York Teaching Hospital NHS
NHS Foundation Trust

Clostridium Difficile Infection (CDI) Infection Prevention Guidelines

Author:	Linda Horton-Fawkes
Owner:	Infection Prevention Team
Publisher:	Healthcare Governance
Version No:	6.0
Date approved:	December 2014
Review Date	30 November 2017

Summary

These guidelines aim to give guidance for the safe management of *Clostridium difficile* infection.

Contents

1 Introduction & Scope

Clostridium difficile infection is the most common cause of hospital-acquired diarrhoea. *Clostridium difficile* is an anaerobic bacterium that is present in the gut of up to 3% of healthy adults and 66% of infants. However *Clostridium difficile* rarely causes problems in children or healthy adults, as it is kept in check by the normal bacterial population of the intestine.

These guidelines are for all health care workers who are responsible for direct care and management of patients.

2 Definitions

CDI - *Clostridium Difficile* Infection

Spore - is a reproductive structure that is adapted for dispersal and can survive for extended periods of time in unfavorable conditions

Sporicidal – a substance that can kill spores

GDH – glutamate dehydrogenase, an enzyme present in most microbes.

PCR – polymerase chain reaction; a process where a single or a few copies of a piece of DNA (genetic material) is amplified across several orders of magnitude.

Toxin - is a poisonous substance produced within living cells or organisms.

Pseudomembranous colitis - Pseudomembranous colitis is an infection of the large intestine, and is mainly associated with an overgrowth of *Clostridium difficile* bacteria in the gut.

3 Overview

These guidelines aim to give guidance for the safe management of *Clostridium difficile*. *Clostridium difficile* Infection (CDI) ranges from mild to severe diarrhoea to, more rarely, severe inflammation of the bowel (known as pseudomembranous colitis). People who have been treated with broad spectrum antibiotics, people with serious underlying illnesses and the elderly are at greatest risk –

over 80% of *Clostridium difficile* infections reported affect people aged over 65 years.

Although some people can be healthy carriers of *C.difficile*, in most cases the disease develops after cross-infection from another patient, either through direct patient to patient contact, via healthcare staff, or via a contaminated environment. A patient who has *C.difficile* diarrhoea excretes large numbers of the spores in their liquid faeces. The spores can contaminate the general environment around the patient's bed (surfaces, keypads and equipment), the toilet areas, sluices, commodes, bedpan washers, etc. They can survive for a long time and be a source of hand-to-mouth infection.

Adapted from;

http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/ClostridiumDifficile

See appendices for medical and nursing management. (appendix list)

4 Trust Associated Documentation

YHFT [CORP.RL10] Policy for the Development and Management of Policies

YHFT [GL.CLIN.CLIN3] Antimicrobial Formularies

YHFT [CLIN.IC19] Infection Prevention Policy for the Decontamination of Reusable Medical Devices and the Environment

YHFT [CLIN.IC12] Infection Prevention Policy for Effective Hand Hygiene

YHFT [CLIN.IC6] Infection Control Standard Precautions Policy

YHFT [CLIN.IC8] Infection Prevention Isolation Policy

5 External References

http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/ClostridiumDifficile

http://www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1232006607827 *Clostridium difficile* infection: How to deal with the problem epic2: *National Evidence-Based Guidelines for Preventing Healthcare-Associated Infections in NHS Hospitals in England* R.J. Pratt, C.M. Pellow, J.A. Wilson, H.P. Loveday, P.J. Harper, S.R.L.J. Jones, C. McDougall, M.H. Wilcox; Richard Wells Research Centre, Faculty of Health and Human Sciences, Thames Valley University (London).

6 Appendices

Appendix i - Clinical Management and treatment of CDI

Appendix ii - Escalation Procedure for Inability to Isolate within Two Hours

Appendix iii - Isolation Cleaning Guidance

Appendix iv – *Clostridium Difficile* Care plan

Appendix v – Risk assessment for *Clostridium Difficile*

Appendix vi – *Clostridium Difficile* Cycle

Appendix vii – CDI management flow charts

Appendix i

Clinical management and treatment of CDI

Medical and nursing staff should apply the following mnemonic protocol (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 must be used for body fluid exposure; 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.

- Patients should be monitored daily for frequency and severity of diarrhoea using the Bristol Stool Chart
- Review antibiotics and discontinue those that are not required as well as other drugs that may cause diarrhoea
- CDI should be managed as a diagnosis in its own right, with each patient reviewed daily regarding fluid resuscitation, electrolyte replacement and nutrition review. This must be documented
- Monitor for signs of increasing severity of disease, with early referral to ICU as patients may deteriorate very rapidly
- A team consisting of a microbiologist, an Infection Prevention and Control doctor, a gastroenterologist or surgeon, and an infection prevention nurse must review all CDI patients at **least** weekly to ensure that the infection is being treated

optimally and that the patient is receiving all necessary supportive care.

- Assess the severity of CDI each day as follows:

  - **Mild CDI** is not associated with a raised WCC; it is typically associated with <3 stools of types 5–7 on the Bristol Stool Chart per day.
  - **Moderate CDI** is associated with a raised WCC that is <15 109/L; it is typically associated with 3–5 stools per day.
  - **Severe CDI** is associated with a WCC >15 109/L, or an acute rising serum creatinine (i.e. >50% increase above baseline), or a temperature of >38.5°C, or evidence of severe colitis (abdominal or radiological signs). The number of stools may be a less reliable indicator of severity.
  - **Life-threatening CDI** includes hypotension, partial or complete ileus or toxic megacolon, or CT evidence of severe disease.

Treat according to severity

- **Mild and moderate CDI** – oral metronidazole 400–500 mg tds for 10–14 days.
- **Severe CDI** – oral vancomycin 125 mg qds for 10–14 days. In severe CDI cases not responding to oral vancomycin 125 mg qds, high-dosage oral vancomycin (up to 500 mg qds, if necessary administered via a nasogastric tube) +/- intravenous (IV) metronidazole 500 mg tds is recommended. The addition of oral rifampicin (300 mg bd) or IV immunoglobulin (400 mg/kg) may also be considered.
- **Life-threatening CDI** – oral vancomycin up to 500 mg qds for 10–14 days via nasogastric tube or rectal installation plus IV metronidazole 500 mg tds.
- Such patients should be closely monitored, with specialist surgical input, and should have their blood lactate measured. Colectomy should be considered, especially if caecal dilatation is >10 cm. Colectomy is best performed before blood lactate rises >5 mmol/L, when survival is extremely poor.

- If diarrhoea persists despite 20 days' treatment but the patient is stable and 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-infective irritable bowel syndrome.
- The patient may be treated with an anti-motility agent such as loperamide 2 mg prn (instead of metronidazole or vancomycin). 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).
- **For subsequent recurrences**, use vancomycin 125 mg qds.

Death certification

- If a patient with CDI dies, the death certificate should state whether CDI was part of the sequence of events leading directly to death or whether it was the underlying cause of death. If either case applies CDI should be mentioned in Part 1 of the certificate.
- If CDI was not part of the sequence of events leading directly to death but contributed in some way to it, this should be mentioned in Part 2.
- Doctors have a **legal duty** to mention CDI on a death certificate if it was part of the sequence of events directly leading to death or contributed in some way.

Adapted from:

http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/documents/digitalasset/dh_093218.pdf

Appendix ii – Escalation Procedure for Inability to Isolate

On occasions it may not be possible to place all patients who require isolation. Inability to isolate will require escalation to senior staff.

The Infection Prevention Team in collaboration with the Consultant Microbiologist is responsible for the clinical decision on which patient(s) should be isolated or cohorted in order to control the spread of infection.

In order to make this decision the Infection Prevention Team & Microbiologist will require the following information:

- The infection status of each patient currently in single rooms
- A description of the physical layout of the wards including;
    - number of beds
    - number and type of bays
    - number and location of side rooms
    - whether any parts of the ward is part of a corridor for through traffic
    - symptoms of clinical infection e.g. purulent discharge, diarrhoea and/or vomiting and coughing/expectorating patient
    - the site or specimen from which the infection has been isolated (e.g. wound swab, sputum etc and when specimen was taken)
    - the organism that is causing the infection (if known)
    - the behaviour of the patient (e.g. tendency to wander, disruptiveness, mobility etc.)
    - psychological and other medical factors (e.g. presence of depression/anxiety, need for observation etc.)
    - current/recent incidences of ‘’inability to isolate’’ resulting in patients with infections being nursed in open bays
    - clinical requirements (e.g. speciality specific treatment/care or clinical reasons why isolation might compromise patient safety)

It will not be possible for the Infection Prevention Team/Microbiologist to make a decision on isolation if this information is not available.

If still unable to isolate an infected patient

Ward staff must alert the Bed Managers, Matron and IPT during office hours and complete an AIR's form if unable to isolate a patient.

If a patient has diarrhoea and there is no clear non infective cause i.e. condition, medication e.g. laxatives, procedure related, isolation must take place within **2 hours**. If this is not possible the shift coordinator must complete an AIR's form in conjunction with following the escalation procedure.

Out of hours the Bed Managers must be informed and the incident should be recorded and reported as above. The Infection Prevention Team must be updated during office hours.

(The above guidance is applicable for all cases of infection that require isolation)

Appendix iii

Isolation Cleaning Guidance

Hand hygiene - staff

- **During isolation for C.diff/diarrhoeal illnesses *all* hand decontamination within the room/area must be with liquid soap and water.**
- Hand decontamination is required in the following circumstances:
    - Immediately before putting on gloves
    - Immediately after removing gloves and apron (e.g. following a procedure or any contact with a patient or their immediate environment)
    - Immediately before donning gloves and apron if these are replaced whilst in the room (e.g. following a procedure, between patients)
    - Immediately before leaving the room
    - Immediately after leaving the room

Environmental Decontamination

- The nursing staff on the ward must notify domestic services for active cases of C.diff that the ward requires a twice daily clean with a sporicidal agent & toilets four times daily
- An **Enhanced** door notice must be displayed at the entrance to the side room, area (e.g. cubicle) or cohort facility by the nursing staff to alert clinical and non clinical staff that the patient/s are in isolation
- The Domestic Supervisor must ensure that all domestic staff working in that area are aware of the procedure for the cleaning of isolation rooms, areas or cohort facilities
- A daily record must be kept as evidence that enhanced cleaning has been performed to a satisfactory standard and signed by domestic and supervisory staff. Standards will be monitored by IPN using the document above
- Nursing staff to escalate concerns regarding cleaning standards via domestic management
- All patient care equipment in the room wherever possible should be dedicated to the isolated patient

- **It is the nurse's responsibility to ensure that all patient care equipment that is used in isolation rooms is decontaminated** using either a sporicidal solution
- Toilets and all commodes must be cleaned after each use as above
- Baths must be cleaned after use as above
- The bed space vacated by the infected patient on the ward must be cleaned thoroughly using a sporicidal agent
- The bed, mattress, bed rails locker, chair and table must be cleaned by nursing staff, this must be recorded on the bed space cleaning record
- Single patient use equipment must be disposed of in clinical waste when no longer required

How to decontaminate the isolation room on a daily basis

- Isolation rooms, bed spaces or cohort facilities should be cleaned after the other rooms, bays and general areas on the ward
- Put on single apron before entering the isolation room, area or cohort facility
- Put on gloves prior to contact with chemicals
- Damp dust all surfaces with the solution using a single use disposable cloth. After use, dispose of cloth as clinical waste into an orange
- Make sure the areas that are touched frequently are cleaned and dried thoroughly e.g. door handles, taps, toilet handles/pulls, and push plates and nurse call bell
- Mop the floor using a sporicidal cleaning agent
- When the cleaning process is finished remove apron and gloves, dispose of into clinical waste bags and wash and dry hands thoroughly with soap and water before leaving the isolation room, area or cohort facility

How to use chemical cleaning products for general environmental disinfection

- Microfibre cloths and mops can be used with disinfectant/sporicidal agents
- Always wear protective gloves and an apron
- Refer to Control of Substances Hazardous to Health (COSHH) information and check date on product label

- Do not use the product unless you have received training on the correct use of cleaning agent, check with the Domestic Supervisors
- Always follow the preparation instructions on the product for correct dilution, incorrectly mixed solutions will not clean effectively
- Mix in a well ventilated room away from the patients using cold water. Label with time of dilution
- **Chlorine products will bleach fabrics and corrode metal, therefore on exposed metal parts wash off the solution with clean water and dry thoroughly with paper towels**

Environmental Decontamination for vacated rooms

- The bed space vacated by the infected patient on the ward must be cleaned effectively and thoroughly
- The bed, mattress, bed rails locker, chair and table must be cleaned by nursing staff, this must be recorded on the bed space cleaning record
- Single patient use equipment must be disposed of in clinical waste when no longer required
- Remove bed linen and all unused linen and dispose of as per Linen Guidelines
- Clean the bed; bed frame and mattress/pillow/s with a single use cloth and a sporicidal solution
- Clean each mattress as per local protocol. Specialist mattresses must be cleaned as above and returned to the equipment library/store

NB The mattress cover should be carefully inspected at each cleaning. If damaged or torn then the mattress should be disposed of as an infection risk.

Domestic Staff

- Walls do not need to be washed unless visibly soiled or otherwise requested by the Infection Prevention and Control Team
- When cleaning is finished, dispose of the single use cloths and mop as clinical waste
- Curtains will need to be changed and laundered (or replaced if disposable paper curtains are used) as a component of the final cleaning process

Hydrogen peroxide vaporization must be deployed when the occupant has had symptoms of diarrhoea. Please contact Sterile Services during office hours for general enquiries 7715302

N.B. HPV Service is available between 08.00 – 20.00hrs Monday to Saturday, Sunday 08.00hrs – 14.00hrs please contact the technician on-call via switchboard

Standard Operating Procedure:

Deployment of Hydrogen Peroxide Vapour (HPV) Decontamination

Scope: York, Scarborough & Bridlington Acute Trust sites (Single rooms or target areas up to 250m3)

By Whom: Approved Personnel

Training Required: Yes; only authorised personnel may deploy HPV

Procedure:

1. HPV will be deployed in the following circumstances:

   i. Decontamination of the patient's environment if the patient has been symptomatic and has a positive *Clostridium difficile* toxin and/or PCR positive result.

   ii. Following outbreaks, clusters or periods of increased incidence of infection, following advice from IPT

2. Advance notice is essential in order to arrange appropriate staffing and transport.

3. The ward manager/Matron has the responsibility to arrange with Domestic Services to effectively pre clean the area prior to HPV deployment. They must then contact SSD to confirm that the area is clean and empty.

4. Following notification by the ward manager/Matron that the room is clean and empty SSD staff will aim to complete HPV

decontamination within 6 hours with a maximum of 12 hours to prevent risk to safe patient placement and disruption to patient flow. However, the ability to achieve this timescale does rely on prompt notification to SSD and the area being properly prepared as in sections 2 and 3.

5. In emergency circumstances a more rapid response may be provided where the service allows.

N.B. HPV Service is available between 08.00 – 20.00hrs Monday to Saturday, Sunday 08.00hrs – 14.00hrs. However the more prior notice is given the better SSD can plan and deploy.

6. The Operator will carry out a preliminary inspection of the target area to assess suitability for HPV Decontamination. Where rooms are not suitable for HPV decontamination due to size, condition, location or other factors the Operator will inform IPT.

7. All deployments including notification details will be recorded on the HPV Deployment Cycle Record by the technician undertaking the deployment.

Appendix iv

Date + Time: ……

The registered nurse in charge of this patient is responsible for the initiation control measures for *Clostridium Difficile Infection* (CDI) treatment and dissemination of information regarding care and management

Every effort should be made to isolate all patients who are symptomatic with diarrhoea within 2 hours, if this is not achievable contact Infection Prevention for advice

☐ Upon diagnosis **isolate** (if not already achieved as above) within 2hrs

☐ Doctors should discuss treatment with microbiologists as required; if commenced on drug therapy review effectiveness after 3 days; check 3rd day CRP.

☐ Bristol stool chart must used to monitor stool frequency and type

☐ Complete High Impact Intervention No. 7 documentation

☐ Allocate an isolation pack containing single patient use items

☐ Use sporicidal agent to clean shared clinical equipment (as above)

☐ Any item which cannot be effectively cleaned must be discarded as clinical waste when no longer required

☐ The patient must be allocated their own toilet/commode/bedpan for the duration of the illness

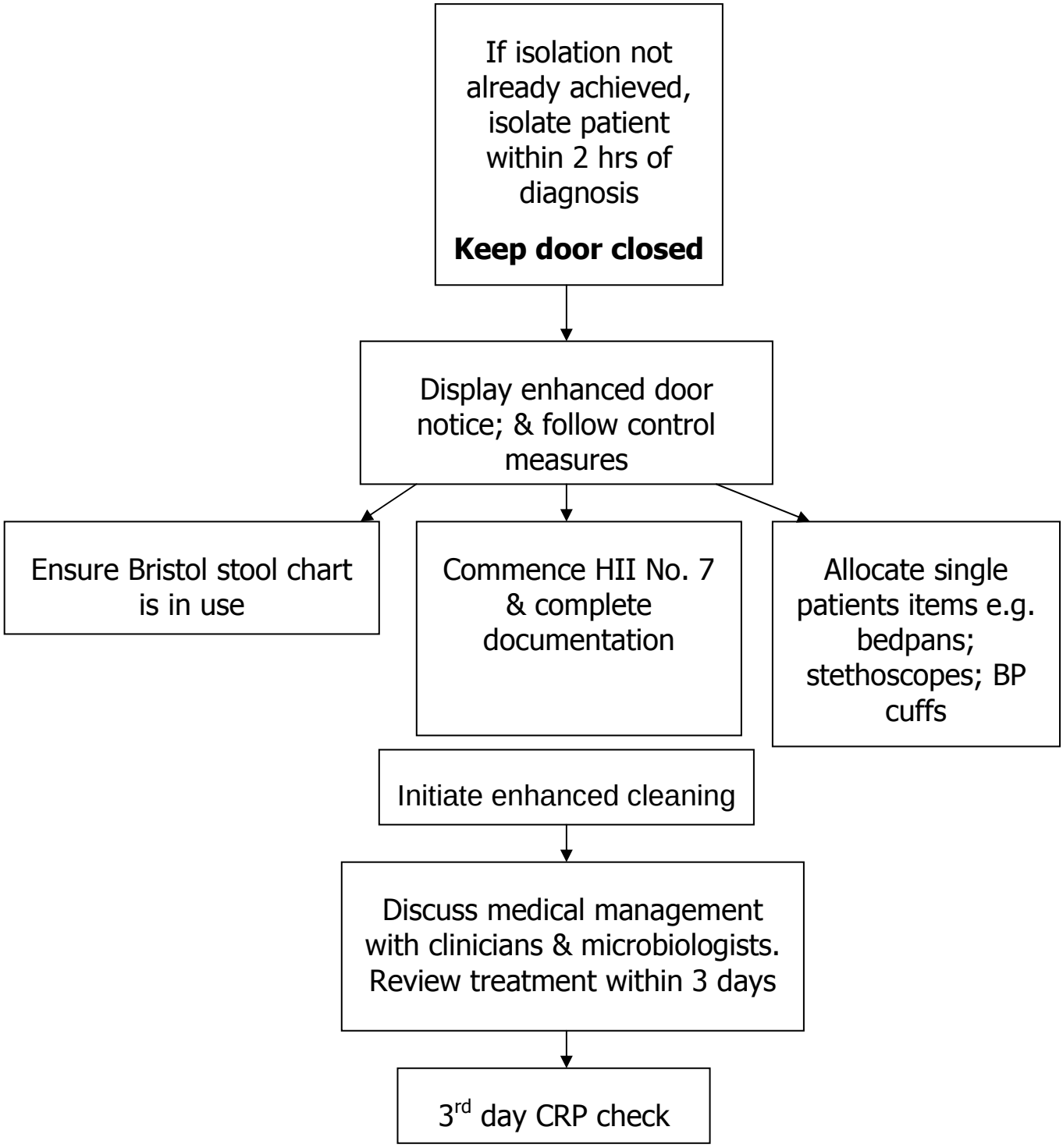
☐ Change bed linen daily, dispose of as infected linen

☐ Ensure 'Enhanced' door notice is displayed

☐ Do not move C.difficile patients out of isolation or to other areas without agreement from IPT

Please refer to door notice for full instructions on Hand Hygiene; Waste/Linen Disposal and Environmental Cleaning. The door must be kept closed at all times

Management of confirmed *c. difficile*



On discharge to another health care facility the nurse in charge of the patient's care must complete an Inter- Healthcare Transfer Form which will inform the receiving health care provider of the patient's infection status (inform ambulance crew transporting patient of status)

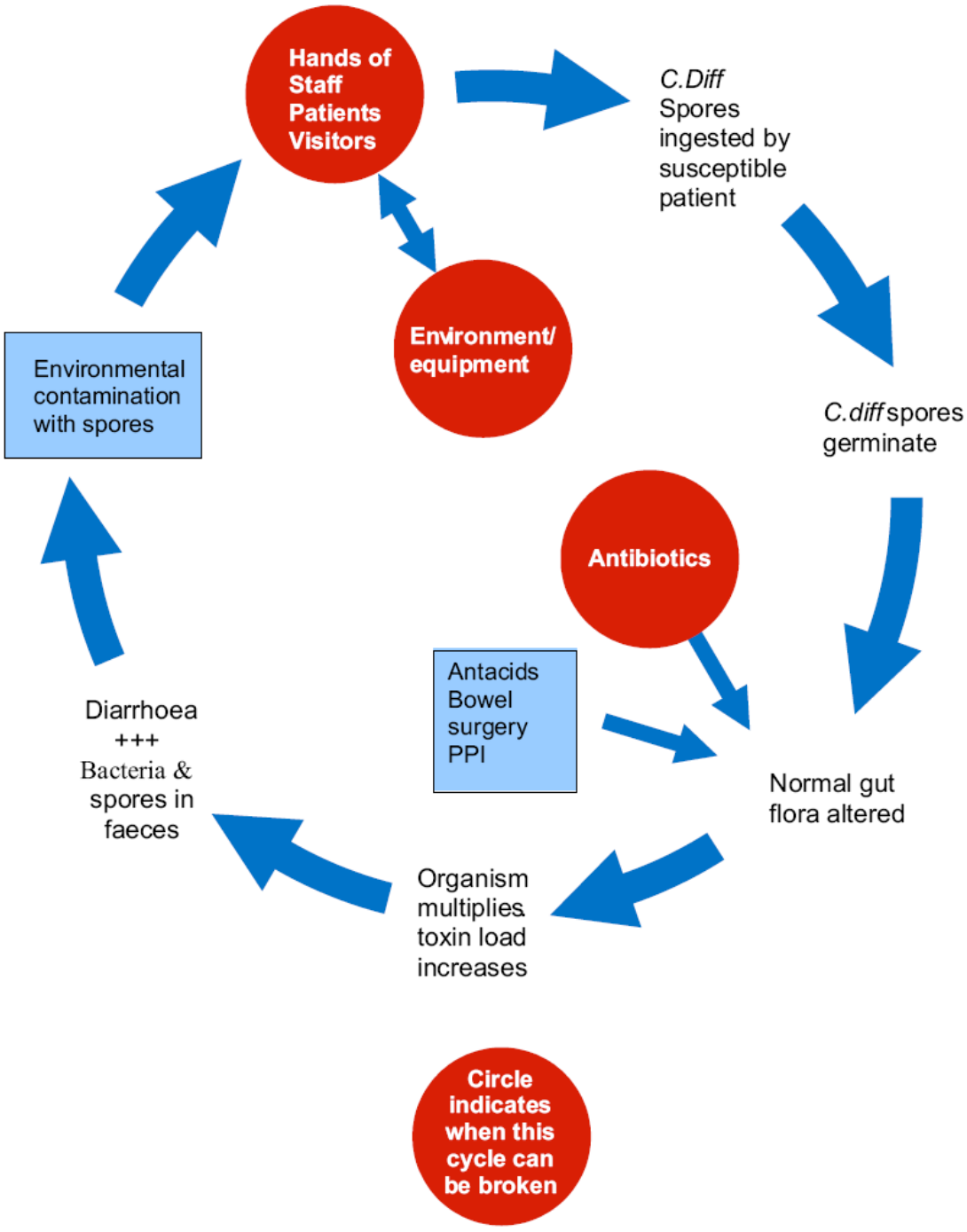
Risk Assessment for Clostridium Difficile (C-diff)

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 must be used for body fluid exposure; 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.**

Risk	**Action**		**Initial**	**Date**
Diarrhoea	Isolate patient immediately; initiate enteric precautions			
	Send stool sample via air tube system			
	Start stool chart			
	Chlor clean vacated area and isolation room			
	Inform Infection Prevention Team (IPT)			
	If sample positive for *C-diff*, initiate enhanced cleaning regimen with a sporicidal agent of the whole ward twice a day and toilets four times a day			
	If unable to isolate:	discuss with IPT		
		review side room occupancy		
		complete an AIRs form		
Flagging or history of *C-diff*	Caution with antibiotics-seek microbiologist advice			
	Observe for diarrhoea			
	Isolation not necessary if no symptoms of diarrhoea on this admission			
Antibiotics **PPI** **Chemotherapy** **Laxatives** **Steroids**	Closely observe for diarrhoea - if patient develops diarrhoea (type 5-7 Bristol score) follow advice above for diarrhoea risk.			
Non of the above	No action required, reassess if condition changes.			

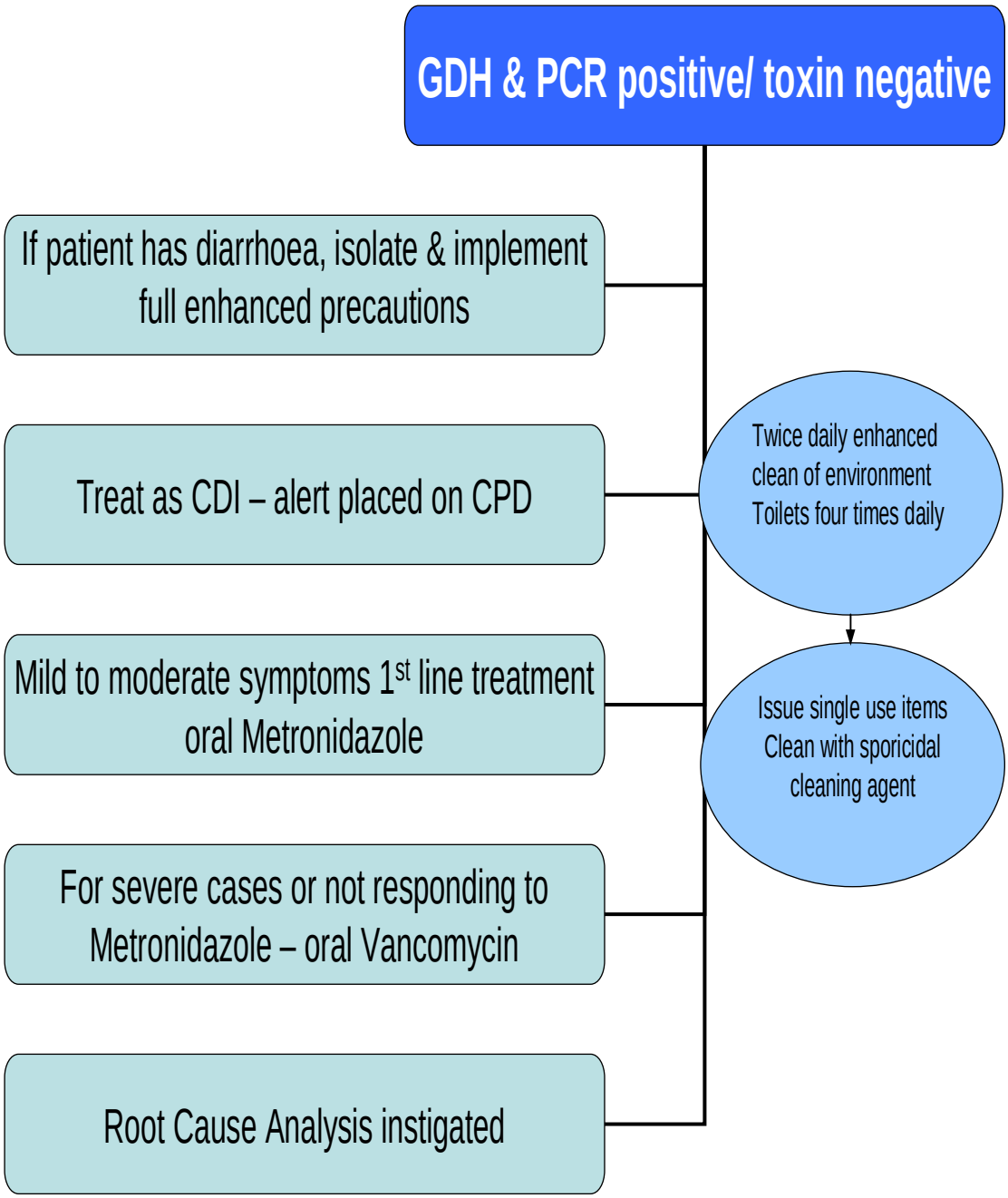
Appendix vi

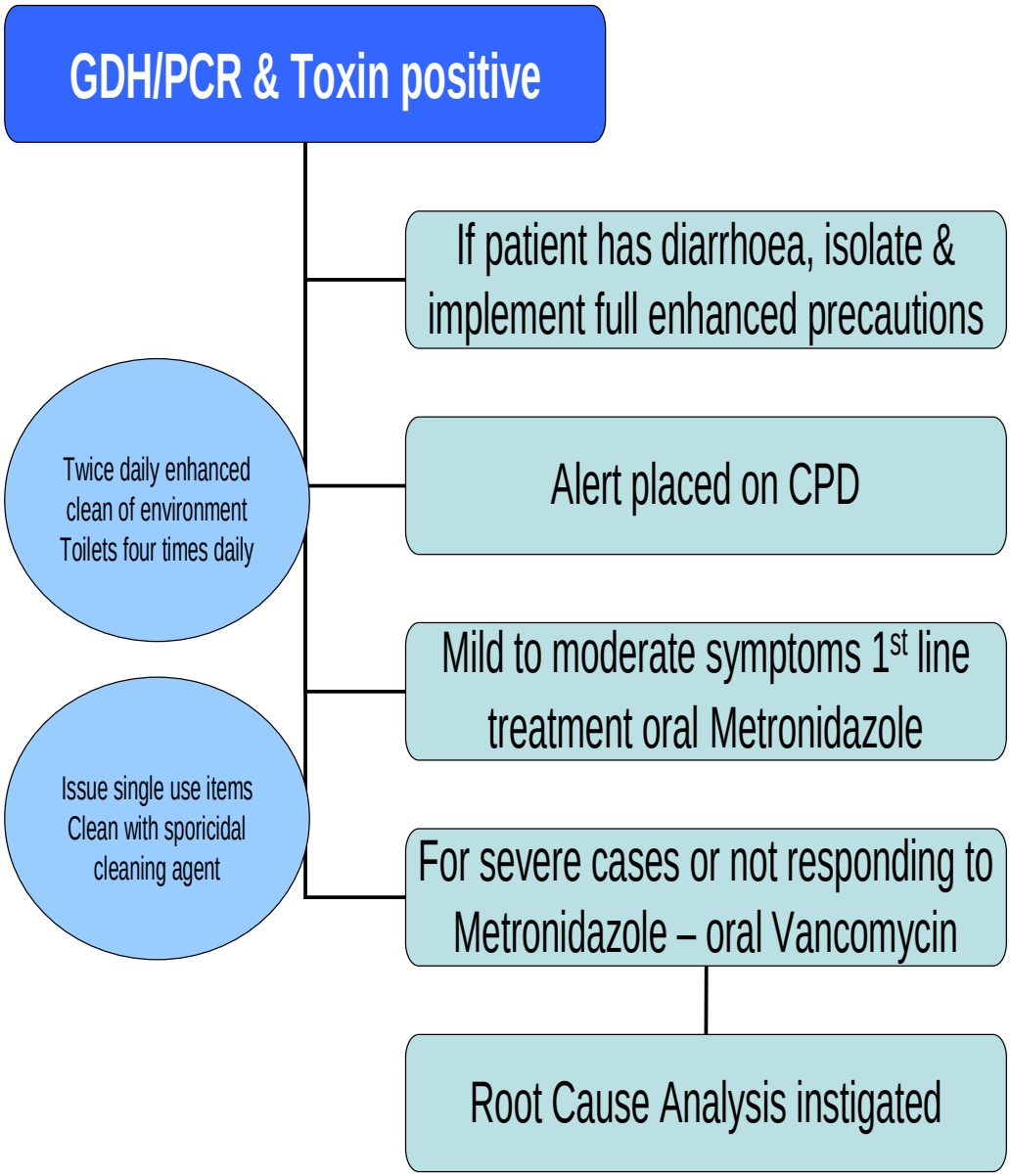
Clostridium difficile cycle



Appendix vii

York Teaching Hospital NHS
NHS Foundation Trust




GDH/PCR & Toxin positive
If patient has diarrhoea, isolate & implement full enhanced precautions
Twice daily enhanced clean of environment Toilets four times daily
Alert placed on CPD
Mild to moderate symptoms 1st line treatment oral Metronidazole
Issue single use items Clean with sporicidal cleaning agent
For severe cases or not responding to Metronidazole – oral Vancomycin
Root Cause Analysis instigated