



SUSQI PROJECT REPORT

Improving the segregation of pharmaceutical waste across Hampshire Hospitals Foundation Trust

Start date of Project: July 2024

Date of Report: 12th October 2024

Team Members:

- Helen Murphy – Trust Waste and Facilities compliance manager
- Rachael Aitken – Lead nurse for patient support services

Background:

Waste segregation in the NHS refers to the process of correctly separating different types of waste generated within healthcare settings to ensure safe disposal, compliance with legal and environmental regulations, and minimisation of costs. This process is critical as healthcare facilities produce various types of waste, including general, clinical, and hazardous waste, which must be handled differently to avoid contamination, protect public health, and ensure proper disposal.

HTM 07-01 The Safe and Sustainable Management of Healthcare Waste provides the framework by which waste must be segregated and allows us as healthcare waste producers to meet legislative, technical and policy requirements.



Within the Trust we have the following waste segregation streams in use on the wards...

- Orange bags- Infectious waste
- Tiger striped bags- Non offensive waste
- Black bags- Domestic waste
- Yellow lidded bins- Sharps such as cannulas and needles
- Blue lidded bins- Pharmaceutical waste (items that contain drugs or have been in contact with them)

Our Trusts performance is monitored through bagged waste audits carried out by an external contractor Stericycle. The Trust should have 10% or less major non-conformances to pass. A non-conformance occurs when an item is discarded in the incorrect stream, for example a pharmaceutical item is placed in an orange bag rather than a blue lidded bin.

In November 2022 Royal Hampshire County Hospital (RHCH) and Andover War Memorial Hospital (AWMH) both failed waste audits. AWMH segregation issues were resolved and they passed the re-audit in June 2023, but RHCH is still failing, with pharmaceuticals the largest point of failure. Pharmaceutical waste includes items such as giving sets, blister packs, medicine bottles, unbroken ampoules and out of date medicines.

It is to be noted however that whilst it is so important from a legislation perspective to get our waste segregation right, it does not mean that getting pharmaceuticals into blue bins instead of bagged

waste will change the route of disposal or will save the Trust money in the near future. However, 'getting it right' will save the Trust from the financial penalties we have been incurring since November 2022 as a result of failed audits due to the large amount of pharmaceutical waste (the main point of failure) ending up in bagged waste instead of blue pharma bins.

The results of the bagged waste audit from Royal Hampshire County Hospital are shown in the table below (this includes both orange bag waste and offensive waste). As stated above incorrect segregation of pharmaceuticals is the hospital's biggest problem.

RHCH				
Date of Audit	Bags audited	Bags Compliant	Bags Failed	% Failures
10.11.22	118	80	38	33%
16.2.23	81	43	38	47%
13.6.23	50	41	9	18%
23.1.24	140	111	29	21%
Totals	389	275	114	30%

There is a penalty to pay for incorrect segregation of waste. Our orange bag (infectious) waste costs £495 per tonne and offensive waste (non-infectious tiger bag) costs £425 per tonne for disposal. By failing the waste audits, all our bagged waste must be disposed of as high temperature incineration and this costs £950 per tonne. So far, the Trust has had to pay an additional £123,763.50 to ensure safe disposal in line with legislation.

At RHCH in 2023 we produced 3.36 tonnes of pharmaceutical waste at a cost of £3,192. Cost per tonne is £950. Across the Trust we produced 9 tonnes at a cost of £8,550.

Waste segregation training at Hampshire Hospitals is not mandatory although waste disposal is the only action that involves every single member of staff, patients and visitors.

Hampshire Hospitals has approximately 7,719 members of staff and sees and treats about 915,210 patients every year and disposes of approximately 1,022 tonnes of clinical waste. Every piece of waste that is incorrectly segregated can cost the Trust money, incur financial penalties and generate bad press.

The team members are Rachael Aitken, Lead Nurse for Patient support Services and Helen Murphy, Trust Waste and Facilities Compliance Manager.

Specific aims

To reduce or eradicate pharmaceutical waste entering the bagged waste stream, by

- Identifying why staff are incorrectly streaming waste
- Educating and empowering staff to stream waste correctly

Achieving our aim will ensure the Trust is compliant with waste legislation, reduce the additional financial cost to the trust incurred by financial penalties, and improve the Trust's carbon footprint.

Methods:

Waste is a broad topic, so for this project's purposes we decided to initially focus on pharmaceutical waste education and resources, as this would have the greatest impact. However, due to the nature of our engagement and discussion with staff on segregation generally, it is possible the project may have impacted on other waste streams in addition to pharmaceutical waste.

Studying the system

To achieve the above aims we first needed to identify why staff were incorrectly streaming waste, and whether any barriers were in place. We sent out a waste survey asking questions about current waste knowledge and segregation practice. We had responses from 58 staff members which represented a diverse spectrum of clinical specialties and professionals, as well as administration and managerial roles.

Key findings of the survey:

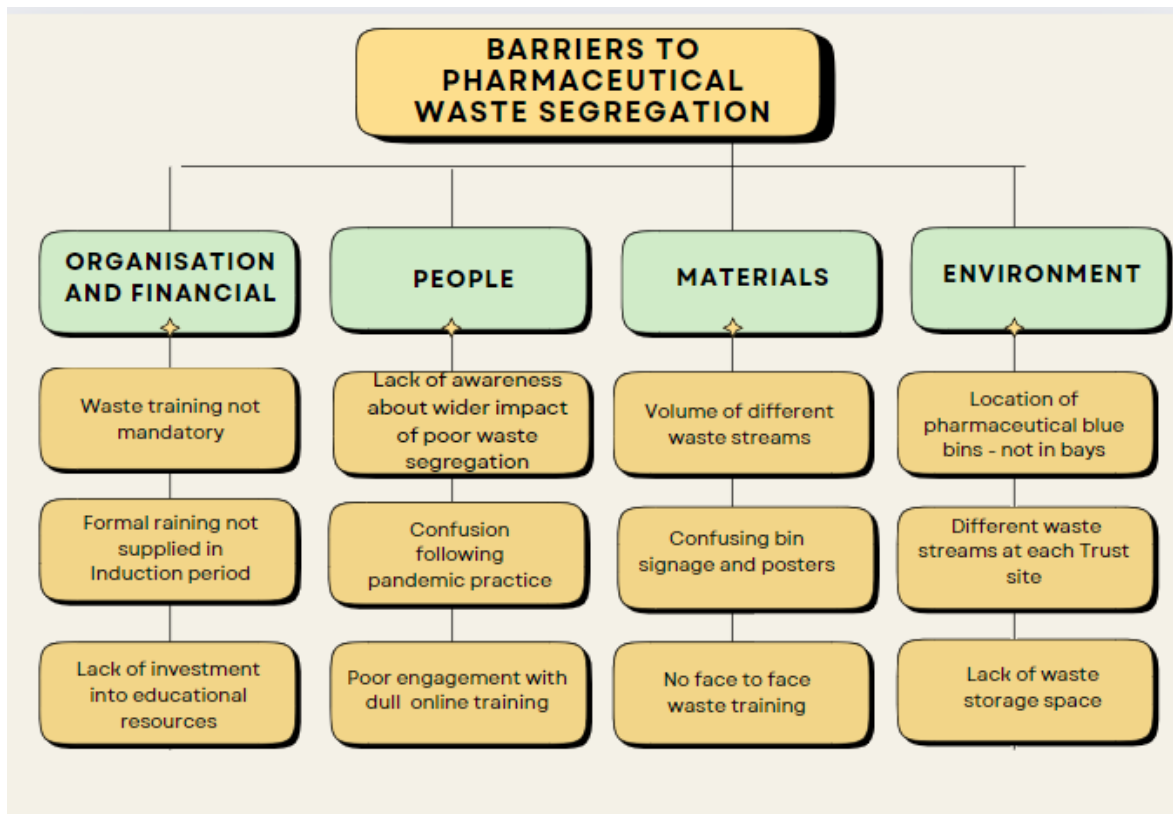
- 96.5% of staff were aware that poor waste segregation negatively impacts the carbon footprint of the NHS
- 58.5% of staff felt that waste was segregated fairly well in their clinical areas, 15.5 % felt it was done very well, and 26% felt it was not done well at all
- 45.8% of staff reported they had received training on waste segregation, and 62% felt they had the right resources such as bins and signage to effectively segregate
- When asked where clinical staff would dispose of an IV paracetamol bag after use 63.3% of staff answered incorrectly, and when asked they would dispose of an empty drug blister pack 60.4% of staff answered incorrectly

We also undertook ward walk arounds to engage directly in conversation with staff, asking what they thought could be done to enhance waste streaming.

Common themes included:

- Educational drop-in sessions on the wards
- Physical delivery of training- not online
- More training to increase staff awareness
- More signs and info for staff
- More identifiable bins
- More posters
- Improved recycling facilities for cardboard and glass

We used a barrier analysis tool to reflect on our findings based on environmental, materials, organizational, financial and workforce factors.



Additional factors impacting correct waste segregation:

Healthcare staff often view waste disposal as a necessary evil, during the covid pandemic all waste was disposed of in orange infectious bags, so we identified there was a need to correct bad habits and teach new staff who have joined the trust in recent years the correct way to waste segregate.

It was also evident that waste education was perceived as being a dull subject, and as waste training is not mandatory there was little motivation for staff to complete the online green brain waste training. The clinical areas are busy, and staff find it hard to get away to attend study sessions, so we decided to respond to the feedback for physical ward-based training and take it to them and make it fun and interactive.

Changes Implemented

We devised a simple board game called “Bin”-go. This consists of a board with pictures of common items thrown away in clinical areas daily which included pharmaceutical products, along with tokens which depict the waste segregation streams. Staff are asked to cover the board pictures with the token of the waste stream they would currently use for disposal, after they have played, we would talk through which they got right and give education on which they got wrong and where it should really go.

"BIN" GO



SOILED PAD



GLASS DRUG AMPOULE



USED DRY WIPES



GLASS MEDICATION BOTTLE



USED FACE MASK



IV N/SALINE WITH KCL



USED CLINELL WIPES



BED PAN AND CONTENTS



IV N/SALINE



DRUG BLISTER PACK



IV DEXTROSE/SALINE



USED GLOVES



CANNULAS AND SHARPS



IV PARACETAMOL



IV ANTIBIOTICS/ GIVING SET



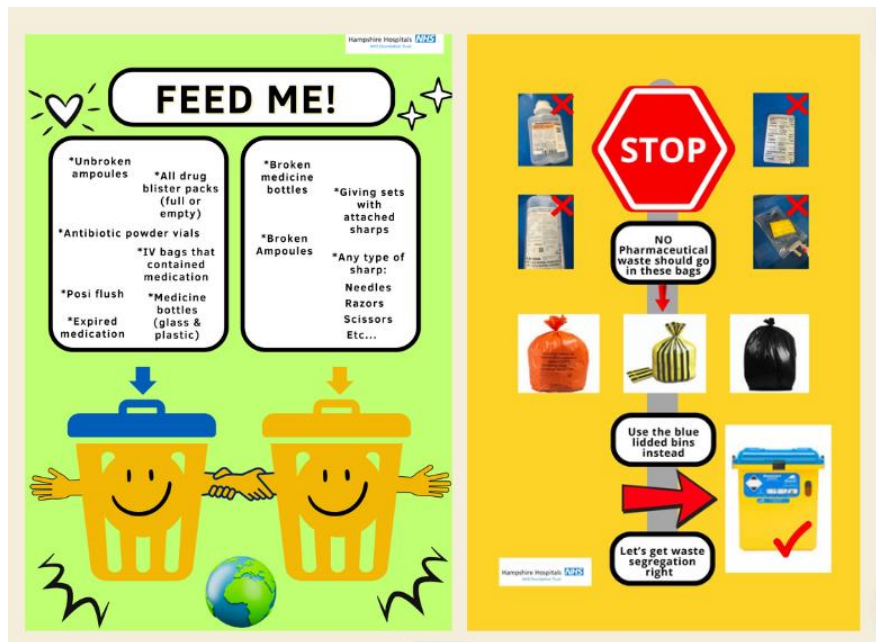
We shared this with staff at the information points, and went out onto the wards across the trust sites with the waste wagon to offer them an opportunity to play the game, learn about waste and ask questions



This game was hugely popular with teams playing it together and enjoying the process and having fun. We found that they were willing to undertake the training without coercion, and as it was informal they felt comfortable asking questions, we gave out small prizes of sweets and mini green bins to those who participated.

We were aware that this method would only capture the staff on the wards at the time of our visit, but we are optimistic that the staff we did encounter would cascade what they had learned to their colleagues. To target a wider audience, we used the Trust Facebook page to promote our Green team project and posted photographs of our walk arounds as well as informational posts.

Clinical areas can be swamped with posters, and after a time staff become used to them and no longer take in the information they are providing. The survey feedback had highlighted that staff wanted clear and concise waste streaming information. We created some bright and colourful posters to be displayed on the wards and in staff rooms which hopefully would attract more attention.



We also wanted to create clearer signage identifying the waste streams, as well as posters these will be made into labels which go on top of the bin lids providing that educational point of contact as staff go to dispose of waste.

Top Tips for Waste Disposal!

Which bin should it be in?

- Did you know that all blister packs must go into a blue pharmi bin and not into a clinical or general waste bag?
- Full/partially full bags of urine or saline must be emptied before disposal into a clinical waste bag.
- A blue pharmi bin must never contain sharps.

Recycling	General	Offensive	Infectious

Posters showing what goes in which bin are available on the waste Trustnet page.

Meds & Sharps

Please use the correct bin! It's important for safe disposal and can also prevent significant costs to the Trust.

Which bin should it be in? **QUICK TIPS**

Blue Container For medicines (no sharps)	Yellow Bin For sharps and medicines	All bags NO MEDICINES or SHARPS
<p>You can use this container for:</p> <ul style="list-style-type: none"> ✓ Giving sets (NO sharp attached) ✓ All blister packs (with or without meds) ✓ Medicine bottles (glass or plastic) ✓ Unbroken ampoules ✓ Out of date meds ✓ Posi flush <p>You must not use this container for:</p> <ul style="list-style-type: none"> × PPE × Packaging (plastic or cardboard) × Hand towels 	<p>You can use this container for:</p> <ul style="list-style-type: none"> ✓ Giving sets (sharp attached) ✓ Broken ampoules ✓ Broken medicine bottles ✓ Any type of sharp object including needles scissors, razors etc) <p>You must not use this container for:</p> <ul style="list-style-type: none"> × PPE × Packaging (plastic or cardboard) × Hand towels 	<p>You can use bags for:</p> <ul style="list-style-type: none"> ✓ PPE ✓ Empty saline/glucose bags (no added medicines) ✓ Other soft waste <p>You must not use bags for:</p> <ul style="list-style-type: none"> × Sharps × Giving sets × Medicine bottles × Blister packs × Ampoules × Posi flush × Infusion bags containing medicines

Over the next few months there will be implementation of cable ties which the domestics will use to seal each bag, each will give clear identification on which clinical area the waste originated from. In the event of a failed audit this will allow us to provide targeted training and education to prevent reoccurrence.

Measurement:

Patient outcomes

The project has not directly impacted on patient care. Patients continued to receive appropriate and safe care and were unaware of any change to processes for disposal of their pharmaceutical waste.

Environmental sustainability:

Inappropriate segregation of pharmaceutical waste could risk staff, waste contractors and the general public being exposed to hazardous products which could harm their health. There could also be an environmental impact if pharmaceutical waste were to end up in land fill sites. Staff should be encouraged to report any instances of inappropriate or unsafe waste segregation via the in-phase system, this will allow risks to be monitored by governance and actions taken to rectify if incidents occur.

Due to the failure of the bagged waste audits at RHCH we currently have a large carbon footprint and a significant increase in costs. In 2023.2024 we produced a total of 386 tonnes of clinical waste with a total carbon footprint of 299 tonnes of CO2e

RHCH	Current Tonnes	CO2e Tonnes	Current Costs	Current % split
Incineration	279	252	265,050	72%
AT	104	45	44,200	27%
Offensive	3	2	1,275	1%
Totals	386	299	310,525	

When we pass our audit (due for November 2024) and our offensive waste (currently being treated as high temperature incineration waste) can go back to being treated as offensive waste - tiger stripe bag (average of 16 tonnes per month) we will save approximately £8,400 per month or £100,800 and reduce our carbon footprint from 14.42 tonnes to 390kg, making a total of 14.07 tonnes.

NHS England has a 10-year strategy to improve waste segregation and to change the % split of waste to 20% high temperature incineration, 20% alternative treatment and 60% offensive waste. To be able to implement this across the Trust will make significant savings both in carbon and financially. We aim to have as close to this split as possible by summer 2025.

Even with correct segregation of pharmaceutical waste the route of disposal will not currently change so will not directly impact our carbon footprint. Our current general waste contractor Veolia is working with the Environment Agency at an ERF in Sheffield to accept non-hazardous pharmaceutical waste so there is a possibility when we tender for a new waste contract in 2026, we may be able to send our pharmaceutical waste to energy recovery which will have a significant impact both on the reduction of our carbon footprint and a financial benefit. Prices for the disposal of such waste would be negotiated within the tender process however if charged at the same rate

as offensive waste could offer a saving of £2604. Potential carbon savings would be a reduction of 3 tonnes. For the Trust, the savings could amount to £6,200 and a carbon saving of 57.51 tonnes.

Social sustainability:

While the social impacts on staff and patients have not been directly measured, we have included some assumptions about social impacts in the results section based on the project’s success and existing literature.

Results:

Patient outcomes:

As above, this project has no impact on the care patients receive and their clinical/health outcomes

Environmental sustainability:

By improving waste segregation and working towards the NHS strategy targets we should be able to achieve the following (see table below) - based on current tonnage

RHCH	Future tonnes	Co2 tonnes	Future Cost	Future % split
Incineration	77	70	73,150	20%
AT	77	28	38,115	20%
Offensive	232	5	98,600	60%
Totals	386	103	209,865	

This will mean a saving of 196 tonnes of co2 and a financial saving of £106,000 per annum. We can also save further by removing the offensive waste stream from our clinical waste contractor and sending it for Energy Recovery locally will save a further £58,000 by reducing the cost per tonne from £425 to £175 and will reduce the distance for the waste to travel by 40 miles.

Once appropriate pharmaceutical waste segregation has been achieved, we will no longer have to dispose of this waste stream via high temperature incineration. This too can also go to the ERF at Chineham and will form part our tender for 2026.

Economic sustainability:

There were minimal initial costs with the creation of the Bin-go game, the original format was handmade and laminated, once we knew it would be successful, we had further boards and tokens professionally printed. We purchased three-fold up trolleys for our waste walkarounds which cost £150 in total so that we could keep one at each Trust site

Posters were self-designed and printed locally. The waste segregation signs, and bin labels will be professionally printed, and the waste identification cable ties were ordered via the Facilities budget. The Bin-go game has generated Interest from external waste contractors, and there is the potential to share this with other Trusts as an educational tool. The trust legal team are exploring copy right options in case we wish to pursue this as a financial venture in future.

For the time being correct segregation in the pharmaceutical waste stream will be cost avoidance because we will avoid fines for incorrectly segregated bagged clinical waste with a chance of savings

by 2026. Correct segregation across the board will make sure the Trust can save money and help to keep our carbon footprint as low as possible.

Social sustainability:

Staff are reporting that pharmaceutical waste bins are often full, and that they are requiring more of them in their areas – indicating strong engagement with the project and that staff knowledge has increased

Qualitative data from conversations with staff indicates that they feel more confident about waste streaming. Whilst streaming pharmaceutical waste correctly can take a little longer (as the blue bins are stored in the treatment rooms rather than the bays), they are willing to take these extra few minutes as they are happier that they are doing the right thing. Staff have also disclosed that they have developed greater insight into the impact that NHS waste has on carbon foot printing, and the financial consequences to the Trust.

While we have not directly engaged patients in our project, there is literature to suggest that patients are concerned about waste in the NHS from both an environmental and financial perspective (1). It is also in patients interests to reduce financial waste that can be better invested in care.

Discussion:

This project has laid good foundations for the improvement of pharmaceutical waste streaming across the Trust, and initial local audits have indicated an improvement from previous results. We will invite our external auditors to complete formal audit process in the Autumn, and based on the successful findings, we hope to negotiate alternative methods for waste disposal away from high-cost incineration. If we achieve this, we will then reduce the final burden, improve the Trust carbon footprint and ensure compliance with the waste legislation which was within our original aims.

Our focus was to identify why staff were not streaming waste properly, and what we could do to improve that. We found the barriers included misunderstanding due to lack of engagement with online training, and confusion regarding the different types of waste streams available and processes to identify the purpose of each bin. There was also an element of post pandemic apathy as practice then had been to throw everything away in an infectious orange waste bag, and staff had continued this habit once the pandemic had ended. We found that senior staff were teaching new staff how to dispose of pharmaceutical waste incorrectly, which compounded the problem.

We knew that our focus needed to be on staff education and engagement, and then the other long-term aims would occur as a result. By bringing the training directly to the wards and creating the fun Bin-go game we were able to bring teams together, create discussion, and create a relaxed environment for education without the formality of a structured study session or dry online training module. It was important to us to educate staff not only on where waste should go but to understand the financial and environmental consequences of getting it wrong.

A barrier to this approach was that we were unable to reach all the teams, but we are confident that cascade training took place once we had visited an area. To support with getting the wider message out we utilized social media on the staff Facebook page to promote our message, and raise awareness,

The roll out of new posters and signage along with bin labels will help staff to clearly identify what should go where, and the area specific cable ties on the waste bags will help us to focus teaching in areas where staff require ongoing support and clarity. Being able to identify specific clinical areas where waste segregation is an ongoing issue will support us in targeting our ongoing efforts and ensure lasting impact of the project. We intend to continue our walkarounds and face-to-face training with particular focus on any clinical areas we can identify as failing due to the waste bag cable ties.

In addition to continuing our engagement project, we have attempted to get waste training included in the new starters local induction training but have been advised there is no space in the schedule, and that waste management is not a priority. We will continue to promote at board level that waste training should be a mandatory session on green brain due to the potential safety, financial and environmental consequences. In future we wish to revamp the online training module to make this simpler to understand and as fun and interactive as the face-to-face training. We have approached the communications team to create a video using children's voices to promote the need to lessen our carbon footprint to protect their future.

The Bin-go game has generated Interest from external waste contractors, and there is the potential to share this with other Trusts as an educational tool. The trust legal team are exploring copy right options in case we wish to pursue this as a financial venture

Conclusions:

Providing education and training in a fun and interactive way has been of great benefit for staff, and they now have a familiarity with the team, so they know who to contact if they have any ongoing questions. The role of Lead nurse for patient support services is unique to the Trust and provides the clinical link between the Chief nursing office, Estates and Facilities. This project has highlighted how valuable the role is in bridging the gap between clinical and non-clinical departments and translating essential trust strategy such as waste management into information that clinical staff can easily understand.

The key elements that contributed to the success was the preliminary work which helped us to identify where the barriers were, and why staff were getting waste segregation wrong, from there we could formulate a plan to improve the training and the signage. Utilising social media also helped us to reach out to larger groups of staff who may not have been accessible on our walk arounds such as those working night shifts, or within closed departments such as theatres

Whilst this project has focused on pharmaceutical waste our research has shown that among the Trust staff there is a real desire to expand our ability to recycle to a greater level. We will network with other trusts and explore options to facilitate this more in the future which will help to empower staff and patients and reduce our carbon footprint further.

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 checked="" type="checkbox"/> Skills and capability of staff <input checked="" 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 checked="" 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 checked="" type="checkbox"/> clear, measurable targets <input checked="" type="checkbox"/> long-term strategy for sustaining and embedding change developed in planning phase <input checked="" type="checkbox"/> integrating the intervention into the natural workflow, team functions, technology systems, and incentive structures of the team/service/organisation	<input checked="" type="checkbox"/> Dedicated time <input type="checkbox"/> QI training / information resources and organisation process / support <input checked="" 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 checked="" 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 type="checkbox"/> 'Permission' given through the organisational context, capacity and positive change culture.

References

- 1) Jane Carn, Pearl Research and Strategy, [A sustainable NHS for the future – Pearl Research & Strategy \(pearl-research.co.uk\)](https://www.pearl-research.co.uk)
- 2) NHS England, NHS Clinical Waste Strategy PR2159_i Version 1 Published January 2023
- 3) HTM 07 01 Safe and Sustainable Management of Healthcare Waste, Published January 2022