Policy for the Management of Clostridium Difficile

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1. Introduction

1.1 Purpose

This policy describes how all NHS healthcare staff can play their part in controlling *Clostridium difficile* Infection (CDI). Over the last five years the rate of *C difficile* infections has been on a general downward trend. This is largely due to the efforts of all staff that care for patients or assist those who do. Careful and complete application of this policy will help not only to maintain this progress but to reduce the number of infections even further. It is based on the principle that *C difficile* is a disease in its own right and most cases are preventable. The policy is based on national guidance, especially 'Guidance on Prevention and Control of Clostridium difficile Infection' (see references) and locally determined best practice.

1.2 What is Clostridium Difficile?

*C. difficile* is a Gram positive, spore forming, anaerobic bacillus. In its vegetative state, it dies rapidly when exposed to air but the spores can survive for up to five months in the environment. It can withstand drying, heat, and is resistant to many disinfectants.

*C. difficile* can cause infection when the balance of the normal gut flora is disturbed by the use of any type of antimicrobial agent, even in patients exposed to short-term prophylactic antimicrobial courses. The normal gut flora provides resistance against invading pathogens by competing for the same resources (such as amino acids and carbohydrates) and thereby protecting people from gastrointestinal infections. This is referred to as ‘colonisation resistance’.

The *C. difficile* spores must be ingested for a person to become colonised and subsequently develop CDI. When the spores enter the colon they germinate into viable bacteria, and, if the strain is toxigenic, produce toxins (toxins A/B) that interact with the epithelium of the gut, which cause damage to the epithelial cells and inflammation of the gut.

Antimicrobial treatment is the risk factor that is most often associated with the development of CDI. However, gastric acid suppressant agents such as protein pump inhibitors, chemotherapy and other agents that destroy or modulate the normal gut flora and/or immune functions have also been implicated in the development of CDI. The effects of antimicrobial (and other drug) treatment on the normal gut flora can persist for weeks or months. The onset of diarrhoea is typically during, or shortly after, receipt of a course of antimicrobial treatment but may occur from a few days to as long as 8 weeks after the termination of the therapy.

In elderly people, the normal gut flora is less dense and contains fewer bacterial species. This reduces the colonisation resistance to invading pathogens such as *C. difficile*. Although CDI can be treated with certain antimicrobials, immune function is also very important for the individual patient outcome. Healthy people with no underlying diseases and a high serum antibody response to toxin A are less likely to develop CDI after ingestion of *C. difficile* spores. It is recognised that gut immunity declines with increased age and poor nutrition.

Other patient risk factors for developing CDI include: increased age (over 65 years), prolonged stays in healthcare settings, serious underlying disease, surgical procedures and immunocompromising conditions.
Antimicrobial resistance (typically to cephalosporins, fluoroquinolones and clindamycin) in C. difficile strains may be playing an increasingly important role in the development and epidemiology of CDI. When a carrier of a resistant C. difficile strain (or infected person) is treated with one of the above antimicrobial drugs, the colonising strain of C. difficile is given a growth advantage over the normal gut flora. This enables it to proliferate and reach high densities in the gut and potentially cause infection and transmission to others.

1.3 What Disease does it Cause?

For mild disease, diarrhoea is usually the only symptom. Other clinical features consistent with more severe forms of CDI include abdominal cramps, fever and leukocytosis.

Symptoms of CDI and associated immune reactions in children differ from those in adults, but the pathology is not well described. Routine testing in children aged 15 years old and under is not recommended as false positive results are common.

1.4 How Can C. difficile Infection Be Controlled

Since C. difficile is an anaerobic bacterium, viable bacteria will quickly die when exposed to air. However, C. difficile produces hardy spores that can tolerate air, heat and resist various detergents and disinfectants, and are able to survive for extended periods in the environment.

C. difficile is transmitted between people via spores that are picked up either by direct contact with an infected (or colonised) person or by indirect contact with a contaminated surface. The ability of these spores to survive in the environment, even when disinfectants are used, has contributed to the spread of C. difficile in healthcare and means that cleaning is central to control.

Symptomatic CDI patients’ shed spores via their faeces into the environment at a high rate. Symptomatic CDI patients are considered the main source of contamination of the environment of healthcare facilities.

Toilets, commodes and the environment of CDI patients (including frequently touched surfaces around toilets and beds) are likely to be contaminated. The hands of healthcare workers are also likely to be contaminated, and if hand hygiene is not optimal C. difficile will spread to other patients or the environment. Alcohol-based hand rubs are not effective in removing C. difficile spores from hands – additional hand washing with liquid soap and water is, therefore, necessary to prevent the spread of the spores.

Once colonised antibiotics and other treatments that reduce bowel flora allow the C difficile spores to survive when they germinate. Those antibiotics which have the broadest effect on the bowel flora have the most effect, e.g. cephalosporins, clindamycin and ciprofloxacin. Careful restriction of these drugs can reduce the number of cases and can reduce antibiotic resistance in general.
2. Roles

HPS provide a more detailed checklist of duties for preventing and controlling *C. difficile* infection that can be used as a basis for best practice or audit: [http://www.hps.scot.nhs.uk/haic/sshaip/publicationsdetail.aspx?id=38848](http://www.hps.scot.nhs.uk/haic/sshaip/publicationsdetail.aspx?id=38848). The duties listed below apply to staff caring for all patients in the NHS Dumfries and Galloway area, both in Primary Care and Acute settings. The policy applies to all staff, not just those with direct patient contact.

2.1 **Senior Charge Nurses** should ensure that there are safe systems in place to enable and prompt:

- All staff to follow Standard Infection Control Precautions at all times, and put in place recommended additional infection control measures (eg. contact precautions) when requested by the ICT.
- A current baseline rate is known and recorded in the ward.
- Contribute to and act upon Root Cause Analysis conclusions.
- Feedback to senior management of any specific issue that hinders the implementation of the recommendations of this policy, including problems with facilities, equipment, resources and staffing.
- Ensure staff are able to challenge poor practice.
- Maintenance of a clean ward by having cleaning schedules in place that comply with national cleaning standards (including frequency of cleaning).
- The maintenance of adequate supplies of equipment including consumables, personal protective equipment (PPE) and care equipment.
- The clean and intact maintenance of fabric and equipment, and that a programme of planned preventative maintenance is followed.
- The provision of adequate hand washing facilities and resources, and to communicate with senior management when these are inadequate.
- New equipment is cleanable and in use equipment in good condition.

2.2 **All Clinical staff:**

- Should understand *C. difficile* infection is a diagnosis in its own right and causes significant harm to patients.
- Should be aware of major risk factors and symptoms of CDI.
- Stool specimens to be obtained from all patients with diarrhoea (see section 3) as soon as possible
- Ensure the prompt contact isolation of patients with diarrhoea.
- Staff authorised to prescribe antimicrobial agents should adhere to local antimicrobial prescribing policy.
- Contribute to antimicrobial prescribing best practice by challenging apparent deviations from guidelines.
- To ensure patients and where appropriate relatives are aware of the diagnosis, control measures and treatments.
- To aid patients and relatives to undertake correct hand hygiene procedures, and ensure that patients and relatives are given oral and written information about *C. difficile*. 
• Members of staff with diarrhoea or confirmed CDI should stay away from work and contact Occupational Health.

2.3 Infection Control Team (Acute Setting)

• Support the implementation of transmission based precautions specific infection control measures, e.g. contact precautions, by all staff groups.
• Support participation in the national mandatory CDI surveillance programme.
• Support the implementation and operation of effective local surveillance systems to detect cases of CDI and changes in numbers of cases in each ward.
• Implement and action trigger tools to assist the detection of early increases.
• Inform senior management when increased numbers of cases or outbreaks of CDI are occurring in ward areas.
• Investigate and review each C difficile case, using Severe Case Investigation tools where appropriate.
• Lead the Root Cause Analysis following death directly or indirectly attributable to C difficile.
• Provide expert support when introducing changes in practice as a result of new guidance and identification of CDI cases.
• Provide education on CDI prevention and control practices for all staff groups.
• Develop and help implement C difficile policy and action plan.
• Ensure hand hygiene audit and environmental audit is undertaken in appropriate units on a regular basis and that results are communicated to the units, HAI Executive lead and ICC.
• Carry out daily ward visits.
• Complete PCIN checklist.
• Issue C.difficile alert card to patients.

2.4 Health Protection Team (Community Setting)

• Support and assist the ICT with national mandatory CDI programme.
• Provide infection control advice and education to community facilities as required.
• Refer GPs to Consultants in Microbiology and/or prompt them to access D&G policy on antimicrobial prescribing.
• CPHM to attend OCT if requested by chair (as per D&G Outbreak control Policy).

2.5 Consultants in Microbiology:

• Participate in the national mandatory CDI surveillance programme.
• Ensure that laboratory antimicrobial reporting procedures support local antimicrobial policy and stewardship.
• Ensure that diarrhoeal stool samples are tested and the results interpreted according to the national guidance on diagnosis of CDI.
• Ensure that stool specimens from all CDI cases are stored at -20°C for a period of one year to enable further investigations.
• Support and advise clinical staff and General Practitioners on testing, interpretation of results and treatment of CDI.
• Provide and interpret laboratory data to inform the Infection Control Team and Antimicrobial Management Team.
• Promptly alert Infection Control Teams to *C. difficile* cases, typing and other relevant results.
• Support and advise Antimicrobial Management Teams on antimicrobial prescribing and implementation of stewardship.

2.6 **Antimicrobial Management Teams (AMT):**

• Ensure implementation, regular review and measurement of compliance through audit of local antimicrobial prescribing policy that minimises the use of agents associated with CDI.
• Ensure that reports on adherence to antimicrobial prescribing policies are fed back to all relevant levels within the organisation including the senior management, and to clinical staff in primary and secondary care.
• Undertake local surveillance of antimicrobial usage of key agents at hospital, directorate and ward level.
• Interpret national surveillance information on antimicrobial resistance and usage.
• Support primary care prescribing advisers in communicating data on antimicrobial prescribing to prescribers.

2.7 **Facilities Managers:**

• Work with ICT’s and others to ensure the risk from the healthcare environment is minimised.
• Work through the Environmental Action Group to assess and prioritise works.
• Ensure resources are in place to maintain equipment and fabric of buildings to meet agreed standards.
• Ensure programme of planned preventative maintenance is in place.
• Ensure that existing and new buildings, furniture and equipment can be easily cleaned and withstand decontamination.
• Ensure adequate and intact hand hygiene and toilet facilities are available.
• Ensure systems are in place to respond promptly to defects of buildings and equipment when identified by staff or through environmental audits.
• Ensure cleaning schedules complying with national cleaning standards are in place; including frequency of cleaning.
• Ensure defined terminal cleaning protocols in place, briefed to staff and implemented when required (on a 24/7 basis).
• Feedback to senior management any issues that hinders the implementation of the recommendations of this policy.
2.8 Chief Executives/ HAI Executive lead /Senior Managers:

- Ensure adherence to the recommendations of this policy.
- Ensure an action plan and systems are in place to help staff implementing the recommended CDI prevention and control practices, including education of all medical and non-medical staff.
- Ensure resources are sufficient to achieve infection prevention and control standards supporting the reduction of CDI throughout the organisation. This includes adequate staffing levels within infection control, surveillance and antimicrobial management teams and within ward areas; and availability of single rooms, commodes, personal protective equipment (PPE), and hand washing facilities, consumables, care equipment, decontamination equipment and chlorine based disinfectants.
- Ensure surveillance systems are in place to detect rising trends, reviews of cases and implementations.
- Ensure reporting systems are in place to alert senior management to specific CDI issues. Reports of increased incidence/outbreak and the causes of these should be reviewed at senior management meetings.
- Ensure information on adherence to antimicrobial prescribing policies and infection prevention and control measures (including audits) are reviewed at senior management meetings.
- Facilitate and support cross-representation between the Infection Control Committee and Antimicrobial Management Team.
3. Diagnosis

Prompt diagnosis is essential both for the most effective control of infection and to ensure correct treatment. Definitions are outlined in Box 3.1 below.

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<td>Definition of CDI</td>
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<td>Someone whose stool has been confirmed positive for <em>C. difficile</em> infection in a two-step laboratory testing algorithm (using a glutamate dehydrogenase (GDH) screening test followed by a confirmatory test using toxin immunoassay) <strong>at the same time as they have experienced diarrhoea not attributable to any other cause</strong>, or from cases of whose stool <em>C. difficile</em> has been cultured at the same time as they have been diagnosed with pseudomembranous colitis (PMC).</td>
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<th>Definition of diarrhoea</th>
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<td>Diarrhoea is defined as the passage of three or more loose or liquid stools per day, or more frequently than is normal for the individual.</td>
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<td>NB: The frequent passing of formed stools is not diarrhoea.</td>
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Suspect *C. difficile* in any patient passing a loose stool (one conforming to the shape of its container). Stool specimens should be obtained as soon as possible after onset of diarrhoea. Laboratory testing is available 7 days a week (Box 3.2).

*C. difficile* is especially likely in patients with the following risk factors:

- Current or recent use of antimicrobial agents
- Use of proton pump inhibitors
- Increased age
- Prolonged hospital stay
- Serious underlying diseases
- Surgical procedures (in particular bowel procedures)
- The immunocompromised

Exclude other causes of diarrhoea before giving the diagnosis CDI Seek advice from the Infection Control Doctor, Infectious Disease Doctor or Consultant Microbiologist. Remember that many medications can cause diarrhoea. Norovirus infection is not a reason to exclude CDI as diagnosis, as co-infection with Norovirus and *C. difficile* is possible.

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<td><strong>Monday to Friday:</strong></td>
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<td>Sample in the lab by 12noon</td>
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<tr>
<td>Result on the browser by 3.30pm</td>
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<td><strong>Saturday and Sunday:</strong></td>
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<tr>
<td>Sample in the lab by 10am</td>
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<td>Result on the browser by 1pm</td>
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Norovirus infection may predispose the patient to developing CDI as the normal gut flora is disturbed by Norovirus infection. When a patient has tested positive for both *C. difficile* toxin and Norovirus a clinical assessment is required to determine the most likely diagnosis.
Box 3.3: Diagnosing C difficile Infection

- Send one faeces sample promptly.
- Ensure the form and container is labelled.
- All diarrhoeal samples from patients over 15 years are tested for C. difficile – there is no need to ask specifically.
- If the result is equivocal, repeat within 24 hours.
- Do not send samples on asymptomatic patients, for ‘screening’ etc.
- Test of cure leads to false positives. Do not repeat for 28 days.

Testing asymptomatic patients is unhelpful even those with risk factors above. **Clearance testing (i.e. test of cure) should not be performed.**

Stool specimens from all CDI cases should be stored by the laboratory at -20°C for a period of twelve months; in particular, from those with a) severe CDI, or b) in suspected outbreak situations so that culture and typing can be performed retrospectively, if necessary.

Box 3.4 lists the different severities. It is important that the severity is assessed because severe and life threatening disease may require additional treatment and wider reporting.

Box 3.4: Guidance on severity of CDI

**Mild CDI** is not associated with a raised white blood cell (WBC) count; it is typically associated with mild diarrhoea (three loose or liquid stools per day or more frequently than is normal for the person).

**Moderate CDI** is associated with a raised WBC count that is <15 cells x 10⁹/L; it is typically associated with moderate diarrhoea (typically three or more loose or liquid stools per day or more frequently than is normal for the person).

**Severe CDI** is when a patient has at least one severity marker including temperature >38.5°C, or WBC >15 cells x 10⁹/L, or acute rising serum creatinine (>1.5 x baseline), or evidence of severe colitis in CT scan/ abdominal X-ray examination, suspicion of PMC, toxic megacolon or ileus.

**Life-threatening CDI** is when a patient has any of the following attributable to CDI: admission to ICU, hypotension with or without need for vasopressors, ileus or significant abdominal distension, mental status changes, WBC ≥35 cells x 10⁹/L or <2 cells x 10⁹/L, serum lactate >2.2 mmol/l, end organ failure (mechanical ventilation, renal failure).
4. Infection Prevention and Control Measures

4.1 Education

All staff should have education on the control of infection which should include *C. difficile* infection. Mandatory training, update training and locally provided sessions provide opportunities to reinforce this training. The Cleanliness Champions Program covers the underpinning elements.

Information for patients and visitors should be available. This may take the form of a leaflet providing basic information that can then be reinforced by staff and the ICT when issuing the C.diff alert card.

4.2 Isolation of the symptomatic patient

The patient should be placed in isolation as soon as possible. Diarrhoea facilitates the spread of *C. difficile* in the environment, increasing the risk of contamination and transmission to other patients. A patient admitted with CDI, or with diarrhoea not yet confirmed as CDI, or who develops diarrhoea during their stay in hospital should be placed in a single room and contact isolation precautions applied. The door should be kept closed. A commode should be provided and dedicated care equipment made available and stored in the room if practicable.

Isolation, especially if prolonged, can have a detrimental effect on the patients care experience. Staff should be especially aware of the potential effects.

The availability of single rooms in hospitals is limited, and symptomatic patients are sometimes nursed in communal ward areas. Strict infection prevention and control precautions must therefore be implemented at point of care in liaison with Infection Control.

All isolation should be continued for 48 hours after the end of symptoms in most cases.

Isolated patients should not be moved between wards or within a ward except to allow single room care, or if there is a clinical deterioration requiring a higher level of care.
Handwashing

Meticulous hand washing with liquid soap and water is necessary for all staff after contact with body substances (including faeces), or following any other potential contamination of hands, e.g., contact with the environment in which a CDI patient is being nursed, when caring for known CDI patients (Box 4.1 and Box 4.2).

Washing of hands using liquid soap and water is recommended after removal of gloves and aprons.

Patients and visitors should be strongly encouraged to wash their hands with liquid soap and water, especially before eating, after using the toilet, and when entering and leaving the healthcare facility.

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**Box 4.3: Handwashing**

The use of liquid soap and water and the physical action of rubbing and rinsing is the only way to remove C. difficile spores from hands.

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**Box 4.3: Handwashing**

Alcohol-based hand rubs are not effective in removing C. difficile spores from hands and should therefore not be used when caring for suspected or confirmed CDI patients.
4.4 Personal Protective Equipment (PPE)

All staff should wear disposable gloves for contact with patients who have diarrhoea; this includes contact with body substances and contaminated environment, including the immediate vicinity of the patient.

Contamination of hands may occur during removal of contaminated gloves. Therefore hand hygiene remains vital regardless of previous glove use. Disposable plastic yellow aprons should always be used for managing patients who have diarrhoea.

The use of a disposable, fluid-repellent gown may be appropriate in order to gain fuller body protection in situations where environmental contamination may be especially severe e.g. faecal incontinence with significant environmental contamination.

PPE should be removed in a manner so as to prevent recontamination of the environment or wearer and disposed of as clinical waste.

4.5 Recording/Communicating/Sharing care

It is important that the ICT be informed when a diagnosis is made. This ensures prompt support. Please also contact the ICT when a known case is admitted.

A Bristol Stool Chart should be used.

Each patient in acute care units will be visited daily by the ICN, and as soon as possible by the dietician.

Severe cases (see table 3.2) should be referred to the Infectious Diseases Team.

Infection Control visits will be recorded in ICNet to provide a record of care shared by both ICT and Public Health.

5. Cleaning

5.1 General Issues

In addition to the regular at least daily cleaning of care areas the following precautions are appropriate for C. difficile patients:

- Regular environmental disinfection of rooms/areas of CDI patients (including frequently touched objects and surfaces such as tables, chairs, telephones, door handles and handsets, e.g., call bells and bed controls) should be undertaken using 1000 ppm available chlorine. This is essential to ensure spores are killed.
- Staff with responsibility for cleaning should be notified immediately when environmental faecal contamination has occurred. Cleaning and decontamination needs to be undertaken as soon as possible.
- Toilets, commodes and items which are likely to be contaminated with faeces should be disinfected meticulously after use.
- Culture of C. difficile from environmental samples is not recommended for routine monitoring of environmental contamination.
- An increase in the frequency of environmental cleaning must be considered after
discussion with the ICT and Domestic Services. This may be appropriate if a patient is incontinent and staff feel environmental soiling is likely.

- Deep cleans of clinical areas may be required after a period of increased incidence, where a trigger has been exceeded, or where a unit is considered at particular risk, e.g. admits patients from another NHS Board area with a higher incidence or where hyper virulent strains circulate.
- Products containing a combination of a detergent and hypochlorite are considered the most effective, as hypochlorite alone is not suitable for removing organic matter.
- After discharge of a CDI patient a terminal clean should be undertaken with 5000 ppm available chlorine.

5.2 Care Equipment

Care equipment such as commodes, blood pressure cuffs and stethoscopes should be dedicated to a single patient where possible.

All care equipment should be carefully cleaned and disinfected using 5000 ppm available chlorine immediately after use on a CDI patient.
6. **Linen and waste**

All linen should be bagged in alginate bags, placed into a plastic bag and then placed in a red linen bag before being sent to the laundry as described in the linen policy.

All waste from the room must be considered as clinical waste and dealt with as per the disposal of waste policy.

Linen and waste must be bagged immediately and never carried to a disposal point as this increased risk of contamination of staff and environment.

7. **Antimicrobial Use**

Exposure to antimicrobial agents leads to disturbance of the normal gut flora, allowing *C. difficile* to proliferate and reach high densities in the colon and cause infection.

Adherence to Board antimicrobial prescribing policies is essential. These have been drafted to minimise the risk of *C difficile* while effectively treating the infection. All staff should feel able to challenge prescribing and to assist prescribers by making them aware e.g. of duration of therapy or of diarrhoea that should prompt a review of prescribing. There is growing evidence that protein pump inhibitors used to suppress gastric acid production should also be considered a significant risk.

While all antimicrobials present a potential risk of *C difficile* there are four groups that pose a particular risk:

- Cephalosporins
- Co-amoxiclav
- Clindamycin
- Fluoroquinolones

When a patient is identified as having *C difficile* infection all antimicrobial and PPI therapy should be reviewed and discontinued if possible. The Infection Control Doctor, Microbiologist or Infectious Disease Team can assist in this often difficult balance.
8. Treatment

8.1 Treatment of First Episode

See Appendix 1

8.2 Treatment of Recurrent Disease

Treatment of first recurrence of CDI including mild, moderate and severe disease, see Appendix 2.

Treatment of second and subsequent recurrences of CDI, see Appendix 3.

9. Outbreaks

It is essential that potential outbreaks of *C. difficile* are identified early and aggressively managed.

9.1 Surveillance

Identifying an outbreak can be difficult as it may develop slowly over weeks or months and may affect more than one unit. To combat this, the Infection Prevention Control Team (IPCT) regularly reviews all cases looking for associations in time and place. Trigger levels are set by the IPCT. When exceeded, the IPCT will investigate using the HPS *C difficile* Trigger Tool [http://www.hps.scot.nhs.uk/haiic/ic/publicationsdetail.aspx?id=42508](http://www.hps.scot.nhs.uk/haiic/ic/publicationsdetail.aspx?id=42508). Typing of severe or prolonged cases should be carried out to identify the pattern of hyper-virulent strains.

Any staff member identifying a potential cluster of two or more cases should contact the Infection Control Doctor.

The Scottish Government has tasked Health Protection Scotland (HPS) to undertake the surveillance of CDI in Scotland. Compliance with this surveillance is mandatory, therefore, NHS Dumfries and Galloway sends information to HPS on all CDIs identified in this Health Board in persons aged 3 years or over. The Scottish Government also sets a Local Evaluation targets (previous HEAT targets) for CDI [http://www.scotland.gov.uk/About/Performance/scotPerforms/partnerstories/NHSScotlandperformance/CDiff2](http://www.scotland.gov.uk/About/Performance/scotPerforms/partnerstories/NHSScotlandperformance/CDiff2).

9.2 Managing an outbreak or period of increased incidence.

See Outbreak Control Policy.

Increased incidence can be defined as a rate of isolation above the trigger rate. It does not imply cross infection while the incidence is investigated the enhanced precautions are prudent.

Outbreaks in Care Homes are not specifically covered by this policy as it is intended for NHS
managed premises but it is recommended to those with responsibility as best practice. The Health Protection Team can be contacted for more details. The IPCNs and ICD will assist if required.
10. **Staff cases**

It is very unusual for staff to contract *C. difficile* or transmit the organism to others at home.

Should a staff case occur the staff member should remain off work until the treatment course is finished or for 48 hours after symptoms settle, whichever is longer.

Occupational health should be informed.

11. **Bibliography**

   

   

   


Appendix 1

Treatment of First Episode of *C. difficile* Infection

Algorithm 1: Treatment of first episode of CDI in adults

Treatment of CDI should be initiated based on assessment of symptoms and severity of disease while taking into account individual risk factors of the patient.

**Severity markers:**
- Temperature >38.5°C.
- Suspicion of PMC, toxic megacolon, ileus.
- Evidence of severe colitis in CT scan/X-ray.
- WBC >15 cells x 10^9/L.
- Acute rising serum creatinine >1.5 x baseline.

**Patient has no severity markers:**
- Treat with oral metronidazole 400-500 mg three times a day for 10 days (IA).
- Rehydrate patient.

**Daily assessment of patient with mild to moderate disease:**
- Observe bowel movement, symptoms (e.g. WBC, fever and hypotension), nutrition and fluid balance and for signs of increasing severity (II).
- If condition does not improve after five days of treatment with metronidazole or worsens at any time, patient should be switched to treatment with vancomycin (125 mg four times a day for 10 days) (II).
- If oral route not available: metronidazole i.v. 500 mg **three times a day** 10 days (II).
- If after 10 days treatment, diarrhoea still persists, seek specialist advice (II).

**Patient has one severity marker:**
- Treat with oral vancomycin 125 mg four times a day for 10 days (IA).
- Rehydrate patient.
- **Surgical consultation** should be obtained on all patients with life threatening disease, i.e. if any one of the following: admission to ICU for CDI; hypotension with or without required use of vasopressors; ileus or significant abdominal distension; mental status changes, WBC >25 x 10^9/L or <2 cells x 10^9/L; serum lactate >2.2 mmol/L; end organ failure (mechanical ventilation, renal failure, etc) (IB).
- If oral route is not available or ileus is detected, treat with 500 mg metronidazole i.v. **three times a day for 10 days** plus vancomycin 500 mg four times a day (intravenous or nasogastric) until ileus is resolved (II).

**Daily assessment of patient with severe disease:**
- Observe bowel movement, symptoms (e.g. WBC and hypotension), nutrition and fluid balance and for signs of increasing severity (II).
- Supportive care: intravenous fluid resuscitation, electrolyte replacement, and pharmacological vencous thromboembolism prophylaxis. In the absence of ileus or significant abdominal distension, oral or enteral feeding should be continued (II).
- Gastroenterology and microbiology consultations. CT scanning/abdominal X-ray; consider PMC, toxic megacolon, ileus or perforation.
Appendix 2

Treatment of First Recurrence of *C. difficile* Infection

**Algorithm 2: Treatment of first recurrence of CDI in adults**

Treatment of CDI should be initiated based on assessment of symptoms and severity of disease while taking into account individual risk factors of the patient (II).

**Severity markers:**
- Temperature >38.5°C.
- Suspicion of PMC, toxic megacolon, ileus.
- Colonic dilatation in CT scan/abdominal X-ray >6 cm.
- WBC >15 cells x 10^9/L.
- Acute rising serum creatinine >1.5 x baseline.

**Patient has no severity markers:**
- Treat with oral vancomycin 125 mg four times a day for 10 days (IIA), or oral fidaxomycin 200 mg twice daily for 10 days (on advice of local microbiologists or specialists in infectious diseases (II)).
- Rehydrate patient.

**Daily assessment of patient with mild to moderate disease:**
- Observe bowel movement, symptoms (e.g. WBC, fever and hypotension), nutrition and fluid balance.
- If condition does not improve after five days, seek specialist advice (II).

**Patient has one severity marker:**
- Treat with oral vancomycin 125 mg four times a day for 10 days (IIA). Consider treating severe first recurrence with oral fidaxomycin 200 mg two times per day for 10 days only on advice of local microbiologists or specialists in infectious diseases (II).
- Rehydrate patient.
- Surgical consultation should be obtained on all patients with life threatening disease i.e. if any one of the following: admission to ICU for CDI; hypotension with or without required use of vasopressors; ileus or significant abdominal distension; mental status changes, WBC ≥35 cells x 10^9/L or <2 cells x 10^9/L; serum lactate >2.2 mmol/L; end organ failure (mechanical ventilation, renal failure, etc) (II).
- If oral route is not available or ileus is detected, treat with 500 mg metronidazole i.v. three times a day for 10 days plus vancomycin 500 mg four times a day (intracolon or nasogastric) until ileus is resolved (II).

**Daily assessment of patient with severe disease:**
- Observe bowel movement, symptoms (e.g. WBC and hypotension), nutrition and fluid balance and for signs of increasing severity (II).
- Supportive care: intravenous fluid resuscitation, electrolyte replacement, and pharmacological venous thromboembolism prophylaxis. In the absence of ileus or significant abdominal distension, oral or enteral feeding should be continued (II).
- Gastroenterology and microbiology consultations. CT scanning/abdominal X-ray; consider PMC, toxic megacolon, ileus or perforation.
Appendix 3

Treatment of Second and Subsequent Recurrences of *C. difficile* Infection

Algorithm 3: Treatment of second and subsequent recurrence of CDI in adults

Treatment of CDI should be initiated based on assessment of symptoms and severity of disease while taking into account individual risk factors of the patient (II).

**Severity markers:**
- Temperature >38.5°C.
- Suspicion of PMC, toxic megacolon, ileus.
- Colonic dilatation in CT scan/abdominal X-ray >8 cm.
- WBC >15 cells x 10⁹/L.
- Acute rising serum creatinine >1.5 x baseline.

**Patient has no severity markers:**
- Treat with a tapered and/or pulsed regimen of vancomycin such as 125 mg four times daily for one week, 125 mg three times daily for one week, 125 mg twice daily for one week, 125 mg once daily for one week, 125 mg on alternate days for one week, 125 mg every third day for one week (II).
- Oral fidaxomicin 200 mg twice daily for 10 days may be preferred (on advice of local microbiologists or specialists in infectious diseases (II).)
- If second recurrence, begin consultation with patient/relative on suitability for faecal transplantation (II).
- Multiple recurrent CDI (third and subsequent episodes) may then be treated with faecal transplantation (nasogastric infusion of faeces), including vancomycin 500 mg four times a day for four days (II).
- If treatment with faecal transplant is not possible treat with vancomycin or fidaxomicin as above.
- Rehydrate patient.

**Patient has one severity marker:**
- Treat with oral vancomycin 125 mg four times a day for 10 days (II).
- Rehydrate patient.
- **Surgical consultation** should be obtained on all patients with life threatening disease i.e. if any one of the following: admission to ICU for CDI; hypotension with or without required use of vasopressors; ileus or significant abdominal distension; mental status changes. WBC ≥35 cells x 10⁹/L or <2 cells x 10⁹/L; serum lactate >2.2 mmol/L; end organ failure (mechanical ventilation, renal failure, etc (II).
- If oral route is not available or ileus is detected, treat with 500 mg metronidazole i.v. three times a day for 10 days plus vancomycin 500 mg four times a day (intracolonie or nasogastric) until ileus is resolved (II).

**Daily assessment of patient with severe disease:**
- Observe bowel movement, symptoms (e.g. WBC and hypotension), nutrition and fluid balance and for signs of increasing severity (II). If patient no longer shows any more severity markers treat as in left-hand box of this algorithm.
- Supportive care: intravenous fluid resuscitation, electrolyte replacement, and pharmacological venous thromboembolism prophylaxis. In the absence of ileus or significant abdominal distension, oral or enteral feeding should be continued (II).
- Gastroenterology and microbiology consultations. CT scanning/abdominal X-ray; consider PMC, toxic megacolon, ileus or perforation.
Appendix B: Short guide to managing CDI in healthcare settings

Symptomatic patient - diarrhoea: Implement contact precautions pending diagnosis.
- Submit sample to laboratory for toxin testing.
- Carry out laboratory tests as per protocol, and store samples for three months at -20°C.
- Submit isolates to reference laboratory as per protocol.

Toxin positive

Clinical team:
- Assess patient symptoms.
- Review and stop antimicrobial treatment where possible.
- Treat as per guidance (Algorithms 1-3).
- Implement infection control measures.
- Monitor clinical condition.

Infection Control Team:
- Ensure infection control measures and local surveillance systems are in place.
- Determine if CDI trigger is breached.

Investigations of cases/triggers etc:
- Where an investigation indicates a true rise in cases, use the HIAT.
- Alert AMT to review antimicrobial prescribing.
- Review infection control procedures.
- Consider establishing a problem assessment group.

Severe CDI or death associated with CDI:
- For severe cases, consider referral to surgeon/ID physician.
- Complete Severe CDI Case Investigation Tool.

Morbidity/mortality reviews:
- Review all severe cases and deaths due to CDI whilst under-care of the clinical team as part of regular morbidity/mortality meetings or clinical case reviews.
- Report back any lessons learned to the Infection Control Team for inclusion in surveillance and/or infection control reports.

Local surveillance:
- Produce regular (weekly/monthly/as appropriate) surveillance reports for ward, units, etc.
- Agree triggers for individual units.
- Produce regular reports for Clinical Governance Committee, Risk Management, AMTs, Infection Control Committees, NHS boards, etc.

Oversight of local and national surveillance data:
- The Chief Executive/Senior Manager must ensure appropriate reporting systems, checks and action plans are in place and implemented.
- Infection Control Committee/Clinical Governance Committee/Risk Management/AMTs should have oversight of trends in surveillance data dependent on local arrangements.
- Agreed action plans should be in place to control the level of CDI.
Appendix 5

When and how to obtain a faecal specimen from a patient
Information for Healthcare Staff (HPS 2009)

A faecal specimen (single) should be obtained as soon as possible following onset of symptoms of diarrhoea.

Definition of diarrhoea:

Diarrhoea is defined as the passage of 3 or more loose or liquid stools per day, or more frequently than is normal for the individual (usually at least 3 times in a 24 hour period). Diarrhoea is usually a symptom of gastrointestinal infection, which can be caused by a variety of bacterial, viral and parasitic organisms. The frequent passing of formed stools is not diarrhoea.

Preparation for faecal specimen collection:

Gather all relevant equipment:

- Clean, disposable/reusable bedpan or similar container.
- Leak proof sterile specimen container preferably with attached spoon or a clean disposable spatula. (Complete patient details on the specimen container before obtaining the specimen – see Additional Information).
- Leak proof sealable bag (with separate compartment for the specimen).
- Laboratory request form (if possible complete patient details before obtaining the specimen).
Guidance for obtaining faecal specimens from patients with diarrhoea (Background Information).

Procedure:

1. Explain the need for the procedure to the patient including the reason for the test (e.g. symptoms of diarrhoea), when and how the results will be given.
2. Ask the patient to pass faeces into the bedpan or container avoiding if possible passing urine at the same time.
3. Put on gloves and aprons to receive the bedpan.
4. Transfer faeces into a leak proof sterile specimen container using the spoon built into the container or a clean spatula to the fill line of the specimen container (or as a minimum covering the cone shape of the container). If the specimen contains blood, pus or mucus try to get these into the container.
5. Put on the container lid and secure. Avoid contaminating the outside of the container.
6. Discard bedpan and contents as usual. Discard other healthcare waste as defined in local policy.
7. Remove gloves and apron and wash and dry hands.
8. Space the specimen container directly into the leak proof sealable bag (The outside of this bag must not be visibly contaminated).
9. Wash and dry hands.
10. Ensure the transport of specimen within 2 hours of collection (if necessary specimens can be refrigerated for up to 24 hours at 4°C in a designated non-food fridge).
Additional Information:

A negative test result does not necessarily exclude infection especially if clinical symptoms are highly suggestive. These cases should be discussed with the Consultant Medical Microbiologist or Infection Control Doctor.

Normally only 1 faecal specimen is required per patient. There are exceptions to this and your Infection Control/Health Protection Team will advise.

Larger amounts of faeces may be required for food borne pathogens.

If a faecal specimen cannot be obtained from a neonate then a rectal swab is usually sufficient.

Document in the medical and nursing notes when the faecal specimen was taken and reason(s) this was required.

Stool charts should be used to monitor bowel pattern when patients have diarrhoea.

Consultation with the Infection Control Doctor or Microbiologist may be required where additional stool sampling is necessary to perform specific types of diagnostic tests.

The laboratory request form should contain relevant clinical information. This may include:

Name

- CHI no or Date of Birth (if CHI not known).
- Ward details/GP Practice
- Name and contact details of clinician requesting the test
- Test required such as culture and sensitivity/virology
- Date of onset of symptoms
- Nature of symptoms
- Duration of symptoms
- Any current or recent antibiotic history (up to 3 months previously)
- Relevant medical history and or diagnosis
- Travel history
- If the faecal specimen has been contaminated with urine or obtained from an incontinence product.
**INFECTION CONTROL RISK ASSESSMENT**

<table>
<thead>
<tr>
<th>CHI</th>
<th>FORENAME</th>
<th>SURNAME</th>
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</thead>
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**MRSA Risk Assessment**

**Clinical Risk Assessment Questions**

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<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
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</thead>
<tbody>
<tr>
<td>Has the patient had any previous history of MRSA colonisation or infection?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is the patient currently resident in care/institutional settings (including prisons, homeless), or transferred from another hospital (for acute settings only)?</td>
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<td></td>
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<tr>
<td>Does the patient have a wound/perforated i.e. one or more breaks in the skin or an indwelling medical device which was present before admission? i.e. invasive device which temporarily enters the body.</td>
<td></td>
<td></td>
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If any of the above answered “Yes” or patient is being admitted to high risk area – Orthopaedics, Cardiothoracic/Vascular Surgery, renal or Intensive Care – proceed to second line screening of MRSA Screening Swabs. The Patient should be placed in isolation room or with patients assessed at similar risk according to NHS D&G policy. If cohort room required discuss with IPCT.

<table>
<thead>
<tr>
<th>Signature</th>
<th>Designation</th>
<th>Date</th>
<th>DD</th>
<th>MM</th>
<th>YY</th>
<th>Time</th>
<th>HH</th>
<th>MM</th>
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**CPE Risk Assessment**

**Clinical Risk Assessment Questions**

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<th>Question</th>
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<th>No</th>
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<tr>
<td>Has the patient had any previous history of CPE colonisation or infection?</td>
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<tr>
<td>Has the patient been transferred from another hospital outside Scotland (excluding Cumberland Infirmary, Carlisle) or has a history of admission outside Scotland (excluding Cumberland Infirmary, Carlisle) in the last 12 months? (including holiday dialysis patients)</td>
<td></td>
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<tr>
<td>Has the patient had Renal Dialysis outside Scotland in the last 12 months?</td>
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If any of the above answered “Yes” proceed to second stage screening of CPE. The Patient should be placed in isolation room and discussed with IPCT according to NHS D&G policy.

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<th>Time</th>
<th>HH</th>
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**Other infection control risk factors**

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<th>Precautions</th>
<th>Specimen</th>
<th>Date Sent</th>
<th>DD</th>
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<tbody>
<tr>
<td>Diarrhoea- Known infection or unknown cause</td>
<td>Yes</td>
<td>No</td>
<td>Contact</td>
<td>Yes</td>
<td>No</td>
<td>Date Sent</td>
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<tr>
<td>Vomiting- Known infection or unknown cause</td>
<td>Yes</td>
<td>No</td>
<td>Contact</td>
<td>Yes</td>
<td>No</td>
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<tr>
<td>Respiratory infection with productive cough</td>
<td>Yes</td>
<td>No</td>
<td>Droplet</td>
<td>Yes</td>
<td>No</td>
<td>Date Sent</td>
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Other type of infection, please contact Infection Control Team

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<thead>
<tr>
<th>Neutropenic</th>
<th>Yes</th>
<th>No</th>
<th>Protective</th>
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<table>
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Version 4 Revised on 14/07/2018
## ISOLATION CARE PLAN - CONTINUATION SHEET

### CHI

### FORENAME

### SURNAME

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<tr>
<th>Type of isolation required (please tick as appropriate)</th>
<th>Contact</th>
<th>Droplet</th>
<th>Airborne</th>
<th>Protective</th>
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<tbody>
<tr>
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<td>DD MM YY</td>
<td>DD MM YY</td>
<td>DD MM YY</td>
<td>DD MM YY</td>
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<tr>
<td>Single isolation room:</td>
<td>DD MM YY</td>
<td>DD MM YY</td>
<td>DD MM YY</td>
<td>DD MM YY</td>
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<tr>
<td>Isolation poster in place</td>
<td>DD MM YY</td>
<td>DD MM YY</td>
<td>DD MM YY</td>
<td>DD MM YY</td>
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</tbody>
</table>

### Precautions & Cleaning

- PPE is readily available, PPE as per isolation order.
- Strict application of hand hygiene.
- All waste is treated as clinical. Clinical waste bags / bins in place. Unless in protective isolation.
- Domestic items of isolation room.
- Isolation room cleaned daily using Aichlor.
- Bed linen & patient clothes changed daily.
- All linen treated as infected i.e. alginate & red bags available. Unless in protective isolation.

### Communications

- Infection Control Team aware.
- Ward Staff Informed.
- AHPs & volunteer staff aware of isolation precautions.
- Patient informed & leaflets given.
- Visitors advised of precautions e.g. Hand hygiene, refrain from sitting on bed etc.

### MRSA Decolonisation Checklist

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<tr>
<th>Day</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7 (Rest)</th>
<th>8 (Re-screen)</th>
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<tbody>
<tr>
<td>Date &amp; Time</td>
<td>DD MM YY</td>
<td>DD MM YY</td>
<td>DD MM YY</td>
<td>DD MM YY</td>
<td>DD MM YY</td>
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<tr>
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</table>

See medicine cards, this should not be used for prescribing treatment.

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**Policy No. IC-121**  
**Title:** Guidance on the Management of Clostridium Difficile  
**Date:** August 2018  
**Version:** 4.0  
**Author:** Dr Martin Connor