

## Summary for Multiple Testing for Correlated Outcomes in Clinical Trials

### Introduction

This summary file provides an overview of multiple testing for correlated continuous outcomes in clinical trials. Two component files plus this summary will form the complete documentation to run the MATLAB function properly. The programs were originally written to see whether Bonferroni adjustment is too conservative for correlated outcomes in designing aging clinical trials at Wake Forest University Health Sciences Pepper Center. The relevant published work is referred to if applicable.

### Keyword Categories

Clinical: Aging, Cross-sectional, physical performance, functional disability

Genetics: N/A

Statistical: multiple testing, Bonferroni, correlated outcomes, type I error

Software: MATLAB

Related: look-up tables

### Components

- 1 Copyright Notice and Disclaimer (pdf file)
- 2 Document: interpreting the methods, function input and output, examples, look-up tables and references (pdf file)
- 3 MATLAB program
- 4 Wiki article  
[http://grasp.med.yale.edu/wiki/Multiple Testing for Correlated Outcomes in Clinical Trials](http://grasp.med.yale.edu/wiki/Multiple_Testing_for_Correlated_Outcomes_in_Clinical_Trials)

### Prerequisites

Basic MATLAB and MATLAB function knowledge is required to run the function properly.

More information about MATLAB can be found at

<http://www.mathworks.com/access/helpdesk/help/techdoc/>

### Potential Applications

If several outcomes are considered in a clinical trial with  $g$  treatment groups, multiple comparisons will be involved when testing hypotheses. We here consider  $k$  (asymptotically) normally distributed outcomes. Assume that based on preliminary data the correlation structure among the  $k$  outcomes can be estimated. This program will provide exact “nominal” significance level  $\alpha^*$  for individual tests for two-sample t-test. For demonstration,  $g = 2$  is considered, but it can be easily extended to  $g > 2$  and ANCOVA.

Non-normal data is not under consideration here.