Information and the management of Clostrioides *difficile* Infection (CDI) for staff

Clostrioides difficile (C.*difficile*, C. *diff*) is a Gram positive, anaerobic, spore-forming organism implicated in Clostrioides *difficile* Infection (CDI) and pseudomembranous colitis (PMC). The overgrowth of the organism within the large intestine and toxin production causes cellular damage and increased fluid accumulation in the gut. *C. difficile* is part of the normal flora of up to 3% of the adult population and up to 90% of children less than 2 years. Asymptomatic carriage in healthcare patients is relatively common.

CDI is defined as any patient in whose stool *C. difficile* toxin has been identified at the same time they have experienced diarrhoea not attributable to any other cause; **or** from patients whose stool *C. difficile* has been cultured at the same time as they have been diagnosed with pseudomembranous colitis (PMC). Health Protection Scotland (2017).

Mild CDI: associated with mild diarrhoea (3 liquid/loose stools or more frequently than normal)

Moderate CDI: associated with a raised WBC count above normal but <15 x 10^9 /L cells, (typically 3 or more loose/liquid stools per day)

Severe CDI: when a patient has at least one severity marker including temperature>38.5˚C, WBC 15 x 10^9/L cells, 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 x 10^9/L cells or <2 x 10^9/L cells, serum lactate >2.2 mmol/l, end organ failure (mechanical ventilation, renal failure).

Recurrence is defined as CDI which re-occurs within 2-8 weeks of previous episode, provided symptoms from previous episode resolved after completion of initial treatment.

Clinical onset of CDI often occurs when patients are on antibiotics, or within 4 weeks and up to 12 weeks of finishing a course of antibiotics.

Patients may be colonised with C. difficile without symptoms.

- CDI may present with malaise, abdominal pain, nausea, anorexia, watery diarrhoea, low-grade fever, and a peripheral leukocytosis. Colonoscopy reveals a non-specific diffuse or patchy erythematous colitis without pseudomembranes.
- Pseudomembranous colitis (PMC) Sigmoidoscopy reveals raised yellow/ orange plaques from 2-10mm in size scattered over the colorectal mucosa. Patients with PMC have a more serious illness than CDI. Diarrhoea may also contain blood and mucous.

NB: Life-threatening symptoms develop in 1.2-3.2% of patients with CDI. This disease is a very important co-morbidity in frail, elderly patients and can have high in-patient mortality.

There is evidence of both direct and indirect spread through the hands of HCWs and patients; and environmental contamination via equipment and instruments, e.g. commodes, bedpans and washbowls. C. difficile produces spores which can survive for long periods in the environment. Environmental cleaning is paramount.

Certain persons are at increased risk of acquiring CDI. CDI should be considered in persons with diarrhoea who also have:

- Current or recent (within last 3 months) use of antimicrobial agents, in particular cephalosporins, broad-spectrum penicillin's, fluoroquinolones and clindamycin
- Increased age (over 65 years).
- Prolonged stay in healthcare settings.
- Serious underlying disease
- Surgical procedures (in particular bowel procedures).
- Immunosuppression (incl. HIV and transplant)
- Use of proton pump inhibitors or H2 antagonists, e.g. omeprazole, lansoprazole, which reduce production of stomach acid.

Clinical cases of CDI

In some circumstances the clinical team will treat a patient for CDI because either they have an equivocal result (GDH positive, toxin negative, the patient has C. difficile in their bowel that has the potential to produce C.difficile toxin, however the toxin has not been detected at this time but may cause disease) or without any positive microbiology following assessment of their presentation and symptoms. In these cases severity scores still need to be completed

Daily assessment of severity by clinical team

A patient diagnosed with CDI must be reviewed daily by the medical staff regarding fluid balance, electrolyte replacement, nutrition review, and monitoring for signs of increasing severity. Severity assessment (See below) must be scored and documented in the patient notes.

Patients must have severity assessment carried out daily by medical staff and recorded in the patient's notes until patient is asymptomatic for 48 hours and bowel movements have returned to normal.

CDI Assessment: TO BE COMPLETED BY MEDICAL STAFF

Completed by:	**Date:**	
CDI Severity Markers	**Yes**	**No**
Temperature > 38.5°C		
Suspicion of PMC, toxic megacolon, ileus		
Colonic dilatation in CT scan/abdominal x-ray 6cm		
WBC >15cells/mm^3		
Creatinine>1.5 x baseline		
Total:		

If two or more of the above markers are positive, this **may** indicate severe disease. In this event the case should be recorded via the NHSGGC clinical incident reporting system, i.e. Datix and the treatment algorithm should be applied if not already in place.

Health Protection Scotland (HPS) Trigger Tool

The Health Protection Scotland (HPS) Trigger Tool must be completed by the IPCT and Clinical Staff if there are two HAI CDI cases in the same ward in a two week period. IPCNs and ward staff will complete the tool daily until there is no longer a trigger i.e. one or both patients are no longer symptomatic or have been discharged. The following actions will be taken by the IPCT when a trigger is met:

- Request a terminal clean of the ward at the start of the trigger
- Advise on enhanced IPC precautions to be in place.
- Undertake IPC audit (if not done in last 3 months)
- Hand hygiene audit
- Ask the antimicrobial pharmacist to review prescribing

Findings will be reported to the SCN and ward staff who will liaise with IPCT and pharmacy colleagues on any actions required as a result.
Following this, should another case of HAI CDI emerge, the IPCT will complete a PAG (Problem Assessment Group) to determine the requirement for an IMT and ward closure.

Clinical Review is required if the patient

- has severe or life threatening CDI
- was admitted to ITU for treatment of CDI or its complications
- had endoscopic diagnosis of pseudomembranous colitis with or without toxin confirmation
- had surgery for the complications of CDI (toxic megacolon, perforation or refractory colitis)
- died within 30 days following a diagnosis of CDI where it is recorded as either the primary or a major contributory factor on the death certificate had persisting CDI where the patient has remained symptomatic and toxin positive despite two courses of appropriate therapy

Deaths due to CDI (Underlying or Contributing)

Patients who have died will have their cause of death reviewed as soon as possible via the ward death certificate records.
If death certificate records are not available, the lead IPCN will contact the General Manager (GM) for the service, and advise them that the records are not available. The Lead Infection Prevention and Control Doctor (LIPCD), Infection Prevention and Control Manager (IPCM), Associate Nurse Director, Infection Prevention and Control (ANDIPC), Clinical Services Manager (CSM) and Lead Nurse for the area must be informed of all patients who died in hospital who are or who have been positive for CDI during their current admission, and the cause of death if available.
Medical staff completing a death certificate in which CDI is noted (part 1 or 2) should discuss this with the consultant in charge of the patient's clinical care and refer case to the Procurator Fiscals Office. If CDI is placed on part 1, medical staff should inform the CSM and GM for the area.
Medical staff should familiarise themselves with NHSGGC Guidance on the Completion of Medical Certificates of Cause of Death.