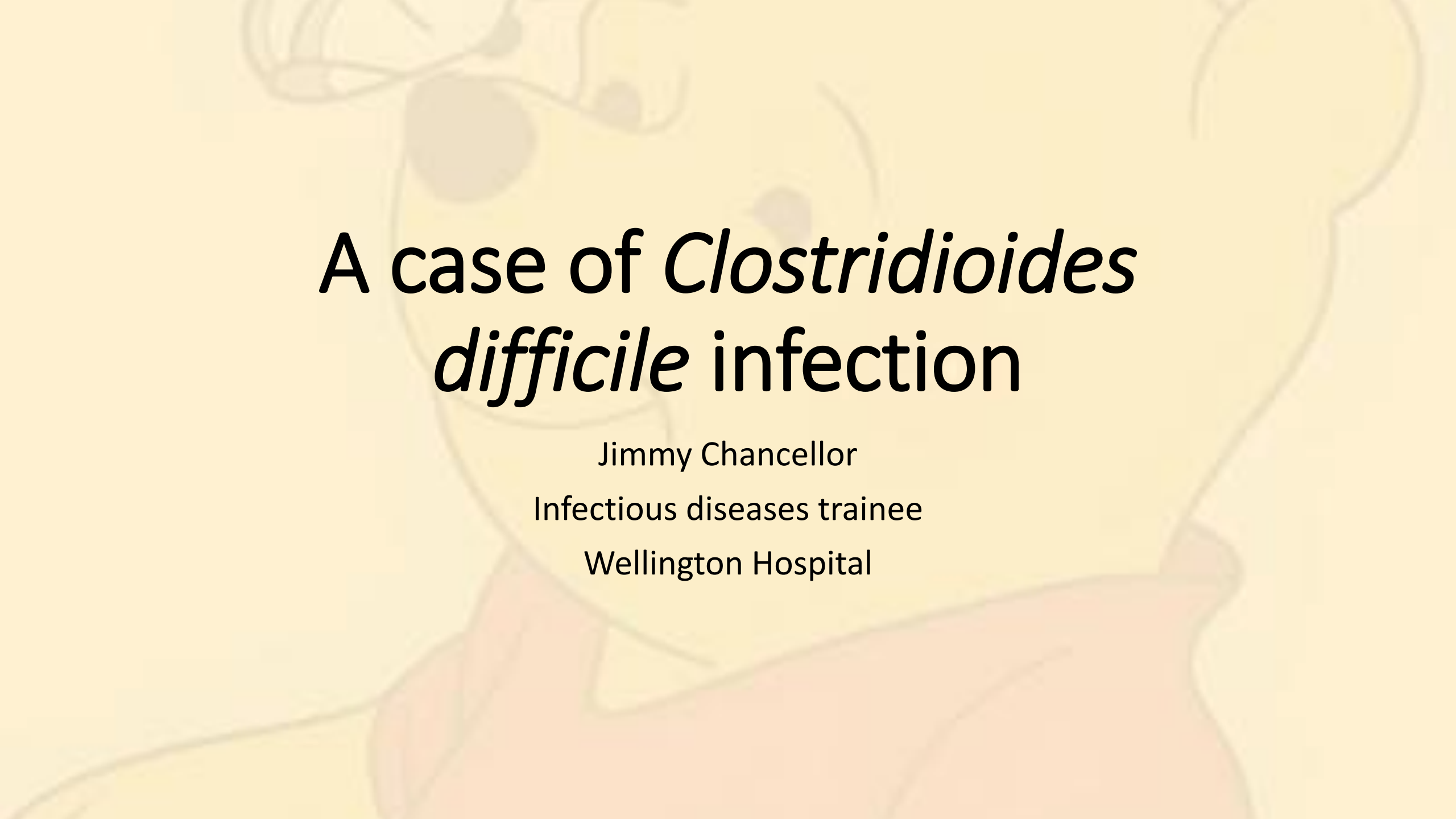


A faint, stylized background illustration of a person's face and hand. The face is in the upper half, with large, dark eyes and a simple nose and mouth. The hand is in the lower half, with fingers slightly curled. The colors are muted, with a light yellow for the face and a light pink for the hand.

A case of *Clostridioides difficile* infection

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Background

- C. difficile is one of the leading cause of healthcare associated infections
- Variations in IPC measures for CDI
- CDI rates are a surrogate marker of AMS & IPC effectiveness
- 0.1-5 cases of CDI per 1000 hospital admissions
- 70% of cases are linked to recent antibiotics
- 1 in 6 patients experience a recurrence

Outline

Case based discussion

- Risk factors
- Signs & symptoms
- Precautions
- Diagnosis
- Initial treatment
- Treatment for recurrent disease
- Take home points

Mrs C's initial presentation

- 82F presents with sepsis of unclear source
- Past depression
- Grows *Capnocytophaga canimorsus* from a set of BCs
- Owns a cat that bites & scratches
- 7 days of IV ceftriaxone then 7 days of PO ciprofloxacin



Risk factors

Established

- Antibiotic use in the last 30 days
- >65 years old
- Hospitalised in the last 30 days
- Severe comorbid illness

Possible

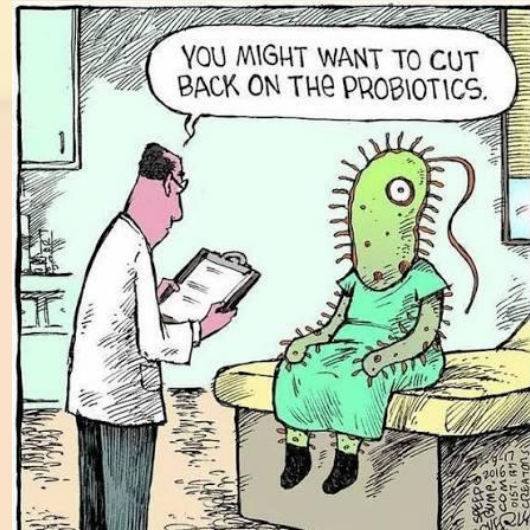
- Gastric acid suppression
- Enteral feeding
- GI surgery
- Obesity
- Chemotherapy
- HSCT
- IBD
- Cirrhosis

Antibiotics associated with C. difficile infection

Frequently associated	Occasionally associated	Rarely associated
▪ Fluoroquinolones ▪ Clindamycin ▪ Penicillins and combinations (broad spectrum) ▪ Cephalosporins (2nd/3rd/4th/5th generation) ▪ Carbapenems	▪ Macrolides ▪ Penicillins (narrow spectrum) ▪ Cephalosporins (1st generation)* ▪ Trimethoprim-sulfamethoxazole ▪ Sulfonamides ▪ Nitrofurantoin	▪ Aminoglycosides ▪ Tetracyclines ▪ Tigecycline ▪ Chloramphenicol ▪ Metronidazole ▪ Vancomycin

Probiotics & acid suppression

- Insufficient good quality evidence to support the use of probiotics
- PPIs & H2 blockers may increase your risk
- After CDI, staying on a PPI increases your risk of recurrence



Mrs C's readmission

- 2/52 after completing ciprofloxacin re-presents with fevers & diarrhoea
- Temp >38, HR ~100, BP 90/40
- Raised inflammatory markers & acute kidney injury

Symptoms & Signs of CDI

- **Watery diarrhoea** (≥ 3 loose stools in 24hrs)
- Diarrhoea frequently mucoid
- Blood uncommon
- Abdominal pain & cramping
- Nausea & anorexia
- Fevers
- Abdominal distension
- Hypotension
- Occasionally ileus with little or no diarrhoea



Complications

- Ileus
- Bowel perforation
- Hypovolemic or distributive shock
- Toxic megacolon



Mrs C is isolated

- Isolated in a single room in ED with contact precautions
- Bathroom is shared with multiple other ED patients...



Isolation

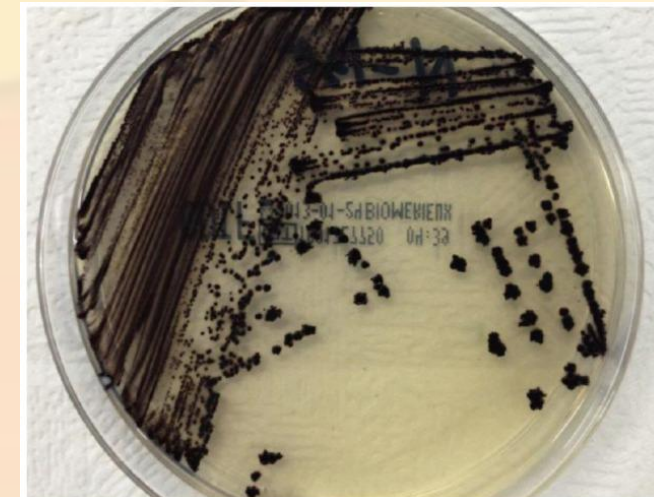
- Isolate confirmed or suspected cases
- Individual bathrooms or bed pans preferred
- If necessary cohort patients with C. difficile infection
- Communication with ward staff is key in managing cases/outbreaks

Mrs C's initial management

- Given ceftriaxone by ED (?GI sepsis)
- Transferred to ward with contact precautions & single bathroom
- Faecal specimen sent to lab
 - GDH antigen screen = positive
 - Toxin A&B = negative
 - Stool cultured on selective anaerobic media = positive
 - Repeat GDH + toxin testing = positive

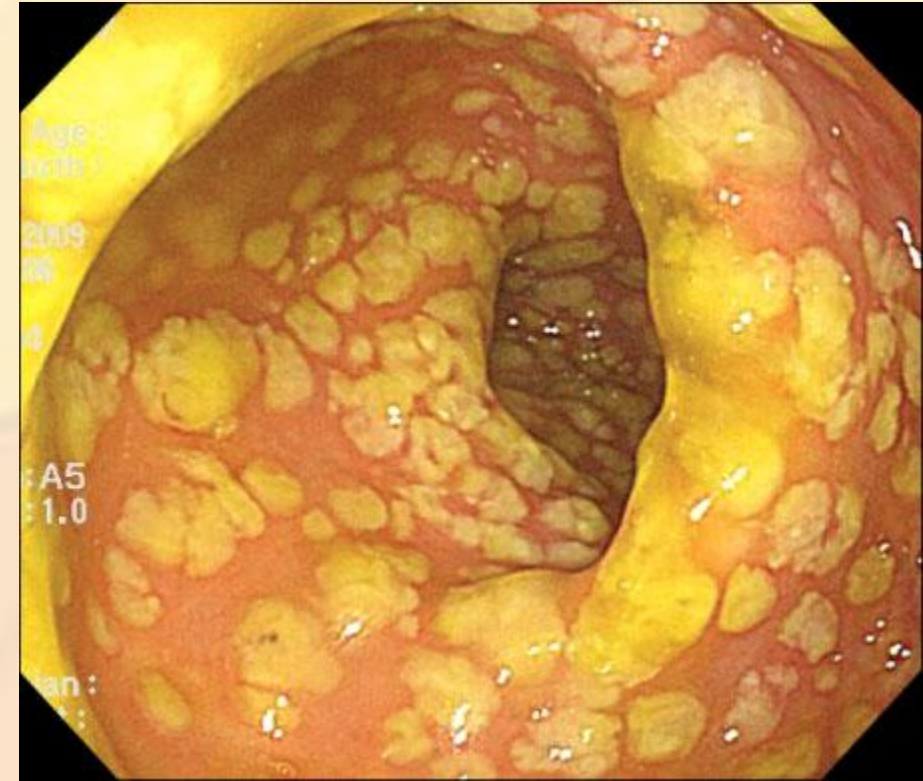
Diagnosis of CDI

- Diarrhoea = stool that takes the shape of the container it is in
- GDH antigen
- Toxin A&B
- Equivocal results -> grow stool on selective anaerobic media
- If *C. difficile* grown -> retest GDH & toxins



Mrs C's diagnosis

- Compatible syndrome + GDH positive + toxin positive = CDI
- Oral vancomycin 125mg QID for 10 days



Treatment of first episode

- Oral vancomycin preferred
- Metronidazole is less effective than vancomycin
- In severe disease add IV metronidazole to PO vancomycin
- Additional therapies should be guided by ID

Mr D

- A patient on another ward is also diagnosed with C. diff
- Hasn't received antibiotics
- Shared the same bathroom in ED as Mrs C
- He is isolated, treated & recovers
- Routine screening of other asymptomatic patients not recommended

Transmission

- Component of normal gut flora in up to 15% of healthy adults
- Flourishes under selective pressure of antibiotics
- May also be transmitted from person to person via faecal-oral
- Spores can survive on dry environmental surfaces for months to years

Hand hygiene & PPE for CDI

- Soap&water VS alcohol based hand rub (ABHR)
- No studies have shown an increase in CDI rates with the use of ABHR
- No studies have shown a decrease in CDI rates with the use of soap&water
- Use of ABHR resulted in decreased transmission of MDROs
- Use of gloves & gowns strongly recommended

Environmental decontamination

- Chlorine-based & sporicidal agents
- Medical equipment should be patient-dedicated or disposable
- Care with BP cuffs, stethoscopes, thermometers etc
- Address areas of stagnant water



Mrs C's deisolation

- Recovers on the ward
- Diarrhoea settling
- Charge nurse wants to know “when can this patient come out of iso?”

Discontinuation of contact precautions

- In suspected cases isolate until faecal testing has excluded infection
- If CDI confirmed continue until >48hrs from resolution of diarrhoea
- BUT continuation of contact precautions beyond this time is reasonable since persistent stool shedding of spores is common
- Contact precautions until discharge if feasible

Mrs C's recurrence of symptoms

- Discharged home well
- Returns 3/7 after completing vancomycin with recurrence of diarrhoea
- Medical team rings IPC and asks: “should we retest her?”

Retesting

- No role for repeat testing during same illness of diarrhoea
- Do not test for ascertainment of cure
- If there is resolution of diarrhoea then recurrence of symptoms it may be reasonable to retest
- Stool assays can remain positive after clinical recovery

Mrs C's repeat test

- The sample was not processed because of “gross contamination due to leakage of the specimen in transit”
- Treated under the presumption that this was a recurrence
- Given a longer weaning course of oral vancomycin

Treatment of recurrent disease

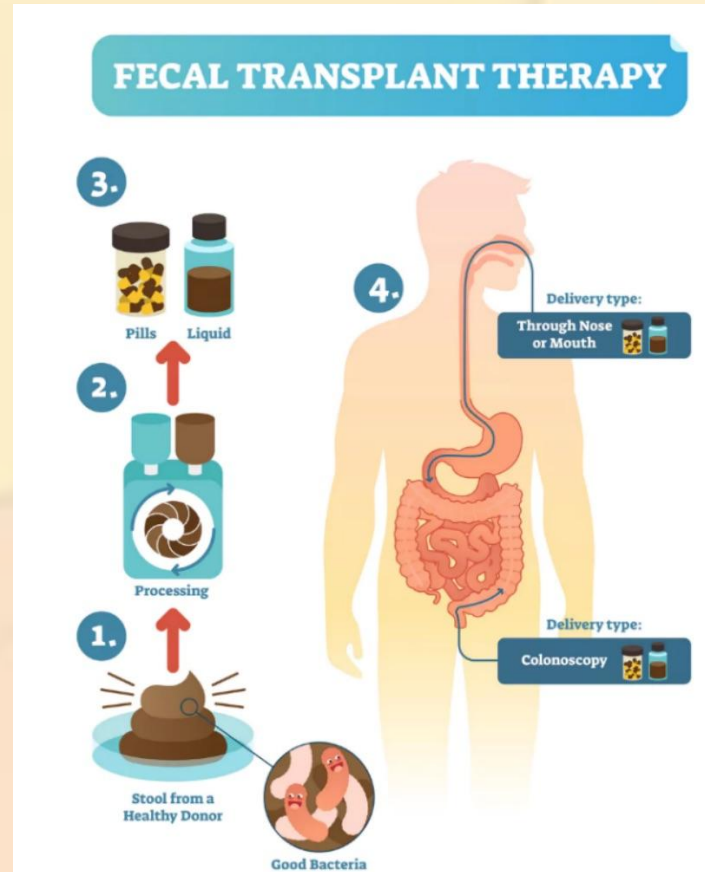
- Oral vancomycin
 - 125mg QID for 14 days
 - 125mg BD for 7 days
 - 125mg OD for 7 days
 - 125mg Q72H for 5 doses
- If recurrence occurred after using metronidazole then 10 days of oral vanc is recommended
- Fidaxomicin is only available in NZ through a named patient pharmaceutical assessment (NPPA)
- FMT is an alternative for recurrent disease

Mrs C's recurrences

- 3 recurrences within 6 months
- Faecal microbiota transplant suggested
- Only relative available to donate was her 88 year old sister
- During this time Mrs C had also developed severe depression

Faecal microbiota transplantation (FMT)

- Suitable donor is screened for transmissible infections
- Fresh sample provided on the day of FMT
- Sample liquefied & inserted rectally as an enema
- Mrs C is cured of her recurrent CDI!



Take home points

- CDI rate may be reflective of AMS & IPC effectiveness
- CDI can range from mild to severe & life-threatening disease
- Recurrences are common & debilitating
- Treatment can be challenging for patients
- FMT shows promise for recurrent disease
- **Australasian Society of Infectious Diseases updated guidelines for the management of *Clostridioides difficile* infection in adults and children in Australia and New Zealand**

References

- Balsells E, Filipescu T, Kyaw MH, Wiuff C, Campbell H, Nair H. Infection prevention and control of *Clostridium difficile*: a global review of guidelines, strategies, and recommendations. J Glob Health. 2016.
- Akorful RAA, Odoom A, Awere-Duodu A, Donkor ES. The Global Burden of *Clostridioides difficile* Infections, 2016-2024: A Systematic Review and Meta-Analysis. Infect Dis Rep. 2025
- Curry SR, Muto CA, Schlackman JL, et al. Use of MLVA genotyping to determine the role of asymptomatic carriers in *Clostridium difficile* transmission. Clin Infect Dis.. 2013.
- Rationale for Hand Hygiene Recommendations after Caring for a Patient with *Clostridium difficile* Infection Erik R. Dubberke, MD, MSPH; Dale N. Gerding, MD. A compendium of strategies to prevent healthcare associated infections in acute care hospitals. 2011.
- Freier L, Zacharias N, Gemein S, Gebel J, Engelhart S, Exner M, Mutters NT. Environmental Contamination and Persistence of *Clostridioides difficile* in Hospital Wastewater Systems. Appl Environ Microbiol. 2023.
- Patil R, Blankenship L. Proton Pump Inhibitors and *Clostridium Difficile* Infection: Are We Propagating an Already Rapidly Growing Healthcare Problem? Gastroenterology Res. 2013.
- Gilboa, M., Baharav, N., Melzer, E. et al. Screening for Asymptomatic *Clostridioides difficile* Carriage Among Hospitalized Patients: A Narrative Review. Infect Dis Ther. 2023.
- Abdali ZI, Roberts TE, Barton P, Hawkey PM. Economic evaluation of Faecal microbiota transplantation compared to antibiotics for the treatment of recurrent *Clostridioides difficile* infection. EClinicalMedicine. 2020.
- Longhitano A, Roder C, Blackmore T, Campbell A, May M, Athan E. Australasian Society of Infectious Diseases updated guidelines for the management of *Clostridioides difficile* infection in adults and children in Australia and New Zealand. Intern Med J. 2025.
- www.uptodate.com