

Clostridium Difficile Infection (CDI) **Infection Prevention Guidelines**

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Version History Log

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

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1) Introduction

Clostridium difficile infection is the most common cause of hospital-acquired diarrhoea. *Clostridium difficile* (*C.difficile*) is an anaerobic bacterium that is present in the gut of up to 3% of healthy adults and 66% of infants.

C.difficile can cause disease when the normal bacteria in the gut are compromised, usually by someone taking antibiotics, allowing the *C.difficile* to grow to high levels. The toxin that some strains of *C.difficile* produce can reach levels where it affects the intestines and causes mild to severe diarrhoea.

C.difficile can lead to serious infections of the intestines with severe inflammation of the bowel (pseudomembranous colitis). *C.difficile* is the biggest cause of infectious diarrhoea in hospitalised patients.

Patients can become infected with *C.difficile* if they ingest the bacterium (through contact with a contaminated environment or transfer from another person). Patients who are prescribed antibiotics are at risk of becoming infected, particularly the elderly and people whose immune systems are compromised.

2) Scope

These guidelines aim to give guidance to all healthcare workers for the safe management of patients with *Clostridium difficile* infection thereby reducing the risk of transmission to other patients and staff within a hospital setting

3) Detail

3.1 Definitions

***Clostridium Difficile* Infection (CDI)** – an infection caused by the bacterium *Clostridium difficile* that affects the bowel and can result in diarrhoea.

Diarrhoea - liquid stool (Bristol type 5, 6, 7).

Spore - is a reproductive structure that is adapted for dispersal, can survive for prolonged periods and is resistant

to killing by many disinfectants. *C. difficile* is a spore forming bacteria.

Sporicidal – a substance that can kill spores. Products include chlorine based disinfectants diluted to 1,000 ppm of available chlorine and peracetic acid wipes (sporicidal wipes).

GDH – glutamate dehydrogenase, an enzyme present in most microbes. GDH is the first test used in laboratory settings to indicate possible presence of *C.difficile*.

PCR (polymerase chain reaction) - a PCR positive test detects the toxin gene is present and indicates that there is a capacity for production of the *C.difficile* toxin.

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

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

Lapse in care - any aspect of care that compromised the patient's safety and where procedures were not followed consistently.

Post Infection Review (PIR) – a review to establish any contributing factors relating to the diagnosis of CDI and determine lapse in care.

Period of increased incidence (PII) - two or more cases occurring more than 48 hours after admission on the same ward over a 28 day period.

Hydrogen peroxide Vapour (HPV) – vapour form of hydrogen peroxide used to decontaminate rooms after vacated by the patient.

3.2 Management of CDI patients

Initial management of suspected case

Early recognition of symptoms that predispose CDI can aid safe management and help prevent spread to other patients.

Symptoms:

- Diarrhoea type 5, 6, 7 Bristol stool chart (Appendix 1)
- Abdominal pain/tenderness
- Fever
- Loss of appetite
- Nausea
- Stool smell/green colour.

Medical and nursing staff should apply the following mnemonic protocol (SIGHT) when managing suspected potentially infectious diarrhoea:

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

Stool sampling

Refer to the 'Stool sampling flow chart' (appendix 2) to determine when to sample.

- Ensure the specimen pot is at least half full and represents what the patient is passing.

- Samples from incontinence pads or sheets are accepted by the laboratory for testing but it must state on the request that the sample has been collected from these sources.
- The result of a stool sample sent before 13:00 hours will be available the same day.
- Repeat samples are not required unless symptoms resolve and then recur.
- Samples should not be contaminated with urine

Procedure on confirmation of a positive result

Results are reported as either *C.difficile* toxin reactive (ie toxin and PCR positive) or *C.difficile* toxin gene reactive (ie PCR positive, toxin negative). Both results must be managed and treated according to the patient's clinical condition.

Results will be reported by Infection Prevention Team (IPT) and microbiologists during working hours and by the laboratory staff outside working hours.

If the patient has been discharged the Infection Prevention Nurses (IPNs) will inform the community IPT and GP.

All patients, including those patients not in hospital, will be flagged as an alert on Core Patient Database by the IPNs. This alerts staff to the *C.difficile* diagnosis in the event of a hospital admission. The alert is not removed in order to inform staff of previous diagnosis on readmission.

A datix is completed by IPNs for all toxin positive cases

***Clostridium difficile* infection medical management**

- Assess the severity of CDI as follows and discuss with the microbiologist for guidance on treatment:
 - **Mild CDI** is not associated with a raised WCC; it is typically associated with <3 stools of types 5–7 on the Bristol Stool Chart per day.

- **Moderate CDI** is associated with a raised WCC that is $<15 \times 10^9/L$; it is typically associated with 3–5 stools of types 5–7 per day.
- **Severe CDI** is associated with a WCC $>15 \times 10^9/L$, or an acute rising serum creatinine (i.e. $>50\%$ increase above baseline), or a temperature of $>38.5^\circ C$, or evidence of severe colitis (abdominal or radiological signs). The number of stools may be a less reliable indicator of severity.
- **Life-threatening CDI** includes hypotension, partial or complete ileus or toxic megacolon, or CT evidence of severe disease.
- Review antibiotics and discontinue those that are not required as well as other drugs that may cause diarrhoea
- Review the indication for any proton pump inhibitor (PPI) prescription (eg lansoprazole, omeprazole) and stop it or switch to ranitidine if possible. PPIs increase the risk of recurrent *C.difficile* infection.
- Discontinue anti-motility drugs during the acute phase of *C.difficile* infection.
- CDI should be managed as a diagnosis in its own right, with each patient reviewed daily regarding fluid resuscitation, electrolyte replacement and nutrition review. This must be documented.
- Monitor for signs of increasing severity of disease. Consider early referral to ICU as patients may deteriorate very rapidly.
- Refer to the [Adult Antimicrobial formulary](#) for advice on treatment or contact the Medical Microbiologist.
- A team consisting of a microbiologist / Infection Prevention and Control doctor, pharmacist, and an IPN will review CDI patients weekly to ensure that the infection is being treated optimally and that the patient is receiving all necessary supportive care.

- Doctors have a legal duty to mention CDI on a death certificate if it was part of the sequence of events directly leading to death or contributed in some way.

Infection Prevention general management

Prevention of spread –

Transmission can occur by contact with toxin spores and infected faeces. Contamination of the environment can be widespread. The route of infection is faecal/oral.

Spread is via:

- Contaminated hands of health workers.
- Direct patient to patient spread.
- Contaminated equipment.
- Contaminated environment.

Appropriate precautions will help reduce transmission including the following -

Isolation -

- Patients with clinically suspected or confirmed CDI must be isolated in a single room within 2 hours from onset of symptoms. Escalate to bed managers and IPT and complete a Datix form if it is not possible to do so.
- The patient should ideally be isolated in a room with ensuite facilities. The patient must have their own dedicated toilet facilities that remain in the isolation room. Toilets and all commodes must be cleaned after each use using a sporicidal solution (sporicidal wipes or chlorine based disinfectant diluted to 1,000 ppm available chlorine).
- All patient care equipment in the room wherever possible should be dedicated to the isolated patient and decontaminated after each use using a sporicidal solution.
- The door must remain closed. If the patient is non-compliant with keeping the door closed, or if a risk assessment raises a safety concern for a patient so preventing the door from being closed this must be documented in the medical notes and discussed with IPT.

- An Enhanced door notice must be displayed at the entrance to the side room, area (e.g. cubicle) or cohort facility by the nursing staff to alert clinical and non-clinical staff that the patient/s are in isolation (Appendix 3)
- A Visitor door notice will guide visitors to the actions they need to take when visiting (Appendix 4)
- All medical notes and charts should be kept outside the room and nothing unnecessarily taken into the room.
- Cohort arrangements will be considered when there is a period of increased incidence of confirmed CDI. The assessment and decision will be undertaken by IPT.

Hand hygiene -

- During isolation for C.diff/diarrhoeal illnesses **all** hand decontamination within the room/area must be with liquid soap and water.
- Disinfectant gel must not be used as a replacement for soap and water but can be used after hand washing to rid hands of other organisms.
- Hand decontamination is required in the following circumstances:
 - In accordance with the World Health Organisation 5 moments for hand hygiene – before and after patient contact, before a clean/ aseptic procedure, and after body fluid exposure or contact with the patient’s surroundings
 - Immediately before donning gloves
 - Immediately after removing gloves and apron (e.g. following a procedure or any contact with a patient or their immediate environment)
 - Immediately before donning gloves and apron if these are replaced whilst in the room (e.g. following a procedure, between patients)
- Staff must be bare below the elbows

Personal Protective Equipment -

Personal protective equipment must be available outside the side room or cohort bay.

- Disposable aprons must be worn for all contact with the patient and environment
- Disposable gloves must be worn for all body fluid exposure
- Eye protection is required when there is a risk of body fluid splashes

Dispose of PPE into an orange infected waste bag either inside the room, or in the sluice if transporting body fluid waste for disposal.

Waste and linen management -

Treat all waste and linen as infected.

- Place waste in an orange bag.
- Place linen in a red water soluble bag prior to placing in a white outer bag. Identify the bag using 'Infected Linen' tape.
- For body fluid waste wear PPE to transport the container to the sluice. Cover the container with a robust cover. Dispose of PPE in the sluice.

Environmental decontamination and safe management -

- The bed space vacated by a symptomatic patient transferred into a side room from a bay requires the following action:
 - Sporidical disinfection (eg chlor clean) prior to being occupied by another patient
 - Curtains changed around the bed area
 - Sporidical disinfection (eg chlor clean) of the toilet area the patient has used
- Wards that have patients with CDI require environmental decontamination using a chlorine based disinfectant (1,000 ppm of available chlorine)
 - Once daily all ward
 - Toilets 4 x day
 - High touch points 3 x day

COSHH regulations must be followed when using chlorine based products.

- The nursing staff on the ward must notify domestic services of active cases of *C.difficile*
- The Domestic Supervisor must ensure that all domestic staff working in that area are aware of the procedure for the cleaning of isolation rooms, areas or cohort facilities and safety of domestic staff when using chemicals
- Isolation rooms, bed spaces or cohort facilities should be cleaned after the other rooms, bays and general areas on the ward
- A daily record must be kept as evidence that enhanced cleaning has been performed to a satisfactory standard and signed by domestic and supervisory staff. Standards will be monitored by IPNs
- Ward nursing staff to escalate concerns regarding cleaning standards via domestic management
- On discharge, transfer or death of a patient, or on the advice of Infection Prevention Team
 - Sporidical disinfection of the ward can be discontinued.
 - The sideroom and all reusable equipment in the room must be decontaminated using a sporidical **before** deployment of hydrogen peroxide vapour (HPV). Refer to the HPV Standard Operating Procedure.
 - Nursing staff are responsible for notifying domestic services and HPV operators (via switchboard).
 - The HPV service is available between 08:00 – 20:00 hours Monday to Saturday and 08:00 to 14:00 hours Sunday
 - Curtains must be changed

Equipment decontamination -

- Use single patient use equipment when possible and dispose of as infected waste (orange bag) when no longer required

- Reusable equipment (including commodes) should be allocated to the patient during their isolation. Decontaminate after each use using a sporicidal product (sporicidal wipes or chlorine based solution diluted to 1,000ppm available chlorine)
- Equipment and supplies must be kept to a minimum in the patient's room as all used and unused single patient use equipment and supplies must be discarded after patient discharge or isolation is discontinued and all reusable equipment must be decontaminated.
- Clean the bed frame and bed rails using a sporicidal product.
- Clean the mattress and pillow using a sporicidal product. Specialist mattresses must be cleaned as per mattress protocol. The mattress and pillow cover should be carefully inspected at each cleaning. If damaged or torn then the mattress or pillow must be disposed of as an infection risk.
- The bed, mattress, bed rails, locker, chair and table must be cleaned by nursing staff on discharge, transfer or death of a CDI patient prior to HPV of the room

Documentation –

- Commence Bristol stool chart when symptoms begin. Accurate recording will help inform clinical management of the patient. (Appendix 1)
- IPNs will place an alert on the patient's Core Patient Database record. This alerts all staff to the *C.difficile* diagnosis during hospital admissions. The alert is not removed.
- IPNs will use CPD whiteboard, nursing handover and inpatient care record to document guidance and advice regarding patient care
- IPNs will place an alert sticker in the patient's medical notes to prompt medical staff to discuss treatment options with the consultant microbiologist.

Information for patients and visitors –

All cases identified during an inpatient stay will be visited by an IPN. The patient will receive a patient card to carry after discharge to alert other health care professionals to the diagnosis.

Discharged patients and community cases will be contacted by the Community IPT.

Visits to other departments -

Unless clinically urgent the patient should remain in isolation rather than attend routine appointments whilst having active symptoms of diarrhoea.

However the presence of CDI must not compromise care or patient safety if investigations are urgent. Prior arrangements need to be made by the nurse in charge of the patient with staff in the receiving department so that infection prevention measures can be implemented. The receiving department must adhere to enhanced precautions and environmental control measures.

In addition;

- Patients should be seen last on the list if possible.
- Patients should spend the minimum time in the department, being sent for when the department is ready to see the patient
- All shared equipment must be decontaminated after patient contact using a sporicidal product
- Theatres – allow 15 minutes between patients for a full air change. Decontaminate all equipment that has direct contact with the patient using a sporicidal product

Transfer to other health care facility -

- Inform receiving hospitals, General Practitioners and other healthcare agencies of continuing care requirements and control measures. Enter the diagnosis on the Electronic Discharge Notification (eDN) and inter-healthcare transfer form (IHTF) – place a copy of the IHTF in the patient's notes

- Inter-hospital transfers for clinical reasons should not be prevented but the receiving hospital must be informed of the diagnosis.
- Ambulance Transportation - patients must not be transported with others in the same ambulance while symptomatic.

Readmission of patients with previous CDI –

The *C.difficile* alert on CPD is not removed. Any patient readmitted and has a CDI alert on their record does not require a side room unless they have diarrhoea at the time of admission or within the previous 48 hours.

The alert prompts caution with antibiotics and the microbiologist's advice should be sought before prescribing.

Deceased Patients -

The infection control precautions for handling deceased patients are the same as those used in life. Body bags are not required unless there is excessive body fluid leakage.

Period of Increased Incidence -

A period of increased incidence (PII) of CDI is identified as 2 or more cases (occurring >48hrs after admission, not relapse), in a 28 day period in the same ward.

Once a PII has been identified a review will be undertaken by the IPNs. This involves additional auditing of antimicrobial prescribing, the environment, hand hygiene observations and hand hygiene facilities, and CDI management.

Any good or poor practice will be escalated to the nursing, medical and domestic staff as appropriate with recommendations.

The IPT will decide if further laboratory testing is required to establish if cross infection has occurred.

Post Infection Review -

In order to examine the effectiveness of measures implemented and learn any lessons to improve patient safety each case of CDI

will be reviewed by a peer review panel consisting of as a minimum:

- Infection Control Doctor/ Consultant Microbiologist
- IPN
- Senior Sister/ Deputy
- Consultant/ Deputy
- Matron
- Antimicrobial pharmacist
- Representative from commissioners

The purpose of this review is to identify any “lapses in care” as per NHS England’s requirements. This includes establishing the following:

- Were there any aspects of care that could have been done differently?
- Were there failures in policy and procedures which directly contributed to the CDI case (for example failure to follow the Trust antibiotic policy) or had an impact on the patients care delivery (for example failure to isolate on the identification of diarrhoea)?

Surveillance

It is a mandatory requirement from Public Health England that all toxin positive cases in patients over 2 years are entered onto a national database. Reports can be viewed on the PHE webpages.

IPT are responsible for ensuring accurate and timely reporting of all cases that fit the criteria.

Trust incidence is reported by ward, directorate and Trust and can be viewed on the Trust Q drive - [Q:\MRSA and Clostridium difficile](#).

4) Accountability

All healthcare professionals and volunteers are responsible and accountable to the Chief Executive for the correct implementation of these guidelines.

Professional staff are accountable according to their professional code of conduct.

5) Dissemination and Implementation

These guidelines once agreed by the Infection Prevention Team and Infection Control Doctors will be approved at the Infection Prevention Operational Group (IPOG) and will then be disseminated trust wide via senior nurse meetings including the professional nurse lead forum (PNLF), via Statutory & Mandatory training and will be published on both Staffroom and the Trusts internet site.

6) Monitoring and Auditing

Minimum Requirements	Monitoring	Responsibility for monitoring	Frequency	Reported to
a. Prompt isolation	IPT documentation records. CPD. Datix forms	IPT	By case	Infection Prevention Operational Group
b. Review of management compliance	Spot check audits by IPT Weekly C.difficile ward round	IPT	Weekly	Nursing, medical and domestic staff responsible for patient's care where issues raised
c. Death certificate reporting	Death certificates	IPT	By case	Infection Prevention and Environmental Operational Group

7) Consultation

These guidelines will be circulated for comment between the Infection Prevention Team and the Infection Control Doctor, following consultation with clinical stakeholders the guideline will be approved at IPOG

8) Supportive Evidence

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

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/321891/Clostridium_difficile_management_and_treatment.pdf Updated guidance on the management and treatment of *Clostridium difficile* infection

Epic 3 guidelines -

https://improvement.nhs.uk/uploads/documents/epic3_National_Evidence-Based_Guidelines_for_Preventing_HCAI_in_NHSE.pdf

R.J. Pratt, C.M. Pellow, J.A. Wilson, H.P. Loveday, P.J. Harper, S.R.L.J. Jones, C. McDougall, M.H. Wilcox; Richard Wells
Research Centre, Faculty of Health and Human Sciences, Thames Valley University (London).

Also refer to Trust Infection Prevention Isolation Practice Standard (available on Staff Room) <http://staffroom.ydh.yha.com/clinical-Directorate-Information/master-clinical-document-library/infection-prevention/isolationpracticejune20153.pdf>

9) Appendices

Appendix 1 – Bristol Stool Chart

Stool Chart

OR PATIENT LABEL	
Patient Name	Date Admitted
Date of Birth	Ward
NHS no	Chart Number

Diarrhoea is defined as stool loose enough to take the shape of a container used to sample it or as Bristol Stool Chart types 5-7 that is not attributable to any other cause, including medicines








SUSPECTED INFECTIOUS DIARRHOEA?

1. Review the patient and consider other potential causes of diarrhoea BEFORE sending a stool specimen
2. Review antibiotic history
3. Review aperient history

Date isolated _____ Single room / cohort bay Enhanced precautions used Yes / No
 Previous Clostridium difficile infection Yes / No

SPECIMENS SENT

Date	Time	Sample taken by Print Name	Sample authorised by Print Name	Result

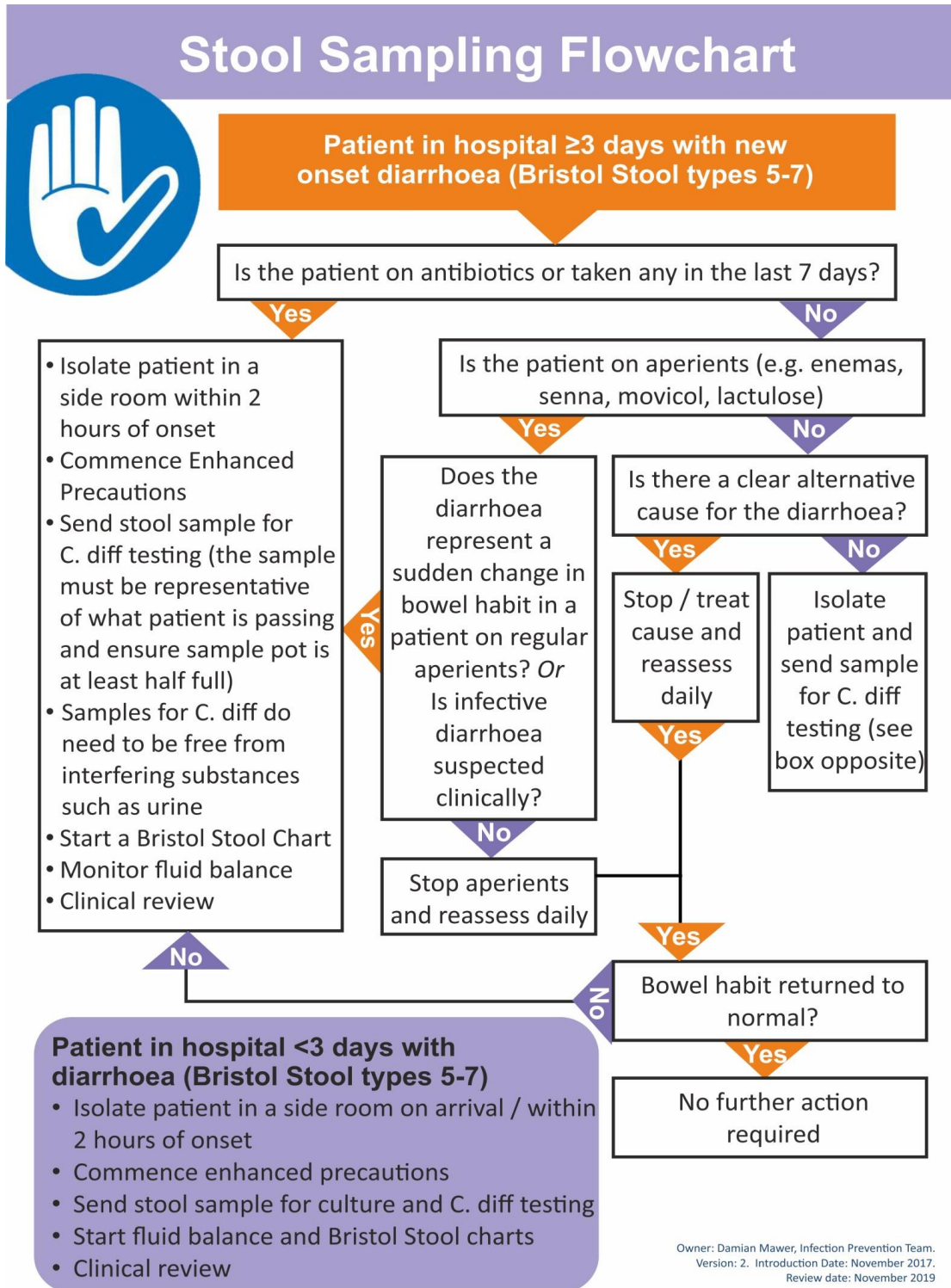
<p>Hard to pass</p>  	<p>IDEAL CONSISTENCY</p>  	<p>Difficult to control</p>   				
<p>TYPE 1 Separate hard lumps, like nuts</p>	<p>TYPE 2 Sausage shaped but lumpy</p>	<p>TYPE 3 Like a sausage but with cracks on its surface.</p>	<p>TYPE 4 Like a sausage or snake, smooth and soft.</p>	<p>TYPE 5 Soft blobs with clear cut edges, passed easily.</p>	<p>TYPE 6 Fluffy pieces with ragged edges.</p>	<p>TYPE 7 Watery, no solid pieces, entirely liquid</p>

Infection Prevention Team October 2015
 Heaton, KW and Lewis, SJ (1997) Bristol Stool Chart *Scandinavian Journal of Gastroenterology*

*Please record amount as: 0 = Bowels not open 1 = Small 2 = Medium 3 = Large










Date	Time	Type (1-7)	Amount *	Incontinent?	Colour	Print Name

Appendix 2 - When to take a stool specimen




Owner: Damian Mawer, Infection Prevention Team.
 Version: 2. Introduction Date: November 2017.
 Review date: November 2019

Appendix 3 – Enhanced door notice

 York Teaching Hospital NHS <small>NHS Foundation Trust</small>	
<h2 style="margin: 0;">Enhanced Precautions</h2>	
	Room Door must be kept closed - any exceptions upon the agreement of the Infection Prevention Team
	Visitors Visitors please report to the nurse in charge before entering the room
	Documentation Must be kept outside room
	Aprons Must be worn for contact with patient or environment. Remove prior to leaving room and wash hands
	Gloves Must be worn if there is a risk of exposure to body fluids. Remove prior to leaving room and wash hands
	Waste Dispose of in room as per Waste Management Policy (via Staff Room Corporate Policy)
	Linen Refer to Laundry Guidelines (via Infection Prevention site on Staff Room)
	Hands Wash hands with soap and water before and after contact with patient / or environment
	Cleaning Floors, flat surfaces, patient equipment must be cleaned using a disinfectant. For C.diff use sporicidal wipes to clean clinical equipment. HPV may be deployed on the patients discharge/transfer on the advice of the Infection Prevention Team

Appendix 4 – Visitor door notice



NHS
York Teaching Hospital
NHS Foundation Trust

**Room/bay/ward closed
due to infection
- Information for visitors**

- **Please limit the number of visitors to two per patient at any one time**
- **Only take in to the room / bay / ward any personal items that you really need for your visit**
- **You do not need to wear an apron and gloves unless you are going to be providing personal care to the patient (e.g. washing, dressing) or you are going to visit another patient in the hospital afterwards**
- **Please wash your hands before leaving the ward (and after providing any personal care to patients)**
- **Please do not sit on the beds - use the chairs provided for visitors**
- **Please do not use patient toilets - ask the staff for directions to visitor toilets**
- **If you have any questions or concerns please speak to the nurse in charge**

