.

Next steps:

This project has been selected for the concept to be spread to other areas of the hospital.

Project 2:

Goal: to reduce plastics waste from serving orange juice on the ward.

Background: individual portions of orange juice are served in small plastic pots. These are handed out to, on average, 20 patients at lunchtime and at the evening meal.

Approach: instead of buying individual portions of orange juice the ward bought hard plastic tumblers and 1 litre cartons of orange juice.

The cost of water and electricity used to run the dishwasher, the carbon conversion factors for the materials used to make the different packaging and the cost of the waste recycling, together with the weight of the two types of packaging was used to calculate environmental and cost benefits of this project.

Results:

Environmental saving: packaging & plastic use was decreased by this change, which is a very important positive environmental impact. The change in the greenhouse gas emissions due to the switch in carton size was not quantifiable as there are no greenhouse gas emission factors available for tetra packs (1 litre cartons). It is likely that the greenhouse gas emissions to produce the containers would be higher in the case of the small carton compared to the 1 litre cartons. Taking energy and water required for dishwasher cleaning of the tumblers, the measurable annual greenhouse gas emissions for this process were calculated as greater after the change to reusable tumblers. However, the calculation is an approximation as accurate data on energy use for the dishwasher on the ward was not available and it was not possible to include data relating to the change in orange juice cartons, which, ideally we would have liked to use in the comparison and may have outweighed the emissions related to operating the dishwasher.

Cost savings: individual portions of orange juice are expensive in relation to a 1 litre carton. Savings were made despite the ward needing to buy new, reusable plastic tumblers. The savings year on year will increase if the tumblers are retained on the ward. The switch saved £1029/year/ward with the potential to save £30,876 if the change was successfully spread to 30 other wards.

Social: foil lids of the individual portions of orange juice can be difficult to open, especially for elderly patients so changing to tumblers may have made it easier for patients to drink orange juice. Drinking from a tumbler is also easier and a more pleasant experience than drinking from a plastic pot.

3. WATER AND WASTE REDUCTION – RENAL UNIT

TEAM MEMBERS: Hannah Jenkins, Lyn Webb, Kathryn Eyles, Michaela Dicks, Nick McAleer, Robert Luke, Hassan Al-Zaved, Jennie Harry, Keith Channing, Angela Hubbard & Coralie Bingham

HIGHLY COMMENDED

In the region, dialysis is offered at 5 nurse-led units, Heavitree, Taunton, North Devon, South Devon and East Devon. Heavitree and South Devon are the largest units. In addition, the unit at the Wonford site offers acute care and medical staff are on site as part of this multidisciplinary team. Home haemodialysis is also offered in the region. A total of 109 patients receive dialysis in the service as a whole.

Goal: The renal team ran 6 different projects, aiming to improve sustainable working at the Heavitree site.

Project 1: Gambro machine settings

Background: 24 Gambro dialysis machines are used on the unit. Each day 3 patients use each dialysis machine. After each patient use the machine goes through a heat disinfection cycle to ready it for the next patient (i.e. 3 times/day). In addition, a 'Hot C-CART' cycle was run at the end of the day to remove calcium, with a further disinfection cycle overnight.

Approach: The third heat disinfect cycle has been eliminated and the Hot C-CART cycle started following the third patient. This saves 24 heat disinfection cycles saved each day and reduces water and energy use.

Results: are given for the savings made at Heavitree. Additional savings would be made if changes were spread to all sites (note that the size of different units varies so the potential for savings would be different at each site).

Cost:

£1790/year in Heavitree unit.

Environmental:

4,406 kgCO2e/year at the Heavitree unit.

52,416 litres of water/year in Heavitree unit.

Social:

None identified for this project.

Project 2: Disposal of bicarbonate canisters

Background: used bicarbonate canisters (Bi-CART) weighing 100g/canister were being put into clinical waste for disposal, which was thought to be an unnecessary expense as disposing of clinical waste is much more costly than disposing of general waste.

Approach: The canisters are now being put in general waste.

Results & discussion:

Cost:

£498/year in Heavitree unit.

Environmental:

The carbon cost of sending the plastic cannisters to landfill **increased** by 280 kgCO2e/year in the Heavitree unit.

Some bicarbonate cannisters (e.g. manufactured by Baxter) can be recycled. Whilst recycling (at a cost of £233.23/tonne) is a more expensive way of processing waste than general waste (at £128.23/tonne), it is cheaper than clinical waste processing (at £350.00/tonne) and is better from an environmental perspective.

Social:

None identified for this project.

Project 3: Introducing patients own blankets

Background: when patients attended for dialysis they were provided with a blanket to make sure that they kept warm whilst sitting for several hours during treatment. After use each blanket was laundered by the hospital. The laundry generated by 109 patients attending for dialysis multiple times per week is costly to process financially and is resource intensive (water and electricity use).

Approach: A letter has been given to all the patients at the Heavitree dialysis unit asking them to bring in their own blanket for use on the dialysis unit. The blankets will be stored in named bags on the unit for repeated use and patients will be responsible for laundering their own blankets, as needed.

Results:

Cost: Potential savings on in-house laundry costs are £4,591 for Heavitree unit.

Environmental*:* 2,250 kgCO2e/year were saved in the Heavitree unit.

Social: Staff thought that patients may prefer their own blanket (no survey was carried out to verify this).

There have been some challenges implementing this project at other sites so currently the project is simply limited to the Heavitree site.

Project 4: Home haemodialysis

Goal: to assess the value of home haemodialysis compared to in-centre haemodialysis in financial, environmental and social terms. The service currently supports 18 patients to undergo home haemodialysis.

Background: the renal service has been aiming to increase the number of patients receiving haemodialysis at home to improve the financial and environmental impact of haemodialysis as well as to improve the patients' experience of care.

Home haemodialysis uses less water - 152 litres/week/patient on average compared with 360 litres/week/patient in conventional in-centre treatment. Consumables such as plastic and cardboard packaging can be recycled by the local council in the domestic recycling. Utility costs involved in the haemodialysis service are borne by the Trust and reimbursed to the patient. Renal nurses visit the patients at home to oversee care.

The process of home haemodialysis is less demanding from a cardiovascular perspective (i.e. less stressful on the heart) as haemodialysis occurs over a longer time. There is evidence that patients undergoing haemodialysis at home:experience an improved symptom profile (improved energy, appetite and sleep), live longer and take fewer medications.

Results: The calculations assume savings as if all these patients were new to the service and would have been on in-centre dialysis. Note that results are based on water use as water use was the largest difference between in-centre and home haemodialysis. Travel (of patients travelling to the units and renal nurses visiting the patients at home) and electricity could also be considered in calculations. A reduction in medication also has a positive impact on the environment, but as there was no data available it has not been included in the calculations.

Cost: savings due to reduced water use amounted to £1,577 per year for the 18 patients.

Environmental*:* savings of water use per year were 194,688 litres, with a carbon footprint reduction of 177 $kgCO_2e$.

Social/health: there is evidence from the literature of patients undergoing home having a better experience of haemodialysis, however no assessment of the social impact/patient experience was carried out as part of this project.

Project 5: introducing NIPRO machines

Background: water use is one of the greatest costs and sources of environmental impact for haemodialysis. The unit continue to choose machines that reduce the unit's water use when purchasing new machines.

Approach: 12 new NIPRO machines came into use in October 2018 (for haemodialysis and haemodiafiltration, HDF). These machines use 0.5l/min less water when starting up. Each machine starts up around 3 times a day and the start-up phase lasts 2 minutes.

Results:

Cost: £53 saved each year.

Environmental: 11,230 litres of water will be saved each year, saving 10 kgCO2e each year. In addition, the new machines do not use water when on 'standby', unlike the Fresenius machines, but data was not gathered on the length of average 'standby' so this was not included in our calculations.

Social: None identified for this project.

Project 6: No Meat Mondays

Background: meat, amongst all food, has a high carbon footprint and is more costly than other foods. The renal unit dietician wished to raise awareness amongst staff of the particularly high carbon footprint of meat.

Approach: Kidney Unit staff were invited to sign the 'Meat-free Monday' campaign pledge.

Results:

30 staff signed up to the pledge.

Environmental: if staff were not eating a portion of meat once a week this would amount to 598 kgCO2e per year. Eating vegetables instead has approximately 77% of the carbon footprint of meat so the savings would be approximately 460 kgCO2e per year (Carbon factor is 2.5 for meat and 1.73 for vegetarian meals).

Cost: savings to the Trust would depend upon whether the staff were buying food from the hospital or providing their own meals. Vegetarian meals tend to be cheaper than meat-based meals and so there would be a potential saving for the Trust if this measure was adopted at scale in the canteens.

Social: there are potential benefits to staff in joining a movement and in raising awareness of the environmental impacts of our daily choices and habits.

4. MINIMISING INNAPPROPRIATE USE OF DIETARY SUPPLEMENTS – NUTRITION AND DIETETICS

TEAM MEMBERS: Martina Bartus, Catherine Tancock & Louis Theodossiou.

Goal: The aims of the project were to reduce the inappropriate use of oral nutritional supplements (ONS)

Background: ONS are easily accessible to ward staff and there has been very little monitoring or control over their distribution. The dieticians postulated that ONS were often given to patients, without a review by a dietician. This was confirmed by an audit in December 2017 that showed a discrepancy between the number of dietician prescriptions for ONS per week and the number ordered by the catering department.

Inappropriate use of ONS has the potential to have a negative impact on patient health, for example if sugar-containing ONS are given to diabetic patients (ONS were given out by catering staff who do not have training on diabetes) or if patients are not assessed adequately and given professional advice on diet and nutrition (for example drinking milk rather than using ONS in patients less 'at risk' of malnutrition).

Furthermore, if patients are discharged to the community with inappropriately dispensed ONS this has the potential to incur large costs for GPs as ONS are cheap for hospitals to provide (1p each) but much more expensive to provide in the community. The prescriptions are sometimes, but not always, reviewed in the community. Where prescriptions are not reviewed unused ONS may accumulate in patient's homes and go to waste.

Approach: establish a more effective management system for the supply and storage of ONS at the RD&E Wonford Hospital at ward level.

Progress:

Designing a system:

- the team were aiming to devise a simple, reliable and uniform system to supply ONS to all wards, regulating distribution but also allowing for large volumes of ONS to be available for patients being discharged with little advanced notice.
- part of streamlining the system involved reducing the number of different ONS supplied by wards. It has been difficult to gain consensus on which reduced range of ONS to use in different locations and this work continues.
- When piloting the system, the Datix system was used to log any problems encountered.

- Prior to the launch information was disseminated about the new system by arranging meetings open to clinical stakeholders (e.g. matrons, registered nurses, HCA's, ward housekeepers, dietitians, logistics, catering). Meetings were poorly attended and some email addresses were out of date.

Launching the system:

The 'Top Up' ordering system for ONS was launched in September 2018. Under the new system:

- all ONS ordered can be tracked and monitored using bar codes.
- The dieticians complete prescription forms for the ward housekeepers so that the housekeepers know which patients are prescribed ONS, which ONS are due and how frequently they should be given.
- There is also a section on the prescription form to help the ward housekeeper manage ward stock levels.
- The forms will also be used for monitoring. They will be returned monthly to the dietetics manager who repeat the audit carried out in December 2017 to see if the new system and communications with different teams has reduced the number of ONS being supplied to patients without dietetics advice.

Results:

The re-audit is yet to take place, so results are awaited.

The team have been learning about managing change including running a consultation process, decision-making in a large, diverse organisation and that disseminating information about change in an organisation is challenging and requires a multi-faced communication strategy.

Savings: In the long term it is hoped that the 'Top-Up' system will be embedded and that most ONS will be prescribed by dieticians. It is expected that this regulated distribution will have the down-stream effect that fewer patients will be discharged on inappropriately dispensed ONS, reducing the cost to NHS North, Eastern and Western Devon Clinical Commissioning Group and reduce the waste of unused ONS.

5. MINIMISING WASTE IN THE LABORATORY – HISTOLOGY TECHNICIANS

TEAM MEMBERS: Olly Mawson, Olly Gomme, Sarah Jones, Eunice Inacio & Alison Finch.

Goal: To improve the value and environmental sustainability of processes across the department.

Background: The Histology team identified 5 areas to tackle: paper waste, water waste, single-use plastic waste, low recycling rates and low awareness amongst staff of the environmental impact of their work.

Approach: The team proposed approaches to amend their processes in the areas above. They came across some significant barriers to taking the projects forward which they were not able to overcome in the timescale of the competition. However, they did learn a great deal about their systems and processes as well as the process of change. This led to the team generating learning points and ideas for new directions in moving towards more sustainable processes in the histology laboratory.

Paper Waste

Background: the laboratory staff print over 200 patient 'histories' a day (record of past and present laboratory results for a patient). This is equal to 1,000 sheets of paper per week, approximately 52,000 sheets of paper a year.

The histories collate laboratory results for each patient from several different pathology IT systems.

The laboratory team suggested either being more selective in printing full paper histories or simply checking results electronically without printing. However, the pathology consultants thought that the existing system allowed greatest speed in providing all the necessary information to support diagnosis, in a form that they could most easily assimilate and avoided searching in multiple IT systems for results. The reduction in printing was therefore not carried out.

Learning:
Cultural change involves negotiating with a variety of people and professionals participating in a process and considering the perspectives and needs of all involved.

Suggestion:
Electronic notes with integrated system for checking laboratory results is due to be introduced so changes to working practises will be reviewed then. The team could proactively discuss with the pathology consultants how results would need to be displayed to reduce the need for printouts/ what tailored printouts would look like, and then present this information to the IT team responsible setting up the new system so that a tailored system is put in place. Ensuring that all pathology systems are integrated and available to view in one area on that system is likely to be important.

Water Waste

Background: there is a high requirement for water use within the department as part of clinical and domestic processes, so an impactful change would be to reduce water use in the department.

The team thought that a feasible change would be to install a 'water hippo' or similar cistern float in the 6 toilets. Over a litre of water per flush could be saved, representing large savings over a year. The team requested the purchase of 'water hippos' for the department but were informed that the estates team were already conducting an audit in to reducing water waste and so the decision was made to await this wider review and report.

Learning: Identifying what action is within the mandate of the team is an important step in planning a project.

Suggestion: Speak to estates to find out if an assessment of the use of water has been made for the laboratories and, if so, what the results were/recommendations made. A team member could also speak to members of the Green Lab network in Cambridge to gather ideas for reducing laboratory water use and then share this information with the estates department and senior management members in the laboratories at RD&E.

Plastic Waste
Background
Specimens are sent to the lab in small plastic bags made from polythene. 100 - 200 specimens arrive in the histology laboratory each day. The laboratory staff noticed that the bags (which they discovered on contacting the manufacturer were made of virgin polythene) were in good condition and could potentially be reusable. They started collecting the bags for reuse until, on further investigation, found that infection control concerns meant that the bags were not suitable for reuse.

Learning:
When making decisions, tensions between clinical need, regulatory requirements, infection control and environmental concerns may pull in a different direction from environmental concerns. These tensions are common in healthcare and navigating these difficult decisions is an important skill when making changes towards more sustainable working.

Suggestion: To find a supplier that uses recycled polythene to make bags as a way of satisfying infection control measures as well and reducing the carbon footprint of bags. More radical solutions could be sought using transport receptacles that can be cleaned and reused.

Carbon Impact of Procurement

Background: the team wished to change suppliers to those that had clear policies and procedures in place for sustainable working and products.

Learning: The team identified lack of flexibility in commissioning services from suppliers who have their environmental impact in mind when designing their services, due to long contract times in the NHS and sometimes lack of competition in the market.

Suggestion: Making a note of when contracts are coming up for renewal/ notice periods and investigating making a switch at that point. If the available suppliers do not have environmental concerns high on their priority list the department could consider attempting to influence the suppliers to provide a more sustainable service. Could the professional body,

Environmental Awareness

Background: The team were successful in raising awareness of environmental issues through a core group participating in the Green Ward Competition, running a poster campaign focussing on turning lights off and introducing recycling bins into the department.

Results: Many staff were very receptive to the idea of the department decreasing the waste and energy footprint and these small changes made some steps towards cultural change.

Suggestion:
To continue the raised profile of environmental concerns in the department ideas include nominating a sustainability champion in the department. The sustainability champion could coordinate action including instigating/collaborating with estates in carrying out regular waste audits, writing and agreeing a 'Green Lab Charter' with the head of department and speaking about the environmental impact of daily work in team meetings (e.g. asking questions such as 'what will the environmental impact of this be?' when proposals for change are made in the department).

In order to influence laboratory professionals as a whole, the team could contact the United Kingdom Accreditation Society (responsible for accrediting laboratories, amongst other government services) to suggest including environmental measures in their accreditation assessments.

6. OTHER IDEAS INSPIRED BY PARTICIPATION IN THE COMPETITION

Further ideas were inspired by the competition and recorded to be taken forward in the relevant departments. Ideas included:

Renal Team

- To look at the cost of funding a link from microbiology to the Proton computer system to download all monthly routine MRSA swab results. This would save the ward clerks manually entering 738 results/month.
- To go paper free using the Proton computer system for all records.
- Skype calls to home haemodialysis patients to reduce nurse home visits thus reducing travel costs and carbon.

Intensive Care Unit

- Reduce monitoring of patients ready for discharge and transferring patients ready for ward discharge onto static beds. This could improve patient satisfaction through allowing them to move more freely, allow specialised beds to be used for patients requiring this enhanced resource and allow staff to use this time in another way.

Housekeeping

- Reducing wastage of unused bedside suction equipment when a patient vacates a bed space.
- To take an active role in negotiation of the new waste tender.
- To reduce laundry of linen by following the Best Practice Linen Guide.

Potential annual savings

The following table provides detail on the annual savings available to the Trust from the 2018 Green Team Competition projects when projects are fully implemented and embedded. These carbon and cost savings will increase if the projects are scaled up across wards.

Project	Money	Carbon	Water
Reducing unnecessary cannulation – Emergency Department ☺	£ 27,830	8,400 $kgCO_2e$	N/A
Switching from plastic to metal spoons – Otter Ward Housekeeping Team	£245	42 $kgCO_2e$	N/A
Switching from individual small plastic orange juice containers to using 1 litre cartons and plastic tumblers - Otter Ward Housekeeping Team	£ 1,029	-40 $kgCO_2e$	N/A
Streamlining disinfection of dialysis machines – Renal Unit	£ 1,770	4,406 $kgCO_2e$	52,416 litres
Using patient's own blankets – Renal Unit ☺	£ 4,591	2,250 $kgCO_2e$	N/A
Disposing of bicarbonate canisters in general rather than clinical waste – Renal Unit	£498	-280 $kgCO_2e$	N/A
Home haemodialysis – Renal Unit ☺	£ 1,577	177 $kgCO_2e$	194,700 litres
Switch to NIPRO machines – Renal Unit	£53	10 $kgCO_2e$	11,230 litres
Meat-Free Mondays Pledge – Renal Unit	-	460 $kgCO_2e$	N/A
Studying distribution of oral nutritional supplements and setting up monitoring & controlled distribution system –Dietetics Team ☺	-	-	N/A
Totals	**£ 37,570**	**15,430 kgCO2e**	**258,340 litres**

☺ indicates a project with the potential to directly benefit either patient wellbeing or health OR staff wellbeing, health or work environment/practices (though no projects assessed this aspect of care/practice).

NEXT STEPS

Having run these pilot projects, CSH will support Luke Mitchell and the teams in developing their projects. The progress of these projects will be recorded in a further report.

ACKNOWLEDGEMENTS

CSH would like to thank the teams for all their enthusiasm, work & creativity in devising and completing their projects and to Luke Mitchell for partnering with us. To demonstrate Luke's commitment to the Green Ward Competition he commissioned ClearLead, a sustainability consulting company who were already working with RD&E, to support him with administration.

We look forward to working with the clinical teams at RD&E and Luke Mitchell in the future.