

BIOSTATISTICS 740 (BIOS7400)
Clinical Trials

Lecture 15

Data Analysis I

(Statistical Methods, Handling of Various Issues)

α Spending Function

- Group sequential boundaries C_1, \dots, C_K for the *standardized test statistics* $Z_k = Z(t_k)$ ($k = 1, 2, \dots, K$) are *determined* based on t_1, \dots, t_K , such that at the k^{th} interim look

$t_k \rightarrow \alpha(t_k) \rightarrow C_k$, where C_k 's are determined by

$$P_{H_0}(|Z_1| \geq C_1) = \alpha(t_1)$$

$$P_{H_0}(|Z_1| < C_1, |Z_2| \geq C_2) = \alpha(t_2) - \alpha(t_1) = \Delta\alpha_2$$

...

$$P_{H_0}(|Z_1| < C_1, \dots, |Z_{k-1}| < C_{k-1}, |Z_k| \geq C_k) = \alpha(t_k) - \alpha(t_{k-1}) = \Delta\alpha_k$$

...

$$P_{H_0}(|Z_1| < C_1, \dots, |Z_{K-1}| < C_{K-1}, |Z_K| \geq C_K) = \alpha(t_K) - \alpha(t_{K-1}) = \Delta\alpha_K$$

Total α



α Spending Function

Total $\alpha = 0.05$ (two-sided)

