

Emma Sheldon – Vernacare

# Toileting aids in hospitals: reuse or dispose?

This article looks at the evidence to support the use of single-use bedpans, in preference to reusable devices, in hospitals as part of a drive to reduce rates of HCAI.

The management of human waste is recognised as a high risk for transmission of infections. Faeces contains most groups of human pathogens, such as *Clostridium difficile* (*C. difficile*), Vancomycin-resistant enterococci (VRE), multi drug-resistant Gram-negatives (MDR Gram-negatives), Methicillin-resistant *Staphylococcus aureus* (MRSA) and norovirus, which are significant to and commonly encountered in healthcare environments.

In healthcare settings, *C. difficile* is usually spread via the hands of staff and those who come into contact with infected patients or with environmental surfaces like floors, reusable bedpans and toilets that have been contaminated with the bacteria or its spores. The bacteria and spores are extremely hardy and some pathogens can survive on dry surfaces such as clothes and environmental surfaces for months.<sup>1</sup>

## Extent of global cross-infection risk

In a 2011 survey undertaken by the US Centers for Disease Control and Prevention (CDC), it was found that on any given day, about one-in-25 hospital patients has at least one healthcare-associated infection (HCAI). This is an estimated 722,000 HCAs in US acute care hospitals. A total of 17% had

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Single-use bedpan sluce room equipment.

gastrointestinal infections, and 13% suffered from urinary tract infections. About 10% hospital patients with HCAs died during their hospitalisation.<sup>2</sup>

Despite evidence linking transmission of multi-drug resistant pathogens in hospital settings, little is known about the handling of faeces and urine in hospitals worldwide.

Items that become contaminated with human faeces, such as bedpans, are categorised as non-critical devices – defined as items that come into contact with intact skin, as opposed to critical items that enter sterile tissue or the vascular system.<sup>3</sup> As a result, surprisingly little attention appears to be paid to the risks of disease transmission and environmental contamination, both of which are particularly likely to occur during diarrhoea episodes. Safe management of contaminated human waste, therefore, has the potential to reduce HCAI through the employment of better hygiene and infection prevention measures.

## Current solutions

There are a number of chemical, physical and mechanical toileting aids and human waste disposal solutions in healthcare environments for immobile patients. These include:

- Reusable plastic/metal bedpans and implements that are manually cleaned

## Emma Sheldon

Emma Sheldon is Group Marketing Director for medical products manufacturer Vernacare – responsible for marketing activities across 48 countries and six continents. She has also headed up Vernacare's international innovation team, which works in partnership with patients and healthcare providers to develop and bring to market next generation infection prevention products.

She has been appointed to the Board of the UK India Business Council and sits on the Industry Board of the University Technical College, Bolton. She is also a professional coach and member of the Institute of Directors and is a UKTI North West Export Champion and a member of the Institute of Directors.



using unvalidated methods and without testing of efficacy.

- Reusable plastic/metal bedpans and implements that are cleaned in local washer-disinfectors.
- Single-use bedpans and implements that are processed in disposal units.

Other more invasive solutions include urinary catheterisation, which is the insertion of a tube to drain the patient's bladder. However, such a procedure should only be undertaken if there is no other option as it introduces the risk of catheter-acquired urinary tract infection (CAUTI). Single-use urinals are a safe and alternative toileting option for patients who are unable to use conventional toileting methods and do not require catheterisation.

### Global differences in human waste disposal practices

Practices with regard to human waste disposal in healthcare environments vary in different parts of the world:

- In countries such as India, South Africa and Poland, manually washing reusable bedpans is a commonly accepted practice.
- In the UK, 94% of hospitals use a single-use pulp disposable system.
- In the US, the preferred method is a single-use patient plastic bedpan.
- In Australia, it is a combination of single-use pulp macerator systems and bedpan washer-disinfectors.

The most common practice worldwide is reusable plastic containers reprocessed in washer-disinfectors.<sup>4</sup>

### Comparison of waste disposal solutions

**1 Reusable bedpans and utensils that are manually washed** – Although considered a somewhat acceptable practice, it has been found that manual washing poses extremely high health risks to both patients and healthcare workers. In a survey undertaken by the International Federation of Infection Control (IFIC), it was found that when bedpans are cleaned manually, 44% of the time it is done in the patient's bathroom.<sup>5</sup>

In the cases of manual cleaning, 'cleaning' typically means just rinsing or spraying with cold water, often with bedpan sprayers or 'wands,' which often results in splashing and the aerosolisation of faecal material. Manual handling also causes visible splashes and splatters on hands and surrounding items.

There is also a lack of standardisation in validation, testing and monitoring of methods, particularly with regard to effectiveness. Disinfection is often carried out without the observation of correct procedures, if it is carried out at all. Survey findings from Belgium, Canada and the US found that even though healthcare workers were aware of the available advice from the WHO Infection Prevention and Control (IPC) that bedpans have to be cleaned and

Features	Reusable utensils reprocessed in washer-disinfectors	Single-use system
Cycle time	Model-dependent, typically 5-10 minutes	2 minutes
Water consumption per cycle	Model-dependent, typically 33-51 litres	24 litres
Energy consumption per cycle	Model-dependent	0.020 Kwh
Capacity	Model-dependent, typically 2 bedpans	Up to 4 items
Running costs	<ul style="list-style-type: none"> <li>• Minimal on-going consumables</li> <li>• Detergent costs, around £700 per annum</li> <li>• Utilities (water and energy)</li> <li>• Engineering time: Periodic (annual) validation and revalidation required</li> </ul>	<ul style="list-style-type: none"> <li>• On-going pulp consumable costs</li> <li>• Utilities (water and energy)</li> </ul>

Comparison of consumables required for reusable bedpan system versus a single-use system.

disinfected after each use, nurses often only used water because of time constraints, only sometimes following up by wiping or spraying with disinfectant. This cleaning method fails to fully eliminate bacterial and spore loads and is believed to be a contributing factor in increased rates of *C. difficile* infection.

A Canadian study showed the infection rate dropped by as much as 50% when a disposable bedpan system and other interventions were introduced. In addition, MRSA rates dropped by between 30% and 50% when using a single-use disposal system.<sup>6</sup> Additional issues for consideration identified in this study included staff exposure to chemicals, local reconstitution of disinfectants leading to potential system failures, and a lack of validation, monitoring and quality assurance across waste management processes.

**2 Reusable bedpans and utensils that are reprocessed in washer-disinfectors** – The reusable bedpan washer system operates in combination with plastic and stainless steel bedpans and urinals used for patient toileting. Pre and full washes last for an average of 5-8 minutes, with pre-wash and rinses using hot and cold water before being washed between 80°C-85°C for 60 seconds. Thermal disinfection and detergents are required to reduce the load of pathogens to a

level thought to be safe, according to the Spaulding classification of 'low' risk.

The benefits of this system include the one-off capital and installation costs, with limited consumable costs thereafter, and a standard operating procedure that ensures continuous monitoring when fitted to the machine. It can be used to clean a range of utensils other than bedpans, and ensures low exposure of chemicals to healthcare workers.

However, a recent study found that 7.6% to 33% of reusable items failed an audit due to visible faecal soiling after processing in a bedpan washer-disinfector.<sup>7</sup> Even though heat and disinfection might reduce pathogens, another study found that 'the current accepted thermal decontamination parameters for all bedpan washer disinfectors (i.e. 80°C for one minute) are not adequate to eliminate *C. difficile* spores from bedpans.'<sup>8</sup> Inadequate disinfection of bedpans was also associated with cross-infection by VRE<sup>9</sup> and has also been linked with transmission of VRE. There is a potential for recontamination of the item as soon as it is removed from the machine if procedures are inadequate. Reusable bedpan washers also required periodic validation as well as revalidation following repair or servicing. Some have a lack of warning systems when the machine is not functioning correctly, giving rise to ineffective function if detergent or rinse aid run out.

**3 Single-use system** – The single-use system comprises the use of a disposal unit and single-use paper-based utensils. The single-use items are broken down into a fine watery slurry using only cold water. Each cycle takes two minutes, reducing instances where there is the potential for a stockpile of soiled bedpans and waste matter is left to dry and

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solidify, leaving residual soil even after the wash and disinfection cycle.

From an engineering standpoint, the time spent on maintaining disposal units is half of that required to maintain washer-disinfectors,<sup>10</sup> and when all costs are considered, the single-use system can be up to 39.4% cheaper to maintain than alternative systems.

### Benefits of single-use disposal system

Eliminating the need to share and reuse bedpans is the biggest advantage of adopting the single-use system approach. This leads to improved labour productivity, reduced utilities consumption, better patient satisfaction and reduced risk of hospital acquired infection. One-third of nursing man-hours can be saved across a year and cleaning tasks attributed to housekeeping hours can free up almost 8,500 hours.<sup>11</sup> In addition, water consumption and the power required can be significantly reduced compared to traditional bedpan sanitisers.<sup>12</sup> From an operating environment perspective, there is reduced odour emitted from the utility room. Patients are also reassured and more comfortable using a new disposable receptacle each time.

### Conclusion

There are comparable benefits to both washer-disinfector and single-use systems, but due to the high risk of HCAs to both patients and healthcare workers, the choice of toileting aid and human waste



A single-use female urinal.

management solutions and systems in healthcare facilities needs to be carefully considered. Both systems require training and can still be subject to the risk of operator error.

Even though the use of reusable bedpans and utensils reprocessed in washer-disinfectors has been a widely-accepted practice, the fact is that the currently accepted thermal decontamination parameters, such as 80°C for one minute, are simply not adequate to eliminate *C. difficile* spores and VRE from bedpans. ■

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