

CLINICAL BIostatISTICS

CTSC 5103S

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LECTURE SCHEDULE

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| <p>Overview and Descriptive Statistics</p> <ul style="list-style-type: none"> a. Application of statistics in biomedical research b. Type of data c. Graphic representation of data d. Summary statistics: central tendency and dispersion e. Introduction to R |
| <p>Probability and Probability Distributions</p> <ul style="list-style-type: none"> a. Probability b. Conditional probability c. Statistical methods in diagnostic medicine and screening test d. Binomial distribution e. Normal distribution |
| <p>Estimation</p> <ul style="list-style-type: none"> a. Sampling distribution b. Confidence interval <ul style="list-style-type: none"> 1) Population means 2) Population proportions c. Sample size estimation based on accuracy of estimation |
| <p>Homework Assignment Due: Summary Statistics</p> |
| <p>Hypothesis Testing</p> <ul style="list-style-type: none"> a. Type I error, Type II error b. Steps of performing hypothesis testing <ul style="list-style-type: none"> 1) Hypothesis testing on population means 2) Hypothesis testing on population proportions c. Power and sample size estimation |
| <p>Analysis of Variance</p> <ul style="list-style-type: none"> a. Comparisons between and among means b. Multiple comparisons |
| <p>Analysis of Categorical Data</p> <ul style="list-style-type: none"> a. Chi-square test b. Relative risk and Odds ratio c. Sample size estimation based on proportions <p>Homework Assignment Due: Confidence interval and hypothesis testing</p> |
| <p>Correlation and Regression</p> <ul style="list-style-type: none"> a. Correlation b. Simple linear regression |
| <p>Multiple Linear Regression and Logistic Regression</p> <ul style="list-style-type: none"> a. Multiple linear regression b. Model building and diagnosis c. Logistic regression <p>Homework Assignment Due: Sample size estimation and Analysis of Variance</p> |
| <p>Nonparametric Statistics</p> <ul style="list-style-type: none"> a. Sign test b. Wilcoxon sign rank test |

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| <ul style="list-style-type: none"> c. Wilcoxon rank sum test d. Kruskal Wallis test |
| <p>Survival Analysis</p> <ul style="list-style-type: none"> a. Kaplan-Meier procedure b. Log-rank test c. Cox proportional hazard model |
| <p>Biostatistics in the Genomic Age</p> <ul style="list-style-type: none"> a. Microarray data analysis |
| <p>Pharmacoepidemiology and Meta-Analysis</p> <ul style="list-style-type: none"> a. Drug utilization b. Drug safety c. Drug effectiveness |
| <p>Biostatistics in the Genomic Age</p> <ul style="list-style-type: none"> a. Microarray data analysis |
| <p>Statistical Analysis Plan in Clinical Trials</p> <ul style="list-style-type: none"> a. Study design in drug development b. Statistical considerations <ul style="list-style-type: none"> 1) Sample size determination 2) Endpoint definitions 3) Analyses (safety, efficacy) 4) Interim analyses |
| <p>Homework Assignment Due: Regression Analysis and Nonparametric Analysis</p> |
| <p>Reading the Medical Literature</p> <ul style="list-style-type: none"> a. Use of statistical analysis in medical literature b. Misuse of statistical analysis in medical literature |