**Introduction to Simulating Adaptive Clinical Trials in R**

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**Introduction**

In this hands-on example a R Studio project (file name: “Example 4.Rpoj”) is provided that contains R code for simulating an adaptive clinical trials. In addition, a R Shiny app is provided as a tool to help understand the value of exploring and understanding more than just false-positive and power figures for a design.

This project “Example 4.Rpoj ” simulates a clinical trial to compare standard of care (S) and experimental (E). The primary outcome is binary and is observed two months, on average, after the time a patient is treated. This R code example is designed to allow users to simulate a range of design options ranging from a fixed sample design to a continuously monitored, Bayesian outcome adaptively randomized study with early selection for futility/success and evaluation of augment priors for S. Simulations may be conducted by running the R code directly in R Studio or by using the Shiny app.

This example is not intended to promote or suggest the use of any particular methodology, but rather to provide details on R custom code developed for conducting simulations of a Bayesian adaptive clinical trial.

**Requirements**

R > V3.5.1; R Studio Version 1.1.463; ggplot2;

For the Shiny App the following packages are required shiny, shinydashboard, shinyBS

**Getting Started**

To gain the most insight into how and adaptive clinical trial is simulated, it is recommended to start with the “Main.R” file and work at the R code level rather than using the Shiny app. The Shiny app makes demonstration very easy with project development teams requires less detailed knowledge of the R code base. If the user is interested in starting the Shiny app then the starting point is the file “ShinyApp.R” Once “ShinyApp.R” is open in R Studio the app is started by clicking the “Run App” button, circled in the figure below.

If the user does not have R Studio the “Main.R” file can be executed directly in R. However, the Shiny app requires R Studio and R Studio provides many features to simplify R code.

