

APPLICATION FORM

Title of Entry: Infection vs. Colonization: C the Diff

Division: Large Organizations

Award: In Safe Hands

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Date Implemented: 01/04/2016
Date Results Achieved: 02/28/2017

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Infection vs. Colonization: C the *Diff*

EXECUTIVE SUMMARY

One-page executive summary should be a concise explanation of the project initiative. It should summarize the quantitative information that best supports the end result and must include: a) title of entry; b) description of the problem/opportunity, including goal, and target audience(s); c) evidence; d) baseline data; e) intervention; and f) results.

At our institution, the rate of healthcare acquired *Clostridium difficile* infection (CDI) continued to increase despite the 90 percent or better adherence to hand hygiene, contact isolation and room cleaning practices. It was time to take a fresh look at the problem and develop a plan to reduce the risk for CDI acquisition. Upon investigation, it was noted that the antibiotic levofloxacin was over utilized for treatment of non-complicated infections. Additionally, patients without true symptoms of CDI were tested for the *C. difficile* toxin. Lastly, there was evidence that many clinicians and nurses in our institution did not have a clear understanding of the *C. difficile* toxin testing criteria or the incidence of *C. difficile* colonization. With this information, we formed a theory that there was not only overutilization of levofloxacin but an overutilization of the toxin test which in turn led to unnecessary testing and treatment of colonized patients.

According to the Centers for Disease Control and Prevention (CDC), *C. difficile* caused approximately 500,000 infections and killed 15,000 people in one year. They estimate 1 in 11 elderly persons with CDI died within a month of diagnosis. The organism is spread via the fecal-oral route. Prevention includes use of contact isolation precautions for those with infectious diarrhea, adherence to hand hygiene by both the healthcare worker and patient, environmental and equipment cleaning and disinfection and lastly, judicious use of antibiotics to prevent resistant organisms and reduce risk for CDI. Colonization with the *C. difficile* toxin producing organism is more common than CDI. Therefore, toxin testing should be reserved for those with clinically significant diarrhea to prevent unnecessary treatment with antibiotics and expose the patient to unnecessary risk for development of resistant organisms.

With this knowledge, a comprehensive plan was put into place in January 2016. The Pharmacy Department improved enforcement of the existing antimicrobial restriction policy and educated prescribers on the optimal use of antimicrobial therapy. The existing nursing policy for early detection of CDI was amended to include symptom assessment guidelines for both nurses and clinicians. Nurses and clinicians were educated on the updated healthcare policy. Infection Prevention and Control (IC) reviews all cases of positive *C. difficile* toxin to verify that the testing criteria is met and gives feedback and education to all involved parties.

To date, this plan has drastically reduced the CDI rate from 3.03 per 1,000 patient days in January 2016 to 0.32 per 1,000 patient days in February 2017. We have also been able to demonstrate a decrease in the use of levofloxacin defined daily dose (DDD) from 56.5 per 1,000 patient days in January 2016 to 25.8 per 1,000 patient days in February 2017.

Assessment

Describe the needs assessment process and/or research conducted prior to implementing the initiative and the results of that needs assessment/research, including evidence and baseline data.

The Pharmacy Department's review of our institution's antibiotic prescriptions revealed a high usage of the antibiotic levofloxacin. However, per hospital policy, this antibiotic is restricted to treat complicated infections. Our theory is that levofloxacin was being over utilized, as well as the over utilization of the toxin test and treatment of colonization.

Infection Prevention and Control (IC) staff reviewed several months' worth of positive *C. difficile* toxin cases for documentation of stool consistency and administration of a laxative or stool softener in the 24 to 48 hour period prior to toxin testing. The review showed many cases did not have documentation of at least three or more episodes of loose/watery diarrhea prior to toxin testing, as per the existing policy. In addition, many cases had evidence of administration of a laxative or stool softener in the 24 hour prior to toxin testing.

Baseline data for our healthcare acquired *C. difficile* rates was trending upward from 0.75 per 1,000 patient days in 2014 to 1.09 per 1,000 patient days in 2015. The January 2016 *C. difficile* rate spiked to 3.03 per 1,000 patient days, triggering the need for an immediate comprehensive, multidisciplinary plan of action.

Interventions

Identify the steps taken to initiate your effort(s) including strategies, implementation plan, and the interventions.

Our well-rounded plan for success includes the following interventions that were implemented by a multidisciplinary team consisting of members from Pharmacy, Infection Prevention and Control, Staff Education, Microbiology Laboratory, physicians and nursing.

Pharmacy strictly enforced the existing antimicrobial restriction policy to reduce the unnecessary ordering and administration of levofloxacin. Pharmacy conducted one-to-one clinician education on optimal antimicrobial prescribing when levofloxacin was prescribed inappropriately. Pharmacy also conducted group in-services during physician house-staff noon conferences in order to educate physician staff on the use of the institution's antibiogram and treatment pathways for the various infection types.

The existing nursing policy for early detection of *C. difficile* infection (CDI) was amended to include symptom assessment guidelines for both nurses and clinicians. These guidelines include review of recent laxative/stool softener administration to rule out its possible cause of diarrheal symptoms. The Microbiology Laboratory staff ensures appropriate specimen is submitted for toxin testing.

Education of nursing and house-staff was provided by the gastrointestinal physicians, nursing directors, Staff Education Department, Pharmacists, and Infection Preventionists. Topics

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included risk factors for CDI, symptoms of infection, other causes of diarrhea, specimen submission, and prompt isolation of patients at the time of CDI suspicion.

As close to real-time as feasible, each *C. difficile* toxin positive case was reviewed by IC staff for documentation of three or more loose/watery stools without the aid of a laxative or stool softener, prompt specimen submission for toxin testing, accurate order placement for contact isolation at the time of testing, and the names of nurses and clinicians involved. Both positive and negative feedback on the case was given to each unit nursing director, direct-care nurse and clinician caring for the patient.

Results

Summarize the success of your initiative and provide evidence of sustained improvements.

Immediately following implementation of education and enforcement of the antibiotic restriction policy in January 2016, the use of levofloxacin decreased dramatically from a high of 56.5 defined daily doses per 1,000 patient days to 31.6 one month later. A continued downward trend in levofloxacin antibiotic use has been sustained to date.

An equally impressive reduction of healthcare associated *C. difficile* infection (CDI) is noted, decreasing from 3.03 per 1,000 patient days in January 2016 to 1.03 per 1,000 patient days one month later. Further reduction of healthcare associated *C. difficile* infection is noted at the time the *C. difficile* toxin testing policy was amended and staff education sessions were implemented; 0.45 per 1,000 patient days in May 2016. To date, a sustained reduced rate of *C. difficile* infection is achieved.

Adaptability

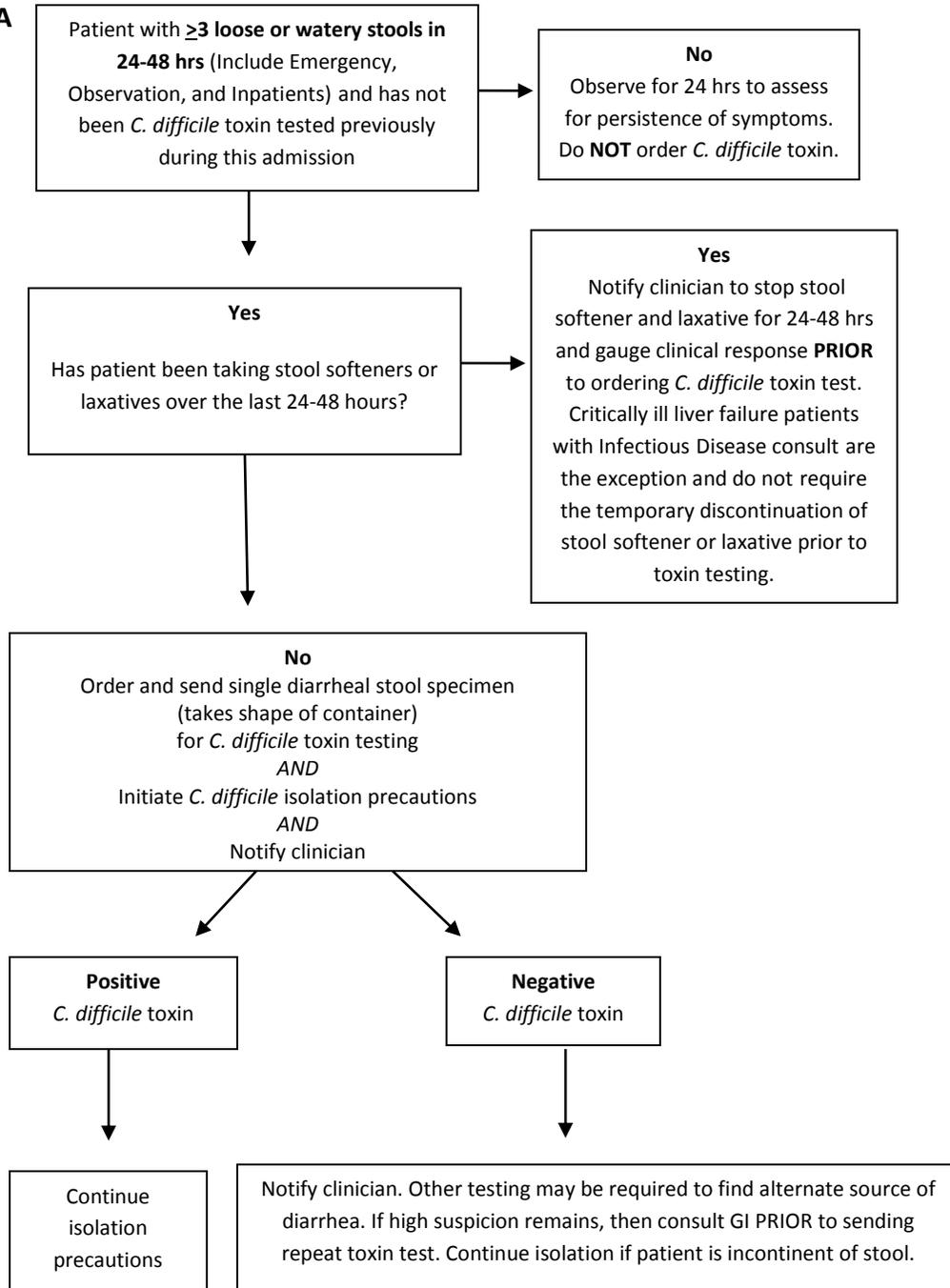
Describe the potential ability to replicate your initiative in other organizations that provide the same service or serve the same type of population. Also, describe how to maintain the initiative and/or its results, any negative outcomes, areas of improvement or lessons learned.

The most important part of our improvements in the organization-wide practice setting was the impact our hospital was able to make in the safety of our patients and the delivery of quality care. Enhancing your organization's practice through an evidence-based policy change coupled with an interprofessional strategy for education and implementation, can lead any organization to successfully decrease their healthcare acquired *C. difficile* infection rates. To sustain this culture of patient safety and high quality care, it is essential that the team continue to meet and review data, current and best practices, disseminate findings with the entire healthcare team, and continue providing ongoing education. The key take-away was changing the healthcare provider's mindset from treatment of colonization to a focus on treatment of true infection.

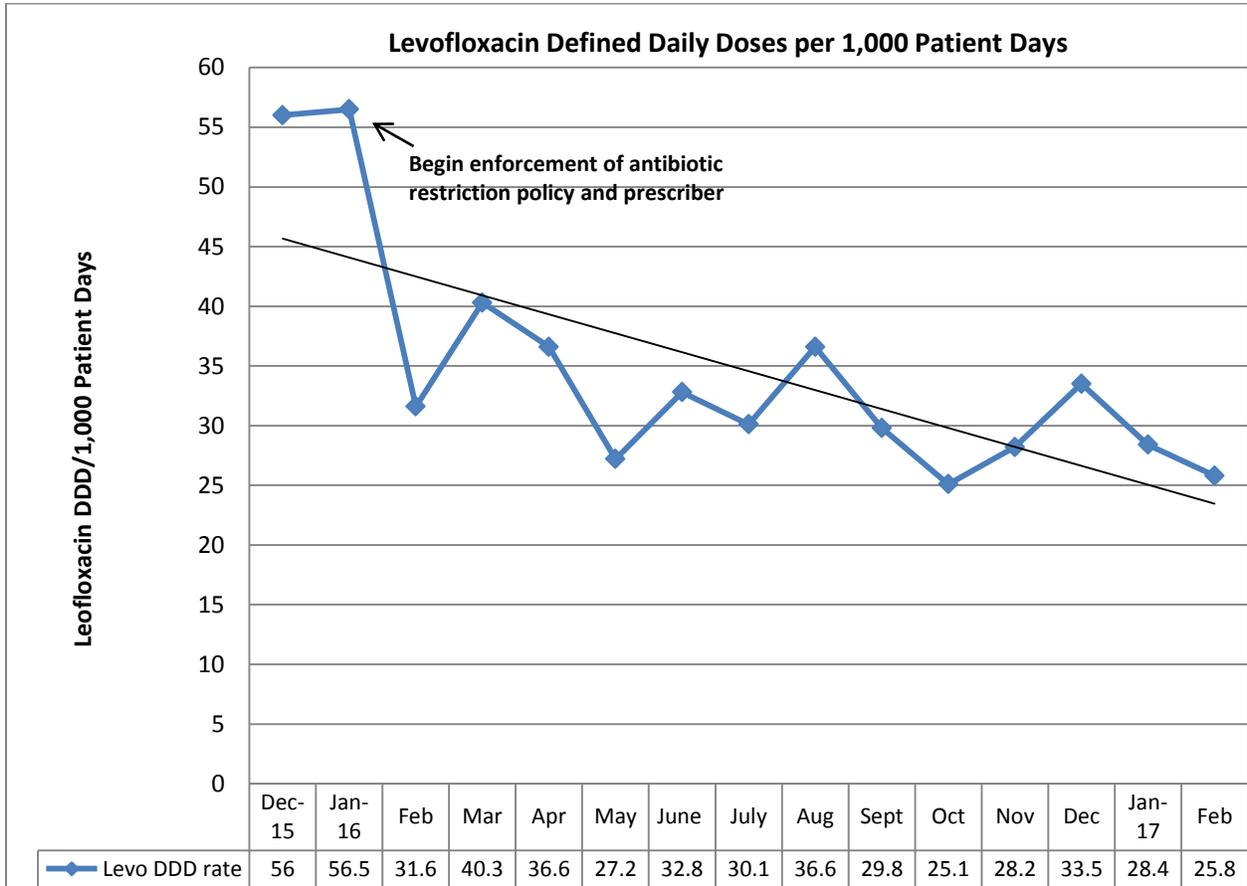
With our detailed structure and processes, any organization can replicate our innovative plan of action for their patient population. This will ultimately improve the organizational culture for patient safety awareness, teamwork, and collaboration.

APPENDICES:

Appendix A



Appendix B



Appendix C

