SUSQI PROJECT REPORT: STREAMLINING CRASH TROLLEY EQUIPMENT OUTREACH TEAM

TEAM MEMBERS:
- Victoria Croft – Critical Care Outreach Sister
- Jude McLellan – Critical Care Outreach and AKI Team Lead
- Tara Minshall – Resuscitation equipment coordinator
- Melanie Lowe - Lead Clinical Pharmacy Technician
- Gwendolen Birkett – Senior clinical pharmacy technician

Background:

It is a Resuscitation Council requirement that healthcare organisations have suitable emergency trolleys with appropriate equipment and medications in the clinical setting[1]. The Critical Care Outreach team are responsible for monitoring and auditing the crash trolleys, of which there are 52 strategically placed around the Christie Trust containing a vast amount of equipment needed for emergencies, vital for patient safety. Through continuously monitoring the crash trolleys, our team identified that there may be unnecessary trolleys or items not clinically indicated or required in resuscitation.

Specific Aims:

1. To identify and remove unnecessary crash trolleys
2. To remove unnecessary medical equipment and medications from remaining crash trolleys for environmental, financial and social benefit.

Methods:

We completed a process map (Appendix 1) to review all crash trolley locations across the Trust. We also reviewed the full list of equipment located within each trolley, for which there is approximately 150 items excluding drugs.

Day to day maintenance of the trolleys lies with the ward/outpatient areas requiring the trolley. It can be time consuming for band 5 and 6 staff who check the trolley is sealed every morning and complete full contents checks monthly. The resuscitation equipment coordinator also helps with auditing and provides stock for the ward when required.

Through this process we identified the following steps that could be put in place to streamline the crash trolleys:

1. Removing crash trolleys

By reviewing crash trolley locations, we identified 2 areas where trolleys were located within 10m of each other and therefore could be reduced to 1 trolley and shared. 1 team agreed to reduce a trolley. Which has been repurposed for training purposes. Other equipment was redirected for use

in clinical areas. The second team was concerned removal of a trolley may compromised patient care, leaving them feeling unsafe. We are working with the team to find a solution with the continued aim to remove another trolley while ensuring patient safety.

2. Remove items that are not clinically indicated from the trolley

Crash trolley contents were reviewed. Gelofusin was identified as an item rarely used that is not recommended in resuscitation anymore[1]. The gelofusin was redistributed into fluid cupboards for other purposes, as it has clinical uses outside of emergency situations.

3. Remove medications not needed in the blue emergency boxes

We reviewed all medications in the blue emergency boxes which contain drugs for different types of emergencies including hypotension, antiarrhythmic, anaphylaxis and asthmatic drugs etc. In discussion with the pharmacy technicians, it was identified that 2 oral drugs, Aspirin and Clopidogrel, used for acute coronary syndrome, would be clinically appropriate to remove, as both medications are readily available via emergency drug cupboards. Retrieving the drugs via the cupboard versus the crash trolley would not impact on time taken in an emergency. A memo will be sent to all outreach staff to inform them of the drug changes as the team is responsible for these drugs in an emergency.

4. Reduce the number of intubation boxes around the trust

Additional intubation boxes were introduced at the beginning of the COVID19 pandemic to ensure timely intubation to reduce the risk of spread. Placement of intubation boxes was reviewed with the pharmacy technicians and 5 boxes were identified as having never been used since introduction 2 years ago. These boxes were subsequently removed, ensuring patient safety by strategically placing the remaining intubation boxes in readily available positions around the Trust.

Measurement:

Patient outcomes:

Crash trolleys have remained in areas that are required to have one or where staff have expressed concern at removal. It was agreed in MDT meetings the changes suggested would not impact on patient safety and care however patient safety will continue to be monitored via daily equipment checklists and our monthly audit process. In addition, spot checks of contents of all trolleys will continue by the outreach team. A yearly audit report is created in July to assess the previous 12 months. The pharmacy technicians will help to identify any issues with the emergency drug boxes.

Environmental sustainability:

We completed a top down, input-output methodology to calculate carbon (CO2e) savings. We used the financial cost of items and applied the relevant emission factors. For pharmaceuticals and medical equipment factors from the Greener NHS 20/21 database were used. To calculate waste disposal savings, the weight of items and their packaging was used with the emissions factors for domestic and clinical waste from Rizan et al 2021[2].

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Economic sustainability:

The cost of gelofusin was obtained from NHS supplies website. The cost of oral drugs and intubation boxes was obtained from our pharmacy procurement team. The cost of remaining items of equipment in a crash trolley was gained from either our procurement team or staff ordering system.

Social sustainability:

We obtained informal feedback via our departmental meetings and staff conversations.

Results:

Patient outcomes:

We do not anticipate any changes to patient safety and clinical care. We will continue to monitor this via our daily checks and monthly audits.

Environmental and Economic sustainability:

Table 1 shows our anticipated annual savings.

Item	Per item		Quantity removed	Total saving	
	kgCO2e	£		kgCO2e	£
Gelofusine	0.9	£6.07	52	44.4	£315.64
Asprin and Clopidogrel	0.1	£0.93	52	6.2	£48.36
Intubation boxes	147.5	£1,155.19	5	737.6	£5,775.95
Red box	22.7	£177.51	1	22.7	£177.51
Blue Box	8.4	£65.64	1	8.4	£65.64
Crash Trolley equipment	81.13	£185.41	1	81.13	£185.41
Crash trolley equipment waste disposal*	10.32	£4.39	1	10.32	£4.39
Total annual saving				**910.75 kgCO2e**	**£6,572.90**

*Waste disposal excludes defibrillation and suction equipment and is based on assumptions of annual turnover of equipment with 90% items disposed of in clinical, and 10% in domestic waste.

Through our changes to streamline equipment, we anticipate savings of **910.75 kgCO2e per year**, equivalent to 2,623.1 miles driven in an average car. We also anticipate a financial saving of **£6,572.90 per year.**

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Social sustainability:

Outreach will have one less trolley to input into the monthly data and one less trolley to monitor.

The Pharmacy technicians felt the reduction in intubation boxes and oral drugs would ease their workload and save time.

Ward staff responsible for daily checks of crash trolleys reported this was a very time-consuming process (taking at least 30 minutes per day), so removing any low value items is helpful for time efficiency. In the area where the crash trolley was removed, the ongoing responsibility has now been split between two teams saving time.

Discussion:

Removing Gelofusin from crash trolleys and changing the folder information was quite time consuming given that it meant going around to the 52 crash trolleys, the equipment coordinator kindly helped with this.

An area that we were planning to remove a crash trolley from didn't go as planned, we felt that this would be beneficial for them however they felt that there was a risk with this given the department was outside the trust building which is understandable. We will continue to work with these and find a solution, using the suitcase crash trolley for this area is a possibility. This is a bag that we take outside the building or in a tricky part of the hospital if there is a crash call. The next phase would be to introduce this idea to the department and to do a mock arrest call to see if this is a suitable solution. A meeting has been set up to discuss this and a mock arrest will follow.

We are now looking at other ways in which we can reduce the waste on the crash trolleys. For example, removing some of the airway equipment. However, this needs wider discussion with the anaesthetists who use the equipment this process has started but will be fully discussed in the new year. In addition, we are looking at going electronic with the monitoring of the crash trolleys which will save time and a significant amount of paper, which will increase our CO2e savings further. We have asked IT to help with this and hopefully will be available in the future.

At the start of the competition, we realised that there were multiple elements to the resuscitation team/equipment that we would like to change however in reducing equipment there was always an element of risk to patient safety. An MDT approach was used to ensure this patient safety.

Conclusions:

Reviewing all the crash trolleys and their contents has been very useful and thought provoking. We will continue to review our service and aim to reduce more waste. We have had good team input from our equipment coordinator and the pharmacy technicians, their input has been invaluable. I feel this project has had a positive benefit on the relationship between the teams by facilitating joint working, which will continue when monitoring the crash trolleys.

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References:

1. Reinhart K, Perner A, Sprung CL, Jaeschke R, Schortgen F, Johan Groeneveld AB, Beale R, Hartog CS; European Society of Intensive Care Medicine. Consensus statement of the ESICM task force on colloid volume therapy in critically ill patients. Intensive Care Med. 2012 Mar;38(3):368-83. doi: 10.1007/s00134-012-2472-9. Epub 2012 Feb 10. PMID: 22323076.
2. Rizan, C., Bhutta, M., Reed, M., and Lillywhite, R. (2021). The carbon footprint of waste streams in a UK hospital, Journal of Cleaner Production. Volume 286
   PDF available from: The carbon footprint of waste streams in a UK hospital - ScienceDirect
3. The Resuscitation Council UK (2022). Available PDF from Quality Standards Acute care equipment and drug lists.pdf

Appendix 1: Process map