Title: To Bayes or Not to Bayes: Practical Challenges and Considerations in Supporting the Design of Bayesian Adaptive Trials

Author: Raviv Pryluk - *PhaseV Trials Inc.*

Abstract:

The implementation of Bayesian adaptive trials in clinical research presents unique practical challenges, particularly when integrating these methodologies into software products. This talk will delve into these challenges and showcase how our software platform addresses them through two case studies, emphasizing recent advances in computational power and the benefits of an API-first approach (i.e.- first defining the application programming interface even before writing the code so as to support easy and seamless integrations).

First, we will examine the computational complexity inherent in the Bayesian approach compared to the frequentist approach. Bayesian methods, with their reliance on extensive probabilistic calculations and simulations, often demand significant computational resources. Recent developments in computational power have opened new opportunities to manage this complexity more effectively. We will discuss how our platform leverages these advancements to make Bayesian adaptive designs both feasible and efficient for practical use.

Second, we will focus on the challenges of soliciting and incorporating input from diverse stakeholders, as well as the importance of clear communication. Bayesian adaptive trials require collaboration among clinical teams, statisticians, and regulatory bodies, each bringing unique perspectives and expertise. We will explore how our platform, with its API-first approach, facilitates effective communication and presents complex Bayesian results in an intuitive manner. This approach ensures that all stakeholders can understand and contribute meaningfully to the trial design process while maintaining flexibility and extensibility for both frequentist and Bayesian Designs.

By focusing on these practical aspects, this talk aims to provide an overview of the real-world challenges and advantages of implementing Bayesian adaptive trials in clinical research. We will demonstrate how our software platform addresses these issues, enhancing the design and execution of clinical trials while balancing computational and communication considerations.