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Important Risk Reduction in Nocosomial *Clostridium Difficile* with Institution of Probiotic Prophylaxis

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OBJECTIVES: Over the last few years, there has been an increase in the rate of *Clostridium difficile* associated diarrhea (CDAD) and in the associated mortality and morbidity rate in several acute care hospitals in Quebec. The literature describes several control measures for preventing and controlling the spread of this disease which include application of contact precautions, vigorous cleaning and disinfection of the environment, control of antibiotic use and proper hand washing with soap and water. There has also been some suggestion that the use of probiotics can help in the prevention of hospital acquired diarrhea. Our hospital, a busy 350 bed community hospital providing trauma services and haematology-oncology services, also witnessed an increase in cases. In the spring of 2004, the use of probiotics (**Probaclac**) was instituted based on a literature review which suggested a risk reduction of 50%. Therefore, the purpose of this study was to determine the impact of the administration of **Probaclac** on the rate CDAD.

METHODS: All patients admitted to the hospital receiving any form of antibiotic therapy also received Probaclac as prophylaxis regardless of the presence or absence of symptoms. Patients 50 years and older received 2 capsules of **Probaclac** BID and patients under 50 years received 1 capsule BID. This was done during a period of 7 months beginning July 6, 2004 through February 7, 2005. The incidence of CDAD was monitored on a daily basis through regular ward contacts and laboratory results. *C. difficile* toxins were investigated using an EIA assay for toxin A and B. A bowel monitoring sheet was placed in the patient's chart if diarrhea developed. The surveillance data was collected beginning April 1, 2003. Surveillance of CDAD incidence was continued post-intervention period until August 20, 2005.

RESULTS: Rates of CDAD were compared using STATA8 glm function. Crude rates, and rates with adjustment for period and year, and risk difference were estimated. The baseline CDAD rate in our institution was mean 3.6 cases per 1000 patient days (min 2.2, max 6.0), the rate on **Probaclac** was mean 2.2 (min 1.4, max 3.0). The crude relative risk was 0.61, 95%CI (0.41, 0.80) $p < 0.0012$. After adjustment for year and period, the relative risk was 0.38, 95%CI (0.24, 0.60).

CONCLUSION: This study demonstrates a beneficial effect of probiotics on the incidence of CDAD with a relative risk of 0.38 in keeping with the systematic review. The main limitation of this study is confounding due to the before and after design and the multiple infection control methods that are involved; however rates of nocosomial CDAD were the lowest recorded rates in the presence pf probiotics.