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Yang Kuang* (kuang@asu.edu). *Dynamics and implications of some clinical data validated prostate cancer growth models*. Preliminary report.

Prostate dependence on androgen makes androgen deprivation therapy (ADT) an important option for treatment of prostate cancer. The progression of ADT is monitored by measurements of prostate specific antigen (PSA). We introduce three models that consider one to three types of prostate cancer cells. We extend an existing model that used measurements of patient androgen levels to accurately fit measured serum PSA levels undergoing intermittent androgen deprivation (IAD) therapy. Our model is able to fit both measured PSA and androgen levels reasonably. We present some routine mathematical analysis of these models, including a global stability result for the simplest model. We analyze steady state solutions using relevant parameters that were fitted to specific patients and explore the biological and medical implications of our mathematical findings. We also discuss some plausible biological hypotheses for the development of castration resistance. (Received September 12, 2015)