This Room is Bugged!

Michael Krease D.O.

Gastroenterology
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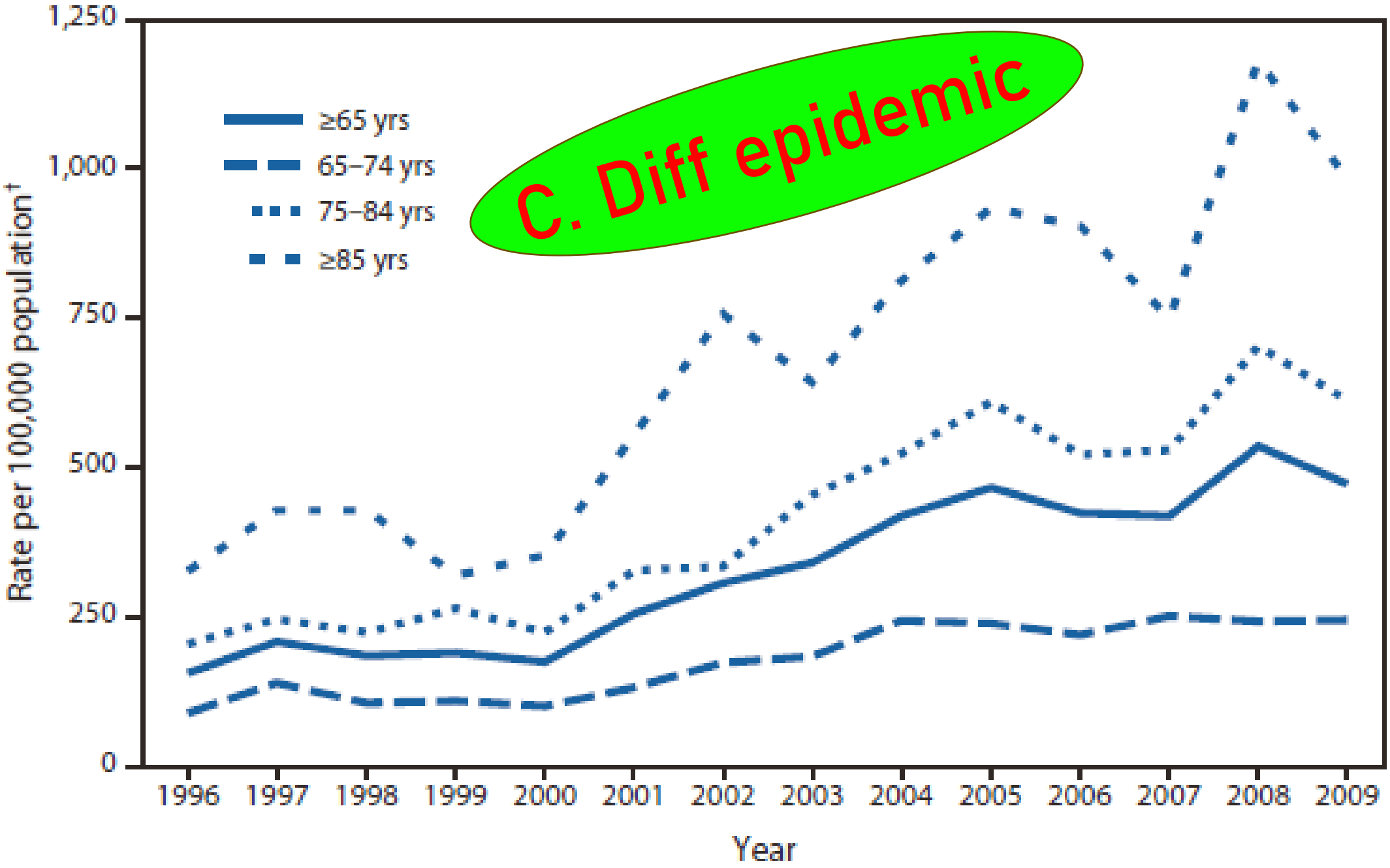
Disclosures

I have the following financial relationships:

- Sanofi / Regeneron (Speaker)
- Phathom (Speaker)
- Madrigal (Speaker)

These relationships have been mitigated.


C. Diff epidemic
≥65 yrs
65–74 yrs
75–84 yrs
≥85 yrs
Rate per 100,000 population†
1,250
1,000
750
500
250
0
1996
1997
1998
1999
2000
2001
2002
2003
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2007
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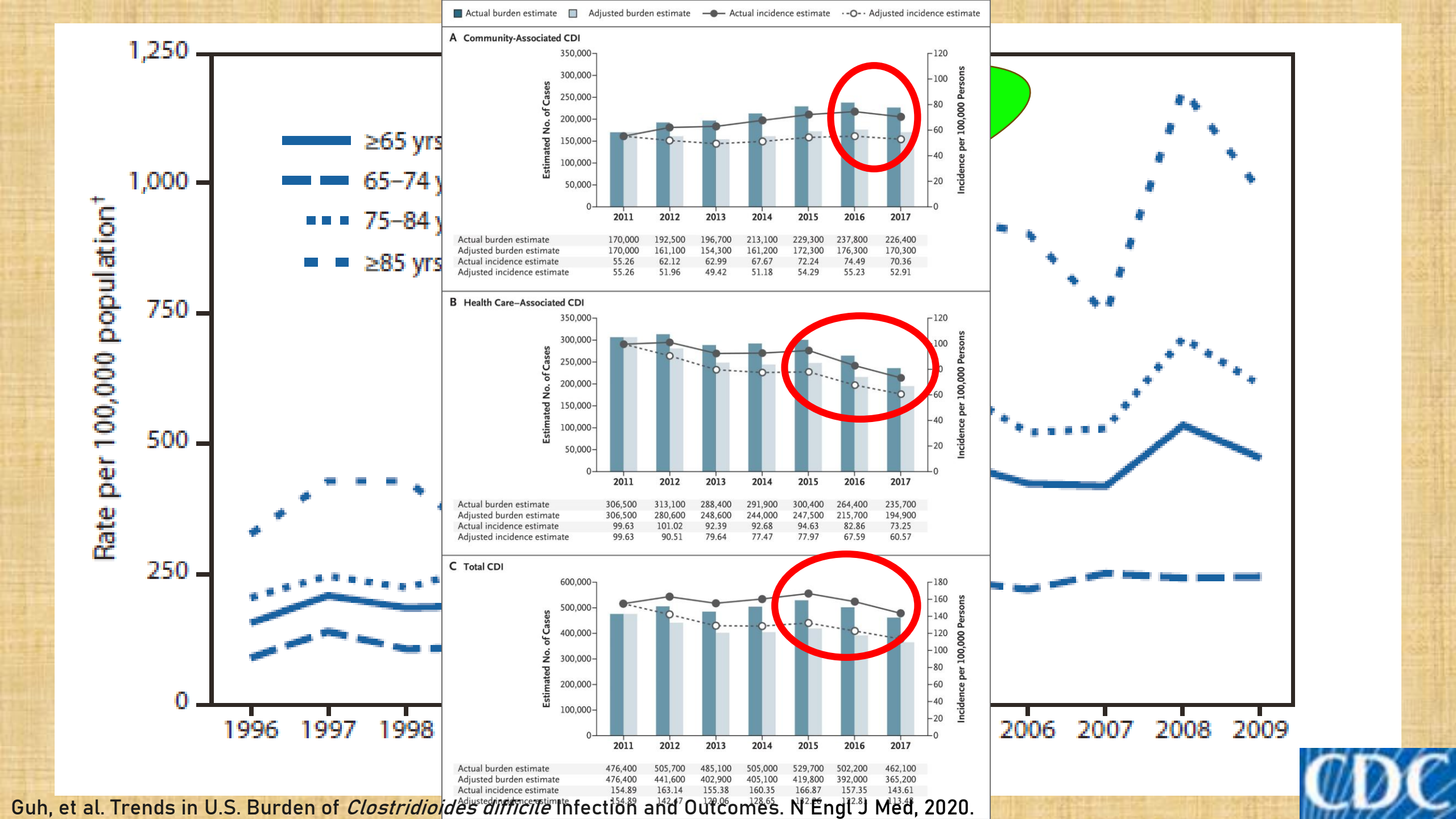
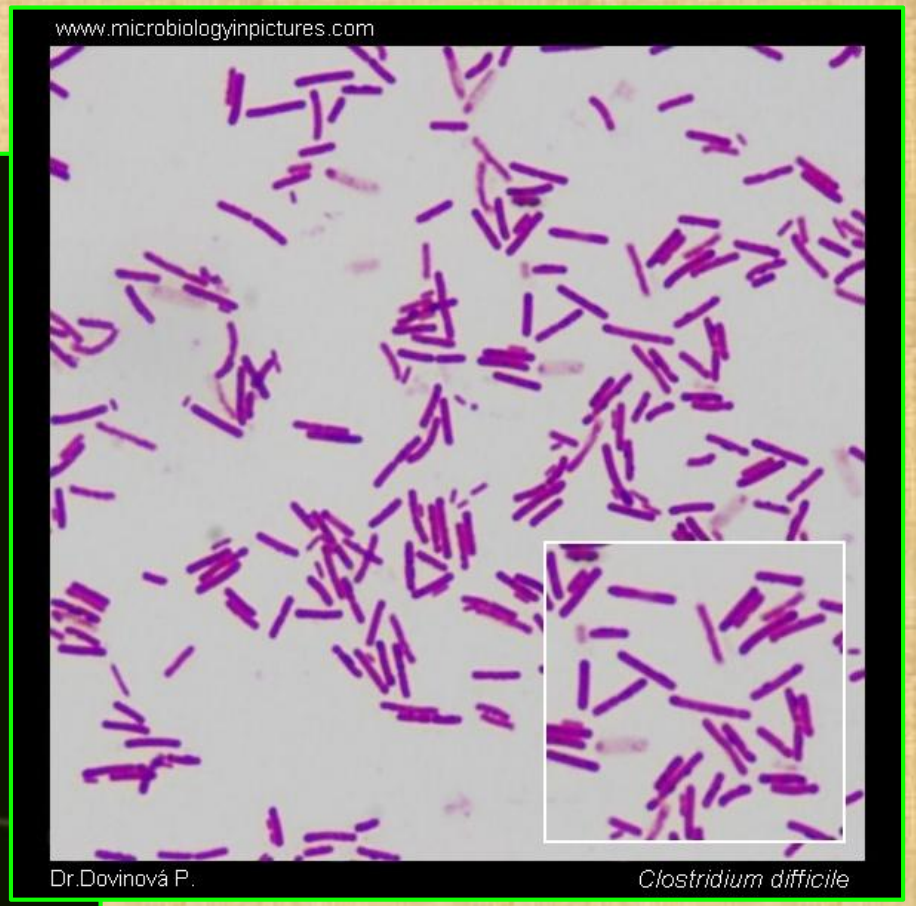
2009
Year

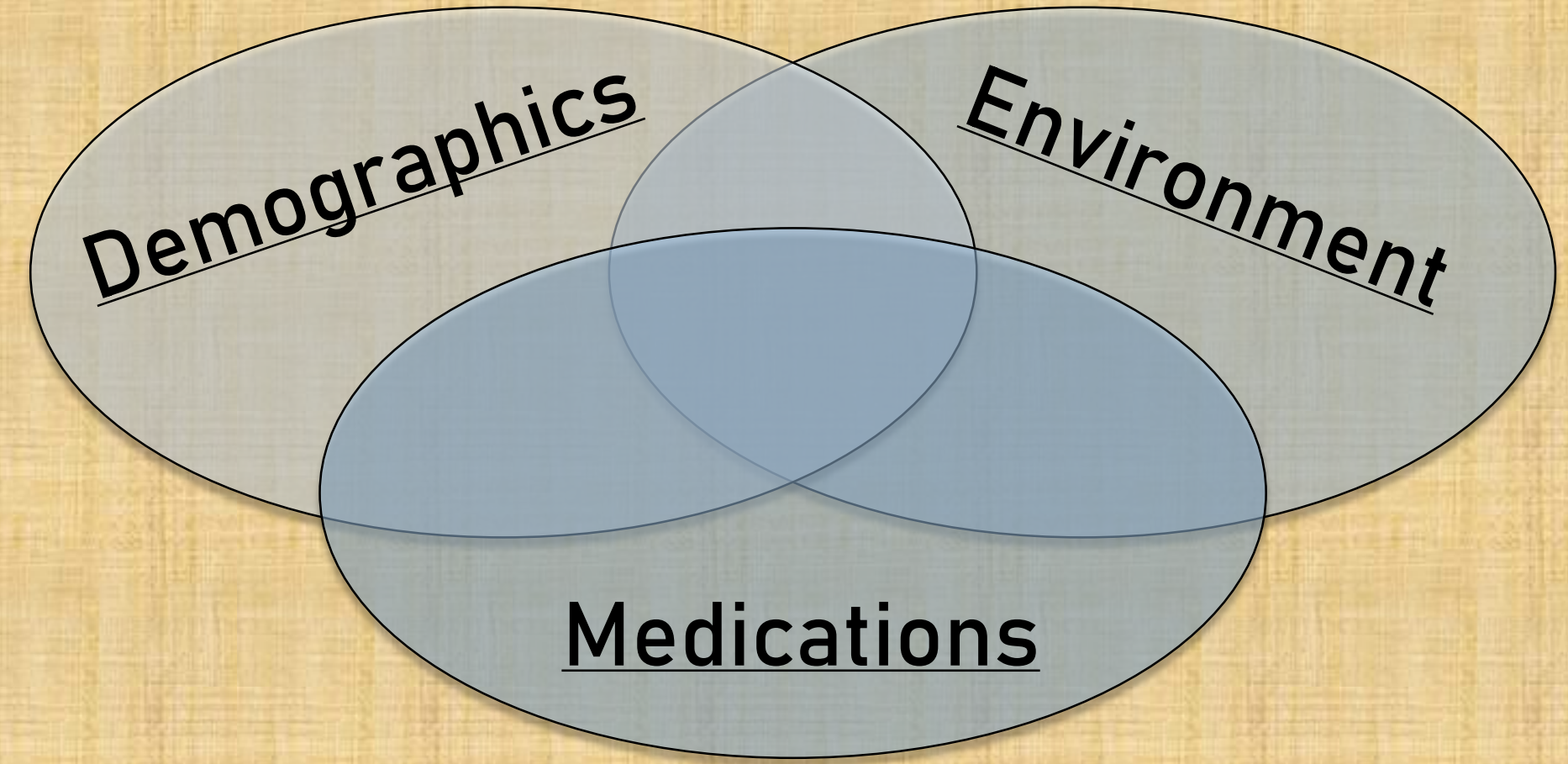


Guh, et al. Trends in U.S. Burden of *Clostridioides difficile* Infection and Outcomes. N Engl J Med, 2020.



- Gram positive
- Anaerobe
- Rod shaped
- Spore forming

Who gets C. diff?



Demographics

- Age > 65
- Females – ?
- Immunicompromise
  - HIV
  - Crohn's
  - Ulcerative colitis

Environment

- Hospital
- Skilled nursing facility
- Nursing Home
- Community
  - Grocery stores
  - Public bathrooms
  - Airplane seats
  - Meat processing plant

Medications

- Antibiotics
- PPIs

Clostridium difficile-Associated Diarrhea and Proton Pump Inhibitor Therapy: A Meta-Analysis

Janarthanan, Sailajah MD[1]; Ditah, Ivo MD, M Phil[1]; Adler, Douglas G MD[2]; Ehrinpreis, Murray N MD[1]

Author Information

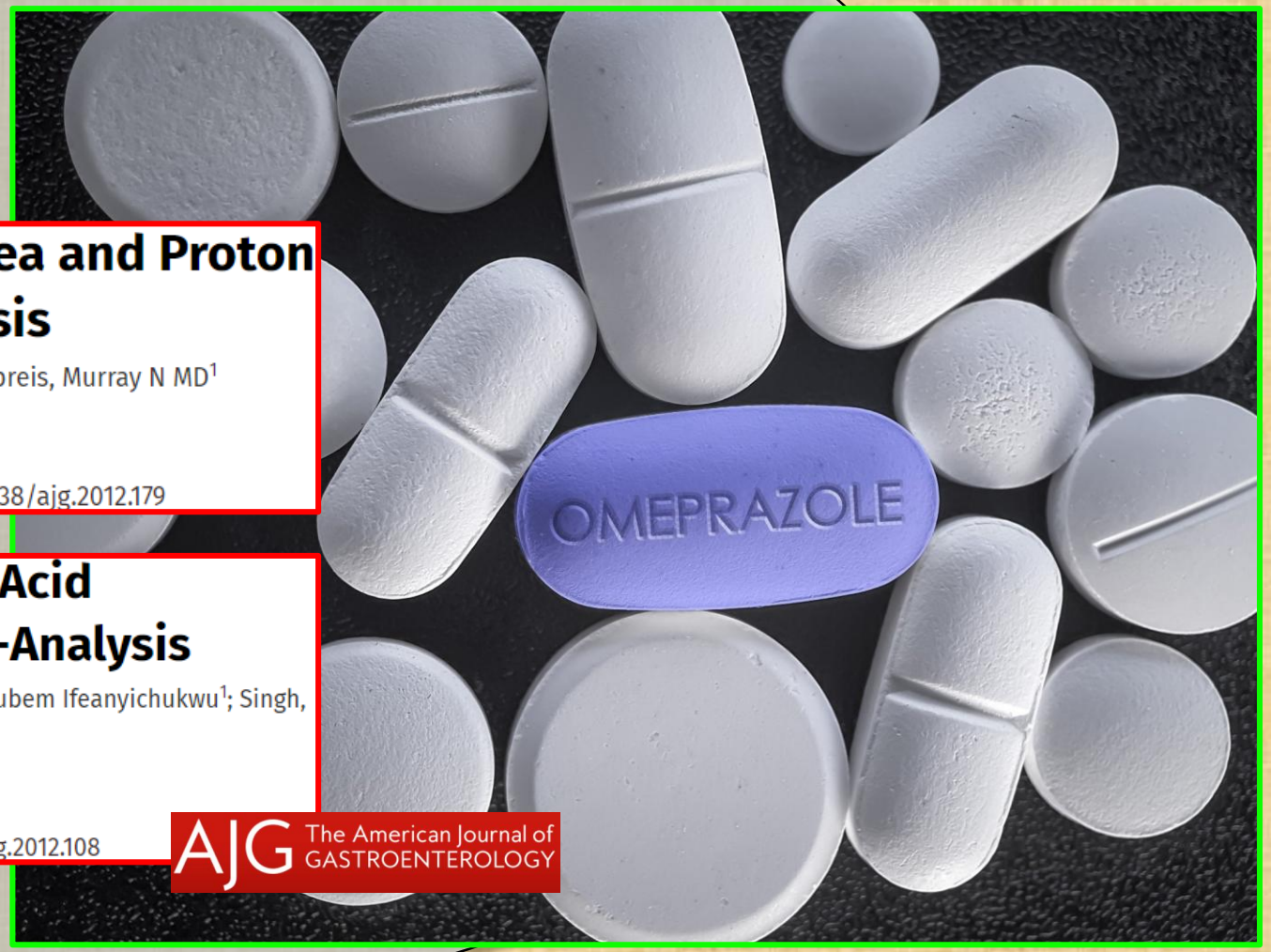
American Journal of Gastroenterology 107(7):p 1001-1010, July 2012. | **DOI:** 10.1038/ajg.2012.179

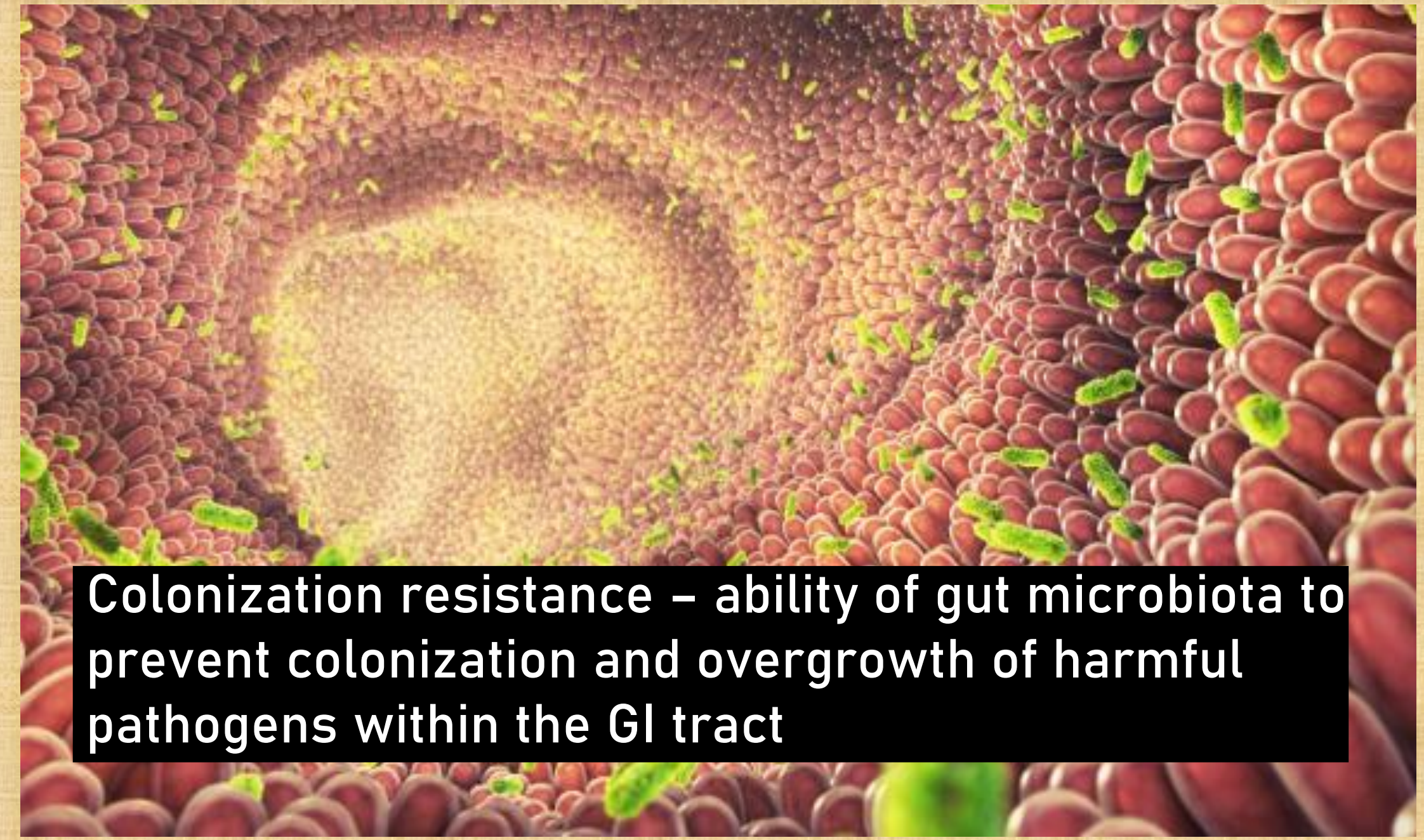
Risk of*Clostridium difficile*Infection With Acid Suppressing Drugs and Antibiotics: Meta-Analysis

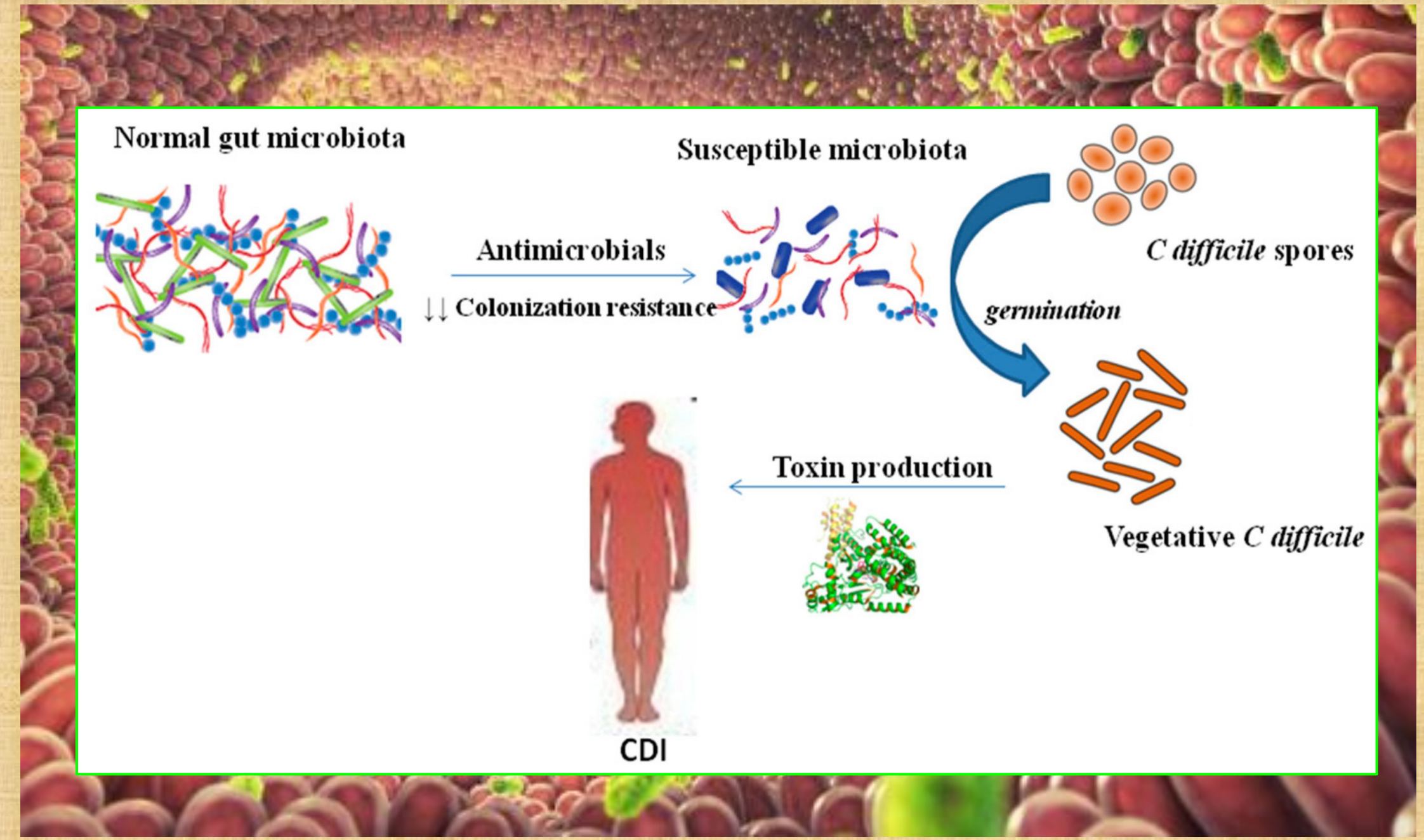
Kwok, Chun Shing MBBS, MSc, BSc[1]; Arthur, Aaron Kobina BSc[1]; Anibueze, Chukwudubem Ifeanyichukwu[1]; Singh, Sonal MD, MPH[2]; Cavallazzi, Rodrigo MD[3]; Loke, Yoon Kong MBBS, MD[1]

Author Information

American Journal of Gastroenterology 107(7):p 1011-1019, July 2012. | **DOI:** 10.1038/ajg.2012.108




Colonization resistance – ability of gut microbiota to prevent colonization and overgrowth of harmful pathogens within the GI tract



Microorganisms 2020

Diagnosis

Angus the C. diff smelling dog!

- GDH
  - Present on all C. diff organisms – great screening test (high sensitivity)
  - Does not differentiate between different strains
- PCR (NAAT)
  - Sensitive test but picks out the organisms that are capable of producing toxin
  - Does not identify whether or not that DNA is actually producing toxin
- EIA
  - Looks for the protein (toxin) responsible for the disease

Dia

- GDH
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  - Doe
- PCR (N
  - Ser
    pro
  - Doe
    tox
- EIA
  - Loc

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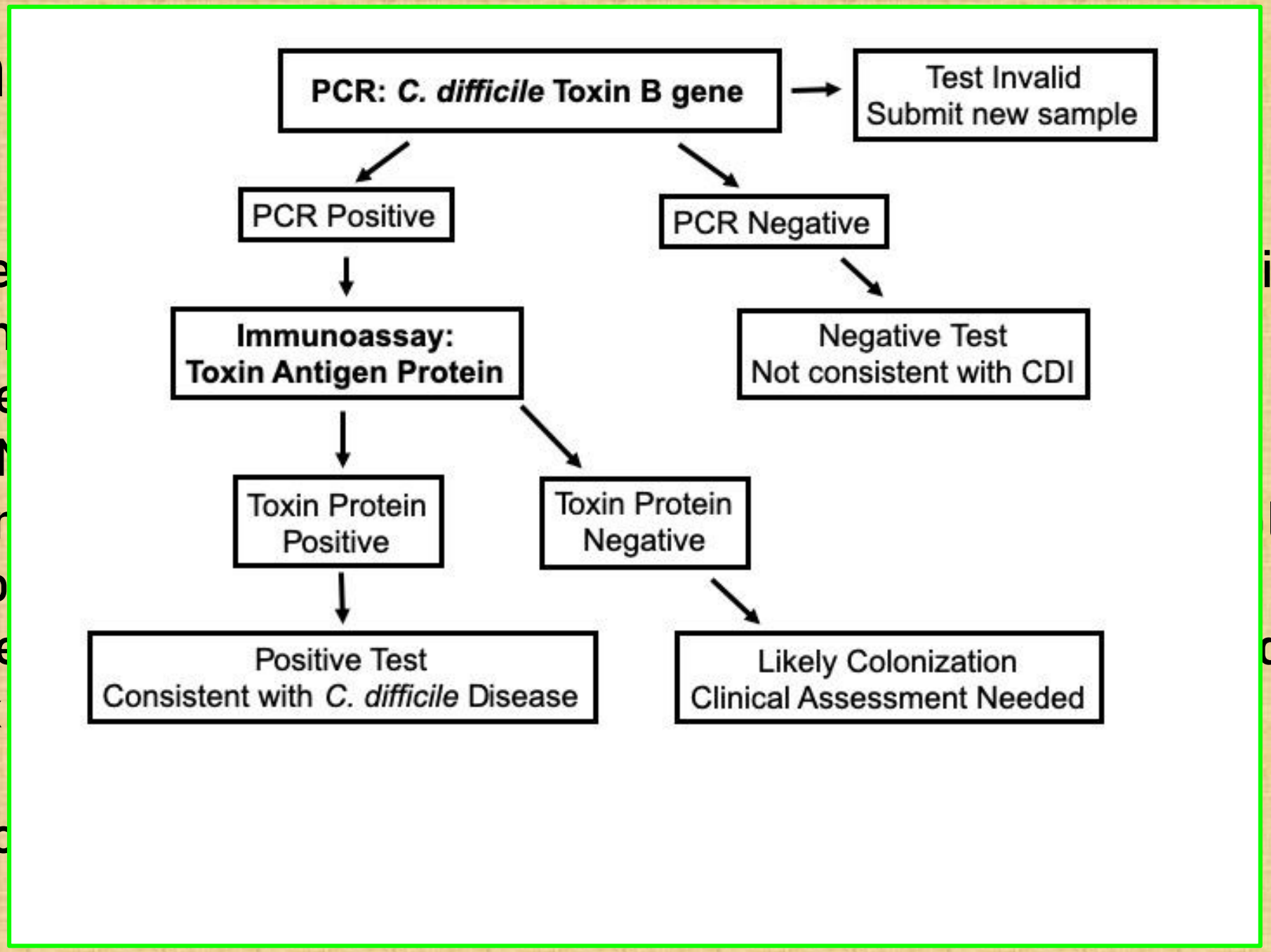

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Guidelines for Diagnosis, Treatment, and Prevention of *Clostridium difficile* Infections

Christina M. Surawicz, MD[1], Lawrence J. Brandt, MD[2], David G. Binion, MD[3], Ashwin N. Ananthakrishnan, MD, MPH[4], Scott R. Curry, MD[5], Peter H. Gilligan, PhD[6], Lynne V. McFarland, PhD[7,8], Mark Mellow, MD[9] and Brian S. Zuckerbraun, MD[10]

Clostridium difficile **infection (CDI) is a leading cause of hospital-associated gastrointestinal illness and places a high burden on our health-care system. Patients with CDI typically have extended lengths-of-stay in hospitals, and CDI is a frequent cause of large hospital outbreaks of disease. This guideline provides recommendations for the diagnosis and management of patients with CDI as well as for the prevention and control of outbreaks while supplementing previously published guidelines. New molecular diagnostic stool tests will likely replace current enzyme immunoassay tests. We suggest treatment of patients be stratified depending on whether they have mild-to-moderate, severe, or complicated disease. Therapy with metronidazole remains the choice for mild-to-moderate disease but may not be adequate for patients with severe or complicated disease. We propose a classification of disease severity to guide therapy that is useful for clinicians. We review current treatment options for patients with recurrent CDI and recommendations for the control and prevention of outbreaks of CDI.**

Am J Gastroenterol 2013; 108:478–498; doi:10.1038/ajg.2013.4; published online 26 February 2013

Clinical Infectious Diseases

IDSA GUIDELINE

Clinical Practice Guidelines for *Clostridium difficile* Infection in Adults and Children: 2017 Update by the Infectious Diseases Society of America (IDSA) and Society for Healthcare Epidemiology of America (SHEA)

L. Clifford McDonald,[1] Dale N. Gerding,[2] Stuart Johnson,[2,3] Johan S. Bakken,[4] Karen C. Carroll,[5] Susan E. Coffin,[6] Erik R. Dubberke,[7] Kevin W. Garey,[8] Carolyn V. Gould,[1] Ciaran Kelly,[9] Vivian Loo,[10] Julia Shaklee Sammons,[6] Thomas J. Sandora,[11] and Mark H. Wilcox[12]

[1]Centers for Disease Control and Prevention, Atlanta, Georgia; [2]Edward Hines Jr Veterans Administration Hospital, Hines, and [3]Loyola University Medical Center, Maywood, Illinois; [4]St Luke's Hospital, Duluth, Minnesota; [5]Johns Hopkins University School of Medicine, Baltimore, Maryland; [6]Children's Hospital of Philadelphia, Pennsylvania; [7]Washington University School of Medicine, St Louis, Missouri; [8]University of Houston College of Pharmacy, Texas; [9]Beth Israel Deaconess Medical Center, Harvard Medical School, Boston, Massachusetts; [10]McGill University Health Centre, McGill University, Montréal, Québec, Canada; [11]Boston Children's Hospital, Massachusetts; and [12]Leeds Teaching Hospitals NHS Trust, United Kingdom

A panel of experts was convened by the Infectious Diseases Society of America (IDSA) and Society for Healthcare Epidemiology of America (SHEA) to update the 2010 clinical practice guideline on *Clostridium difficile* infection (CDI) in adults. The update, which has incorporated recommendations for children (following the adult recommendations for epidemiology, diagnosis, and treatment), includes significant changes in the management of this infection and reflects the evolving controversy over best methods for diagnosis. *Clostridium difficile* remains the most important cause of healthcare-associated diarrhea and has become the most commonly identified cause of healthcare-associated infection in adults in the United States. Moreover, *C. difficile* has established itself as an important community pathogen. Although the prevalence of the epidemic and virulent ribotype 027 strain has declined markedly along with overall CDI rates in parts of Europe, it remains one of the most commonly identified strains in the United States where it causes a sizable minority of CDIs, especially healthcare-associated CDIs. This guideline updates recommendations regarding epidemiology, diagnosis, treatment, infection prevention, and environmental management.

Keywords. *Clostridium difficile*; *Clostridioides difficile*; Guidelines; CDI; CDAD.

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A panel of experts was con... America (SHEA) to updat... has incorporated recomm... includes significant chan... nosis. *Clostridium diffic*... identified cause of he... important communi... along with overall C... it causes a sizable... demiology, diagno...

Clinical Infectious Diseases

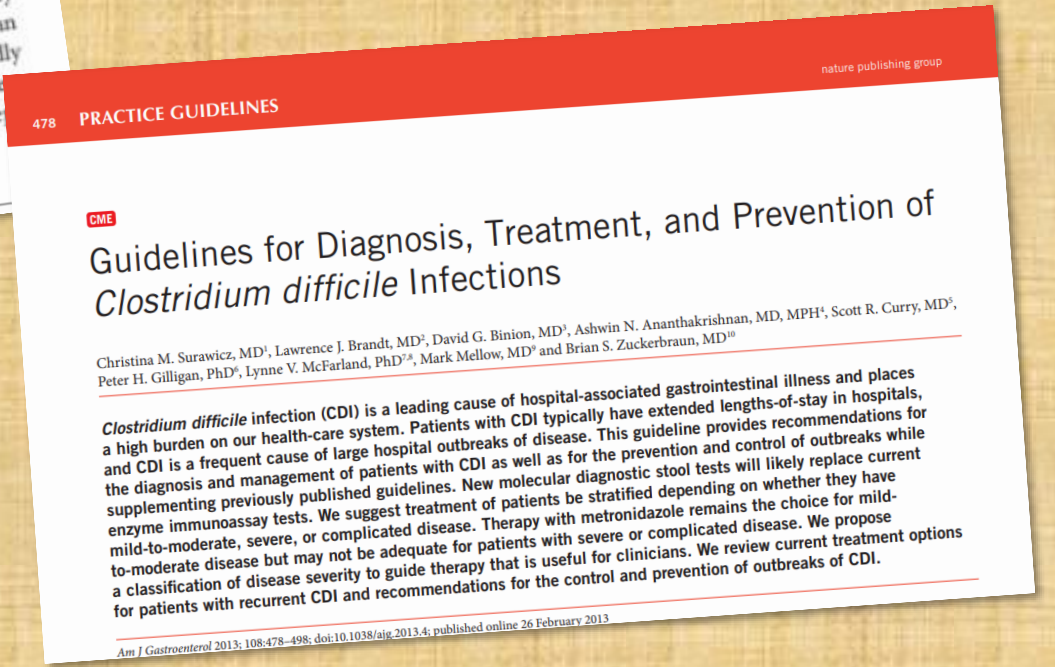
IDSA GUIDELINES

Clinical Practice Guideline by the Infectious Diseases Society of America (IDSA) and Society for Healthcare Epidemiology of America (SHEA): 2021 Focused Update Guidelines on Management of *Clostridioides difficile* Infection in Adults

Stuart Johnson,[1,2] Valéry Lavergne,[3,4] Andrew M. Skinner,[1,2] Anne J. Gonzales-Luna,[5] Kevin W. Garey,[5] Ciaran P. Kelly,[6] and Mark H. Wilcox[7]

This clinical practice guideline is a focused update on management of *Clostridioides difficile* infection (CDI) in adults specifically addressing the use of fidaxomicin and bezlotoxumab for the treatment of CDI. This guideline was developed by a multidisciplinary panel representing the Infectious Diseases Society of America (IDSA) and the Society for Healthcare Epidemiology of America (SHEA). This guideline is intended for use by healthcare professionals who care for adults with CDI, including specialists in infectious diseases, gastroenterologists, hospitalists, pharmacists, and any clinicians and healthcare providers caring for these patients. The panel's recommendations for the management CDI are based upon evidence derived from topic-specific systematic literature reviews. Summarized below are the recommendations for the management of CDI in adults. The panel followed a systematic process which included a standardized methodology for rating the certainty of the evidence and strength of recommendation using the GRADE approach (Grading of Recommendations Assessment, Development, and Evaluation). A detailed description of background, methods, evidence summary and rationale that support each recommendation, and knowledge gaps can be found online in the full text.

Keywords. *Clostridioides difficile*; guidelines; CDI.



CME

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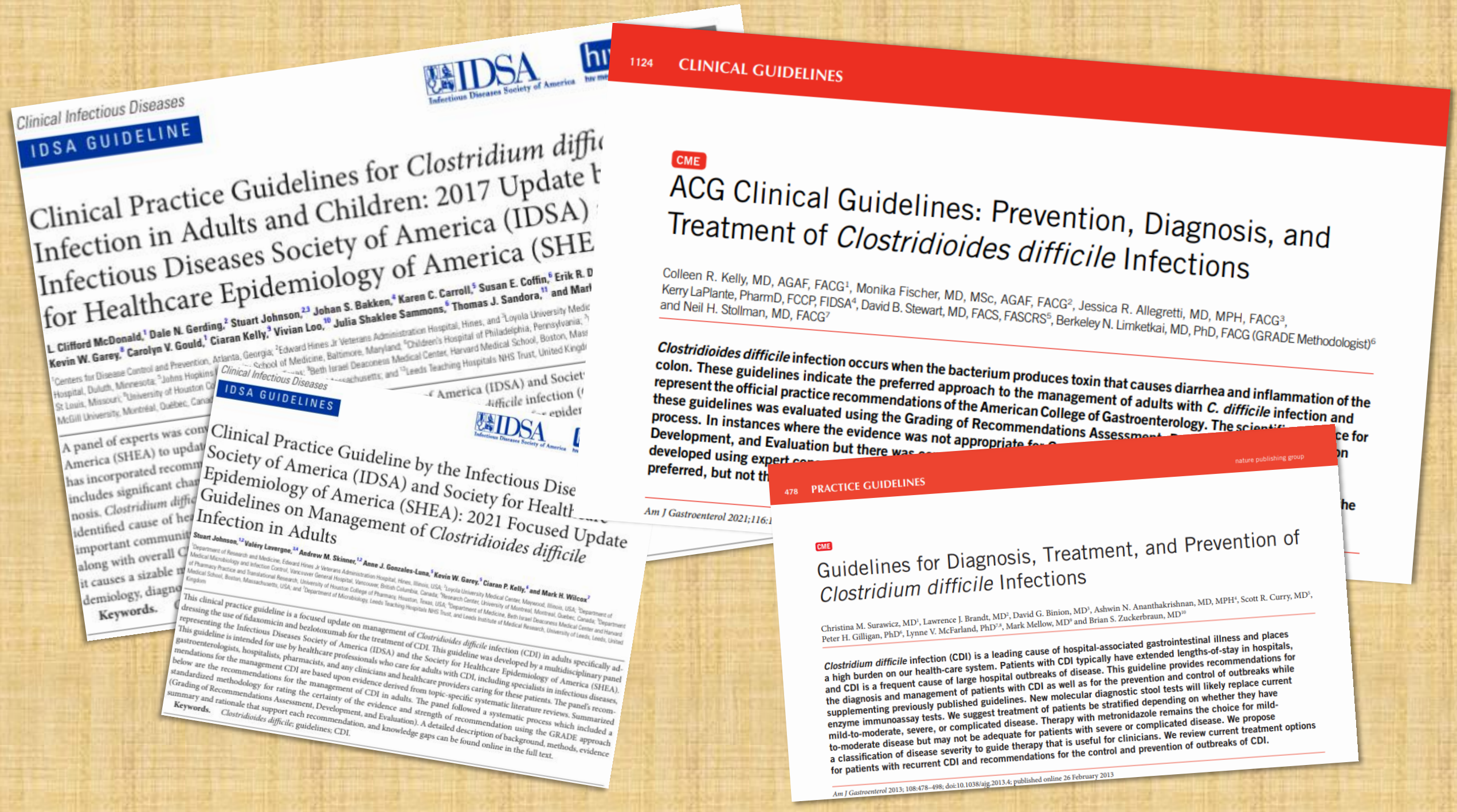

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Keywords. *Clostridioides difficile*; guidelines; CDI.

CME

ACG Clinical Guidelines: Prevention, Diagnosis, and Treatment of *Clostridioides difficile* Infections

Colleen R. Kelly, MD, AGAF, FACG[1], Monika Fischer, MD, MSc, AGAF, FACG[2], Jessica R. Allegretti, MD, MPH, FACG[3], Kerry LaPlante, PharmD, FCCP, FIDSA[4], David B. Stewart, MD, FACS, FASCRS[5], Berkeley N. Limketkai, MD, PhD, FACG (GRADE Methodologist)[6] and Neil H. Stollman, MD, FACG[7]

***Clostridioides difficile* infection occurs when the bacterium produces toxin that causes diarrhea and inflammation of the colon. These guidelines indicate the preferred approach to the management of adults with *C. difficile* infection and represent the official practice recommendations of the American College of Gastroenterology. The scientific ce for these guidelines was evaluated using the Grading of Recommendations Assessment, n process. In instances where the evidence was not appropriate for S Development, and Evaluation but there was he developed using expert co preferred, but not th

Am J Gastroenterol 2021;116:1

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Classification	Clinical presentation
Nonsevere	WBC ≤ 15000/μL and serum creatinine < 1.5 mg/dL
Severe	WBC ≥ 15000/μL or serum creatinine > 1.5 mg/dL
Fulminant	Hypotension/shock, ileus, or megacolon

Abbreviation: WBC, white blood cell count.

Treatment – non severe CDI

- Metronidazole?

Editorial commentary: Vancomycin for your mother, metronidazole for your mother-in-law

Robert C. Read

Affiliations & Notes Article Info

- Vancomycin 125mg po q6 hours x10 days
- Fidaxomicin 200mg po bid x10 days

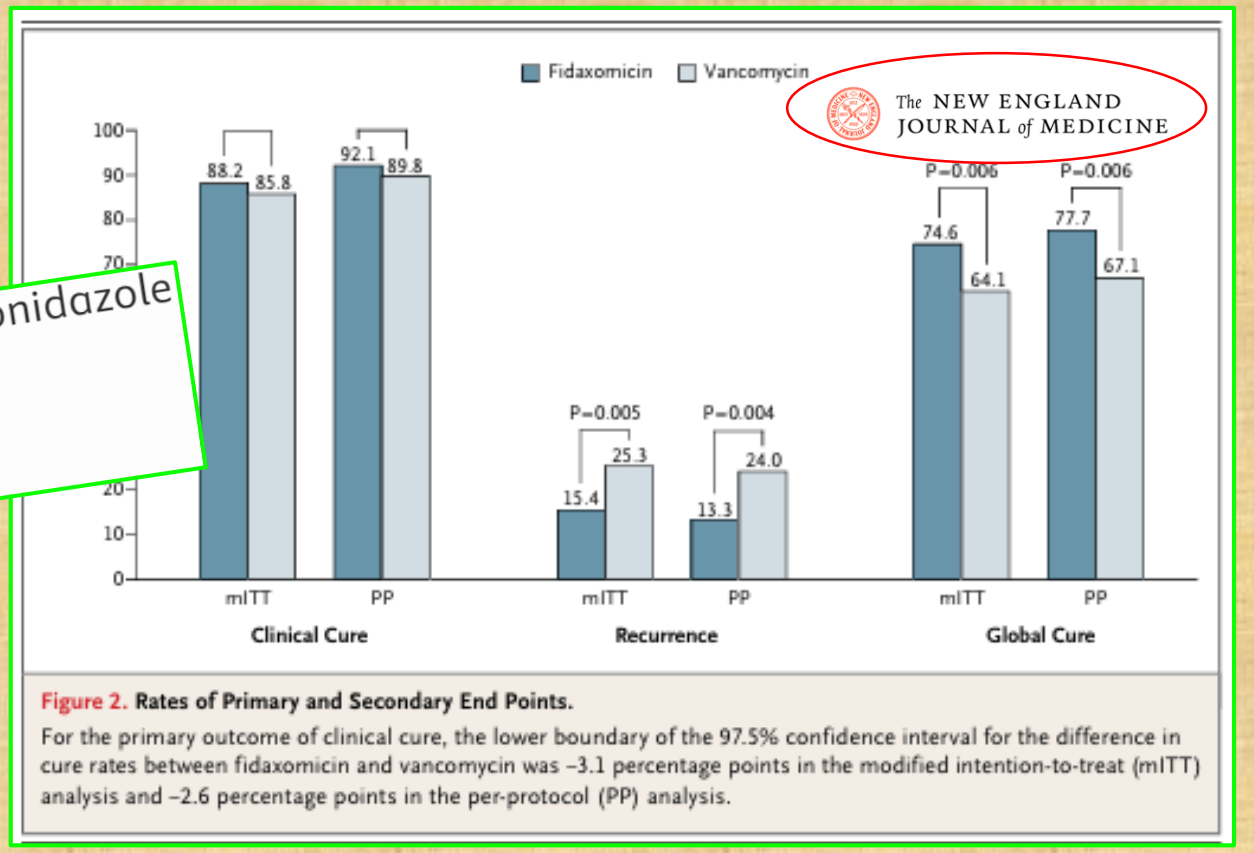


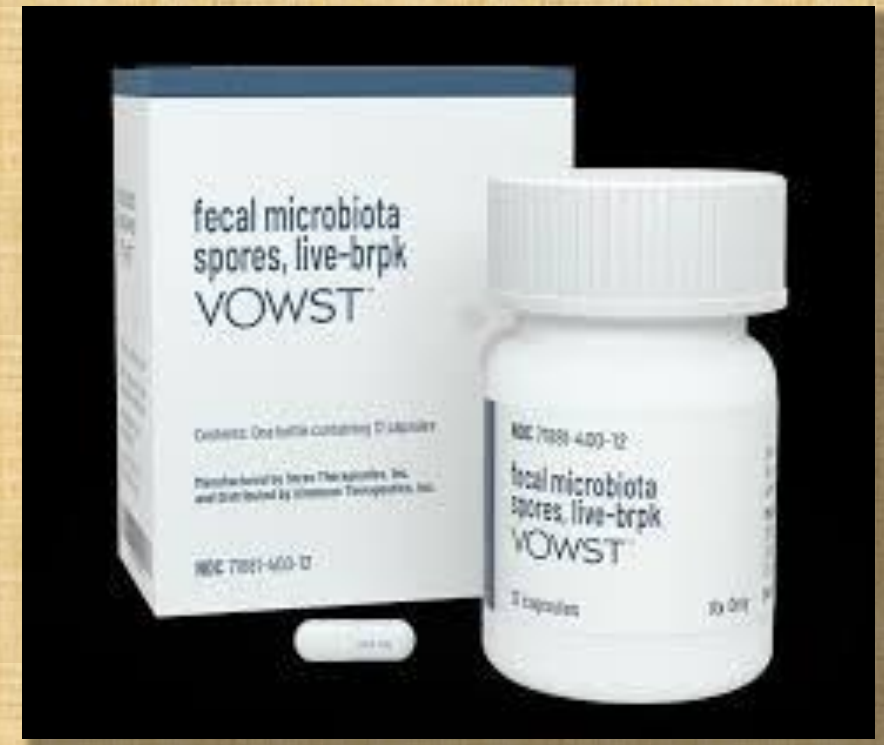
Figure 2. Rates of Primary and Secondary End Points.

For the primary outcome of clinical cure, the lower boundary of the 97.5% confidence interval for the difference in cure rates between fidaxomicin and vancomycin was −3.1 percentage points in the modified intention-to-treat (mITT) analysis and −2.6 percentage points in the per-protocol (PP) analysis.

Louie TJ, MillerMA, Mullane KM, et al. Fidaxomicin versus vancomycin for Clostridium difficile infection. N Engl J Med 2011;364:422–31

Treatment – recurrence

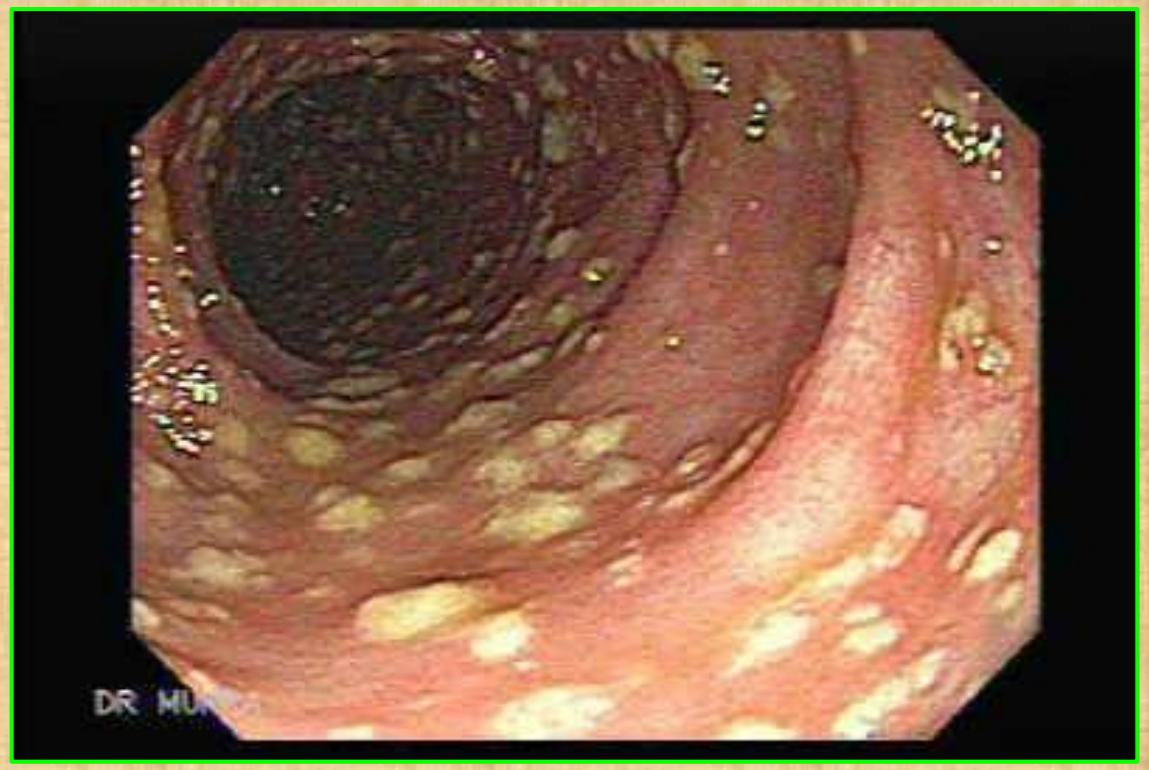
- Use something different!



Treatment – severe and fulminant CDI

- Vancomycin 125mg po q6 hours x10 days
- Fidaxomicin 200mg po bid x10 days

- Vancomycin 500mg po q6 hours + vancomycin enemas q6 hours if ileus + IV metronidazole
- FMT
  - Look for pseudomembranes



CDI Recurrence

- Retest?
- “window of vulnerability”
- Role of bezlotuxumab?

Probiotics?


CS1711718
DRUGS
PLACEBOS
EX-STRENGTH PLACEBOS
DAVE CARPENTER...

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