Sustainable products in Hospitals

Group Clinical
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Introduction

Our health is affected by the environment in which we live, and the way in which we deliver modern healthcare impacts our environment through **emissions, pollution, and waste**. To meet the health needs of the present without compromising the health of **future generations**, we must embrace **sustainable healthcare** – the highest quality care, with the lowest possible environmental impact.

As part of Bupa's wider sustainability strategy, one of our ambitions is to identify **circular solutions for non-hazardous waste** across all our markets. To achieve this, we must reuse resources and minimise waste.

Single-use items are widely used in hospitals, and whilst many of these are vital for the safe and effective delivery of care, there is an opportunity to replace some single-use items with a more sustainable alternative.

The accompanying list contains a list of potential items that can be **switched to reusable** products and related information on the cleaning of those items.

Replacing certain items may not be appropriate or practical for every hospital, so please **choose the initiatives that are relevant** and feasible for your workplace. The 'suggested alternatives' are meant as examples – suppliers will vary country to country and this is just an example of what the alternative may look like/cost.

Some reusable items are more expensive than single use, but because they can be used many times, they are **often more cost effective** in the long-term.

Dr Anne Lepetit
Chief Medical Officer, Bupa

Did you know?

- Eliminating single-use items or switching to reusables where possible, alongside optimising decontamination processes and waste segregation and recycling, could reduce each product's **carbon footprint by 33%.**

Equipment

Reusable alternative available	Suggested alternative/ product example	Cleaning process	Supporting information
Ambu-bags	• Reusable Ambu-bag	Autoclavable	Reusable Ambu bags must be disassembled and thoroughly cleaned. [1]
Anaesthesia circuits	• Reusable anaesthesia circuits	Sterilised/ high-level disinfection	Studies have demonstrated that bacterial or viral contamination was very low and did not increase with the time of use.
Anaesthesia mask	• Reusable anaesthesia mask	Autoclavable	The moulded texture of the rim ensures maximum patient comfort and a tight seal, while the transparent face piece allows patient monitoring at all times. [2]
Arthroscopic shavers	• Reprocessed arthroscopic shavers	Send for reprocessing	In one study, surgeons were unable to distinguish reprocessed arthroscopic shavers that passed acceptance tests from new shavers based on functional characteristics.
Arthroscopic wands and electrodes	• Reprocessed arthroscopic wands and electrodes	Send for reprocessing	The US Government Accountability Office (GAO) and the Food and Drug Administration (FDA) declared that reprocessed single-use devices do not increase adverse events and do not present an elevated risk to patients.
Back table covers	• Reusable back table covers	Laundered	Reusable textiles are recommended by the Royal College of Surgeons.
Bed pans	• Reusable bed pan	High-level disinfection by heat or chemicals (under controlled conditions with minimum toxicity for humans).	Outlined as a reusable product in the WHO Global Guidelines for the Prevention of Surgical Site Infection.

Equipment continued

Reusable alternative available	Suggested alternative/ product example	Cleaning process	Supporting information
Bits Burs Blades	• Reprocessed bits/burs/blades	Send for reprocessing	The Joint Commission suggest that contracting with an approved third party to reprocess single-use devices (such as blades, bits and burs), can help mitigate costs.
Blood pressure cuffs	• Reusable blood pressure cuff	Low-level disinfection between patients	There is no data that reusable blood pressure cuffs increase infection risk versus disposable cuffs.
Catheter introducer sheaths	• Remanufactured introducer sheath	Send for reprocessing	The US Government Accountability Office (GAO) and the Food and Drug Administration (FDA) declared that reprocessed single-use devices do not increase adverse events and do not present an elevated risk to patients.
Cautery handles and cords	• Reusable handles • Reusable cords	Sterilisation	A randomised trial found that reusable cautery instruments were less expensive than single use and had excellent surgeon satisfaction.
Chisels	• Reusable chisels • Remanufactured chisel	• Steam autoclave • Send for reprocessing	Remanufacturing devices can result in up to 50% cost savings per product, reduced waste to landfill and incineration, and reduced CO2 emissions by 50% per device.
Cold biopsy forceps	Remanufactured: • Surgical Forcep Biopsy • Surgical Forcep Tissue • Surgical Forceps Dressing/Grasping	Sterilisation	University Hospitals Plymouth NHS Trust case study.
Corner protectors	• Reusable corner protectors	Steam sterilisable	The Centers for Disease Control and Prevention: virtually no risk of infectious agent transmission to patients through noncritical items when they do not contact non-intact skin and/or mucous membranes.

Equipment continued

Reusable alternative available	Suggested alternative/ product example	Cleaning process	Supporting information
Cubicle curtains	• Reusable cubicle curtains	Laundered	Another alternative would be recyclable curtains, for example by Marlux Medical.
Disinfectant wipes	• Paper towel and DiffX spray	Clinical waste	The WHO Standard Precautions in Health Care: "Use adequate procedures for the routine cleaning and disinfection of environmental and other frequently touched surfaces."
DVT sleeves/sequential compression	• Reusable DVT sleeves	Disinfection	Reprocessing of a deep vein thrombosis compression sleeve: estimated to save one US hospital around US$75,000 per year.
EKG/ECG leads and cables	• Remanufactured ECG leads and cables	Disinfection and sterilisation	This guide provides information to support proper cleaning and disinfecting of reusable ECG lead sets and trunk cables.
Endotracheal tubes (ETT)	• Reusable endotracheal tubes	Sterilisation	A prospective randomised study found that endotracheal tubes can be reused safely if sterilised according to Centers for Disease Control and Prevention guidelines.[3]
EP cables	• Remanufactured EP catheters	Send for reprocessing	The US Government Accountability Office (GAO) and the Food and Drug Administration (FDA) declared that reprocessed single-use devices do not increase adverse events and do not present an elevated risk to patients.
EP diagnostic catheters	• Remanufactured CARTO3 (Diagnostic and ablation catheters) • And EnSite Precision (Diagnostic and ablation catheters)	Sterilisation/ remanufacturing	Catheter reuse is currently authorised in the European Union under the Medical Device Regulation (MDR) (EU) 2017/745-Art.17, if permitted by national law and under specific requirements.[4]

Equipment continued

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External fixation devices	• Remanufactured external fixation devices	Send for reprocessing	One randomised controlled trial demonstrated that reusable external fixation devices are safe and effective. The potential savings are 25% of the cost of new devices.
Grounding pads	• Reusable grounding pads	Disinfection	Reusable for 24 months - it would take 2,080 disposable sticky pads to cover one OR for the same 2-year period.
Hot biopsy forceps	Remanufactured: • Surgical Forcep Biopsy • Surgical Forcep Tissue • Surgical Forceps Dressing/Grasping	Sterilisation	University Hospitals Plymouth NHS Trust case study.
ICE catheter	• Remanufactured ICE catheter	Sterilisation/ remanufacturing	This study found no cases of ICE probe steering mechanism malfunction, no procedure related infections, and no allergic reactions that could be attributed to the resterilisation process.
Iodine (angiography)	• GE Healthcare offer recycling of iodine	Recycle via supplier	Northumberland Hills Hospital, Canada case study.
Kidney dish	• Reusable kidney dish	Autoclavable	As recommended by the Royal College of Surgeons Intercollegiate Green Theatre Checklist.
Laryngeal mask airways (LMA)	• Reusable silicone laryngeal mask airway	Sterilisation	A comparative study found that the material in reusable classic LMAs does not lose its strength after 100 uses.[5]
Laparoscopic dissectors	• Reusable laparoscopic dissectors	Sterilisation	Studies from laparoscopic surgery show that disposable instruments carry no advantage for sterility.[6]
Laparoscopic graspers	• Reusable laparoscopic graspers	Sterilisation	Studies from laparoscopic surgery show that disposable instruments carry no advantage for sterility.[6]

Equipment continued

Reusable alternative available	Suggested alternative/ product example	Cleaning process	Supporting information
Laparoscopic needle drivers/suture passers	• Reusable laparoscopic handle	Sterilisation	Studies from laparoscopic surgery show that disposable instruments carry no advantage for sterility. [6]
Laparoscopic scissors	• Reusable laparoscopic scissors	Sterilisation	Studies from laparoscopic surgery show that disposable instruments carry no advantage for sterility.
Laryngoscope handles	• XLED Laryngoscope handle	Autoclave	There has not been a documented case of a hospital-associated infection transmitted by laryngoscope handles or blades that were reprocessed as per current CDC guidelines.
Laryngoscope blades	• Reusable laryngoscope blades	Autoclave	There has not been a documented case of a hospital-associated infection transmitted by laryngoscope handles or blades that were reprocessed as per current CDC guidelines.
Lateral transfer device (Hovermatt)	• Reusable Hovermatt	Laundered	The Centers for Disease Control and Prevention state virtually no risk of infectious agents transmission to patients through noncritical items when they do not contact non-intact skin and/or mucous membranes.
Ligasure sealers/dividers	• Reusable ligasure sealer/divider • Reprocessed ligasure sealer/divider	Sterilisation	One study found that even single-use Ligasure sealers/dividers could be reused, with repeated use and resterilisation successful up to 9 times. [7]
Light handles	• Reusable surgical light handles	Sterilisation	As recommended by the Royal College of Surgeons Intercollegiate Green Theatre Checklist.
Mayo stand covers	• Reusable Mayo cover	Laundered	Reusable textiles are recommended by the Royal College of Surgeons.

Equipment continued

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Male urine bottle	• Reusable male urinal	High-level disinfection by heat or chemicals (under controlled conditions with minimum toxicity for humans).	Outlined as a reusable product in the WHO Global Guidelines for the Prevention of Surgical Site Infection.
Multiclip appliers	• Reusable multi clip appliers	Sterilisation	Can produce significant cost savings and also provides precise control of bleeding during surgery, which could lead to less potential injury to surrounding structures.
Pneumatic compression tourniquets	• Reusable pneumatic compression tourniquets	Disinfection	The Association of Surgical Technologists recommend reusable cuffs and tubing be cleaned and decontaminated between patient uses according to manufacturer's instructions and department policy.
Pneumatic tourniquet cuffs	• Reusable pneumatic tourniquet cuff	Disinfection	Reusable tourniquet cuffs should be protected from contamination by fluid, blood, and other potentially infectious material during surgery.
Pulse oximetry sensors	• Reusable oximetry sensor • Remanufactured pulse oximetry sensor	Low-level disinfection between patients/ remanufacturing	By switching to reusables, one US hospital reduced the average cost of providing pulse oximetry readings by 56%.
Sterilisation wrap	• Reusable tray wraps	Laundered	Cork University Maternity Hospital case study.

Equipment continued

Reusable alternative available	Suggested alternative/ product example	Cleaning process	Supporting information
Surgical staplers	• Reusable stapler	Sterilisation	This study presents evidence that reusable staplers produce less waste, require less resource input, and have a reduced impact on greenhouse gas emissions than single-use staplers.
Surgical drapes	• Reusable drapes	Laundered	The WHO Global Guidelines for Prevention of Surgical Site Infection found no evidence of difference in surgical site infection rates when single-use versus reusable drapes were utilised.[8]
Surgical towels	• Reusable huck towels	Laundered	A life-cycle assessment estimated that reusable surgical towels had a 51% lower carbon footprint relative to single-use.
Safety belts	• Reusable safety belts	Laundered	NHS case study; One of Practice Greenhealth's top 10 priority reusable healthcare products.
Speculum	• Reusable metal speculum	Autoclave/ High-level disinfection	The WHO 'decontamination and reprocessing of medical devices for health care facilities' guide states that speculums are suitable for reuse, provided they undergo high-level disinfection.[9]
Suction tubing	• Reusable tubing for safety suction	Tubing can be disinfected through spray, wipe, and flush	Bulky single-use plastic items such as suction tubing make significant contributions to the carbon footprint of operations.
Surgical basins	• Reusable basin	Disinfection/ sterilisation	Healthcare Without Harm (HCWH) state that basins and pitchers are safe to reuse.[10]

Equipment continued

Reusable alternative available	Suggested alternative/ product example	Cleaning process	Supporting information
Surgical pitchers	• Reusable pitcher	Disinfection/ sterilisation	Healthcare Without Harm (HCWH) state that basins and pitchers are safe to reuse.[10]
Surgical medicine cups	• Reusable medicine cup	Disinfection/ sterilisation	NHS Scotland case study; there were no known infections recorded from the routine reuse of medicine cups.
Suture kits	Contact your current supplier	Sterilisation/ autoclavable	University Sussex Hospital NHS Trust case study.
Tongue depressors	• Reusable tongue depressor	Autoclavable	Metal tongue depressors must be manufactured following Good Manufacturing Practices (GMPs) as they are designed to be reused.
Trocars	• Reusable trocar	Sterilisation	In a Swedish study, the single-use trocar system had a 182% higher impact on resources than the reusable system.
Trolley covers	• Reusable trolley cover	Laundered	Reusable textiles are recommended by the Royal College of Surgeons.
Ultrasonic scalpels	• Remanufactured ultrasonic scalpels	Cleaning and sterilisation	One comparative study found that reusable scalpels resulted in significant cost savings without impact on complication rate and ease-of-use.
Velcro straps	• Reusable Velcro strap	Disinfection	The Centers for Disease Control and Prevention: virtually no risk of infectious agent transmission to patients through noncritical items when they do not contact non-intact skin and/or mucous membranes.
Walking aids	• Reuse and refurbish walking aids, provided they are still safe to use	Disinfection	• NHS case study • Find your local recycling point if no longer usable

Patient

Reusable alternative available	Suggested alternative/ product example	Cleaning process	Supporting information
Patient belonging bags	• Reusable patient belongs bags	Laundered	University Health Network Toronto case study and UVA Health.
Patient linens (gowns, sheets, bath blankets, pillow cases)	• Patient linens	Laundered	Disposal of one tonne of linens via landfill is associated with 445 kg CO2e.
Patient positioning devices	• Reusable foam wedges	Disinfection	The Centers for Disease Control and Prevention: virtually no risk of infectious agent transmission to patients through noncritical items when they do not contact non-intact skin and/or mucous membranes.
Patient transfer devices	• Reusable slide sheets	Laundered	Suitable for hospital laundering using standard hospital laundry guidelines HSG(95)18.
Patient warming devices	• Reusable patient warming system	Disinfection	This study shows the clinical efficacy of reusable blankets for the prevention of core hypothermia during major neonatal surgery.

Staff

Reusable alternative available	Suggested alternative/ product example	Cleaning process	Supporting information
Apron	• Reusable apron	Laundered	Aprons can be wiped between patient contacts. They need to be laundered between days outside of decon or per use in decon.[11]
Isolation gowns	• Reusable isolation gown	Laundered	Reusable are typically made of polyester or polyester-cotton fabrics – they can be safely laundered and reused after each use.
Surgical hats/caps	• Caps	Laundered	Multiple studies have demonstrated no difference in surgical site infections with disposable bouffant caps compared to traditional, reusable cloth caps.[12]
Surgical gowns	• Reusable gowns	Laundered	The WHO confirms that reusable gowns are equivalent to disposables in terms of sterility and infection prevention, water resistance, comfort, and are cost-effective.[13]

Future opportunities

To the right is a list of items that are often disposable/single-use but have been identified as having potential to be reusable but as yet alternatives are not available, or no case studies have been found. If you are able, ask your supplier if they are able to procure reusable alternatives – ideally they would provide a lifecycle assessment for the reusable item, so we can verify that the reusable option is less impactful on the planet.

Reusable alternative not yet available

- Visitor jump suits
- Surgical skin clipper blades for fixed head clipper system
- Laryngeal masks
- Negative pressure wound therapy system - 2 dressing kit (temperature control)
- Ultrasound catheters
- Laparoscopic scissor tips
- **Reamers**
- **Canisters**

References

Reusable alternative available	Additional information
[1] Abmu-bags	Reusable Ambu bags must be disassembled and thoroughly cleaned, first of any "gross soiling" through meticulous hand-rinsing, washing, and re-rinsing, then sterilised in an autoclave at 134° C or 272° F.
[2] Anaesthesia mask	This **mask** is reusable and fully autoclavable up to 50 cycles, with a shelf life of 5 years from the date of manufacture.
[3] Endotracheal tubes (ETT)	The physical integrity of ETT cuffs may be compromised by glutaraldehyde or ethylene oxide sterilisation treatments.
[4] EP catheters and EP diagnostic catheters	**In this study**, reuse of the catheters did not resulted in any major catheter failures or any major adverse clinical complications.
[5] Laryngeal mask airways (LMA)	**A lifecycle assessment (LCA)** found that reusable laryngeal mask airways had a 65% lower carbon footprint relative to single-use alternatives.
[6] Laparoscopic dissectors, Laparoscopic graspers, Laparoscopic needle drivers/suture passers, and Laparoscopic scissors	**Studies from laparoscopic surgery** show that disposable instruments have a 19-fold increase in costs, and at least a four-fold higher carbon footprint.
[7] Ligasure sealers/dividers	The study found that single-use **Ligasure sealers/dividers could be reused** successfully up to 9 times - there was failure of the vascular seal due to inadequate tissue apposition after a minimum of 10 cycles.
[8] Surgical drapes	Leeds Teaching Hospital NHS Trust **case study**.
[9] Speculum	Another alternative is this **single use speculum** made of 100% sugarcane.
[10] Surgical basins and Surgical pitchers	One of **Practice Greenhealth's** top 10 priority reusable healthcare products.

References continued

Reusable alternative available	Additional information
[11] Apron	The **Revolution Zero apron** is able to be decontaminated at least 75 times, is CE marked EN13795, is alcohol and water resistant, and the fabric is 99.4% polyester and 0.6% carbon that is optimised for repurposing or recycling at end of life. Aprons can be wiped between patient contacts. They need to be laundered between days outside of decon or per use in decon.
[12] Surgical hats/caps	Reusable caps are more cost efficient in the long run; see this **NHS case study**, where cost savings were estimated at £50,000 over 3 years. Reusable textiles are recommended by the **Royal College of Surgeons**.
[13] Surgical gowns	Reusable gowns have a **lower environmental impact.** Leeds Teaching Hospital NHS Trust **case study.** Already in use at Cromwell Hospital.