The Right Treatment for the Right Patient (at the Right Time):
Personalized Medicine and Dynamic Treatment Regimes

With the advent of the 'omics era, achieving the goal "personalizing" treatment to the patient based on his/her genetic/genomic as well as physiological, demographic, and other characteristics and past history has become more promising than ever. One perspective on personalized medicine involves identifying subgroups of patients sharing certain characteristics who are likely to benefit from a specific treatment or to whom a new treatment may be targeted ("the right patient"). Another is based on formalizing how clinicians make treatment decisions in practice, where the goal is to identify the most beneficial treatment to administer to a patient from among the available options given his/her characteristics ("the right treatment"). In chronic diseases and disorders like cancer or substance abuse, a series of treatment decisions must be made, and the objective is to determine the "best" treatment option for a patient at each decision given all information accrued on the patient to that point, including responses to previous treatments, so as to lead to the most beneficial long term outcome. This sequential decision-making introduces many complications; for example, treatments chosen early on may affect how well treatments given later will work ("at the right time").

The development of optimal, evidence-based personalized treatment strategies (dynamic treatment regimes) can be formulated as a fascinating statistical problem. I will provide an overview of challenges involved and of study designs and methodological developments that can be used in the quest for personalized medicine.

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Helen Wood Hall – 1W510
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