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Replaces: Version 4 Management Of Clostridium difficile Infection (CDI) CORP/GUID/092	Description of amendments: Amendments throughout – main changes include C difficile treatment updated as per national guidelines and updated current sampling/ root cause analysis process	
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Blackpool Teaching Hospitals NHS Foundation Trust aims to design and implement services, policies and measures that meet the diverse needs of our service, population and workforce, ensuring that they are not placed at a disadvantage over others. The Equality Impact Assessment Tool is designed to help you consider the needs and assess the impact of your policy in the final Appendix.

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1 PURPOSE

The purpose of this document is to provide guidance on the management, prevention and control of *Clostridium difficile* infections (CDI) within the healthcare setting.

2 TARGET AUDIENCE

This document applies to all healthcare personnel working within the Blackpool Teaching Hospitals NHS Foundation Trust.

3 GUIDELINE

3.1 *Clostridium difficile* Infections (CDI):

Clostridium difficile is a spore-forming, Gram-positive anaerobic bacillus that produces exotoxins; causes gastrointestinal infections in human, and is shed in faeces.

C. difficile may be found in the large intestine of approximately 5 - 15% of population and about 20% of hospitalised patients.

The spores of *C. difficile* are resistant to heat, alcohol and other disinfectants and may therefore persist for months in the hospital ward environment. Ingestion of spores may occur after contact between patients or with a contaminated environment e.g. locker top, medical equipment, bed linen, or when transmitted on the hands of person attending to the patient.

Spectrum of disease: The range of infections in humans can be from asymptomatic colonisation to severe disease, including diarrhoea, pseudomembranous colitis, toxic megacolon, colonic perforation, and death. Morbidity can range from discomfort or embarrassment due to diarrhoea to severe septic illness and colectomy with resultant colostomy.

Case definition of *Clostridium difficile* infection (CDI): One or more episodes of stool **loose enough to take shape of container** (or Bristol stool chart types 5-7), not attributable to any other cause such as following use of laxatives, enteral feed, overflow etc and positive for *Clostridium difficile* toxin (CDT) assay and/or endoscopic evidence of pseudo-membranous colitis.

CDI – a diagnosis in its own right: Doctors should consider CDI as a ‘diagnosis in its own right’; stratify each confirmed case for severity, treat accordingly and review each patient daily, monitoring bowel function using Bristol stool chart.

Case definition of a *Clostridium difficile* outbreak: This must be discussed with the Consultant Microbiologist or Nurse Consultant. Number of cases clearly in excess of the basal rate for a ward and related to primary case.

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3.2 *Clostridium difficile* Infections (CDI):

Doctors and Nurses should follow the SIGHT protocol when managing potentially infective diarrhoea.

Suspect infective aetiology if no clear alternative cause of diarrhoea

Isolate the patient in a side room and discuss with infection control team at first opportunity

Gloves and aprons **MUST** be used for all contacts with the patient and their environment

Hand washing with soap before and after each contact with the patient and/or their environment (including case notes).

Test the stool (confirming to Bristol stool chart type 5-7) for *C. difficile* toxin (CDT) **immediately**.

Severity stratification: Refer appendix 2. Appropriate treatment of the patient should be planned after severity stratification.

Empiric prescription: Pending results of CDT test, symptomatic patients with strong clinical suspicion of CDI could be initiated on empiric treatment (refer Appendix 2).

Daily Review: Each patient with CDI should be reviewed daily by the clinical team, with fluid resuscitation, electrolyte replacement and nutrition review as necessary and monitored for daily frequency and signs of increasing severity.

Antibiotics other than those for treating CDI: In general, antibiotics other than those used to treat CDI should be stopped unless that places the patient at risk. Other drugs that may cause diarrhoea and anti-motility agents should also be stopped. Review the necessity of giving Proton pump inhibitors (PPI) (discontinue if possible).

Patient asymptomatic for 48-hours:

- The treatment should be continued at least to day 14.
- A clearance sample (post response) for CDT testing **must not** be sent to the laboratory.
- Additional barrier restrictions may be lifted, in consultation with the ICT. .
- Full clean (Barrier clean) of bed space after shifting a symptomatic CDT positive testing patient.

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3.3 Risk Factors:

- Elderly patient (>65 years)
- Multiple stays or Long length of stay in healthcare setting
- Recent use of antibiotics (commonly co-amoxiclav, quinolones, 2nd or 3rd G cephalosporins)
- Repeated courses and/or prolonged courses of any antibiotic could raise the risk for *C. Difficile*.
- Recent surgery (especially gastrointestinal surgery)
- Serious underlying disease or illness
- Immuno-compromising conditions
- Prolonged use of proton pump inhibitors.
- Poor cleaning or poor adherence to infection control practices.

3.4 Antibiotic Associated Diarrhoea (AAD) And Clostridium difficile Infection (CDI):

AAD: Use of antibiotics can be associated with loose stools.

CDI: *C. difficile* accounts for 15-25% of antibiotic associated diarrhoea. *C. difficile* disease is most frequently associated with use of antibiotics (commonly co-amoxiclav, fluoroquinolones or 2nd/3rd generation cephalosporins). The antibiotics disturb the balance of bacteria (normal gut flora) in the large bowel that enables the *C. difficile* bacteria to proliferate; produce toxins causing diarrhoea.

3.5 Laboratory Diagnosis: Clostridium difficile Toxin (CDT) Test

- Stool specimen pots from patients should ideally be at least 1/4 filled to indicate that the patient has diarrhoea (Bristol stool type 5-7 or sample taking the shape of container) MUST be sent immediately to the laboratory for *C.difficile* testing.
- Microbiology laboratory (Ext. 56951) offers testing 7days a week and twice a day. Samples that reach by 1130h & 1800h should get included in the test run.
- Positive results are communicated to Consultant Microbiologists, who would then discuss the management with the clinical team. Infection Control Nurses (during weekday working hours) would contact the ward nurses.
- Empiric treatment of CDI may be commenced in a patient with strong suspicion of moderate, severe or complicated CDI. Stool frequency may be a less reliable indicator in complicated / life threatening CDI.

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3.5.1 C. difficile Testing Algorithm:

The laboratory now offers the 2 test algorithm for when testing stool samples for *C. difficile* as recommended by DoH. Refer appendix 4

2 Test Algorithm	Interpretation	Include in Mandatory Reporting to HPA ¹
GDH + / CDT +	CDI is likely to be present	Yes
GDH + / CDT -	<i>C. difficile</i> could be present, so may have transmission potential. Patient could be potential <i>C. difficile</i> excretor.	No, but may be suitable for local reporting.
GDH - / CDT -	<i>C. difficile</i> or CDI is very unlikely to be present, so may have transmission potential. Patient could have other potential pathogens.	No

****GDH:** Glutamate Dehydrogenase positive indicates presence of *C. difficile* in specimen, but not necessarily indicate infection. **CDT:** *C. difficile* toxin positive indicates presence of *C. difficile* toxin and in presence of symptoms of CDI, indicates infection.

- **GDH positive, CDT negative patients:** the clinical team will be contacted either by the IPC team (or the consultant microbiologist), during weekday working hours. The patient should be isolated and management decisions will have to be tailored to each patient after discussion between the team and the consultant microbiologist. Repeat testing is occasionally required for clinical reasons to inform treatment decisions. This should be discussed with Consultant Microbiologist. Please do not send sample for repeat testing as a routine.
- **Re-testing CDT in a symptomatic and CDT positive patient:** Repeat testing is occasionally required for clinical reasons to inform treatment decisions. This should be discussed with Consultant Microbiologist. Please do not send sample for repeat testing as a routine.
- **A 24-hour turnaround time from sample collection to result availability is important.** Sample must be transported to laboratory without any delay, cyberlab request must clearly indicate:
 - Bleep or phone number and name of person requesting the test.
 - Any antibiotic use within previous 12-weeks
 - Any previous CDI episodes within current year
 - Result of previous *C. difficile* testing.
 - Severity of CDI

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3.6 Prevention Protocols for CDI:

- Prevention through isolation
- Prevention through environmental cleaning and disinfection
- Prevention of CDI through antibiotic prescriptions:

3.6.1 Patient and Family Communication:

Explanation to the patient and visitors of a GDH positive and CD toxin negative results as well as GDH positive and CD toxin positive result is essential. It is also important to maintain patients' dignity and confidentiality at all times. While information leaflets should be made available to the patient and visitors, the patient should be explained their condition and the importance of their isolation in a single room along with various precautions being observed by the attending staff. The visitors must be instructed to observe hand hygiene protocol and use aprons and gloves.

3.6.2 Patient Movement and Discharge:

- Symptomatic patients should not be moved between wards unless unavoidable. All patients with confirmed CDI, should be transferred to isolation ward – ward 8, unless there are patient safety or clinical reasons. Such reasons should be discussed with Consultant Microbiologist and/or infection prevention nurse consultant, during weekday working hours.
- For investigations, the staff of the receiving department should be informed and patient should be kept last on the list, the time in Department to a minimum and area / equipment MUST be cleaned thoroughly after use.
- For patient having CDI during their hospitalisation, a letter must be written to their GP (appendix 11). Patients will also have an e-discharge.
- Receiving hospital or care homes MUST be informed about the patients CDI status well in advance.

3.7 Key Points to Remember While Managing a Patient with CDI:

Follow SIGHT protocol while dealing with a patient with potentially infective diarrhoea – see 3.2

Upon confirmation of CDI, stop (if possible), other antibiotic agents (non CDI treating); PPIs, anti-motility agents.

Treatment based on severity stratification.

Daily assessment of patient including severity monitoring, bowel chart monitoring based on Bristol stool type; electrolytes, nutrition and fluid resuscitation.

Toilet / commode MUST be cleaned and disinfected with a chlorine containing solution (e.g. HazTab, Chlorclean or Acticlolor) or sporicidal wipes after each use.

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Full clean (Barrier Clean) of the area after patient discharge or once barrier nursing has been discontinued.

3.8 Key Performance Indicators

- Rates of Clostridium difficile infections are monitored monthly through the Health Care Associated Infection Data Capture System
- Rates of Clostridium difficile infections are reported to each Division on a monthly basis
- Rates of Clostridium difficile infections are reported bi-monthly to the Hospital Infection Prevention and Control Committee
- Each Division is performance managed on their Clostridium difficile infections rates

4 ATTACHMENTS	
Appendix Number	Title
Appendix 1	Duties and Responsibilities
Appendix 2	Severity stratification and treatment
Appendix 3a	Bowel Chart
Appendix 3b	Bristol Stool Form Scale
Appendix 4	Treatment of <i>Clostridium difficile</i> infection (1 st episode)
Appendix 5	Treatment of <i>Clostridium difficile</i> infection (2nd / recurrent episodes)
Appendix 6	Prevention through isolation, cleaning/disinfection & antibiotic prescription
Appendix 7	Algorithm for Management of a Patient with Unexplained Diarrhoea - <i>Suspected Clostridium difficile infection (CDI)</i>
Appendix 8	Antimicrobial agents that may induce CDI
Appendix 9	Surveillance and suggested audits
Appendix 10	Example of death certification
Appendix 11a-f	Sample discharge letter for GPs / another hospital
Appendix 12	Equality Impact Assessment Form

5 PROCEDURAL DOCUMENT STORAGE (HARD AND ELECTRONIC COPIES)
Electronic Database for Procedural Documents
Held by Procedural Document and Leaflet Coordinator

6 LOCATIONS THIS DOCUMENT ISSUED TO		
Copy No	Location	Date Issued
1	Intranet	20/04/2017
2	Wards, Departments and Service	20/04/2017

7 OTHER RELEVANT / ASSOCIATED DOCUMENTS	
Unique Identifier	Title and web links from the document library
CORP/PROC/418	Hand Hygiene procedure http://fcsp.xfyldecoast.nhs.uk/trustdocuments/Documents/CORP-PROC-418.docx

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7 OTHER RELEVANT / ASSOCIATED DOCUMENTS	
Unique Identifier	Title and web links from the document library
CORP/GUID/309	Antimicrobial Formulary – For the Management of Common Infections in Adults within General Medicine and Surgery http://fcsp.xfyldecoast.nhs.uk/trustdocuments/Documents/CORP-GUID-309.docx

8 SUPPORTING REFERENCES / EVIDENCE BASED DOCUMENTS	
References In Full	
1.	Public Health England. (01/06/2013). Clostridium difficile infection: guidance on management and treatment. Available: https://www.gov.uk/government/publications/clostridium-difficile-infection-guidance-on-management-and-treatment . Last accessed 26/04/2017.
2.	Health Protection Scotland. (01/10/2014). Guidance on Prevention and Control of Clostridium difficile Infection (CDI) in healthcare settings in Scotland. Available: http://www.hps.scot.nhs.uk/haic/sshaip/resourcedetail.aspx?id=184# . Last accessed 26/04/2017..
3.	ESCMID guideline: update of the treatment guidance document for Clostridium difficile infection. Clin Micro Infect 2013
4.	NICE – interventional procedure overview of faecal transplant for recurrent Clostridium difficile infection. July 2013
5.	NICE . Clostridium difficile infection: risk with broadspectrum antibiotics. March 2015
6.	Start Smart then Focus. March 15 <Accessed 30.1.17> https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/417032/Start_Smart_Then_Focus_FINAL.PDF
Department of Health. (1999). Saving Lives: Our Healthier Nation. Available: https://www.gov.uk/government/publications/saving-lives-our-healthier-nation . Last accessed 26/04/2017.	

9 CONSULTATION / ACKNOWLEDGEMENTS WITH STAFF, PEERS, PATIENTS AND THE PUBLIC		
Name	Designation	Date Response Received
	Whole Health Infection Prevention Committee (WHIPC)	10/03/2017
	Medicine Management and Safety Review Committee	20/04/2017

10 DEFINITIONS / GLOSSARY OF TERMS	
AAD	Antibiotic Associated Diarrhoea
AMT	Antimicrobial management team (Microbiologist, antibiotic pharmacist, Information technology specialist)
CCG	Clinical Commissioning Group
CDAD	<i>Clostridium difficile</i> associated diarrhoea
CDI	<i>Clostridium difficile</i> infections
CDT	<i>Clostridium difficile</i> toxin assay
DIPC	Director of infection prevention and control
GDH	Glutamate Dehydrogenase
HIPCC	Hospital infection prevention and control committee

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10 DEFINITIONS / GLOSSARY OF TERMS	
IPCT	Infection prevention and control team
MCRT	Multi-disciplinary clinical review team (Microbiologist, Gastroenterologist, Surgeon, infection control nurse, nutritionist)
PPI	Proton pump inhibitors

11 AUTHOR / DIVISIONAL / DIRECTORATE MANAGER APPROVAL			
Issued By	Dr Achyut Guleri	Checked By	Alastair Gibson
Job Title	Consultant Microbiologist	Job Title	Director of Pharmacy
Date	October 2016	Date	November 2016

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APPENDIX 1: DUTIES AND RESPONSIBILITIES

1. Trust Board

- The board will ensure that the guideline is implemented
- Must support the control and reduction of CDI, prioritising the management of patient risk and ensuring that the patient safety is not compromised by the pursuit of other strategic objectives.
- Must ensure that infection prevention and control education and training of all healthcare personnel actually happens and is informed by audit.

2. Should ensure that isolation capacity matches demand. Optimal utilization of the isolation ward is essential to prevent environmental contamination unless there is clinical justification for not moving the patient to ward 8, in which case, the patient's care should be discussed with infection prevention team.

3. The Chief Executive

- The Chief Executive will ensure that the guideline is implemented in all areas and will ensure that the effectiveness of the guideline is constantly reviewed through regular audit once the guideline is issued trust wide

4. Director of Nursing and Quality

- Should ensure each clinical area is covered by link nurse who will have ring-fenced time to train, audit and feedback to staff on isolation, hand-hygiene, cleaning and protective clothing practices.
- Must ensure cleanliness in all clinical areas is assessed through regular audits and the results discussed at meetings of infection control team, cleaning staff and matrons on a regular basis.

5. Executive/Clinical Directors

- Executive and Clinical Directors have the responsibility for the co-ordination of health and safety activities and for ensuring that decisions are implemented in accordance with this policy.
- Should ensure daily review of drug charts by ward pharmacist to check compliance with antibiotic formulary and 5-day stop policy for all empiric antibiotic prescriptions;

5. Consultants

- Should consider CDI as a diagnosis in its own right, conduct severity stratification, treat appropriately and review each patient with daily monitoring of bowel function using Bristol Stool Chart.
- Should review antibiotic prescriptions and ensure appropriateness of antibiotics used.

6. Antimicrobial Management Team:

- This should be commissioned by CCG in each trust.
- Consist of Consultant Microbiologist, Antibiotic pharmacist and information technology specialist

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APPENDIX 1: DUTIES AND RESPONSIBILITIES

6. Root cause Analysis:

- An RCA is to be completed by the treating Consultant, Directorate Manager and Matron within 5-working days of notification of the positive result.
- The findings of the RCA shall be discussed at a Post Infection Review (PIR) panel meeting which is chaired by the Director of Infection Prevention and control (DIPC) and attended by representatives from the local Clinical Commissioning Groups (CCG), to determine whether or not there have been any lapses in care.
- Any lapses in care or learning points shall be communicated by letter to the Clinical Director of the relevant Division with the expectation that this information will be cascaded throughout the Division.
- Clinical Directors should then provide feedback to the Whole Health Infection Prevention Committee (WHIPC) in relation to any actions the Division has taken to address these issues.

7. DIPC / The Hospital Infection Prevention and Control Committee

- The hospital infection prevention committee has a responsibility to ensure that this policy allows the Trust to comply with directions and guidance from the Department of Health and other bodies.

9. The Infection Prevention and Control Team (IPCT)

- The IPCT will audit and support local audit of compliance with the policy as part of the infection control audit programme.

10. Managers and Supervisors

- Have a responsibility to ensure staff and new starters are aware of and comply with this guidance on CDI within this document.

11. Employees

- Have a responsibility to abide by this policy. This policy is enforceable through Health and Safety legislation and Trust disciplinary procedures. If employees are aware that the policy is not being complied with they must first take the issue to their line manager and if the problem is not resolved to the infection control team.

12. Clinical Commissioning Groups:

- Should commission an ANTIMICROBIAL MANAGEMENT TEAM (AMT) consisting of Consultant Microbiologist, antimicrobial pharmacist and an information technology specialist.
- Must ensure collection of data and meet regularly to discuss cases of CDI from community.
- Role and responsibility of AMT referred above.

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APPENDIX 2: SEVERITY STRATIFICATION AND TREATMENT:		
All severe, complicated, life threatening and recurrent cases MUST be discussed with the Microbiologist or the Multidisciplinary clinical review team at first opportunity.		
Severity	Features	Treatment
MILD	<ul style="list-style-type: none"> • ≤3 stools/day; • Bristol type 5 – 7; • Normal WCC 	Oral Metronidazole 400mg 8-hourly X 14 days
MODERATE	<ul style="list-style-type: none"> • 3-5 stool/day; • Bristol type 5-7; • WCC raised but <15 	
SEVERE	<ul style="list-style-type: none"> • WCC >15 OR • Temp >38.5°C OR • Acute rising serum creatinine (>50% above baseline) OR • Hypoalbuminaemia (<25g/L) • Evidence of severe colitis (abdominal or radiological signs). • pseudomembranes on colonoscopy <p><u>Number of stools may be a less reliable indicator of severity.</u></p>	Oral / Nasogastric (NG) Vancomycin 125 mg 6-hourly X 14 days
COMPLICATED /LIFE THREATENING (Discuss with Microbiologist/ Gastro-enterologist)	<ul style="list-style-type: none"> • hypotension OR • partial ileus OR • CT evidence of severe disease • Complete ileus OR • Toxic megacolon 	Vancomycin 125-500mg NG/PO q6h +/- metronidazole IV 500mg q8h for 14days*
1st / 2nd Recurrence		<u>Mild/ Moderate:</u> : Vancomycin 125mg PO/NG q6h for 14 days <u>Severe infection:</u> Vancomycin 125mg PO/NG q6h plus Metronidazole 500mg q8h IV for 14 days
Subsequent Recurrence		Vancomycin Tapering Course should be used only after discussion with microbiologist during working hours
<ul style="list-style-type: none"> • IV Vancomycin is NOT indicated for treatment of CDI. • IV or oral Metronidazole may be used for treatment of CDI (oral is the preferred option) • Oral, nasogastric or rectal instillation of Vancomycin may be used in complicated / severe CDI • Parenteral preparation of Vancomycin may be used for oral use. It is cheaper and equally effective. • In patient specific situations – alternatives such as intracolonic vancomycin, pulse/taper regimes, fidaxomycin, faecal transplant, etc. may be discussed with consultant microbiologist 		

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APPENDIX 3B: THE BRISTOL STOOL FORM SCALE

Type 1



Separate hard lumps like nuts (hard to pass) **CONSTIPATION**

Type 2



Sausage-shaped but lumpy
TENDING TOWARDS CONSTIPATION

Type 3



Like a sausage but cracks on the surface
'NORMAL' STOOL – EASY TO PASS

Type 4



Like a sausage or snake, smooth and soft
'NORMAL' STOOL – EASY TO PASS

Type 5



Soft blobs with clear-cut edges (easily passed)
TENDING TOWARDS DIARRHOEA

Type 6



Fluffy pieces with ragged edges, a mushy stool
TENDING TOWARDS DIARRHOEA

Type 7



Watery, no solids pieces, entirely liquid
- DIARRHOEA

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**** Bristol stool type 5 – 7 or stool assuming shape of container – appropriate sample for CDT testing**

Evidence Links:

1. Heaton.K.W., Radvan J., Cripps H. *et al* (1992) Defecation frequency and timing and stool form in the general population: a prospective study. *GUT*. **33**: 818 - 824. Bristol Stoll Scale (1997) Heaton and Lewis. *Scandinavian Journal of Gastroenterology*
2. *Clostridium difficile* Infection: How to deal with the problem. A Board to Ward Approach. A report to the Department of Health from the Steering Group on Health Care Associated Infection. 2008
3. Health Protection Agency. July 2006 Mandatory Surveillance of Health Care Associated Infections 2006

National *Clostridium difficile* Standards Group (2003) Report to the Department of Health

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APPENDIX 4: TREATMENT OF CLOSTRIDIUM DIFFICILE INFECTION (1ST EPISODE)

Clostridium difficile infection (CDI) 1st episode

Diarrhoea and one of the following:
 GDH & Clostridium difficile toxin (CDT) test +ve OR
 Lab test for GDH/CDT pending AND clinical suspicion of *C. difficile* infection(CDI)

- Ideally discontinue non- *C. difficile* antibiotics to allow normal intestinal flora to re-establish; avoid anti-motility agents; hydration
- Suspected case/s must be isolated in single room or cohort nursed
- Inform infection control team (Ext 22120 / 22051 or through switch)
- Severity stratification and treatment plan.
- Refer all severe/complicated/recurrent cases to Microbiologist

Symptoms/signs: non-severe CDI
 (≤ 5 stools/d; Bristol chart 5-7; WCC<15)
 Metronidazole 400mg PO q8h X 14d;

Symptoms/signs: severe CDI
 (WCC>15 or acute rising creatinine and/or colitis
 Vancomycin 125mg PO/NG q6h X 14d

Daily Assessment
 (include stool chart, review of fluid / electrolytes)

Symptoms improving
 Diarrhoea should resolve in 1-2 weeks
 Recurrence occurs in ~20% after 1st episode; 50-60% after 2nd episode

Symptoms not improving or worsening
 (Should not normally be deemed a treatment failure until day 7 of treatment)
 However, if evidence of severe CDI continues or worsens

In case with severe colitis or pseudomembranes on colonoscopy:
 Vancomycin 125-500mg PO/NG q6h plus
 Metronidazole 500mg q8h IV for 14 days
 * Number of stools may be less reliable indicator of severity
AND Surgery / GI / Microbiology CONSULT

Symptoms not improving or worsening
Should not be deemed a treatment failure until day 7 of treatment
 However, if evidence of severe CDI (WCC>15 or acute rising creatinine or signs/symptoms of colitis

Switch to oral Vancomycin 125mg q6h 14 days
And
Discuss with Microbiologist

Further Surgery / GI / Microbiology consultation

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APPENDIX 5: TREATMENT OF CLOSTRIDIUM DIFFICILE INFECTION (2ND / RECURRENT EPISODES)

**Recurrent *Clostridium difficile* infection (CDI)
≥ 2 episodes**

Diarrhoea and one of the following:
GDH & Clostridium difficile toxin (CDT) test +ve OR
 clinical suspicion of *C.difficile* infection (CDI) in a previous CDI patient, pending confirmation lab test GDH+/CDT+

- **MUST** discontinue non - *C. difficile* antibiotics if at all possible to allow normal intestinal flora to re-establish.
- Review all drugs with gastrointestinal activity or side effects (stop PPIs unless required acutely)
- Suspected case/s with diarrhoea must be isolated
- Must refer all complicated/life threatening/recurrent cases to Microbiologist
- Inform infection control team (Ext 22120 / 22051/bleep or through switch)

Symptoms/signs: non-severe CDI
 (≤ 5 stools/d; Bristol chart 5-7; WCC<15)
Vancomycin 125mg PO q6h X 14days

If severe CDI suspected/ documented
 (see [algorithm for 1st episode of CDI](#))

Daily Assessment
 (include stool chart, review of fluid / electrolytes)

Symptoms improving
 Diarrhoea should resolve in 5-10 d
 Recurrence occurs in ~20% after 1st episode; 40-60% after 2nd episode

IF MULTIPLE RECURRENCES ESPECIALLY IF EVIDENCE OF MALNUTRITION, WASTING, etc

1. Review ALL antibiotic and other drug therapy (consider stopping PPIs and/or other GI active drugs)
2. Discuss with consultant microbiologist for further treatment options

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APPENDIX 6: PREVENTION THROUGH ISOLATION, CLEANING/DISINFECTION & ANTIBIOTIC PRESCRIPTION

Prevention through isolation:

- 3.6 Patients with clinical suspicion of infective diarrhoea should be immediately moved into a side-room with self-contained toilet/commode and its own wash basin and stool sample sent immediately for GDH & CDT testing.
- 3.6 All staff and visitors entering an isolation-room MUST use gloves and aprons for all contact with the patient and /or patient's environment.
- 3.6 Hand-hygiene in prevention of CDI: Hands should be washed with soap and water before and after contact with patient/patient environment incl. case notes. An alcohol gel can be used after washing hands. This MUST not be used as an alternative to soap.
- 3.6 If isolation in side-room is not possible the infection prevention team must be informed at the first opportunity (Bleep or contact through switch board). Any out-of-hours queries can be discussed with Microbiologist on call.
- 3.6 All clinical waste and linen from patients with CDI should be considered contaminated, including bedding and adjacent curtains.
- 3.6 Risk of cross-infection from a patient with CDI to other patients in an ambulance is minimal so long as good infection control practices are observed. Faecal soiling should be cleaned with chlorine-containing agents.
- 3.6 Handling of deceased patients require similar level of infection control precautions. Faecal soiling should be cleaned first with detergent and then with chlorine based cleaning agent. Provided good infection control practices are observed, risk of cross-infection to mortuary staff or undertakers is minimal.

3.6 Prevention through environmental cleaning and disinfection

- 3.6.1 At least daily cleaning of rooms or bed spaces of CDI patients should be carried out using chlorine containing agents (at least 1000 ppm available chlorine)
- 3.6.2 After each use – all commodes, toilets and bathroom are should be cleaned using chlorine containing agents (at least 1000 ppm available chlorine) or sporicidal wipes
- 3.6.3 Quarterly environmental audits of all clinical areas (esp. toilets and bathrooms) MUST be carried out and fed back to clinical and cleaning teams. Infection control and cleaning staff should meet at least quarterly.
- 3.6.4 Full clean (Barrier or terminal clean) of bed space, bay or ward area after the discharge of patient with CDI or when symptoms have resolved should be thorough, using chlorine based agents and curtains changed (and UVC clean where possible)
- 3.6.5 Ward environment should not be cluttered; medical equipment should ideally be single patient use or thoroughly cleaned after and before patient use.
- 3.6.6 Director of Nursing should ensure each clinical area is covered by an infection prevention champion and this person will have ring-fenced time to train, audit, and feed back to staff on cleaning, isolation, hand-hygiene and protective clothing practices.

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APPENDIX 6: PREVENTION THROUGH ISOLATION, CLEANING/DISINFECTION & ANTIBIOTIC PRESCRIPTION

3.7 Prevention of CDI through antibiotic prescription

3.7.1 CCGs should commission an antimicrobial management team (AMT) consisting of a consultant Microbiologist, antimicrobial pharmacist and an information technology specialist. CCGs should ensure that funding for antimicrobial pharmacist currently in post should continue or commission posts when there are none.

3.7.2 The Trust should, through AMT, develop 'restrictive narrow-spectrum antibiotic guidelines', antibiotic review/stop policy and support antibiotic stewardship program; develop programmes to capture and feedback to directorates & ward data on antibiotic consumption (in defined daily doses per 1000 bed days).

3.7.3 All consultants should be responsible for reviewing empiric antibiotic prescription at 48-hours, stopping unnecessary prescriptions, changing those non-compliant with trust antibiotic guideline, change from IV to oral or to targeted narrow spectrum agent based on laboratory result.

3.7.4 Clinical Directors should ensure good antimicrobial practice through - Daily review of drug charts by ward pharmacists to check compliance with guidelines and discuss deviations with prescribing doctor with support of AMT.

WARD / BAY (Partial) CLOSURE: Closure of beds to further admission and restriction on staff / patient movement to/from affected area may be advised by the infection prevention team.

- This should be discussed with the duty director of operations.
- This advice may be communicated by telephone from Nurse consultant / DIPC or Microbiologist to nurse in charge of affected area and duty manager.
- E-mail sent to key personnel.
- Re-direction of admissions to be in consultation with ICT
- Daily review of situation to be undertaken by ICNs within normal working hours
- E-mail update of situation following review with DIPC to be cascaded to key personnel (as above). E-mail to include update of current situation, environmental decontamination, staff or patient restrictions and any potential plans to re-open the affected area.

Re-opening of beds **should** only occur in consultation with the ICT and following environmental decontamination as advised by ICT (**terminal cleaning**).

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APPENDIX 7: ALGORITHM FOR MANAGEMENT OF A PATIENT WITH UNEXPLAINED DIARRHOEA - SUSPECTED *CLOSTRIDIUM DIFFICILE* INFECTION (CDI)

If a patient has diarrhoea (Bristol Stool Chart types 5-7) that is not clearly attributable to an underlying condition (e.g. inflammatory colitis, overflow) or therapy (e.g. laxatives, enteral feeding) then it is necessary to determine if this is due to CDI. If in doubt please seek advice.

This pathway relates to the diagnosis of CDI. Patients should be considered for treatment of CDI *before* test results are available, particularly if symptoms / signs indicate severe infection. Patients with suspected infectious diarrhoea should be isolated to prevent the transmission of *C. difficile*, norovirus or other transmissible pathogens.

Ideally isolate patient in a single room - if unable to do this within 2 hours escalate the problem.

Collect stool specimen & send to Microbiology

In order for the specimen to be processed for *C. difficile* the sample must take on the shape of the container and ideally be at least ¼ filled (to indicate the patient has diarrhoea).

Diarrhoeal samples should be tested for *C. difficile* from:
 * hospital patients aged ≥ 2 years, and,
 * community patients, aged ≥ 65 years, and
 * community patients aged < 65 years wherever clinically indicated.

GDH EIA positive, toxin EIA positive:

CDI is likely to be present,

- **for mandatory reporting to HPA,***

OR

GDH EIA positive, toxin EIA negative:

C. difficile could be present i.e. potential *C. difficile* excretor,

- **not for mandatory reporting** (but may have transmission potential and be suitable for local reporting);

OR

GDH EIA negative, toxin EIA negative: *C. difficile* or

CDI is very unlikely to be present,

- **not for mandatory reporting** but may have transmission potential (other pathogens)

* Please note other indications for mandatory reporting of CDI.

Refer to the following local policies:

- Remember the **SIGHT** list (see bottom of page)
- *Clostridium difficile* Policy
- *Clostridium difficile* Treatment Guideline
- Source Isolation Policy
- Source Isolation Cleaning Policy

Consider other causes of diarrhoea. Consider continuation of single room isolation and other measures to reduce risk of CDI.

S	Suspect that a case may be infective when there is no clear alternative cause for diarrhoea
I	Isolate the patient within 2 hours
G	Gloves and aprons must be used for all contacts with the patient and their environment
H	Hand washing with soap and water should be carried out before and after each contact with the patient and the patient's environment
T	Test the stool for <i>C. difficile</i> by sending a specimen immediately

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APPENDIX 8: ANTIMICROBIAL AGENTS THAT MAY INDUCE CDI

Frequently	Occasionally	Rarely
Ciprofloxacin	Clarithromycin	Aminoglycosides
Levofloxacin	Erythromycin	IV Vancomycin
Ceftriaxone	Trimethoprim	Teicoplanin
Cefuroxime	Penicillin V	Tetracyclines
Augmentin	Benzyl penicillin	Metronidazole
Amoxicillin	Meropenem	
	??Clindamycin	
	Piperacillin-tazobactam	

Multiple courses or prolonged courses of any antibiotic could raise the risk for CDI. Antibiotics must always be used cautiously, optimally and reviewed regularly. Narrow spectrum antibiotic should be preferred to broad spectrum agent to reduce the CDI risk. Empiric antibiotics should be reviewed as per Start Smart then Focus Document.

Clindamycin: In original papers Clindamycin was associated with a high-risk of causing CDI. However, recent clinical experience has been more favourable. A multidisciplinary audit on CDI and associated risk factors (Author: Dr Guleri, et al) did not observe association of Clindamycin in 62 - patients with CDI.

Meropenem: In-vitro resistance to carbapenems in local strains of C. difficile sent to reference laboratory for typing, recent literature and audit (ref above) have shown increasing association between carbapenem use and CDI.

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APPENDIX 9: SURVEILLANCE AND SUGGESTED AUDITS

Surveillance:

- Department of Health **C. difficile** mandatory reporting system of all cases of CDT positive diarrhoea in patients **over 2-years** of age.
 - Laboratory protocol for testing only diarrhoea samples (Bristol stool chart type 5-7 / taking shape of container)
 - All community samples for >65-years and <65-years if indicated **MUST** be tested. Clear differentiation between hospital and community diagnosed cases should be provided by the laboratory.
- **Continuous local surveillance of cases with CDI:** Capturing and feeding back to directorates, wards and units on a **monthly** basis with analysis of trends and exceptional events. Discussion should be standing item on agenda for directorate meetings.
 - **Monthly or at least quarterly** these reports should be discussed in hospital infection prevention and control committee meetings and trust board meetings
 - **Outbreak** and comparatively high numbers of CDI must be reported as Serious Untoward Incidents (SUIs) to local health protection unit and SHA and be subjected to root cause analysis.
 - **Local surveillance must include:**
 - Number of patients with severe infection
 - Number of patients requiring surgery
 - Number of patients dying where CDI caused or contributed to the death
 - (A regular review should be conducted of deaths within 30-days of diagnosis of CDI to ensure compliance to standards of death certification in relation to CDI).
 - Attached example of death certification
 - This will be facilitated by the multidisciplinary clinical review team (MCRT)
 - Storage of CDT positive samples at –20C is recommended for one year to enable retrospective study.

SUGGESTED AUDITS:

- DH Saving Lives High-impact intervention area 7
- Multidisciplinary and patient centred audit on CDI, associated risk factors and outcomes
- DoH CDI mortality audit
- Vertical audit to monitor compliance to turn around time of CDT testing from sample collection to report within 24-hrs.
- Antimicrobial Management Team: Capturing association data on antimicrobial consumption and CDT rates and feeding back to directorates and wards.
- Audit of compliance to 'revised antimicrobial formulary'
- Audit of compliance to 5-day stop/48-hour review empiric antimicrobial policy.

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APPENDIX 10: EXAMPLE OF DEATH CERTIFICATION

Example A:

If a healthcare associated infection (HCAI) was part of the sequence leading to death, it should be written in part I of the certificate, and you should include all the conditions in the sequence of events back to the original disease being treated.

- Ia. *Clostridium difficile* pseudomembranous colitis
- Ib. Multiple antibiotic therapy
- Ic. Community acquired pneumonia with severe sepsis

II. Immobility, Polymyalgia Rheumatica, Osteoporosis

Example B:

If your patient had a HCAI that was not a part of the direct sequence, but which you think contributed at all to their death, it should be mentioned in part II

- Ia. Bronchopneumonia
 - Ib. Carcinomatosis and renal failure
 - Ic. Adenocarcinoma of the prostate
- II. *Clostridium difficile* infection secondary to antibiotic therapy for recurrent bronchopneumonia

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APPENDIX 11A: SAMPLE DISCHARGE LETTER FOR GPS / TRANSFER TO ANOTHER HOSPITAL WHERE PATIENT GDH POSITIVE

Date:

Dear Dr.

Re:

Your patient was found to be GDH positive while testing negative for Clostridium difficile toxin. This implies that the patient is colonised with C.difficile and is at an increased risk of developing the infection.

After an MDT discussion, your patient has been treated/or not treated with:

.....(antibiotic)

.....(dose)

.....(duration)

to which the patient responded / did not respond.

This infection is almost exclusively associated with the use of antibiotics. Therefore, there are some key points you can address to minimise the risk of these patients from developing symptomatic disease:

- Ensuring that patients receive adequate dietary advice.
- Prudent antibiotic prescribing is crucial including reviewing the need for antibiotics, if at all.
- Choosing narrow spectrum antibiotics over broad spectrum antibiotics
- Using antibiotics that are associated with a lower risk of precipitating CDI
- Emphasizing the need for hand hygiene to the patient particularly before meals and after using toilet facilities
- Using household bleach to clean toilet facilities if patients are still symptomatic

Follow-up samples for clearance are not required.

For further advice on antimicrobial prescribing the Consultant Microbiologist may be contacted through the switchboard on 01253 953777 (during working hours).

For infection prevention advice please contact 01253 953874.

Yours sincerely,

Director of Infection Prevention & Control

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APPENDIX 11B: SAMPLE DISCHARGE LETTER FOR GPS / TRANSFER TO ANOTHER HOSPITAL WHERE PATIENT CDI POSITIVE

Date:

Dear Dr.

Re:

During the inpatient stay your patient was diagnosed as having Clostridium difficile infection (CDI) and was treated with:

.....(antibiotic)

.....(dose)

.....(duration)

to which the patient responded / did not respond.

This infection is almost exclusively associated with the use of antibiotics. Having had CDI once the patient is at increased risk of either relapse or recurrence of this infection. Therefore, there are some key points you can address to minimize the risk:

- Ensuring that patients receive adequate dietary advice.
- Prudent antibiotic prescribing is crucial including reviewing the need for antibiotics, if at all.
- Choosing narrow spectrum antibiotics over broad spectrum antibiotics
- Using antibiotics that are associated with a lower risk of precipitating CDI
- Emphasizing the need for hand hygiene to the patient particularly before meals and after using toilet facilities
- Using household bleach to clean toilet facilities if patients are still symptomatic
- If your patient is symptomatic on discharge they will be followed up in the community by an infection prevention nurse

Once the patient has recovered, follow-up samples for clearance are not required.

For further advice on antimicrobial prescribing the Consultant Microbiologist may be contacted through the switchboard on 01253 953777 (during working hours).

For infection prevention advice please contact 01253 953874.

Yours sincerely,

Director of Infection Prevention & Control

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APPENDIX 11C: SAMPLE LETTER FOR GPS WHERE GP SAMPLE TESTED GDH POSITIVE

Date:

Dear Dr.

Re:

Your patient was found to be GDH positive while testing negative for Clostridium difficile toxin. This implies that the patient is colonised with C.difficile and is at an increased risk of developing the infection.

This infection is almost exclusively associated with the use of antibiotics. Therefore, there are some key points you can address to minimise the risk of these patients from developing symptomatic disease:

- Ensuring that patients receive adequate dietary advice.
- Prudent antibiotic prescribing is crucial including reviewing the need for antibiotics, if at all.
- Choosing narrow spectrum antibiotics over broad spectrum antibiotics
- Using antibiotics that are associated with a lower risk of precipitating CDI
- Emphasizing the need for hand hygiene to the patient particularly before meals and after using toilet facilities
- Using household bleach to clean toilet facilities if patients are still symptomatic

Follow-up samples for clearance are not required.

For further advice on antimicrobial prescribing the Consultant Microbiologist may be contacted through the switchboard on 01253 953777 (during working hours).

Yours sincerely,

Director of Infection Prevention & Control

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APPENDIX 11D: SAMPLE LETTER FOR GPS WHERE GP SAMPLE TESTED CDI POSITIVE

Date:

Dear Dr.

Re:

Your patient has tested positive for Clostridium difficile toxin which is indicative of a CDI.

This infection is almost exclusively associated with the use of antibiotics. Having had CDI once the patient is at increased risk of either relapse or recurrence of this infection. Therefore, there are some key points you can address to minimize the risk:

- Ensuring that patients receive adequate dietary advice.
- Prudent antibiotic prescribing is crucial including reviewing the need for antibiotics, if at all.
- Choosing narrow spectrum antibiotics over broad spectrum antibiotics
- Using antibiotics that are associated with a lower risk of precipitating CDI
- Emphasizing the need for hand hygiene to the patient particularly before meals and after using toilet facilities
- Using household bleach to clean toilet facilities if patients are still symptomatic

Once the patient has recovered, follow-up samples for clearance are not required.

For further advice on antimicrobial prescribing the Consultant Microbiologist may be contacted through the switchboard on 01253 953777 (during working hours).

Yours sincerely,

Director of Infection Prevention & Control

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APPENDIX 11E: SAMPLE LETTER FOR CONSULTANT WHERE INPATIENT SAMPLE TESTED GDH POSITIVE

Date:

Dear Dr.

Re:

Your patient was found to be GDH positive while testing negative for Clostridium difficile toxin. This implies that the patient is colonised with C.difficile and is at an increased risk of developing the infection. Your team will be contacted by a consultant microbiologist to discuss individual patient management.

As you are aware this infection is almost exclusively associated with the use of antibiotics. Therefore, there are some key points you can address to minimise the risk of these patients from developing symptomatic disease:

- Prudent antibiotic prescribing is crucial including reviewing the need for antibiotics, if at all.
- Choosing narrow spectrum antibiotics over broad spectrum antibiotics
- Using antibiotics that are associated with a lower risk of precipitating CDI.
- Ensuring that patients receive adequate nutrition. .
- Emphasizing the need for hand hygiene to the patient.

Follow-up samples for clearance are not required.

For infection prevention advice please contact the IP nursing team on 01253 303874.

Yours sincerely,

Director of Infection Prevention & Control

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APPENDIX 11F: SAMPLE LETTER FOR CONSULTANT WHERE INPATIENT SAMPLE TESTED CDI POSITIVE

Date:

Dear Dr.

Re:

Your patient has been diagnosed as having Clostridium difficile infection (CDI). Though the management of the patient and subsequent treatment for CDI will be guided by the patient's clinical condition using the disease severity stratification as outlined in the antimicrobial formulary, it would still be very useful to consider the following: -

Having had CDI once the patient is at increased risk of either relapse or recurrence of this infection. Therefore, there are some key points you could address to minimize the risk if your patient requires further antibiotic treatment whilst still an inpatient:

- Prudent antibiotic prescribing is crucial including reviewing the need for antibiotics, if at all.
- Choosing narrow spectrum antibiotics over broad spectrum antibiotics.
- Using antibiotics that are associated with a lower risk of precipitating CDI.
- Emphasizing the need for hand hygiene to the patient.
- Ensuring that patients receive adequate nutrition.
- If your patient is symptomatic on discharge they will be followed up in the community by an infection prevention nurse.

Once the patient has recovered, follow-up samples for clearance are not required.

For further discussion on antimicrobial prescribing please contact the Consultant Microbiologist through switchboard.

For infection prevention advice please contact the IP nursing team on 01253 953874.

Yours sincerely,

Director of Infection Prevention & Control

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APPENDIX 12: EQUALITY IMPACT ASSESSMENT FORM					
Department	Organisation Wide	Service or Policy	Guideline	Date Completed:	October 2012
GROUPS TO BE CONSIDERED					
Deprived communities, homeless, substance misusers, people who have a disability, learning disability, older people, children and families, young people, Lesbian Gay Bi-sexual or Transgender, minority ethnic communities, Gypsy/Roma/Travellers, women/men, parents, carers, staff, wider community, offenders.					
EQUALITY PROTECTED CHARACTERISTICS TO BE CONSIDERED					
Age, gender, disability, race, sexual orientation, gender identity (or reassignment), religion and belief, carers, Human Rights and social economic / deprivation.					
QUESTION	RESPONSE			IMPACT	
	Issue	Action	Positive	Negative	
What is the service, leaflet or policy development? What are its aims, who are the target audience?	The Procedural Document is to ensure that all members of staff have clear guidance on processes to be followed. The target audience is all staff across the Organisation who undertakes this process.	Raise awareness of the Organisations format and processes involved in relation to the procedural document.	Yes – Clear processes identified		
Does the service, leaflet or policy/ development impact on community safety • Crime • Community cohesion	Not applicable to community safety or crime	N/A	N/A		
Is there any evidence that groups who should benefit do not? i.e. equal opportunity monitoring of service users and/or staff. If none/insufficient local or national data available consider what information you need.	No	N/A	N/A		
Does the service, leaflet or development/ policy have a negative impact on any geographical or sub group of the population?	No	N/A	N/A		
How does the service, leaflet or policy/ development promote equality and diversity?	Ensures a cohesive approach across the Organisation in relation to the procedural document.	All policies and procedural documents include an EA to identify any positive or negative impacts.			
Does the service, leaflet or policy/ development explicitly include a commitment to equality and diversity and meeting needs? How does it demonstrate its impact?	The Procedure includes a completed EA which provides the opportunity to highlight any potential for a negative / adverse impact.				
Does the Organisation or service workforce reflect the local population? Do we employ people from disadvantaged groups	Our workforce is reflective of the local population.				
Will the service, leaflet or policy/ development i. Improve economic social conditions in deprived areas ii. Use brown field sites iii. Improve public spaces including creation of green spaces?	N/A				
Does the service, leaflet or policy/ development promote equity of lifelong learning?	N/A				
Does the service, leaflet or policy/ development encourage healthy lifestyles and reduce risks to health?	N/A				
Does the service, leaflet or policy/ development impact on transport? What are the implications of this?	N/A				
Does the service, leaflet or policy/development impact on housing, housing needs, homelessness, or a person's ability to remain at home?	N/A				
Are there any groups for whom this policy/ service/leaflet would have an impact? Is it an adverse/negative impact? Does it or could it (or is the perception that it could exclude disadvantaged or marginalised groups?	None identified				

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APPENDIX 12: EQUALITY IMPACT ASSESSMENT FORM				
Does the policy/development promote access to services and facilities for any group in particular?	No			
Does the service, leaflet or policy/development impact on the environment	No			
<ul style="list-style-type: none"> ● During development ● At implementation? 				
ACTION:				
Please identify if you are now required to carry out a Full Equality Analysis		Yes	No	(Please delete as appropriate)
Name of Author:		Date Signed:		
Signature of Author:				
Name of Lead Person:		Date Signed:		
Signature of Lead Person:				
Name of Manager:		Date Signed:		
Signature of Manager				

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Revision No: 5	Next Review Date: 01/03/2020	Title: Management of Clostridium difficile Infection (CDI)
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