Discipline MCP5835  
Principles of Biostatistics and Data Analysis

Subject Area: 5156

Created: 16/10/2014

Active since: 16/10/2014

Number of credits: 4

Hours:

<table>
<thead>
<tr>
<th>Theoretical (per week)</th>
<th>Practical (per week)</th>
<th>Self-study (per week)</th>
<th>Duration</th>
<th>Total</th>
</tr>
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<tbody>
<tr>
<td>10</td>
<td>2</td>
<td>18</td>
<td>2 weeks</td>
<td>60 hours</td>
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</tbody>
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Faculty Member Responsible:

Luiz Felipe Pinho Moreira

Objectives:

The aim of the discipline is to present and discuss the basic concepts about the conception and the characteristics of the employed variables and of the types of data used in clinical researches and in laboratory animals. The concepts of statistical analysis employed in the main types of research designs will be discussed, focusing on the identification of the appropriate techniques for the analysis of the various problems and the correct interpretation of their results.

Background:

To assure that new researches in biological sciences may contribute adequately to the broadening of knowledge it is crucial that their results be presented in a clear and comprehensive fashion and that they be critically analyzed, based in the fundamental principles of validity and probability. The adequate choice of statistical tests, considering the objectives and the research design, is one of the most important aspects in conducting clinical research studies and animal experiments. In this respect, the understanding of the proposal in each one of the tests available, as well as of the type of analysis made, provides the researcher with the essential tools not only to enrich their work, but also to adequately understand literature.

Content:

- Basic Concepts of Epidemiology and Biostatistics - Principles of Critical Analysis (Aristotelian Logic) - Formulation of Hypothesis Tests - Characteristics and Determination of Study Designs - Definition of Systematic Error and Random Error - Concepts of Internal and External Validity - Definition of Nullity Hypothesis And Statistical Error - Calculus of Sample Size - Methods of Randomization • Tabular and Graphical Presentation of Data - Types of Variables and Order of Magnitude - Construction and Presentation of Tables and Graphs - Calculation of Index and Indicators / Concept of Accuracy - Sample Distributions and Hypothesis Tests - Comparison of Nominal and Ordinal Variables - Calculation of Indicators in Diagnostic Studies / Concept of Accuracy - Principles of Comparison of...
Numerical Variables - Parametric and Nonparametric Methods in Comparison of Two Variables - Analysis of Variance with a Factor (Repeated Measures) - Analysis of Variance with Two Factors - Longitudinal Analysis of Data Collected in Different Periods • Study of the Association between Variables - Association between Qualitative Variables - Association between Quantitative Variables - Definition and Applications of Mathematical Regression Methods • Analysis of Survival and Non-Morbid Events - Survival Calculation (Kaplan-Meier) - Calculation of the Actual Incidence of the Event • Analysis of Risk Factors for Mortality and Complications - Uniform Risk Analysis - Logistic Regression Models - Cox Proportional Risk Models • Concepts of Risk Reduction and Number Needed to Treat • Concept and Interpretation of Meta-analysis Results

Assessment Method:

A written evaluation will be carried out to assess the acquired knowledge concerning the concepts that govern data analysis and biostatistics, through analysis and critical interpretation of scientific papers that address the context of clinical research and research with laboratory animals.

Observation:

Maximum number of regular students: 20 Maximum number of special students: 10 Minimum number of students: 10

Bibliography:

• HairJF; Anderson RE; Tatham RL; BlackWC. Análise Multivariada de Dados. 5ª edição. Porto Alegre: Bookman, 2005.
• Massad E; Menezes RX; Silveira PSP; Ortega NR. Métodos Quantitativos em Medicina (1ª edição), São Paulo: Manole, 2004.

Idiomas ministrados:

Português