

## C. difficile- A Hardy Foe

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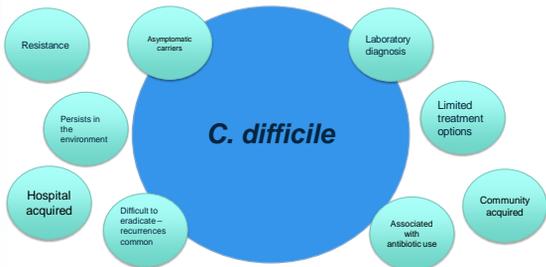
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### Difficult by name, difficult by nature...



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## Clostridioides difficile

- *Clostridioides difficile* (*C. difficile*) is an anaerobic bacteria normally found in the large intestine
- Forms spores
- Toxin producer
- Antibiotic use can cause other bacteria to die allowing *C. difficile* to multiply and cause infection



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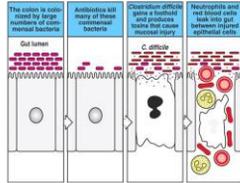
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### How *C. diff* causes diarrhea



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### The Microbiota: A Line of Defense Against Infection



B. Chiriac, Scientific American 2012

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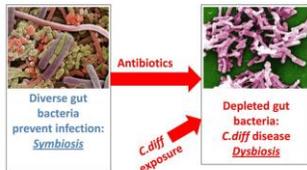
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### *C. diff*: The Disease



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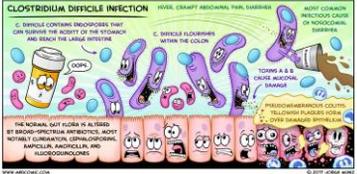
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**CDI and antimicrobial use** 

- CDI is directly related to antimicrobial use




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**Clinical impact – C.difficile infection (CDI)** 

- Diarrhoea
- Pseudomembranous colitis
- Severe colitis
- Toxic megacolon
- Sepsis
- Death
- Difficult to eradicate
  - recurrences common (1 in 5)




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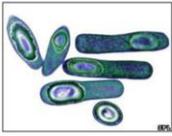
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**The C.diff Lifecycle: Spore Formation** 



- C. diff can reproduce by creating hardy, long-lasting spores
- Spores are difficult to kill on surfaces
- Spores can reside in the gut and evade antibiotic treatment

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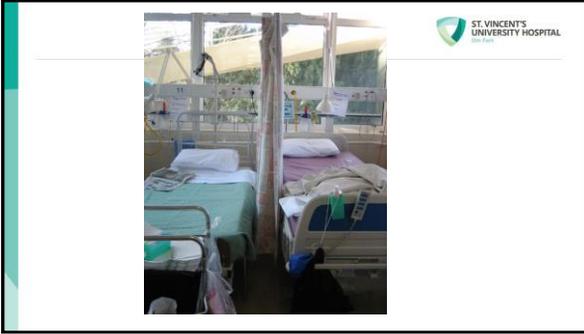
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### Epidemiology

- First identified 1935, associated with disease in 1978
- Carried in the gut by infants up to the age of 2 years
- Present in 2-5% of the adult population
- Cases can be healthcare associated or community acquired
- Mid 2000s appearance of hypervirulent, resistant strains

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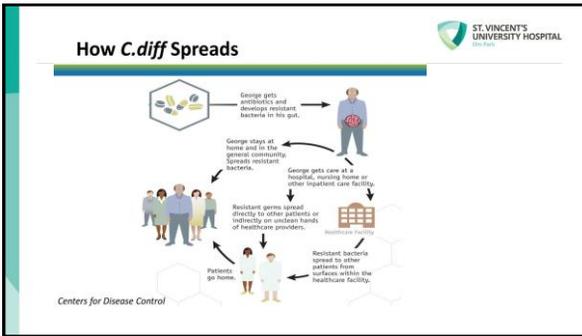
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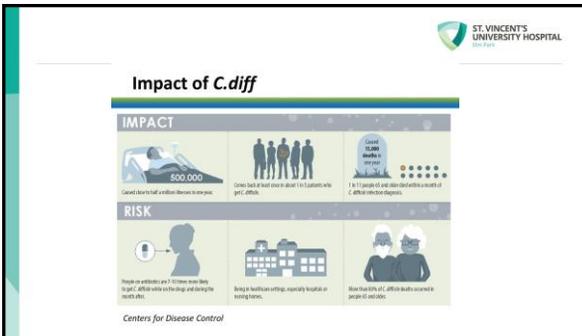
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### *C. difficile* in Ireland

2017

- 1,766 *C. difficile* infections notified
- 32.4 Crude Incidence Rate/100,000 population
- 2.2 Rate hospital-acquired\* cases/10,000 BDU
- Notifiable since May 2008

\*New and recurrent cases

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### Can we combat CDI?

- Surveillance
- Infection control
  - Isolation
  - PPE
  - Hand hygiene
- Cleaning
  - Environment
  - Equipment
- Antimicrobial stewardship

CDC estimate a 10% decrease in antibiotic use could reduce a hospital's rate of *C. difficile* infections by 34%

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### Conclusion

- Antibiotics do not cause CDI but they disrupt the microbiota predisposing to infection – **Antimicrobial stewardship**
- Spread within healthcare settings – **Infection control**
- Major public health crisis – **raise awareness**
- New treatment – **research**

CDC goal – Reduce CDI by 30% by 2020

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