Meeting: 999, Nashville, Tennessee, SS 12A, Special Session on Biomathematics

999-92-91 **Erika M. D'Agata** (edagata@caregroup.harvard.edu), Beth Israel Deaconess Medical Center, Division of Infectious Diseases, 330 Brookline Ave., Mailstop SL-435G, Boston, MA 02215, **Mary Ann Horn** (horn@math.vanderbilt.edu), Mathematics Department, Vanderbilt University, Nashville, TN 37235, and **Glenn F. Webb*** (glenn.f.webb@vanderbilt.edu), Mathematics Department, Vanderbilt University, Nashville, TN 37235. *Transmission Dynamics of Antibiotic Resistance in Hospitals.* Preliminary report.

A mathematical model is developed to simulate the development of antibiotic resistance of patients in hospitals. The patient population is divided into patients uncolonized and colonized with the resistant bacteria strain, both on and off antibiotic regimens. Patients interact with health care workers (HCW) both uncontaminated and contaminated with the resistant bacteria strain. The model quantifies specific factors contributing to the epidemic, such as patient-HCW ratios, HCW hand hygiene compliance, patient length of stay, and duration of colonization. The reproductive value R0 of the epidemic is computed in terms of model parameters. It is shown that improving HCW compliance with hand hygiene measures, decreasing patient-HCW ratios, and reducing the duration of colonization of colonized patients are significant factors in controlling the epidemic. (Received August 13, 2004)