

# Research is an *interactive* and *iterative* process!

## The Sound Idea:

### Idea ↔ Argument ↔ Research Question

- Idea: What is the goal of your research? What do you want to explore?
- Argument: What is unknown? How will your study fill a gap?
- Research Question Types
  - Exploratory (What questions)
  - Descriptive (How or Who questions)
  - Explanatory (Why questions)

## Get i-SMART

- **I**nteresting (to you and others)
- **S**pecific (simple to understand)
- **M**easurable (able to assess pertinent variables and outcomes)
- **A**chievable (within a reasonable timeframe)
- **R**elevant (adds to existing knowledge)
- **T**imely (provides relevant answers within specified period)

## Research Methods

- **Experimental/Quasi-experimental**
- **Cohort/Causal Comparative**
- **Single Subject/Case Study**
- **Cross-sectional/Descriptive**

## Variable Types

Type	Description	Example
Continuous	Numerical scale without gaps	Age, MCQ score
Dichotomous	Two possible outcomes	Pass/Fail, Yes/No
Ordinal	Ranking or Rating items	Likert scale
Nominal	Categorization	Specialty Choice

## Statistical Analyses

- **Dependent on the research question and variables**

## Case 1: Draft a Research Question

Individual interest, something that persists regardless of the situation, and situational interest, finding personal value in an educational context, have not been studied in medical student education. The objective of this study was to determine if individualized case discussions enhance interest in pediatric medicine. Beck GL et al. Med Teach 2012; 34:330-332.

What outcome are you interested in (dependent variable)?

What intervention are you applying (independent variable)?

Are you considering differences or a relationship?

To what group do you wish to apply your results (population)?

Use the above information to draft a research question



Revise your first draft in the space provided

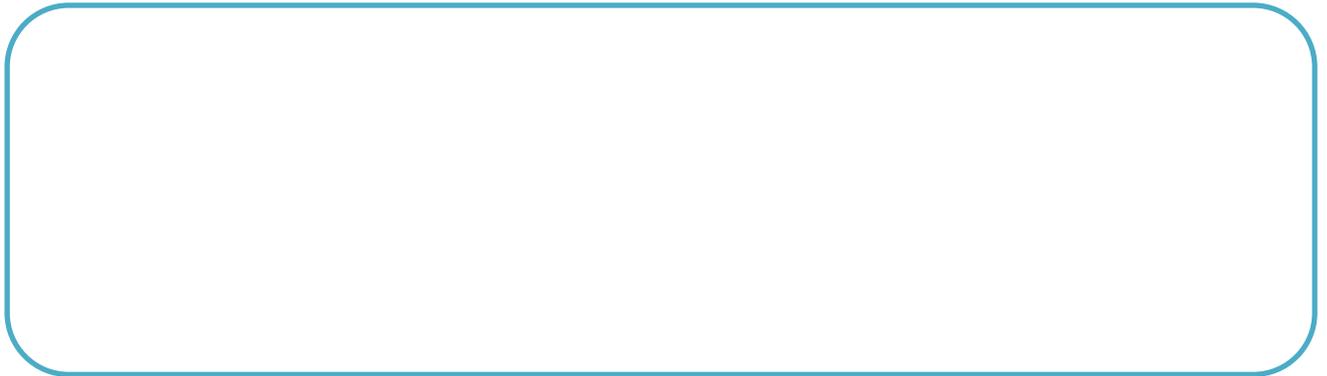


## Activity 2: Choosing Variables



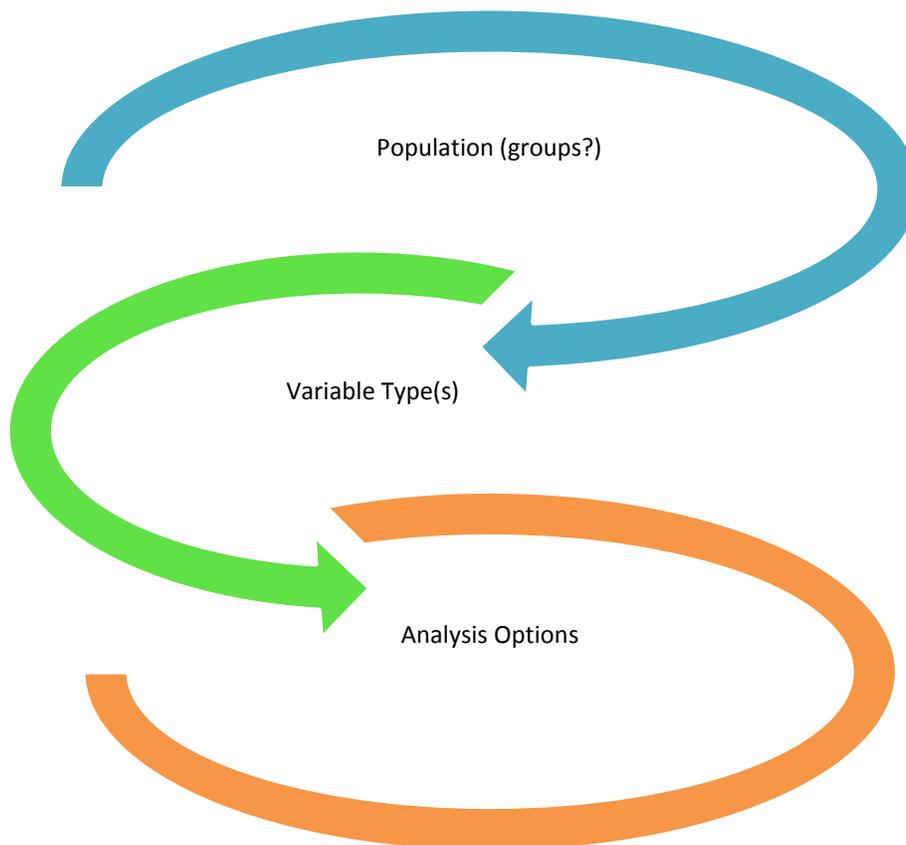
### Activity 3: Choosing Study Designs

Using the Study Design Handout as a guide, develop a flowchart of your study. What design does it most closely align?



### Activity 4: Choosing Statistical Analysis

Using the Statistical Analysis Handout as a guide, what potential statistical analyses might you use to analyze your data?



## Case 2: Draft a Research Question

Most of the recent work in pediatric vancomycin utilization has evaluated initial dose and trough concentrations or nephrotoxicity risks independently as primary outcomes, and are based on single center experiences. We sought to examine the relationship between trough concentrations with initial doses of vancomycin, age, and weight by hospital setting [i.e., hematology /oncology (H/O), PICU or medical-surgical (Med-Surg)], across two geographically distinct hospitals. We also sought to determine risks for vancomycin-associated nephrotoxicity among this diverse set of patients across hospital settings while adjusting for initial dosing regimen. Matson KL et al. *Pharmacotherapy* 2015; 35(3):337-343.

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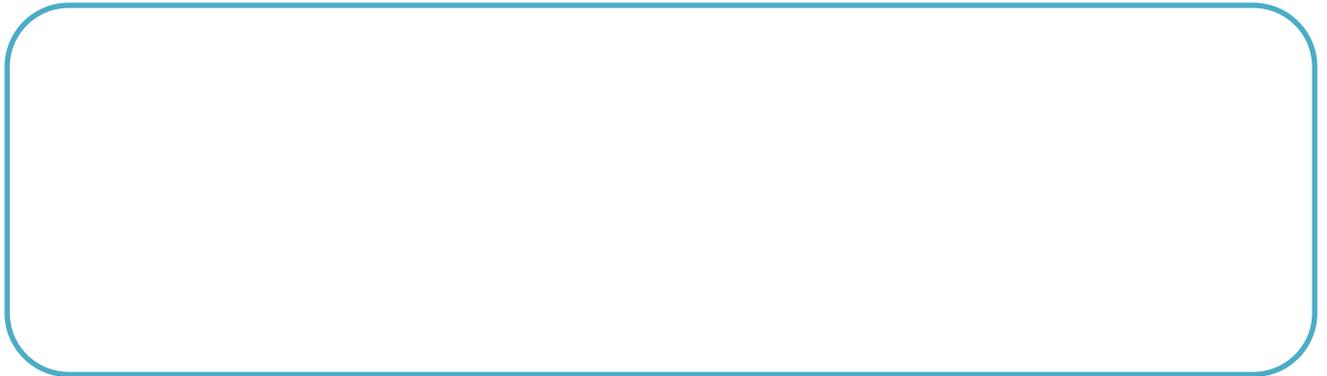


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