AUSTRALIAN COMMISSION ON SAFETY AND QUALITY IN HEALTH CARE

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INFORMATION
for clinicians

Clostridioides difficile infection (CDI) - Information for primary health providers

This resource is designed to assist primary health providers identify and manage patients with *Clostridioides difficile* infection (CDI) in the community.

Primary and community healthcare services provide a range of services that address the prevention, treatment and management of illness and injury, and the preservation of physical and mental wellbeing.[1, 2,] Recommendations for the management of CDI in residential aged care facilities and acute care hospitals can be found in the Australian Guidelines for the Prevention and Control of Infections in Healthcare.

The early detection and appropriate treatment of CDI will benefit local communities by:

- Promoting appropriate use of antimicrobials and laboratory testing
- Reducing the unnecessary use of antimicrobials
- Improving detection and treatment of CDI
- Reducing hospital readmissions and community transmission of CDI.

Primary health providers are ideally placed to help reduce the risk of CDI in the community and address variations in care at a local level.

CDI is a community health issue

Background information for clinicians

Clostridioides difficile (*C. difficile*) is a spore-forming bacterium that causes diarrhoea, commonly after exposure to antimicrobial agents.[3] Exposure to other medications, such as proton pump inhibitors and immunosuppressant agents can independently contribute to CDI for some patients.[4, 5] *C. difficile* is typically found in the gastrointestinal tracts of many young animal species, humans, and contaminates the natural environment including agriculture and food production, as well as in built environments.[6, 7] Transmission of *C. difficile* occurs by ingestion of spores, either through person-to-person contact, or animal-to-person contact. *C.difficile* spores can also survive on environmental surfaces for extended periods of time and can be transferred from person-to person by contaminated hands or equipment.[7]

Symptomatic CDI is mediated through toxin production by the bacterium in the gut. Toxins A and B cause fluid accumulation in the gut, and inflammation and ulceration of the gut lining.[5] The spectrum of disease associated with *C. difficile* ranges from asymptomatic colonisation through to fulminant colitis.[5]

Patients can be colonised with *C. difficile* without symptomatic infection. Antimicrobial treatment may not be required for these patients.

In 2020 and 2021, over 80% of hospital patients with CDI had symptoms before admission to hospital.[8] There are a number of factors that influence the onset of CDI in the community, including:

- Prior antimicrobial use
- Recurrence of CDI following recent hospitalisation
- Post discharge continuation of medical treatment in the community (e.g., antimicrobial, chemotherapy treatment)
- Exposure to sources or reservoirs of C. *difficile* in the community (e.g., animals, environment or other colonised people).

Individuals with community-onset CDI are less likely to have had prior antimicrobial exposure or recent hospitalisation. Individuals with community-onset CDI have a similar likelihood of disease recurrence compared to hospital-onset CDI.[3, 4] Up to 20-25% of individuals will have recurrent infection within eight weeks of the onset of the original infection.[9]

Information for clinicians- Early detection, testing and treatment

Early detection with appropriate testing and treatment, are key interventions that will help improve patient outcomes, reduce the severity of disease, and prevent further spread of CDI in the community.

Diagnosis

Symptoms:

- Fever
- Severe watery diarrhoea, usually more than three episodes in 24 hours
- Blood in stool
- Acute abdominal pain
- Nausea
- Elevated white cell count
- Hypoalbuminaemia.[5, 10]

History/risk factors:

- Recent or prolonged hospitalisation
- Recent use of medications that alter balance of gut bacteria such as proton pump inhibitor, laxatives, antimicrobials (especially broad-spectrum antimicrobials, cephalosporins, fluoroquinolones, clindamycin or macrolides)
- Recent chemotherapy or presence of significant immune compromise (e.g., long-term treatment with a systemic immunosuppressant)
- Gastrointestinal surgery/procedures
- Chronic co-morbidities[9] (e.g. chronic renal failure, gastrointestinal disease,).[5, 11]

Testing:

Testing for CDI should be considered for any patient with moderate to severe acute diarrhoea of over 48 hours duration, if no other aetiology can be clearly identified, to promote early detection and prevent further transmission.[12]

When investigating diarrhoea for CDI, consider the following:

- Clinical symptoms and risk factors for CDI
- If the diarrhoea lasted for 48 hours or longer
- Previous stool tests returned negative results for other common enteropathogens.

See section 3.1 Testing criteria of the Public Health Laboratory Network (PHLN) Clostridiodes difficile infection (*Clostridioides difficile*) Laboratory case definition for recommendations for the specimen selection for CDI testing.

Laboratory testing: The Public Health Laboratory Network (PHLN) has developed a standard case definition for the diagnosis for CDI.[9]

CDI laboratory definition

1.1.1 Definitive laboratory criteria

Direct identification of preformed *C. difficile* toxin(s) in an unformed (diarrhoeal) stool sample.

1.1.2 Suggestive laboratory criteria

a. Direct detection of gene(s) within the Pathogenicity Locus (PaLoc) (which encodes *C. difficile* toxin production - *tcdA* and/or *tcdB, tcdE)* - in an unformed (diarrhoeal) stool sample or in bowel tissue by nucleic acid amplification tests OR
b. Isolation, from an unformed (diarrhoeal) stool sample or bowel tissue, of *C. difficile*, which EITHER
    - possesses one or more *C. difficile* toxin-related gene(s) carried on the pathogenicity locus (PaLoc) plus or minus the *C. difficile* transferase locus (CdtLoc), OR
    - produces toxin A and/or B in vitro

Public Health Laboratory Network (PHLN) Clostridiodes difficile infection (*Clostridioides difficile*) Laboratory case definition

A combination of rapid tests for the detection of toxins A or B, or toxin genes, and toxigenic culture to recover an organism and identify strain type should be considered when testing for CDI.

Rapid enzyme immunoassays (EIAs) for detecting one or both toxins A and B should never be used as the only test for CDI due to a lack of sensitivity. Molecular tests, such as PCR for detecting toxin genes are over-sensitive and should only be used with significant clinical input. The ideal approach is a 2-step algorithm employing a highly sensitive initial test such as PCR or detection of

glutamate hydrogenase (GDH) to screen out negative samples, followed by a more specific test such as an EIA to detect toxins in the stool. Culture to recover the infecting organism and identify the strain type should be considered for epidemiological purposes.

Laboratory results should always be interpreted in conjunction with clinical information.

Key points for investigating CDI:

- Stool testing is sensitive and specific for the detection of *C. difficile.*
- Tests should only be done on symptomatic patients
- A patient with a positive test who recovers may remain positive for at least one month.

Repeat tests are not advisable within seven days of prior negative tests or within one month of a positive test.

Minimising the risk of CDI

To reduce the risk of CDI, ensure that antimicrobials are only used as indicated by the Therapeutic Guidelines: Antibiotic and minimise the duration of antimicrobial treatment as much as possible. Avoid prolonged use of proton pump inhibitor medicines unless there is a defined clinical indication for their use.[13]

Treatment

Manage any modifiable risk factors. Review the use of antimicrobials and proton pump inhibitor medicines. For pharmacological management of non-severe, non-recurrent CDI, see current Therapeutic Guidelines.[14] For the treatment of recurrent or severe CDI, refer patients to infectious disease physician/microbiologist and/or admission to hospital.

The Access to Therapeutic Guidelines fact sheet provides information for clinicians on how to access the Therapeutic Guidelines for information on the appropriate prescribing of medicines.

CDI prevention and control

Several strategies can be implemented in community and primary health to prevent and control the transmission of CDI.

Antimicrobial stewardship (AMS) in primary health

Primary health has an important role in improving the safe and appropriate use of antimicrobials, reducing patient harm and the risk of antimicrobial resistance (AMR) in Australia. The Commission has developed a suite of resources to support primary health practitioners to implement AMS in primary health.

Information for AMS in primary health is available here.

Antimicrobial stewardship (AMS) in aged care

Antimicrobial stewardship in aged care can improve the safe and appropriate use of antimicrobials and decrease the risk of AMR, an increasing risk for older people. Almost 1 in 6 antimicrobials in

the aged care setting is prescribed without a clinical indication or 'just in case', which may lead to unnecessarily long treatment duration and increase the risk of *C. difficile* and AMR infection.

Information for AMS in aged care is available here.

Standard and transmission-based precautions

Standard precautions are the primary strategy for minimising the spread of infectious diseases, such as CDI. Standard precautions must be used when providing care to all patients, regardless of whether they have an infection.[15] Patients with CDI will also require **contact precautions** in addition to standard precautions. This means:

- Personal protective equipment (PPE), including gloves, gowns or aprons should be worn by healthcare staff to provide protection to hands, skin and clothing from exposure to blood and body fluids (exposure to diarrhoea). PPE must be changed and hand hygiene must be performed when PPE becomes soiled, between different patient care activities and between providing care to different patients or leaving the patient's environment.[15] Section 3.3 Personal Protective Equipment, of the Australian Guidelines for the Prevention and Control of Infection in Healthcare provides further information on the use of PPE for standard and transmission-based precautions.
- Hand washing with soap and water for at least 20 seconds to facilitate the mechanical removal of spores. Longer hand washing is likely to be required if visible soiling is present. If gloves are worn during the care of patients in settings where *C. difficile* is suspected or known to be present, spore contamination of the hands will be minimal and alcohol-based hand rub remains the agent of choice for hand hygiene.[15] More information on hand hygiene is available here.
- Cleaning and disinfection of environmental surfaces (beds, chairs, bathrooms, toilets) and equipment between patient use and on discharge home. All equipment and environmental surfaces should be cleaned first with a neutral detergent, followed by disinfection with a **hypochlorite** solution.[15] Information on environmental cleaning is available here
- The use of dedicated patient care equipment to minimise sharing of contaminated equipment between patients.
- Isolation in single room accommodation, with a dedicated ensuite if available for duration of infection/ symptoms.

In the community setting, hand hygiene and environmental cleaning are two key elements of standard precautions which are important for controlling the transmission of CDI.

More information on standard and transmission-based precautions is available here.

Consumer information

C. difficile is a bacterium that naturally lives in the gut of young humans and animals. Overuse of antibiotic treatments or some other medications may change the composition of the normal gut bacteria and lead to CDI. CDI can cause significant gastrointestinal illness, such as severe diarrhoea and inflammation of the bowel, and can be deadly.

Patient information about CDI, including risk factors for CDI, how CDI is treated and how to prevent the spread of CDI is available here.

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