

REDUCING HEALTHCARE ACQUIRED INFECTIONS – GOOD PRACTICE CONCERNING *C. DIFFICILE* INFECTIONS

Introduction to Clostridium difficile

Clostridium difficile is a bacterium that is common in the environment and is transmitted by the faecal-oral route. Its resistant spores are ingested, survive passage through the stomach and ultimately reside in the colon. Antimicrobial therapy disrupts the ecosystem of stool flora, which can cause *C. difficile* overgrowth. It is calculated that around 30% of high-risk patients in hospital are colonised with *C. difficile*, with only a subset of these ever developing symptoms¹.

Treatment of the infection typically involves “cessation of the offending antibiotic, initiation of oral metronidazole or vancomycin therapy, and fluid replacement”. In very severe cases the colon may perforate so that colectomy is required. Preventing noscomial transmission of *C. difficile* “depends on careful attention to isolation and barrier precautions, cleaning of the physical environment all through the symptomatic period of the disease, and handwashing. Correct handwashing involves a 2-minute scrub with soap to remove the surface layer of skin oil (which holds spores). Followed by hand-drying with a disposable paper towel”².

According to a survey of directors of infection and prevention control in England the key obstacle to the effective management of *C. difficile* is a lack of isolation facilities. In March 2007, the Healthcare Commission called for further improvements in hygiene in acute trusts. A survey of 128,000 staff across 326 Trusts found that 36 % reported that hot water, soap, paper towels and alcohol rubs were not always available when needed by staff and 45% reported they were not always available to patients³.

Examples of Good Practice – UK

Doncaster and Bassetlaw Foundation NHS Trust, England⁴

(Third Place in the Oxoid Infection Control Team of the Year Awards, 2005)

¹ Weir, E. and Flegel, K, Protecting against *Clostridium difficile* illness, *Canadian Medical Association Journal* (2005), **172 (9)**, 1178

² Weir, E. and Flegel, K, Protecting against *Clostridium difficile* illness, *Canadian Medical Association Journal* (2005), **172 (9)**, 1178

³ Lyall, J., Beating the bug, *Nursing Management (Harrow)* (2007), **14 (2)**, 12

⁴ Information extracted from Wallace, D., Infection Control Best Practice: Simply the best, *Healthcare Equipment and Supplies* (August 2007), www.hesmagazine.com/story.asp?storyCode=2030305

The *C. difficile* rates of this Trust “have been among the lowest in [its] region since mandatory surveillance began”. The Trust proposes that this is due to several factors:

- A restricted antibiotic formulary has both reduced the costs of antibiotics and reduced antibiotic selection pressure;
- Focus on hand hygiene;
- Focus on ‘central line’ management; and
- *C. difficile* test results are reviewed daily by the infection control nurses, allowing rapid follow-up of patients and prompt implementation of infection control procedures.

With regard to the first point, a restricted antibiotic formulary, there is restricted use of second and third generation cephalosporins. The infection control team developed cross-site antibiotic guidelines for the management of chest infections, which were made available on the Trust internet and in junior doctor’s handbooks. The team continues to address this issue through the education of doctors at induction and other teaching sessions, while monitoring the use of non-formulary antibiotics via ward pharmacists.

Weston Area Health NHS Trust, Somerset, England⁵

In 2007, the *C. difficile* rate of this Trust was 3.79 per 1000 bed days and it had set a service level agreement target of 3.00 with North Somerset Primary Care Trust.

The measures this Trust has been implementing are⁶:

- Using Capital Challenge Fund⁷ resources, the Trust was establishing ten new side rooms at Weston General Hospital, which would be cleaned twice a day with a new chorine based disinfectant if patients are infected with *C. difficile*;
- A rolling programme of regular high pressure steam cleaning in every ward has also been started, new bed pan cleaners have been bought, old commodes replaced and extra basins fitted;
- Disposable curtains have been introduced throughout the Trust as they are quicker to replace in the event of an outbreak;
- The Trust is considering how nursing home residents with *C. difficile* could be managed in their own rooms of the nursing home rather than admission to hospital; and
- With regard to visitors, when callers ring the hospital they hear a recorded message reminding them not to visit patients if they have been feeling sick or have had diarrhoea recently.

Derby Hospitals NHS Foundation Trust, England

In 2007, the Trust had a *C. difficile* rate of 2.00 per 1000 bed days and had set a reduction target of 25% with its local Primary Care Trust. The Trust is aiming for a 50% reduction. The Director of Nursing is confident of progress and claims “we have housekeepers who challenge consultants about not washing their hands”.

The measures this Trust has been implementing are:

⁵ Lyall, J., Beating the bug, *Nursing Management (Harrow)* (2007), **14** (2), 12

⁶ Lyall, J., Beating the bug, *Nursing Management (Harrow)* (2007), **14** (2), 12

⁷ All acute Trusts were allocated £300K from the Department of Health Capital Challenge Fund to help refurbish bathrooms and toilets, convert older wards into single rooms and ensure that surgical instruments and other equipment are decontaminated.

- Using its Capital Challenge Fund allocation to purchase steam cleaners for every ward and to update bath and shower rooms;
- Establishment of an Outbreak Control Committee, led by the Director of Nursing and the Director of Infection Prevention and Control;
- A 30-bed medical ward has been designated a cohort ward restricted to patients with *C. difficile* infection and those with diarrhoea who are suspected of having the infection;
 - Confirmed and suspected cases are nursed in separate bays;
 - All clinical staff wear scrubs;
 - Posters on ward doors remind everyone to wash their hands;
 - Patients cannot be moved from this isolation ward until they have been free of diarrhoea for 72 hours
- Visiting hours are restricted across all wards, visitors may not sit on patient beds or bring in children under 12 years of age;
- Visitors are asked to wash their hands with soap and water before entering and leaving patient bays.

Royal Bournemouth and Christchurch Hospitals NHS Foundation Trust⁸

This Trust has one of the lowest *C. difficile* infection rates in the country at 0.65 per 1000 bed days (2007). The Trust has a strict antibiotic prescribing policy and all junior doctors wear laminated badges printed with the trust's antibiotic policy, including recommendations for common infections. When junior doctors start at the trust, each is accompanied by a microbiologist for the first month of ward rounds to familiarise them with the antibiotic policy.

The Trust also has a scoring system for staff to use to advise them on priority allocation of side rooms.

Maidstone and Tunbridge Wells NHS Trust

Although not strictly an example of good practice, the findings of the Healthcare Commission investigation into the outbreaks of *C. difficile* at Maidstone and Tunbridge Wells NHS Trust (Oct 2005 – Sept. 2006⁹) serve as wider lessons on how to prevent, control and treat infection with *C. difficile*. Some of the main key findings were:

- The Trust's guidelines for the management of *C. difficile* were not sufficiently clear about the importance of isolation of patients (it took 4 months for the Trust to establish an isolation ward¹⁰;
- Management of the Infection Control Team was inadequate, with no strategic direction and a lack of consistent approach¹¹,
- Almost 50% of Clinical staff had not attended updated infection control training¹²;
- Many of the buildings were old and in a poor state of repair with inadequate storage, space or handbasins¹³;

⁸ Lyall, J., Beating the bug, *Nursing Management (Harrow)* (2007), **14** (2), 12

⁹ During this period 500 patients developed the infection and approx. 60 died where *C. diff.* was definitely or probably the main cause

¹⁰ Investigation into outbreaks of *Clostridium difficile* at Maidstone and Tunbridge Wells NHS Trust, October 2007, Healthcare Commission, Executive Summary, pg. 3

¹¹ Investigation into outbreaks of *Clostridium difficile* at Maidstone and Tunbridge Wells NHS Trust, October 2007, Healthcare Commission, Executive Summary, pg. 5

¹² Investigation into outbreaks of *Clostridium difficile* at Maidstone and Tunbridge Wells NHS Trust, October 2007, Healthcare Commission, Executive Summary, pg. 5

- The Trust's bed occupancy rate was consistently over 90%, therefore less time for thorough cleaning¹⁴; and
- The Trust delayed announcing the outbreak and underestimated the number of deaths¹⁵.

Overall, the Healthcare Commission found similarities between this investigation and a similar one at Stoke Mandeville Hospital (Buckinghamshire Hospitals NHS Trusts)¹⁶.

“Both Trusts had undergone difficult mergers, were preoccupied with finances, and had a demanding agenda for reconfiguration and private finance initiative, all of which consumed much management time and effort. They also had poor environments, with many dormitory style wards and few single rooms...In both we observed unacceptable examples of contamination and unhygienic practice”.

Additional Expertise

On 11th March 2008 the Fifth Annual Conference on Healthcare Acquired Infection will be held in London. There are several experts identified in the conference information with reference to *C. difficile* and these contacts and any 'proceedings' issued from this conference may be of use to a future Committee Inquiry:

Chairman: Professor Mark Wilcox – Clinical Director of Microbiology and Director of Infection Prevention and Control, Leeds Teaching Hospital NHS Trust.

Bernard Place – Director of Healthcare Planning and Commissioning, Maidstone and Tunbridge Wells NHS Trust

Dr Louise Teare – Consultant Microbiologist and Director of Infection Prevention and Control, Mid Essex Hospitals NHS Trust.

Dr Bharat Patel – Consultant Medical Microbiologist, North Middlesex University Hospital.

Dr Peter Wilson – Consultant Microbiologist, University College London Hospitals NHS Trust

Examples of Good Practice – Canada

Multiple Hospitals across Quebec, in Canada, have experienced “a disastrous and highly lethal outbreak of nosocomial *Clostridium difficile* associated disease” in the past few years. Two thirds of the cases were caused by one strain which makes 15-

¹³Investigation into outbreaks of *Clostridium difficile* at Maidstone and Tunbridge Wells NHS Trust, October 2007, Healthcare Commission, Executive Summary, pg. 6

¹⁴Investigation into outbreaks of *Clostridium difficile* at Maidstone and Tunbridge Wells NHS Trust, October 2007, Healthcare Commission, Executive Summary, pg. 6

¹⁵Investigation into outbreaks of *Clostridium difficile* at Maidstone and Tunbridge Wells NHS Trust, October 2007, Healthcare Commission, Executive Summary, pg. 8

¹⁶Investigation into outbreaks of *Clostridium difficile* at Maidstone and Tunbridge Wells NHS Trust, October 2007, Healthcare Commission, Executive Summary, pg. 9

20 times the amount of toxin as other 'normal' strains. This strain has also been detected in the US, UK and the Netherlands¹⁷. In Quebec it is thought that the main factors accounting for the emergence of such a strain were:

- An elderly hospital population;
- Crowded wards;
- Suboptimal toilet-bed ratios; and
- Poor infection control performance.

Calgary – The Foothills Medical Centre¹⁸

The risk of noscomial acquisition of MRSA and *C. difficile* was reduced four-fold after the medical teaching unit at the Foothills Medical Centre moved from a 5:1 to a 1:1 bed-toilet ratio. This evidence is seen as support for moving ahead rapidly with long overdue upgrades in hospital infrastructure.

Ontario – Sault Area Hospital¹⁹

In the autumn of 2006, more than 50 patients were identified at Sault Area Hospital as having the virulent NAP-1 strain (identified in Quebec) of *C. difficile*. The Hospital brought in Dr. Michael Gardham, the Director of Infection Prevention and Control from the Toronto University Hospital Network who made 29 recommendations, which were all implemented, including an expensive housekeeping regime.

February 2009

¹⁷ Louie, T.J., How should we respond to the highly toxogenic NAP1/ribotype 027 strain of *Clostridium difficile*?, Canadian Medical Association Journal (2005), 173(9), www.cmaj.ca/cgi/content/full/173/9/1049

¹⁸ Louie, T.J., How should we respond to the highly toxogenic NAP1/ribotype 027 strain of *Clostridium difficile*?, Canadian Medical Association Journal (2005), 173(9), www.cmaj.ca/cgi/content/full/173/9/1049

¹⁹ <http://tahilla.typepad.com/mrsawatch/2007/07/c-diff-spurs-in.html>