Stats Section- ABP Specs

The outline below is taken directly from the ABP Content Outline for Pediatric Endocrinology. These are the Specs used until 10/1/2023 (more detail than the most recent version

Note: Slide numbers are approximate

Core Knowledge in Scholarly Activities

A. Principles of Use of Biostatistics in Research

1. Types of variables
   a. Distinguish types of variables (eg, continuous, categorical, ordinal, nominal) *Slides 3-5*
   b. Understand how the type of variable (eg, continuous, categorical, nominal) affects the choice of statistical test *Slides 21-26*
2. Distribution of data *Slides 6-12*
   a. Understand how distribution of data affects the choice of statistical test
   b. Differentiate normal from skewed distribution of data
   c. Understand the appropriate use of the mean, median, and mode
   d. Understand the appropriate use of standard deviation
   e. Understand the appropriate use of standard error of the mean
3. Hypothesis testing *Slides 13-15*
   a. Distinguish the null hypothesis from an alternative hypothesis
   b. Interpret the results of hypothesis testing
4. Statistical tests *Slides 15-25*
   a. Understand when to use and how to interpret the chi square test
   b. Understand when to use and how to interpret tests comparing continuous variables between two groups (eg, t test, Mann Whitney U)
   c. Understand when to use and how to interpret tests comparing continuous variables between three or more groups (eg, ANOVA, Kruskal-Wallis)
   d. Understand when to use paired tests
   e. Understand the appropriate use of parametric versus nonparametric tests
   f. Interpret a p value
   g. Interpret a p value when multiple comparisons have been made *Slide 41*
   h. Interpret a confidence interval
   i. Identify a type I error
   j. Identify a type II error
5. Measurement of association and effect *Slides 27-37*
   a. Understand how to interpret relative risk and absolute risk
   b. Understand how to interpret odds ratio
   c. Understand how to interpret number needed to treat or harm
   d. Understand how to interpret hazard ratio
   e. Understand when to use and how to interpret correlation coefficient *Slide 25*
6. Regression
   a. Understand when to use and how to interpret regression analysis (eg, linear, logistic) *Slide 26*
   b. Understand when to use and how to interpret survival analysis (eg, Kaplan Meier). *Slides 39-40*
7. Diagnostic tests *Slides 42-50*
   a. Recognize the importance of an independent "gold standard" in evaluating a diagnostic test
   b. Interpret sensitivity and specificity
   c. Interpret positive and negative predictive values

d. Understand how disease prevalence affects the positive and negative predictive value of a test
e. Interpret a receiver operating characteristic curve

8. Systematic reviews and meta-analysis *Slide 51*
   a. Understand the purpose of a systematic review
   b. Understand the advantages of adding a meta-analysis to a systematic review
   c. Interpret the results of a meta-analysis

B. Principles of Epidemiology and Clinical Research Design
1. Assessment of study design, performance and analysis (internal validity)
   a. Recognize and understand the strengths and limitations of a cohort study, case control study, and randomized controlled clinical trial *Slides 53-56*
   b. Recognize the use and limitations of surrogate endpoints *Slide 59*
   c. Understand the use of intent-to-treat analysis *Slide 60*
   d. Understand how sample size affects the power of a study *Slide 16*
2. Assessment of generalizability (external validity) *Slide 69*
   a. Understand how nonrepresentative samples can bias results
   b. Assess how the data source (eg, diaries, billing data, discharge diagnostic code) may affect study results
3. Bias and confounding *Slides 57-58, 60, 66-68*
   a. Identify common strategies in study design to avoid or reduce bias
   b. Identify common strategies in study design to avoid or reduce confounding
4. Causation
   a. Understand the difference between association and causation *Slide 61*
5. Incidence and prevalence *Slide 70*
   a. Distinguish disease incidence from disease prevalence
6. Screening
   a. Understand factors that affect the rationale for screening for a condition or disease (eg, prevalence, test accuracy, risk benefit, disease burden, presence of a presymptomatic state)
7. Cost benefit, cost effectiveness, and outcomes *Slide 76*
   a. Interpret cost-effectiveness ratios
   b. Distinguish costs from charges
   c. Understand quality-adjusted life years
8. Measurement *Slides 71-75*
   a. Understand the types of validity that relate to measurement (eg, face, construct, criterion, predictive, content)
   b. Distinguish accuracy from precision
   c. Understand when to use and how to interpret a kappa coefficient

C. Ethics in Research
1. Professionalism and misconduct in research *Slide 78-79*
   a. Identify and manage potential conflicts of interest in the funding, design, and/or execution of a research study
   b. Identify various forms of research misconduct (eg, plagiarism, fabrication, falsification)
   c. Know how, and to whom, to report concerns of research misconduct
2. Principles of research with human subjects *Slides 80-84*
   a. Understand and contrast the functions of an Institutional Review Board and a Data Safety Monitoring Board
   b. Recognize the types of protections in designing research that might be afforded to children and other vulnerable populations
   c. Understand the federal regulatory definitions regarding which activities are considered research and what constitutes human subjects research

d. Understand the federal regulatory definition of minimal risk and apply this to research involving children
e. Understand the ethical considerations of study design (eg, placebo, harm of intervention, deception, flawed design)

3. Principles of consent and assent *Slides 85-86*
   a. Understand what constitutes informed consent in research
   b. Distinguish between consent and assent in research involving children

D. Quality Improvement

1. Design of a Project *Slides 88-90*
   a. Understand various models of quality improvement and recognize that all utilize a data-informed, iterative process using tests of change to achieve a stated aim
   b. Understand that the aim of any quality improvement project should be specific, measurable, achievable, realistic, and time-limited
   c. Understand strategies to optimize identification of key drivers and interventions to achieve a specific aim
   d. Understand tools to facilitate completion of quality improvement work, including key driver diagrams and process maps
   e. Understand each phase of a Plan-Do-Study-Act (PDSA) cycle
2. Data and Measurement *Slides 91-100*
   a. Differentiate between process, outcome, and balancing measures
   b. Interpret a run chart and identify shifts, trends, and outliers in data
   c. Differentiate between a run chart and a control chart
   d. Differentiate between common cause and special cause variation