

# Clostridium Difficile Infection

## The effects of acid suppression therapy in patients with cancer

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**BACKGROUND:** *Clostridium difficile* infection (CDI) is common among hospitalized patients and is particularly serious in patients with cancer. Acid suppression therapy, particularly that which uses proton pump inhibitors (PPIs), has been shown to place hospitalized adult patients at greater risk for CDI, but this relationship has not been proven among patients with cancer.

**OBJECTIVES:** This review assesses risk factors for CDI among patients with cancer, with a specific focus on acid suppression therapy using PPIs and histamine-2 receptor antagonists (H2RAs).

**METHODS:** A literature search was performed using four electronic databases: CINAHL®, Embase®, MEDLINE®, and PubMed®. Six articles were deemed relevant and included in this review.

**FINDINGS:** CDI increases morbidity and mortality in patients with cancer and interferes with their active treatment plans. PPIs and H2RAs increase the risk of developing CDI among patients with cancer, but PPIs carry a higher risk. Other risk factors include antibiotics, transplantation, and chemotherapy.

### KEYWORDS

*Clostridium difficile* infection; acid suppression therapy; PPIs; H2RAs; prevention

### DIGITAL OBJECT IDENTIFIER

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**CLOSTRIDIUM DIFFICILE IS A BACTERIAL ORGANISM** that is gram-positive and spore-forming. It is transmitted via the fecal-oral route, and symptoms of infection range from mild diarrhea to life-threatening colitis. According to the Centers for Disease Control and Prevention (2015), there are about 500,000 cases of *C. difficile* infection (CDI) each year in the United States. The combined expense annually for acute care facilities to manage CDI is about \$4.8 billion (Leffler & Lamont, 2015). Of the 500,000 CDI cases each year in the United States, about 29,000 result in death. CDI has been found to be the leading cause of death in gastroenteritis-associated cases (Lessa et al., 2015). Since 2000, the CDI mortality rate has been rising and is expected to continue to increase (Surawicz et al., 2013). CDI is particularly significant in hospitalized patients and is the most frequently reported nosocomial infection (Leffler & Lamont, 2015).

Risk factors associated with *C. difficile* include acid-suppressing drugs, antibiotics, healthcare environments (e.g., hospitals, skilled nursing facilities, rehabilitation facilities, long-term acute care facilities), gastrointestinal surgery, and old age (Surawicz et al., 2013). Of these risk factors, administration of acid-suppressing drugs is one that oncology nurses and advanced practice nurses can actively manage, consequently preventing CDI. Acid-suppressing medications decrease acidity in the gastrointestinal tract, and this increases the risk for organisms such as *C. difficile* to colonize.

In addition, acid-suppressing medications, such as proton pump inhibitors (PPIs), histamine-2 receptor antagonists (H2RAs), antacids, and sucralfate, are frequently used in the hospital setting and most notably in intensive care units for stress ulcer prophylaxis, which reduces the risk of gastrointestinal bleeding in critically ill patients (Krag et al., 2015). Preventing gastrointestinal bleeding, in turn, decreases intensive care unit mortality by about 25% and length of stay by about 18 days (Krag et al., 2015). Stress ulcer prophylaxis is clinically indicated in some situations, but current guidelines for administration are inadequate; there is no clear consensus for the use of stress ulcer prophylaxis in terms of indication, agent, or length of therapy (Ye, Liu, Cui, & Liu, 2016). Ye et al. (2016) noted that the inappropriate use of stress ulcer prophylaxis is a common occurrence in the hospital setting. Overuse of stress ulcer prophylaxis is on the rise, particularly in non-intensive care unit environments outside of the hospital setting (Davis, Hanners, & Lockwood,