Applied Dynamical Systems Seminar

Dr. Amy Hurford,
Memorial University

Monday, October 29, 2012
12:00p.m., HH-3017

The effect of three different interventions on the prevalence of antibiotic resistance in the Intensive Care Unit

Abstract:

Patients in intensive care units are particularly at risk for infection with antibiotic-resistant organisms. To reduce this risk, an antibiotic stewardship program simultaneously instituted three interventions: antibiotics prescribed to fewer patients; different types of antibiotics prescribed; and antibiotics prescribed for a shorter length of time. We derived a simple system of coupled ordinary differential equations to model the effect of these interventions on C, the total number of patients that are colonized (with either sensitive or resistant bacteria), and R, the number of patients colonized with resistant bacteria over a six-month period. We found that: i) a decrease in C can only be achieved by prescribing antibiotics less often; ii) for a fixed decrease in C, if R is lower than a critical value, then treating fewer patients alone cannot account for this decrease; and, iii) decreasing the duration of treatment has a negligible effect on both C and R. These results suggest that by considering data on both C and R, before and after an intervention, it is possible to determine which of the three interventions contributed to the observed changes.

Coffee and cookies will be served.

Seminar website: http://www.math.mun.ca/~xiangshengw/seminars.html

----------All are welcome----------