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**STATISTICS COLLOQUIUM**

**MONDAY, FEBRUARY 23, 2015**

**TALK: 4:15 PM — SCIENCE CENTER RM. 705**

**RECEPTION: 3:50 PM — SCIENCE CENTER, 7TH FLOOR**

**“Inference for Dynamic Treatment Regimes”**

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**ABSTRACT**

Dynamic treatment regimes are of growing interest across the clinical sciences because these regimes provide one way to operationalize and thus inform sequential personalized clinical decision making. Formally, a dynamic treatment regime is a sequence of decision rules, one per stage of clinical intervention. Each decision rule maps up-to-date patient information to a recommended treatment. We review a critical inferential challenge that results from nonregularity, which often arise in inference for parameters in the optimal dynamic treatment regime. Nonregularity is associated with asymptotic distributions of estimators that are sensitive to local perturbations. We demonstrate that previous attempts to mitigate nonregularity through shrinkage can be arbitrarily worse than no shrinkage at all. We propose a locally consistent adaptive confidence interval for the parameters of the optimal dynamic treatment regime. We use data from the Adaptive Pharmacological and Behavioral Treatments for Children with ADHD Trial as an illustrative example.