



SUSQI PROJECT REPORT

Reducing hospital plastic use through re-use of LPDE plastic feed hanging bags for up to 7 days.

Team Members:

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Background:

On Koala ward we see many patients who are unable to drink orally. This means that the milk must be administered by an alternative route. A tube can be inserted into a patient's nose and down into their stomach which allows milk to be administered via enteral feeding. Many children receive enteral milk, water or dioralyte feeds with volumes and feeding times specified by the dietician team. Feeding schedules can range from continuous feeding with minimal breaks to 8 feeds per day, given over an hour each time. Some children also receive bolus feeding and this is where we see the potential for our current project to expand.

Feeds are stored in our ward milk room or are delivered to the ward fridge daily. When milk feeds are required to be given over a specific time (e.g. continuously, over 1 hour, over 2 hours), the feed bottle must be hung on a drip stand next to the patient for that period of time. In order to hang the feed, we use feed hanging bags. The feed bag simply holds the feed bottle and does not come into contact with the feed or any liquid.

The feed hanging bags used at our hospital are made from LPDE plastic and are made and sourced from China. The plastic bags are single use, replaced with every new feed that is hung, however they could easily be re-used multiple times throughout a patient's admission to reduce the hospital's plastic usage.

This simple yet effective change is easy to implement across the Trust through dissemination of information to educators, dieticians and potentially as a trust wide initiative.

Specific Aims:

To re-use enteral feed hanging bags for all eligible patients on Koala ward for the duration of their admission or up to 7 days.

Methods:

We performed 2 separate week-long audits of feed hanging bag use on Koala, added the totals together and divided by 2 to find an average number of bags used.

We engaged with the infection prevention and control (IPC) team who confirmed that changing the bags every 7 days for long term patients would be appropriate provided the bags are not damaged or soiled with milk. Patients with an MRSA skin shedder alert should have the bag changed with every feed. We also discussed the change with the dietetics team and no issues were identified.

We educated our team through a poster (Appendix 1) explaining the project. This was placed at the nurse's station and where the feed hanging bags are stored. We also sent an email to every nurse working on the ward and had a register which we could ask nurses to sign to confirm that they were aware of the implemented change and would begin reusing feed hanging bags.

Due to a large accumulation of ward stock from last year (5000) bags, it is difficult to see change in terms of procurement in such a short space of time, however, based on the 2 week audit we were able to predict a reduction. With consideration for a proportion of bags breaking, being accidentally not reused or soiled with milk, we believe reduction in the use of the bags could be up to 75%, or 16,000 bags in Koala ward alone.

Trust wide procurement was contacted for the number of feed hanging bags ordered by the trust in the past 12 months (November 22 - November 23). A total of 64 boxes with 1000 bags per box were ordered, equating to 64,000 plastic feed hanging bags per year.

Measurement:

Patient outcomes:

Patients will not be affected by the change.

Environmental sustainability:

A bottom-up process-based approach was used to estimate the carbon footprint of the plastic bags. With support, we calculated the carbon footprint per hanging bag inclusive of the material the bag is made from, the material that it arrives in (packaging) and the cardboard box that the bags are delivered in. We also took into consideration the country of origin and the transportation to GOSH via container ship and HGV. The 2023 UK Government Carbon Conversion Factor database was used to convert activity into carbon dioxide equivalents (CO₂e).

Economic sustainability:

Financial information was gained from the Trust procurement team. 1000 bags cost £150 (0.15p per bag). No investment costs were incurred.

Social sustainability:

Staff were surveyed on the ward to explore their perceptions of waste and the environmental impact of healthcare, and on the project change.



Results:

Patient outcomes:

Patients are not affected by the change due to considerations put into place following discussions with infection control. Any bag that is torn or damaged could be at risk of not holding the feed safely and appropriately would be replaced, as well as any bag that is soiled. In addition, it was agreed that for any MRSA skin shedder, the bags would be replaced after each use.

In terms of the future for patients, a reduction in the use of plastics will have a positive impact on the environment. Nurses will save time through not needing to walk to the milk room for a new bag for every feed which means there is more time for patient care.

Environmental and economic sustainability:

In the first audit week, 136 bags were used. In the second week 191 were used. We have taken an average of 165 bags used per week and a potential reduction of 75% on Koala ward to estimate potential outcomes.

Average weekly reduction of 123.75 bags

This project has a ward saving of £18.60 and 3.71 kgCO₂e per week

This project has a ward saving of **£967.20 and 193.05 kgCO₂e** per year, equivalent to driving 570.1 miles in an average car.

Based on procurement data and a predicted reduction of 48,000 bags across the Trust, implementing this change across GOSH's 20 inpatient wards would save £7,200 and 1,439 kgCO₂e, equivalent to driving 4,250 miles in an average car.

Social sustainability:

100% of nurses who were surveyed on Koala ward said they had concerns about environmental impacts of providing healthcare today, and 96% said they were concerned about waste on Koala. Through this project we have supported staff to take action to address these concerns by empowering staff to reduce their plastic usage.

Staff have reported that it is a very simple change that saves time as a new bag is not needed for every feed.

Discussion

Dissemination of this change happened via various methods including emails, posters, training register. Some minor challenges were reminding staff not to discard bags after each use, but this was overcome by snapshot bedside teaching, poster use throughout the ward and reminders at the daily ward huddle. The risks of bags becoming damaged because of ongoing reuse, and therefore not safely holding a feed bottle are present but felt to be small and manageable through staff member checks when hanging each feed.

As highlighted by [Brownson et al \(2018\)](#), involving stakeholders ensures change is sustained and therefore we ensured to inform ward nurses, managers and dieticians of this change. It was important to consider the infection control impact of reusing a piece of material, and therefore this was discussed early on to identify any barriers. Consequently, certain precautions were taken around MRSA skin shedder patients and this was relayed to staff.

We have demonstrated that some changes can be easily and quickly implemented with no harm to patients and no additional time required for staff. However we have learned that not all changes in equipment reuse will be as simple. We have also been exploring the potential to reuse enteral syringes for aspiration of gastric contents for pH testing and administration of water flushes in collaboration with the IPC team. Patients/families regularly reuse syringes at home, however there are several barriers to implementing the same on the ward. These include having appropriate sinks dedicated to washing syringes as hand washing sinks are not appropriate, a means of drying and storing clean syringes before the next use and a location to store between uses. Until a decision regarding cleaning is made, we are unable to progress with this project. Based on a 24-hour review of 16 patient feed charts, we could reduce use of 93 syringes per day (15x 60ml syringes, 31x 20ml, 39x 10ml and 8x 5ml). In Koala ward alone, this would be a saving of 33,945 syringes annually, equivalent to approximately 2,564.9 kgCO₂e per year (this does not take into account the emissions associated with cleaning). We plan to continue working with the IPC team to move this project forward, as it could lead to significant environmental and financial savings Trust wide, and contribute to the Trusts participation in the [Healthcare Without Harm Born Free project](#).

Conclusions:

Our results show that a simple change to reuse feed hanging bags is an effective way to reduce plastic waste on Koala ward, and across the Trust if/when further expanded. This study did not add to nursing time or workload pressures and was an easy change to implement, which contributed to its success. It has led to improvements to staff and patient experience while reducing financial and carbon waste.

In order to disseminate our findings to the wider trust we could present our findings at our monthly education meeting - Practice Educators Network (PEN). This would educate the hospital's educators of our findings and the benefits both financially and environmentally of re-using the hanging bags and this could then be taken back to each clinical area. To share findings and change with other organisations within the NHS, findings could be presented at environmental/sustainability conferences. Following review of local IPC guidelines, we do not anticipate barriers to other organisations beginning the reusing of feeding bags.



Appendices

Appendix 1: team education poster

SUSTAINABILITY PROJECT

Waste Recycling Gas Fuel Electricity Offsets Transport

REDUCE KOALA'S CARBON FOOTPRINT BY USING ONE HANGING FEED BAG PER PATIENT

RE-USE WHEN YOU CAN!

REPLACE if damaged, after 7 days for long term patients and daily if MRSA skin shedder

Critical success factors

Please select one or two of the below factors that you believe were most essential to ensure the success of your project changes.

People	Process	Resources	Context
<input type="checkbox"/> Patient involvement and/or appropriate information for patients - to raise awareness and understanding of intervention <input checked="" type="checkbox"/> Staff engagement <input type="checkbox"/> MDT / Cross-department communication <input type="checkbox"/> Skills and capability of staff <input type="checkbox"/> Team/service agreement that there is a problem and changes are suitable to trial (Knowledge and understanding of the issue) <input type="checkbox"/> Support from senior organisational or system leaders	<input type="checkbox"/> clear guidance / evidence / policy to support the intervention. <input type="checkbox"/> Incentivisation of the strategy – e.g., QOF in general practice <input type="checkbox"/> systematic and coordinated approach <input type="checkbox"/> clear, measurable targets <input type="checkbox"/> long-term strategy for sustaining and embedding change developed in planning phase <input type="checkbox"/> integrating the intervention into the natural workflow, team functions, technology systems, and incentive structures of the team/service/organisation	<input type="checkbox"/> Dedicated time <input type="checkbox"/> QI training / information resources and organisation process / support <input type="checkbox"/> Infrastructure capable of providing teams with information, data and equipment needed <input type="checkbox"/> Research / evidence of change successfully implemented elsewhere <input type="checkbox"/> Financial investment	<input type="checkbox"/> aims aligned with wider service, organisational or system goals. <input type="checkbox"/> Links to patient benefits / clinical outcomes <input type="checkbox"/> Links to staff benefits <input checked="" type="checkbox"/> 'Permission' given through the organisational context, capacity and positive change culture.