

# How to measure and reduce plastic in healthcare – experiences at North Bristol NHS Trust



## Southmead Hospital, North Bristol, UK

- 900 beds, 75% individual bedrooms, 25% 4-bed bays
- 48 Intensive Care beds
- Regional Trauma Centre
- 8000+ staff
- 2841 tonnes of waste 2019-20
- Sustainability team-led audits



## Process - planning

- COVID-Green wards selected: Orthopaedic and Neurosurgery, Neurology, Spine & VT departments
- Opted for paid resource to complete audits, not volunteers
- Organised suitable venue and PPE/equipment, risk assessment
- Organised waste collection, labelling, storage, movement



## Process - delivery

- Collected 48 hrs of waste from 2 wards (267kg)
- Conducted the audits over 2 days
- Team of 6 led by the Axion advisor
- Examined each ward's waste, a stream at a time – offensive hygiene, general waste and recycling



## Process - delivery



## Data compilation

- 372 separate weights logged!
- Example of data entries: source, waste stream, type of product, product category...

Department	Source	Waste Stream	Type of Product	Product	Plastic	Manufacturer	Country of	No items	Weight of all items (g)	Weight less container (g)	Other information (optional)
84	Neurosurgery, Neurology	off	MD Medical item	MD18 other	MX Mixed materials				425.1	67.1	dressings
85	Neurosurgery, Neurology	off	PK Packaging	PK13 medical packaging	MX Mixed materials				364	6	medical packaging
86	Neurosurgery, Neurology	off	MD Medical item	SN2 other sanitary item	MX Mixed materials				425.6	67.6	female sani
87	Neurosurgery, Neurology	off	PK Packaging	PK13 medical packaging	NK unknown	Optimum Medical Solutions			367.2	9.2	Optilube sachet - Optimum Medical Solutions Lot160520 5g
88	Neurosurgery, Neurology	off	PK Packaging	PK13 medical packaging	NK unknown	Norgine			365.7	7.7	Laxitive by Norgine 13.8g sachet
89	Neurosurgery, Neurology	off	PK Packaging	PK13 medical packaging	NK unknown				360.4	2.4	Metalised films - packaging
90	Neurosurgery, Neurology	off	PK Packaging	PK13 medical packaging	NK unknown				360.3	2.3	Metalised films - packaging
91	Neurosurgery, Neurology	off	MD Medical item	MD4 other medical bag	L3 PVC	Vyair			440.5	82.5	IV bags Vyair, sterile water, ref 2d0735x Airlife
92	Neurosurgery, Neurology	off	PK Packaging	PK10 other plastic food packet	NK unknown				369.8	11.8	food wrappers
93	Neurosurgery, Neurology	off	MD Medical item	MD5 medical bottles and acces	L5 PP	Danone			401.9	43.9	Nutricia Protien Plus 500ml
94	Neurosurgery, Neurology	off	PK Packaging	PK13 medical packaging	G5 PP				368.3	10.3	rigid plastic
95	Neurosurgery, Neurology	off	MD Medical item	MD15 Sterile wrap	G2 HDPE	DuPont			381.1	23.1	Tyvek sheeting
96	Neurosurgery, Neurology	off	MD Medical item	MD2 Surgical glove	G9 nitrile				367.5	9.5	Gloves
97	Neurosurgery, Neurology	off	PK Packaging	PK13 medical packaging	MX Mixed materials				361	3	Medical packaging film plastic
98	Orthopaedic	off	MD Medical item	MD11 Surgical gown / apron	L4 LDPE				1679.1	1321.1	Aprons
99	Orthopaedic	off	MD Medical item	MD14 Wipes	MX Mixed materials				1870.5	1512.5	clinical wipes
100	Orthopaedic	off	MD Medical item	MD11 Surgical gown / apron	L4 LDPE				683.9	325.9	Aprons
101	Orthopaedic	off	MD Medical item	MD2 Surgical glove	L9 nitrile				3164.2	2806.2	Gloves
102	Orthopaedic	off	MD Medical item	MD15 Sterile wrap	G2 HDPE	DuPont			1000	642	Tyvek sheeting
103	Orthopaedic	off	MD Medical item	MD12 Surgical mask	G5 PP				385.9	27.9	masks
104	Orthopaedic	off	PK Packaging	PK13 medical packaging	G5 PP				506.4	148.4	hard plastics
105	Orthopaedic	off	PK Packaging	PK13 medical packaging	MX Mixed materials				576.24	218.24	peel packs
106	Orthopaedic	off	SN Sanitary item	SN1 diaper	MX Mixed materials				3745.8	1118	adult nappies (total less container 3387.8g). Figure correct
107	Orthopaedic	off	SN Sanitary item	SN2 other sanitary item	MX Mixed materials	Attende			1026.9	414.1	absorbent bed sheets (total less container 678.9). Figure co

## Waste Composition

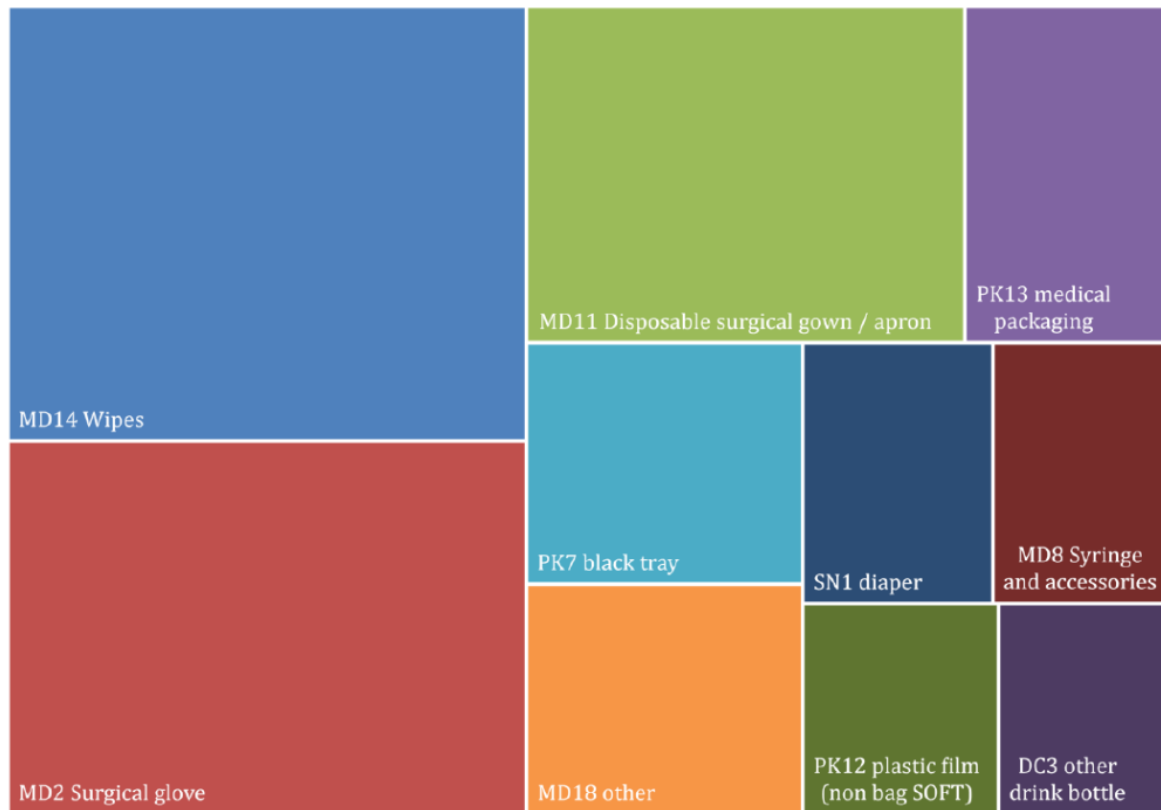
The total sample was weighed and categorised according to the department and waste stream source.

Material Source	Total Mass (Kg)	% of department sample	% of total sample
<b>Orthopaedic</b>	<b>167.25</b>	<b>62.63%</b>	<b>62.63%</b>
General	114.02	68.17%	42.70%
Offensive	34.10	20.39%	12.77%
DMR	19.14	11.44%	7.17%
<b>Neurosurgery, Neurology, Spine and VT</b>	<b>99.79</b>	<b>37.37%</b>	<b>37.37%</b>
Offensive	62.79	62.92%	23.51%
General	34.34	34.41%	12.86%
DMR	2.66	2.67%	1.00%
<b>Grand Total</b>	<b>267.04</b>	<b>100.00%</b>	<b>100.00%</b>

Table 1 gives the breakdown of material audited showing that the largest proportion (43%) of the mass attained in the sample was general waste generated in the Orthopaedic Ward (overall 63% of total sample).

## Waste composition: top 10 plastic item product types by mass

- Wipes – 24%
- Nitrile gloves – 21%
- Aprons/gowns – 16%
- Medical packaging – 7% (of this, 57% mixed materials, 27% PP)
- Black trays – 7% (Catering regeneration oven trays)





## Problems & lessons learned

- COVID – restricted what we wanted to do
- Capacity issues resulted in paying for staffing to support the audits
- Lack of expertise in identifying plastic types...
- Being one of the UK hospitals meant we could have the Advisor on site
- The audits highlighted a variety of waste-related issues
- Bag labelling was poor

## Using the audit results

- Recruiting plastic champions & engaging stakeholders
- Holding workshops to discuss audit findings
- Using results to engage staff on correct use (wipes & gloves) and alternatives (e.g., paper towels/spray vs. wipes), Gloves Off
- Using results to engage procurement – non-plastic wipes, re-usable gowns
- Develop action plan
- Further audits – Neonatal intensive care
- Repeat audits – under ‘normal’ conditions, post-COVID