

Danielle's Difficulty: Risks, Treatments, and Prevention of *Clostridium difficile*

by

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Part I – A Difficult Disease

What an awful holiday season it had been for Danielle, an 11th grader at Ithaca High School. It all started right before Thanksgiving when she had to have her wisdom teeth removed. Her mouth hurt so much she couldn't enjoy most of the Thanksgiving meal. That and the antibiotic she was taking, clindamycin, gave her a metallic taste in her mouth, and so even the mashed potatoes she could eat didn't taste right. On Thanksgiving, her 83-year-old grandmother had fallen and broken her thumb and elbow. She had been in the hospital for a few days and then in a rehab center for a week. When Danielle had visited her grandmother in the rehab center, she had seemed to be in good spirits and was looking forward to getting ready for the Christmas holiday. Danielle had promised her grandmother she would come and help decorate her Christmas tree.

Shortly before Christmas, Danielle's grandmother developed watery diarrhea. Her doctor told her to take Imodium[®] A-D, an anti-diarrhea medicine that works by slowing down intestinal motility. The next day she had terrible abdominal cramping and Danielle's father took her grandmother to the urgent care center. As soon as they took her vital signs and heard her history, they sent her to the emergency room. From there Danielle's grandmother was admitted to the intensive care unit with a diagnosis of kidney failure due to dehydration induced by diarrhea caused by infection with *Clostridium difficile*. Within days, in spite of aggressive antibiotic therapy with metronidazole and vancomycin as well as heroic medical care, Danielle's grandmother's condition worsened and on December 30th she died of sepsis.

Now it was New Year's Eve day and Danielle was starting to experience severe abdominal pain. Danielle was hoping it was just stress and not that she had "*C. diff*" like her grandmother.

Questions

1. What are the risk factors for developing *Clostridium difficile* disease?
2. Which of these risk factors did Danielle's grandmother probably have?
3. What, if any, risk factors did Danielle have for developing *C. difficile* disease?
4. What is the role of spores in the development of *C. difficile* disease?
5. How do the toxins of *C. difficile* contribute to the signs of disease?

Part II – Relapse

When Danielle mentioned her stomachache to her father, he immediately took her to the emergency room. There they confirmed Danielle had *C. diff*. Danielle was given a three-week course of metronidazole, by the end of which she was feeling better. Once she went off the drugs, however, her abdominal pain returned.

Questions

1. Does the reappearance of Danielle's symptoms suggest another bout of *C. difficile* disease?
2. What factors could cause a relapse in *C. difficile* disease?
3. If Danielle's symptoms are due to a relapse of *C. difficile*, what alternative treatments might you suggest for her?



Image in title block is a micrograph depicting Gram-positive *C. difficile* bacteria from a stool sample culture obtained using a .1 μ m filter. Photo by Janice Carr, provided courtesy of CDC/ Lois S. Wiggs, public domain, <http://phil.cdc.gov/phil/details.asp>.

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