

**SEMINAR SERIES**  
**Department of Quantitative Analysis and Operations Management**  
**University of Cincinnati**

**The Optimal Time to Initiate HIV Therapy under Ordered Health States**

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**12:30 p.m.**  
**214 Lindner Hall**

The question of when to initiate HIV treatment is perhaps the most important question in HIV care today. We model this problem as an optimal stopping problem: for certain health states patients may choose to wait one more month, whereas for others they may decide to accept the expected remaining lifetime associated with initiating therapy. To our knowledge, this is the first HIV-related optimization model that considers the possibility of patient death. We prove conditions under which there exist structural properties of the optimal solution and compare them to our data and results. Additionally, we consider patient-specific factors such as quality of life and likelihood to adhere to therapy. We use real data from a set of 25,000 HIV patients and solve the problem as a Markov decision process. In addition, we will present an extension of this problem to incorporate therapy sequencing.

Matt Bailey is an Assistant Professor in the Department of Industrial Engineering at the University of Pittsburgh. He received his B.S. in mathematics from Purdue University and his Ph.D. in industrial and operations engineering from the University of Michigan. His research interests are in the areas of network interdiction and medical decision making. He is a member of INFORMS and IIE.

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