

Effective reduction of *Clostridium difficile* infection rates after implementation of a comprehensive care bundle

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Introduction

In 2009 Infection Prevention and Control (IP&C) at Trafford Hospital performed a comprehensive review of their IC processes and identified five areas where improvements could be made in order to reduce the risk of nosocomial infection (specifically *Clostridium difficile* Infection (CDI)). The five areas of interest were;

- ✓ **Hand hygiene** – education around the five moments of hand hygiene and the six step hand hygiene process in order to improve staff compliance
- ✓ **IV lines** – aim to improve the placement and care of IV lines by training all appropriate clinical staff in IV therapy aseptic non-touch technique
- ✓ **Education**, awareness and documentation to enhance numerous IC processes
- ✓ **Environmental cleaning** – aim to improve process efficiency by identifying and implementing an effective, easy to use product in order to increase compliance with cleaning and disinfection protocols
- ✓ **Clean equipment** – aim to simplify the cleaning process and improve cleaning efficiency and compliance with equipment decontamination protocols by sourcing an effective, easy to use, non-corrosive alternative to current practice

The IP&C team at Trafford wanted to implement the above changes as an overall care bundle in order to reduce the risk of infection (specifically CDI) to its lowest possible level. This poster focuses primarily on the changes made to environmental and equipment cleaning and reports the overall incidence of infection over the three years post implementation of the above care bundle.

Aims and Objectives

The aim was to identify an appropriate product which met the cleaning / disinfection requirements for the IP&C team at Trafford and adopt it into clinical practice while monitoring overall facility infection rates.

Key requirements for any new product were; broad spectrum antimicrobial efficacy (equivalent or better to existing chlorine based disinfectants); non-corrosive / non-damaging to medical equipment / environmental surfaces; safe and easy to use; reduces time required for cleaning (improves process efficiency); suitable for cleaning electrical equipment; user acceptance.

Method

Previously Trafford had used the following cleaning and disinfection process;

- **Stage 1 (cleaning)** neutral detergent and water
- **Stage 2 (disinfection)** sodium hypochlorite solution at 1000ppm
- ***Stage 3* (disinfection of metal surfaces only)** rinsing with water and drying with paper towels – to minimise any corrosion due to hypochlorite

This multi-stage, chlorine based disinfection process presented the IP&C team with several important issues including;

- ✗ A labour intensive protocol (2 or 3 stages) which reduced staff compliance with equipment decontamination and environmental cleaning
- ✗ Damage to equipment and environmental surfaces
- ✗ Limited disinfection of more delicate medical devices due to the use of corrosive cleaning chemicals. This led to an increased risk of infection as a result of infrequent cleaning of these devices

Prior to adopting a new cleaning / disinfection product into clinical use the IP&C team firstly assessed all appropriate product claims and reviewed the necessary technical documentation such as in-vitro efficacy (EN test reports); Material Safety Data Sheets; product formats and pricing. Once the IP&C team were satisfied that the product met the appropriate efficacy, safety and technical requirements an in-use clinical evaluation was set up to determine product user acceptance and effectiveness using microbiology and Adenosine Triphosphate (ATP) swab testing. Subject to a successful clinical evaluation, the product would be adopted hospital wide. Its impact (in association with the other elements of the above care bundle) would be monitored in terms of healthcare associated infection incidence (specifically CDI and MRSA).

The IP&C team chose TECcare® CONTROL wipes (see Figure 1) to replace their existing neutral detergent and chlorine based multistage cleaning and disinfection protocol. The change to a combined cleaner / disinfectant greatly improved process efficiency as it required only a single stage for cleaning and disinfection.

TECcare® CONTROL is a safe, non-corrosive, broad spectrum, high level disinfectant that offers a cost effective single stage cleaning and disinfection process. The wipes were subjected to an in-use product evaluation at Trafford Hospital where they performed well in all microbiology and ATP swab testing. Staff reported excellent levels of user satisfaction with the new product and the wipes were adopted into clinical use for all environmental and equipment cleaning and disinfection across the hospital in January 2010.



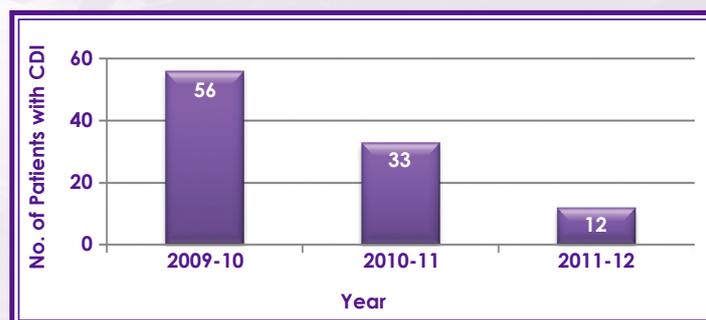
Figure 1. TECcare® CONTROL wipes

Results

CDI rates reduced by forty four cases (seventy eight percent) in the three years after adoption of TECcare® CONTROL wipes and the other elements of the care bundle (Figure 2). Furthermore the hospital has reported over 1000 days without a nosocomial MRSA bacteraemia.

Use of TECcare® CONTROL wipes in clinical practice enabled a more efficient single step cleaning / disinfection process to be implemented. The improvement in process efficiency coupled with the non-corrosive nature of the product improved staff compliance with environmental and equipment cleaning and disinfection protocols, resulting in improved IP&C audit outcomes. Staff also found the wipes easy to use with no detrimental effects on their skin or the equipment.

Figure 2. Three year incidence of *Clostridium difficile* infection



Discussion / Conclusion

There is increasing evidence linking transmission of nosocomial pathogens with environmental surfaces¹⁻⁴. Therefore, the provision of a clean clinical environment is a key objective for all healthcare settings. To achieve optimal levels of clinical cleanliness frequent and on-going use of an appropriate cleaning / disinfection product is required. The goal for any cleaning / disinfection product is to offer safe, broad spectrum efficacy (to reduce microbial bioburden) coupled with user friendliness and ease of use (to enhance process efficiency and improve staff concordance with protocols). The IP&C team at Trafford wanted to move away from a labour intensive multi-stage, chlorine based cleaning and disinfection protocol primarily due to complexity, corrosiveness and lack of staff concordance with protocols. The TECcare® CONTROL wipes are non-corrosive, offer independently proven high level sporicidal efficacy equivalent to recognised chlorine based disinfectants⁵ and evaluated very well with all staff during an in-use product evaluation at Trafford. Their adoption has resulted in improved compliance with cleaning and disinfection protocols coupled with no further damage to medical devices and delicate or vulnerable environmental surfaces.

It is important to view the reduction of CDI and MRSA incidence rates at Trafford in the overall context of a comprehensive care bundle being implemented by the IP&C team. However, with a clean clinical environment underpinning all other IC practices and protocols and clinical literature clearly pointing to improved environmental cleanliness resulting in reduced incidence of CDI, MRSA and VRE^{6,7}, it is logical to propose that the introduction of a proven sporicidal disinfectant⁵, which streamlined the cleaning / disinfection process and was well liked by the staff, played an important role in helping to produce these impressive figures.

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