York Hospitals NHS
NHS Foundation Trust

Infection Prevention Team

The Prevention and Control of *Clostridium difficile* Infection (CDI)

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Version History Log

This area should detail the version history for this document. It should detail the key elements of the changes to the versions.

Version	Date Approved	Version Author	Status & location	Details of significant changes
3				New Trust format and management of treatment updates
				To incorporate: • DH Guidance • Requirements of the Hygiene Code 2009 • Revised Trust Prescribing formularies • Clear Pathway Charter

Contents

1 Introduction & Scope

This policy outlines how to minimise the risk of infection caused by *Clostridium difficile* which is the most commonly identified pathogen causing hospital acquired infective antibiotic associated diarrhoea. *Clostridium difficile* has emerged as a Healthcare Associated Infection (HCAI) of great clinical and economic significance. Patients who have been treated with broad spectrum antibiotics (those that affect a wide range of bacteria), those with serious underlying illnesses and the elderly are at greatest risk – over 80% of *Clostridium difficile* infections reported are in people aged over 65 years and can contribute to death of patients.

Clostridium difficile can be spread on the hands of healthcare staff and others who come into contact with infected patients, or environmental surfaces (e.g. floors, bedpans, toilets) contaminated with the bacteria or its spores. Spores are produced when *Clostridium difficile* bacteria encounter unfavourable conditions, such as being outside the body. They are very hardy and can survive on clothes, patients' skin and environmental surfaces for long periods.

In those who are susceptible, diarrhoea typically starts within a few days of commencing antibiotics although antimicrobials taken 1-2 months previously can still predispose to *Clostridium difficile* infections. *Clostridium difficile* usually produces two toxins A and B – the latter is probably most important in human disease.

Patient safety needs to be paramount in the provision of healthcare and must not be comprised by other strategic objectives.

This policy applies to all healthcare workers, allied health professionals, all other employees working within the Trust who will come into contact with patients.

Training, all clinical Trust staff including Domestic Staff must attend annual mandatory infection prevention training. None clinical staff must attend bi-annual infection prevention training.

2 Definitions

Clostridium difficile (c-diff): a spore forming bacteria found as part of normal bowel flora in approximately 3% of adults and 66% of infants. *Clostridium difficile* rarely causes problems in children or healthy adults, as it is kept in check by the normal bacterial population of the intestine. When certain antibiotics disturb the balance of bacteria in the gut, *Clostridium difficile* can multiply rapidly and produce toxins which cause illness. *Clostridium difficile* infection ranges from mild to severe diarrhoea to, more unusually pseudo membranous colitis.

Clostridium difficile infection (CDI): one episode of diarrhoea, not attributable to any other cause including medication, and that occurs at the same time as a laboratory toxin positive assay with or without a positive c diff culture, and/or endoscopic evidence of pseudo membranous colitis.

Toxin: a poisonous substance produced by living cells or organisms, which are capable of causing disease on contact with or absorption by body tissues.

Period of increased incidence (PII) of CDI: two or more new cases (occurring 48 hours post admission, not relapses) in a 28 day period on a ward.

Outbreak of CDI: two or more cases on the same ward caused by the same strain related in time and place over a defined period that is based on the date of onset of the first case.

Diarrhoea : a stool loose enough to take the shape of a container used to sample the stool or Bristol Stool Chart types 5-7- see appendix 1.

Pseudo membranous colitis: severe inflammation of the bowel.

3 Policy Statement

It is important that when a patient presents with diarrhoea, the possibility that it may have an infectious cause is considered. Patients with suspected potentially infectious diarrhoea must be isolated in order to reduce the incidence and spread of *Clostridium difficile* infection, and to protect those who are susceptible.

Patients with CDI must be assessed at least daily for the severity of the condition. There must be evidence of accurate fluid balance, nutrition and stool frequency/description records. If bloody diarrhoea, severe abdominal pain, fever or other signs of systemic toxicity develop a formal medical review must be undertaken immediately. In severe cases pseudomembranous colitis and toxic megacolon can develop.

3.1 Professional Responsibilities

Clear Pathway Charter

The failure to send appropriate and adequate microbiological samples before prescribing, plan intended courses of antimicrobials, review and appropriately stop such treatment has adverse consequences for individual patients and the population as a whole.

Its purpose is to ensure collaboration between healthcare professionals results in implementation of a **Clear Pathway for use of antimicrobials** for all patients

3.2 Management of CDI

Clinicians (doctors and nurses) must apply the following mnemonic 'SIGHT' when managing suspected potentially infectious diarrhoea:

S	Suspect that a case may be infective where there is no clear alternative cause for diarrhoea.
I	Isolate the patient and consult with the infection prevention team (IPT) while determining the cause of the diarrhoea.
G	Gloves and aprons must be used for all contacts with the patient and their environment.
H	Hand washing with soap and water must be carried out before and after each contact with the patient and the patient's environment.
T	Test the stool for toxin, by sending a specimen to the laboratory at onset of symptoms.

3.3 Isolation

All patients with diarrhoea should be isolated promptly but must be isolated within 2 hours of diagnosis of CDI. If this cannot be achieved an AIRS form must be completed by the ward staff.

- Single room isolation, with a toilet where possible/designated bedpan/commode. When isolation is not possible, this must be discussed with Infection Prevention Nurse (IPN) immediately and the reason documented in the patient's care plan or MDT notes.
- Acutely ill patients should not be placed in inappropriate wards without adequate medical and nursing support.
- Toilets/bedpans/commodes and any other communal clinical equipment must be designated per patient and cleaned/disinfected between **each** use.
- Gloves and aprons must be used for all contact with the patient and their environment including emptying and cleaning toilets/commodes/bedpans.

3.4 **Stools -** Samples and record

- A faecal sample must be submitted for microbiological testing in all patients in whom a diagnosis of CDI is suspected. Recent and/or current antibiotic use must be stated on the specimen request form.
- Send stool samples at onset of symptoms.
- Samples must arrive in the laboratory on the day of collection or out of hours specimens the morning following collection, to ensure optimum microbiological testing.
- A record of daily stool frequency and severity of diarrhoea **must** be kept using the Bristol Stool Chart. This must be reviewed at least daily and documented in patients' medical notes.
- Patients must be isolated and precautions followed until at least 48 hours after the last symptom. (Clearance specimens are **not** required **unless** diarrhoea re-starts.)

- Greater attention must be given to patients with CDI to ensure their intake and loss of fluids is monitored and recorded. If such patients become systemically unwell or febrile or pass blood in their stools, medical staff should be informed immediately.
- Further laboratory test of *Clostridium difficile* isolates for typing purposes may be appropriate. This will enable the identification of potentially hyper-virulent strains such as the type 027. Arrangements must be made through the regional HPA offices and the Anaerobe Reference Laboratory for an agreed testing programme in these circumstances; this will be initiated by the IPT.

3.5 Hand Hygiene

- Effective **hand washing** using soap and water must be performed before and after direct patient contact, with the patient's environment and following handling of sanitary facilities. **Hand washing must replace the use of disinfectant gel as the spores of *Clostridium difficile* are resistant to the gel.**
- Hands **must be** washed before **and** after wearing gloves.
- Hand hygiene facilities must be provided (e.g. hand wipes, soap and water) for the patient following use of sanitary equipment and prior to eating and drinking.
- Advise visitors to hand wash before and after visiting.

3.5.1

- Patients must bath/shower or have a bed bath daily to reduce the burden of spores on the skin.
- Clothes, nightwear must be changed daily.

3.6 Linen

- All contaminated laundry from patients with CDI must be treated as infected, categorised hazardous and placed in a hot water soluble bag and then red outer plastic one.
- Bed linen must be changed daily to reduce environmental burden and contamination.

3.7 Environmental disinfection

One case or more on the ward:

- All floors and flat surfaces in the ward environment **must be** disinfected twice daily using Chlor-Clean diluted***** to 1,000ppm. The bathroom/toilet disinfected 4 times daily. Domestic staff must be informed on the day of diagnosis by the IPT. This must be continued for 48 hours after the last case/patient recovery.
- Toilets, bedpans, or commodes must be disinfected **between use** using Clinell sporicidal wipes or Chlor-Clean, diluted* to 1,000 ppm.
- On discharge or transfer, the isolation room /cohort room must be thoroughly cleaned with Chlor clean diluted to 1,000ppm and curtains changed.
- Once the patient has recovered from their CDI the isolation room /cohort room must be thoroughly cleaned with Chlor clean diluted to 1,000ppm and curtains changed.
- Minor faecal contamination that does not contain blood must be removed using Clinell sporicidal wipes or Chlor-Clean diluted* to 1,000 ppm.
- Gross faecal contamination or spills that contain visible blood must be dealt with using Haz Tabs diluted* to 10,000 ppm.

***Use the re-usable diluter bottles obtainable from IPT.**

Evaluate control measures with the IPN at least weekly.

3.8 Bed Management and movement of patients

Patients who are symptomatic with CDI **must not** be moved:

- from their side room
- from one ward to another
- from one bay (if cohorted) to another
- from hospital to another care facility outside the hospital

Patients requiring investigations in other department must be discussed with IPT to enable control measures to be put in place should the procedure be considered urgent.

Patients with CDI **must not** be moved unless:

- 48 hours have elapsed since the last symptom
- this has been agreed with the IPT

3.9 Clinical Management and Treatment

- Restricted broad-spectrum antibiotics should be used when indicated by the patient's clinical conditions, and should be reviewed on results of microbiological testing or according to the local sensitivities of causative organisms. The guidelines on indications for use should be easy to understand and follow.
- Please refer also to the Antimicrobial Stewardship Clear Pathway Charter and the Antimicrobial Adult Formulary in the Clinical Handbook on Horizon.
- Assess and document the severity of CDI each day as follows:
  - **Mild CDI** is not associated with a raised WCC; it is typically associated with < 3 stool type 5-7 on the Bristol Stool Chart per day.
  - **Moderate CDI** is associated with a raised WCC that is <15 x 10^9 /L, it is associated with 3-5 stools type 5-7 per day.
  - **Severe CDI** is associated with a WCC > 15x10^9 /L or an acute rise in serum creatinine (i.e. > 50% rise above baseline) or a temperature of >38.5^{o}C or evidence of severe colitis (abdominal pain or radiological signs). The number of stools per day may be a less reliable indicator of severity.
  - **Life-threatening CDI** includes hypotension, partial or complete ileus or toxic mega colon or CT evidence of severe disease.
- Urgent medical review of antibiotic therapy is required. Those not required must be stopped as must other drugs that may cause diarrhoea.

- If antibiotic treatment is required consider use of agents with low propensity to cause CDI-Consult with Clinical Microbiologist.

- If provoking antibiotics have been stopped some patients will spontaneously improve without specific therapy. Therefore observe if minor symptoms.

- Treat according to severity

  (i) **Mild and Moderate Disease** - oral metronidazole 400-500 mg 8-hourly for 10-14 days.

  (ii) **Severe Disease** - oral vancomycin 125 mg 6-hourly for 10-14 days.

  (iii) **Complicated Disease** - oral vancomycin up to 500 mg 6-hourly for 10-14 days *plus* IV metronidazole 500 mg 8-hourly

  (iv) **Life Threatening** - oral vancomycin up to 500 mg 6-hourly for 10-14 days via naso-gastric tube or rectal installation *plus* iv metronidazole 500 mg 8-hourly. Such patients should be monitored with serum lactate and *colectomy* considered especially if caecal dilatation is >10 cm. Colectomy is best performed before serum lactate rises >5 mmol/L when survival is extremely poor

  If diarrhoea persists despite 20 days' treatment but the patient is stable, the daily number of Type 5-7 motions has decreased, the WCC is normal, and there is no abdominal pain or distension, the persistent diarrhoea may be due to post-infectious non-specific causes. The patient may try an anti-motility agent such as loperamide 2mg prn. The patient should be closely observed for evidence of a therapeutic response and to ensure there is no evidence of colonic dilatation.

  For first recurrence, repeat the same antibiotic used to treat the initial episode (unless the first episode was treated with metronidazole and the recurrence is severe CDI, in which case vancomycin should be used).

Subsequent recurrences use vancomycin 125 mg qds, followed if necessary by pulsed doses of oral vancomycin.

- CRP must be done on day 3 of diagnosis.
- All cases of CDI will be reviewed weekly by the CDI multi-disciplinary team (Consultant Gastroenterologist, Consultant Microbiologist, IPN , Anti-microbial Pharmacist and dietician. Recommendations from the review will be documented in the patient's medical notes by IPT.

3.10 Documentation

- CDI History Sheet – IPN will complete.
- CDI Care Plan – IPN will deliver to the ward.
- CDI Patient information leaflet – Ward staff must ensure patients have access to these (available from IPT)
- Data collection tool for Saving Lives High Impact Intervention 7, Care bundle to reduce the risk of *Clostridium difficile*, (Appendix 2) to be completed by the ward staff for 7 days following diagnosis and then collected by IPN.
- Weekly ward round data collection form to be completed by ward staff in time for CDI multi-disciplinary ward round Friday pm. Collected by IPN.
- Bed Management Isolation sheet
- Domestics cleaning sheet
- IPT database

} IPT will manage these electronically

- A root cause analysis (RCA) must be conducted on all hospital acquired cases of CDI. The RCA lead is responsible for producing and implementing a RCA action plan. IPT will maintain a RCA register. RCA summaries are presented to the Executive Board by the Clinical Director.

- Mandatory surveillance requires the Trust to test for and (in all patients over 2 years) report to the Health Protection Agency the number of cases of infection caused by *Clostridium difficile.*

3.11 Outbreaks of CDI

- Outbreaks of CDI must be detected and reported as serious untoward incidents. An outbreak may be indicated by two or more cases caused by the same strain related in time and place over a defined period that is based on the date of onset of the first case.

3.12 AB Prescribing

- Within Directorates, protocols for managing infections must be developed. These must limit the use of broad spectrum antibiotics. Implementation and compliance must be audited by users. Difficult or complicated cases must be discussed with the clinical microbiologist.

- Almost all antibiotic classes have been implicated in causing *Clostridium difficile* infection although it is probably most common with cephalosporins, penicillins and clindamycin. Particularly high risk has been associated with the third generation cephalosporins and more recently with quinolones (e.g. ciprofloxacin).

- Protocols for managing infections in susceptible patients must limit antibiotic use to those patients with good evidence for an infection. In difficult cases advice is available from the Clinical Microbiologist.

4 Equality Impact Assessment

The Trust aims to design and implement services, policies and measures that meet the diverse needs of our service, population and workforce, ensuring that none are placed at an unreasonable or unfair disadvantage over others.

In the development of this policy, the Trust has considered its impact with regard to equalities legislation.

5 Accountability

The Antimicrobial Clear Pathway Charter (refer also to section 3.1) specifies clear responsibilities for Doctors, Pharmacists and Nurses.

6 Consultation, Assurance and Approval Process

6.1 Consultation Process

This policy has been reviewed by the Hospital Infection Prevention and Control Committee (HIPCC).

6.2 Quality Assurance Process

Following consultation with stakeholders and relevant consultative committees, this policy has been reviewed by the Trust's Quality Assurance group to ensure it meets the NHSLA standards for the production of procedural documents.

6.3 Approval Process

Following completion of the Quality Assurance Process, this policy, and any subsequent policy revisions will require the approval of Hospital Infection Prevention and Control Committee.

7 Review and Revision Arrangements

The review of the document will be undertaken with the collaboration of all parties involved in 2 years or earlier if there are changes in recommended practice or legislation.

8 Dissemination and Implementation

8.1 Dissemination

This policy is available in alternative formats, such as Braille or large font, on request to the author of the policy.

8.2 Implementation of Policies

Infection Prevention policies are available on Horizon, the policy will be implemented via mandatory training and via Saving Lives High Impact interventions.

9 Document Control including Archiving Arrangements

9.1 Register/Library of Policies

This policy will be stored on the Trust's electronic portal, Horizon, on the policies and procedures site and will be stored both in an alphabetical list as well as being accessible through the portal's search facility.

9.2 Archiving Arrangements

On review of this policy, archived copies of previous versions will be automatically held on the version history section of each policy document on Horizon. It is the responsibility of the Publisher(s) to ensure that version history is maintained on Horizon.

9.3 Process for Retrieving Archived Policies

To retrieve a former version of this policy from Horizon, the publisher of this policy, identified on the front sheet, should be contacted.

10 Monitoring Compliance With and the Effectiveness of Policies

This policy will be monitored for compliance with the minimum requirements outlined below.

10.1 Process for Monitoring Compliance and Effectiveness

In order to fully monitor compliance with this policy and to ensure that the minimum requirements are met, the policy will be monitored as follows:

Minimum Requirements	Monitoring
a. Isolation	Core Patient database records IPT bed management records IPT documentation
b. Hand Hygiene	Saving Lives HII 7 (Care bundle to

	reduce the risk of *Clostridium difficile)* NHSLA Standard 2.2.8 Ward hand hygiene audits
c. Stool record	Multi disciplinary CDI ward round documentation Stool charts
d. Stool – specimens	Telepath records for microbiology requests
e. Linen	Environmental audits for Infection Prevention
f. Environmental disinfection	Saving Lives HII 7 (Care bundle to reduce the risk of *Clostridium difficile*) IPT and domestic cleaning records Environmental audits for Infection Prevention
g. Bed Management	Core Patient Database records IPT bed management records IPT documentation
h. Treatment	Medical notes Saving Lives HII 7 (Care bundle to reduce the risk of *Clostridium difficile*) Multi disciplinary CDI ward round documentation
i. Documentation	IPT records IPT CDI database Medical notes
j. Outbreaks	Serious untoward incident records
k. Antibiotic prescribing	Antimicrobial policy audits Clear Pathway Charter

10.2 Standards/Key Performance Indicators

Adherence to the guidelines produced by the Department of Health and Care Quality Commission.

11 Trust Associated Documentation

Antimicrobial Stewardship Clean Pathway Charter

Antimicrobial Adult Formulary

Isolation

Effective Hand Hygiene

Antiseptic and Decontamination

Reporting HCAI to HPA

12 External References

a) Healthcare Commission: Investigation into outbreaks of *Clostridium difficile* at Stoke Mandeville Hospital, Buckinghamshire Hospitals NHS Trust, July 2006

b) Yorkshire and the Humber NHS: Summary of the Healthcare Commission Investigation into outbreaks of *Clostridium difficile* at Stoke Mandeville Hospital (Buckinghamshire Hospitals NHS Trust) published July 2006

c) The Journal of Hospital Infection, Volume 56, Supplement 1, February 2004

d) Saving Lives: a delivery programme to reduce Health care Associated Infection.

e) DH 2009 *Clostridium difficile* infection: How to deal with the problem

13 Appendices

Appendix 1: Bristol Stool Chart

STOOL CHART	Patient Details

IF STOOL TYPE 5, 6 OR 7, REPORT TO NURSE IN CHARGE AND SEND FAECAL SAMPLE TO THE LABORATORY FOR INVESTIGATION.

CONSIDER MOVING PATIENT TO SIDE ROOM IF NO CLINICAL REASON FOR DIARRHOEA

DATE	TIME	COLOUR/ BLOOD/ MUCUS	BRISTOL STOOL SCALE (see chart overleaf)	AMOUNT 1 = Small 2 = Medium 3 = Large	ACTION	TIME SAMPLE WAS TAKEN:	SIGNATURE

THE BRISTOL STOOL FORM SCALE

Type 1		Separate hard lumps, like nuts (hard to pass)
Type 2		Sausage-shaped but lumpy
Type 3		Like a sausage but with cracks on its surface
Type 4		Like a sausage or snake, smooth and soft
Type 5		Soft blobs with clear-cut edges (passed easily)
Type 6		Fluffy pieces with ragged edges, a mushy stool
Type 7		Watery, no solid pieces ENTIRELY LIQUID

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