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Rebecca A. Everett* (rarodger@asu.edu), Arizona State University, 901 S Palm Walk, Department of Mathematics, Tempe, AZ 85287-1804, and **Yang Kuang**. *Predicting the time and mechanism for resistance in prostate cancer patients undergoing androgen suppression therapy.*

Prostate cancer is the most common non-skin cancer in men and second most fatal in the United States. It is often treated by a hormone therapy called androgen suppression therapy since both normal and cancerous prostate cells depend on androgens for growth and survival. Due to the side effects of this treatment, the quality of life decreases for the patients while on the therapy. Thus patients often choose intermittent androgen suppression therapy (IAS), in which the patients alternate between durations of on and off treatment. However, the timing for the switching is dependent upon the doctor's experience and intuition. Using a mathematical model, we predict whether or not a patient can undergo another off treatment cycle and test this prediction with clinical data. We use our mathematical model to predict the time and the main mechanisms for the development of resistance to androgen suppression therapy for each patient. Clinically, this can become an important tool for determining the appropriate treatment option for individual patients. (Received September 16, 2013)