NHS
The Leeds Teaching Hospitals
NHS Trust

LEEDS TEACHING HOSPITALS
GREEN WARD COMPETITION
CASE STUDY AND IMPACT 2018

CENTRE *for* SUSTAINABLE HEALTHCARE
inspire • empower • transform

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.

Libby Sutherland, Environmental Manager at the Leeds Teaching Hospitals NHS Trust, commissioned CSH to give clinical teams at Leeds Hospitals 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 2018. 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, RD8E

Green Ward Competition Workshop with the Radiography Team, Bexley Wing, St James' Hospital, Leeds.

Projects were run over 8-12 weeks, supported by Louis Pilard, the Clinical Programme Manager at CSH and Libby Sutherland. In September 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.

> *'The Green Ward Competition is an excellent programme for engaging clinical staff in improving the sustainable practices of their wards and teams. Support from a member of the senior management team is essential for ensuring good visibility for the programme and encouraging as many participants to join the competition as possible'.*
>
> *Yvette Oade, Chief Medical Officer, The Leeds Teaching Hospitals NHS Trust*

Following on from the competition, the winning project will be spread to other departments in the hospital and Dr Olivia Bush, Clinical Programme Lead at CSH will work to facilitate and publicise the advancement of the sustainability agenda at Leeds Hospitals. A separate report will be written on the outcome of the 'spread' phase of the Green Ward Competition.

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COMPETITION ENTRIES

1. INTRODUCING A VETTING SYSTEM FOR THE 'WALK-IN' RADIOLOGY SERVICE – RADIOGRAPHY TEAM

TEAM MEMBERS: Katy Mallender-Ward, Caroline Jessell, Christine McNally.

This project was the winning team and was a Finalist at the Sustainable Health and Care Awards 2018.

Goal: to improve delivery of appropriate radiological investigations being carried out in a timely manner for patients.

Background:

There are 5 radiology departments within the Trust; the radiography team at St James' hospital participated in the competition. Historically, the radiology departments in Leeds ran an appointment-based service for patients referred by their GP. However, with rising demand, waiting times were increasing. A new 'walk in' service, operating 8:30-17:00 Monday-Friday and 9:00-10:00 on Saturdays was set up. GPs send the requests via an electronic referral system and patients then travel to the radiology department. This provides a flexible, responsive service, saves administration time, dispenses with paper appointment letters and helps to keep waiting times down as demand rises. The department website states that most patients are seen within 30 minutes.

"The workshops supported us to develop and deliver a project to assess the environmental and social impacts of our service.

Entering the competition helped us make improvements as it gave our ideas publicity throughout the Trust and the opportunity to present our findings to the senior management team. This helped us to gain senior support in our department for the project and taking changes forward in the other radiology departments in Leeds. '

- Katy Mallender-Ward

The previous paper system with booked appointments involved all requests being vetted by a radiographer before the appointment was made. This meant that any queries surrounding the request were resolved before the patient arrived. As part of the 'walk in' service the referrals were not reviewed before the patient arrived for the examination as it was expected that many patients would attend directly from their GP appointment and there would not be time for vetting to take place. The walk-in system means that referrals from GPs that either contain inadequate information or are deemed inappropriate by the radiology may result in patients appointments being cancelled after they have arrived at the hospital (and patients advised to go home), the risk of inappropriate examinations being carried out or unacceptable delays occurring whilst discussion takes place amongst the team about the justification of an examination. In addition to contributing to a poor patient experience, these problems may result in a negative environmental impact related to use of fuel and emissions/air pollution caused by unnecessary travel. A previous audit carried out by the St James' radiography team suggested that unnecessary journeys were occurring.

The radiology team gathered empirical evidence on the impact of introducing a vetting system on reducing unnecessary journeys and waiting times for patients and compared 2 different vetting systems.

Approach:

The team trialled and assessed two different vetting systems over 6 weeks, for 3 weeks each, introducing a new 'duty radiographer' rota.

Phase 1:

The duty radiographer vetted requests Monday – Friday once, in the morning.

Phase 2:

The duty radiographer vetted requests Monday – Sunday twice, in the afternoon and during the nightshift. The night radiographer gave a clear handover to morning coordinator who can focus on discrepancies and contacting GPs, thus reducing interruptions for the day team.

The team also developed and conducted a travel survey to identify the average mileage that patients travelled when attending their department. The survey was given to a sample of 28 patients attending the walk-in service to the radiology department with a GP referral.

A data sheet was used to record a number of parameters including how long each vetting session took, the total number of requests vetted, if the patient would have been asked to return home, the reason for a request being rejected and how long it took to resolve a query (from identifying a problem, speaking to a clinician and reaching a conclusion).

Results

Request Capture

In **phase 1** a total of **1,527** requests were received (626 attendees + 901 requests cancelled or patients DNA) and 518 requests were recorded as vetted. In **phase 2** a total of 1,422 requests were received (6.4 attendees + 818 requests cancelled or patients DNA) and 491 requests were recorded as vetted. **This shows that 34% of requests were vetted in phase 1 and 35% in phase 2. Conclusion; no difference was demonstrated between the two different patterns of vetting sessions.**

Unjustified requests

In **phase 1**, 9 of the requests vetted were identified as unjustified. 1 patient arrived and was immediately turned away but in 8 of these cases the vetting occurred before the patient arrived so it is assumed that these patients were saved unnecessary journeys. In **phase 2**: 6 requests were identified as unjustified during the vetting process.

The number of patients arriving to the walk-in service and turned away due to an unjustified request, before the request was vetted (so not picked up by the vetting system) was; 4 in phase 1 and 2 in phase 2, **so 6 overall.**

In summary, **a total of 21 patients** [slipped through net + identified and saved a journey +turned away] **would be turned away due to unjustified requests over the 6 weeks** of the quality improvement project if a vetting system had not been in place. **The vetting system saved 14 patients attending unnecessarily and being turned away, equating to 121 patients annually, a 66% decrease in wasted journeys.** If this change was made in all 5 radiology departments and assuming that all departments had similar numbers and patterns of patients' attendance, unnecessary journeys would be saved for 606 patients annually.

Queries identified; number and type

20 queries were recorded in phase 1 (0.04% of all requests vetted). 41 queries in phase 2 (0.08% of all requests vetted). The cause of the increased number of queries identified in phase 2 was not clear. It might be assumed to be due to increasing the number of vetting sessions from 1 to 2 each day, however, similar numbers of requests were

vetted in phase 1 and phase 2 making this explanation unlikely. Other possible explanations are a natural fluctuation in the quality of requests or a different mix in the seniority/knowledge of the staff vetting the requests.

The **most frequent queries** were insufficient clinical information provided by the referrer, referrer not recognised as an authorised referrer, inconsistencies between clinical details and presentation/existing patient records, appropriateness of the imaging modality.

Time taken to resolve queries

During **phase 1** the mean average time to resolve queries (time taken to resolve query from identifying a problem to resolution) was 16 minutes, with a range of 5-70 minutes.

During **phase 2** the time taken to resolve requests were captured in 22 of the 41 queries. Time taken to resolve queries took longer, mean average time of 22 minutes, range 5-150 minutes.

There was little difference in the average time taken to resolve queries in the two phases. The difference in total amount of waiting time saved may have been due to some queries that took unusually long to resolve. It would be expected that it would take longer to resolve queries raised during the night vetting but long resolution times were also recorded during the day shift. The cause of longer resolution time was not clear from the data collected and may be due to natural variation in patterns of referral. The time taken to resolve queries does not equate to the waiting time for patients as for longer resolution times the team would have sent the patient away and contacted them with the outcome of the query.

Amount of Radiographer Time Required for Vetting

During **phase 1** a (mean) average number of 37 requests were vetted in 24 hours (range 22-71) and in **phase 2** an average number of 30 requests were vetted in 24 hours (average of 15 requests per vetting session, range 0-49, as 2 sessions were carried out in 24 hours**).**

Time taken for vetting

Each vetting session (data from phase 1) took 49 minutes on average (range 15-90 mins, anecdotal evidence that time taken varied depending upon the seniority of the radiographer), 1.3mins on average per request. Furthermore, the vetting is used as a training activity for new radiographers to increase their familiarity with IRMER guidance. Time for junior staff to discuss queries with a senior member of staff has not been included.

Travel survey:

- 90% of patients travelled to the hospital by car.
- The average distance travelled from home to the hospital was 3.6miles, 7.2 miles round trip (11.59km)
- The average journey time was 18 mins, 36 minutes round trip.
- For 96% of patients the purpose of the journey was solely to visit radiology.
- 32% of patients attended radiology department on the same day as GP appointment.
- The average time between the patients' GP appointment and attending the radiology department was 3 days.

Overall findings:

Introducing a vetting system did reduce unnecessary journeys for patients and may reduce waiting times. As far as we could conclude from limited data, the two different vetting systems were equally effective. There are possible benefits for staff workflow and training achieved through introducing a vetting system.

Environmental:

The vetting project has achieved the following impact:

The yearly driving distance (whether in a car or bus) saved was **1400 km.** Using a combined and proportional emissions rate of 0.18064 CO_2e/kg for car journeys and 0.10097 CO_2e/kg for bus journeys, the **yearly emissions avoided were 232 kgCO_2e** (4% of patients who made a journey for other purposes as well as the trip to radiology were not included in this calculation, so this figure is a conservative estimate).

Social impacts:

Patients:

Over 1 year, through preventing unnecessary journeys, 55 minutes per patient, equating to **a total of 73 hours of patient time,** was saved based on average patient travel (excluding time taken to find a parking space for the 90% of patients travelling by car). There would also be a cost saving to patients both for fuel costs and car parking.

For those patients attending the department, whose requests had been vetted and queries resolved, there may be reductions in waiting times, assuming that there were not other causes for delays.

Staff:

If vetting had not taken place each patients request would have been justified at arrival in the x-ray department. If a query was raised by the radiographer then workflow would be interrupted to resolve the issue. By introducing vetting these interruptions would be considerably reduced given the high capture rate of vetting system and rapidity of resolving queries.

Due to the small numbers no conclusions could be drawn on the superiority of one of the vetting systems over the other.

Introducing a vetting system also provided an opportunity for training of new staff in IRMER regulations.

Financial:

It is difficult to cost the savings to the Trust . However, if staff have fewer interruptions they will be more productive, which in turn can lead to financial benefits.

Waiting Times

Suggestions for improvement:

Find out how long it took for queries to be resolved, using the time of the referral arriving as time zero. This is important given that 32% of patients reported attending the department on the day of referral by the GP.

Investigate the pattern of timings of referrals arriving to inform deciding when vetting occurs. It is possible that twice daily vetting in the morning and afternoon could be trailed as queries can be resolved more readily during the day and GP requests and patients will arriving only during day time hours.

Next steps:

The idea of purchasing software to reduce the need for vetting was suggested. When making a decision about this it would be necessary to note the causes of queries being raised and whether introducing software would solve these queries. Administrative problems such as the referrer not being recognised by the system could be resolved with an IT system but the other causes of queries are more complex and vetting may continue to be required.

Final Conclusion:

Overall introducing a vetting system was impactful in reducing unnecessary journeys for patients with benefits for patients, the environment and staff, in line with the lean 'Leeds Way' principle of working in the Trust. This project is a demonstration on how small changes can make a big difference, given the scale of NHS work. It is also an example to other departments on the positive impact of reducing unnecessary hospital visits in a department.

Research and Innovation Centre Workshop

Goal: reduction in the waste of unused medical equipment on a clinical trials unit.

Background: Boxes of unused equipment and medication supplied for running clinical trials are thrown away unused when the trial closes. There is waste when the trial closes but also during the trials if packs of clinical equipment pass their expiry date. Since there is no robust system for tracking kits there is the potential for kits not to be available for patients when they visit if kits have expired, which may necessitate a repeat visit.

Approach:

1. Providing an estimate on the amount of waste produced currently by the clinical trials unit by collecting data on two small trials.
2. Noticing the processes and pathways involved in generating and disposing of the waste.

Results:

Studying the system:

During 2 small trials 47 kits were delivered. At the end of the trial 16 kits had been used, 14 kits had expired and were disposed of and 17 kits were still in date but were not required as the trials had closed. The majority of the kits were basic blood sampling kits containing a green Vacutainer 21 gauge needles which the clinical trials team did not use as they favour butterfly needles for a better patient experience (patients have poor venous access due to treatment with chemotherapy agents). In an attempt to reduce waste vacutainer needles from the packs were offered to wards but were declined as the vacutainers from the packs were from a different manufacturer from the vacutainers used on the ward. In total 498 different pieces of medical equipment were discarded as waste. These pieces of equipment were worth £131. The green house gas emissions caused by the production of this equipment that was not used but wasted was 47 kgCO_2e.

Considering that 200 trials are currently open on the trials unit and that many are much larger than then 2 trials identified then it can be safely assumed that the cost of the waste of equipment is high.

Procedural problems identified included:

- Currently physical labelling of tubes by the drug company prior to arrival at the study site makes it very difficult to redeploy the tubes for other patients, trials or areas of the hospital (or when expiry dates of kits are changed/updated).

- Paper system for tracking of the equipment, which is the responsibility of the research nurse. This is not an easy to use system to keep track of expiry dates of equipment and does not facilitate efficient management of stock.
- Currently kit is just disposed at the end of the trial rather than being shared with other parts of the hospital.
- Useable equipment is sometimes declined for use in other wards if the manufacturer of the equipment is different from that routinely used.

Suggestions for system re-design:

- Negotiating with the drug companies for e-labelling, where protocol numbers can be programmed on the label later in the process (i.e. at site level). The benefits of this would be to:
    - allow expiry updates to be made without relabeling.
    - allow tubes to be used across trials.
    - track kits.
- Discussing the content of kits (i.e. butterflies rather than vacutainers) with drug companies at the contract stage/site initiation visit as well as strategies for allowing efficient supply of kit (neither under nor over supply).
- Consider entering kit that is still 'in date' on the hospital equipment sharing system, which is 'Warp It' at Leeds Teaching Hospitals.
- Discussing barriers to redeployment of equipment with the Warp It team with a view to finding a workable solution.

Potential savings:

Financial & environmental: if the equipment from these 2 trials were re-used, rather than disposed of then 48kgCO_2e (of the manufacture of the equipment) would be saved as well as saving the hospital from having to buy that equipment. Furthermore, the cost and carbon footprint of disposing of the waste would be saved (no data on weights of equipment so carbon footprint could not be calculated). If the equipment was not over-supplied to the trails unit in the first instance then resources, transport and cost would be saved.

Social: savings in staff time if a more efficient system for keeping track of equipment and equipment rotation is implemented, reduced waste of patient time, emotional energy and disruption to life and work if repeat patient visits are eliminated.

3. REDUCTION OF PRESSURE ULCERS– L34

Goal: The aims of the project were to reduce wasted dressings, patient complications and stay in hospital and save staff time on dressing orders.

Background: The risk of pressure ulcers developing can be reduced. Pressure ulcers lengthen hospital stays, produce physical complications, increase pain and risk of infection, require more staff to be able to turn patients over more often and make community aftercare necessary. People with pressure sores need expensive equipment to be hired such as inflatable mattresses to help with the healing, more dressings and sheet changes, and disposal single-patient foam supports/cushions.

Approach:

1. The ward has been encouraging patients to get out of bed to sit in the chair in the day and walk around the ward.

2. Estimate the number of bed days that have been saved, and the amount of money saved on equipment.

Results:

The nurse leading on the project stated that 'there hasn't been a pressure ulcer on the ward for many weeks'. It is assumed that savings have been made in dressing equipment, staff time and length of patient stay. An unintended consequence of patients mobilising more is that falls have gone up on the ward. But none of the falls have led to patients having fractures, and the benefits of no pressure ulcers was judged to outweigh the impacts of increased falls.

4. INTRODUCE RECYCLING – OPHTHALMOLOGY DAY UNIT

Goal: To introduce recycling on ward

Background: There were no recycling bins on ward.

Approach:

Order recycling bins for the ward. This was carried out.

Savings:

The bins were well used and staff reported patients coming from other areas to dispose of recyclable waste in the bins, so reducing waste in the whole clinical area, so reducing the carbon footprint of the ward and cost of disposing of waste.

3 further project ideas were 'seeded' to be taken forward when there is more capacity to do so:

1. MINIMISATION OF SINGLE-USE ITEMS ON THEATRE – THEATRES

Goal: To reduce amount of single-use items used in theatres.

Background: There are many single-use items on theatre, including kidney dishes used prior to each procedure/operation.

Approach:

To phase out single-use kidney dishes and replace with reusable dishes.

Potential savings:

Financial and environmental: after initial spend on reusable dishes then there would be a financial saving in the procurement and disposal of the single use dishes, including the raw materials, travel and processing of waste.

Social: staff time would be gained in decreasing time ordering and storing dishes.

2. INTRODUCING STOCK CONTROL IN ISOLATION ROOMS TO PREVENT UNNECESSARY WASTE – INFECTIOUS DISEASES

Goal: To reduce the unnecessary waste of equipment and materials.

Background: Equipment or materials taken into an isolation room are disposed of when the room is cleaned after use, whether the equipment has been used or not, and rooms often become overstocked. For example, three stethoscopes had accumulated in an isolation room and all were disposed of when the room was cleaned to admit

a new patient. Overstocking the rooms contributes to a shortage of equipment on the ward and then further waste of staff time. A staff member said, "I spend more time searching for stuff than using it".

Proposed Approach:

1. Brief staff on the waste generated due to overstocking rooms and educate colleagues on the importance of reducing waste.
2. Introduce a sign up-sheet to track stock.
3. Exhibit posters reminding staff to be careful with stock and listing equipment costs as a deterrent.

Potential savings:

Reduced cost and carbon footprint with less waste disposal and procurement of replacement equipment. Staff time would be saved in searching for equipment and ordering replacement equipment.

NEXT STEPS

Having run these pilot projects, CSH will support the radiology team in spreading their idea to the 3 other radiology sites in the hospital. The progress of these projects will be recorded in a further report.

THANKS

CSH would like to thank Libby Sutherland and the teams for all their enthusiasm, work & creativity in devising and completing their projects. We look forward to working with them in the future.