Hypothesis and Study Design

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Lubitz, Carrie C., M.D.

Hey guys. You have both reached out to me about what to cover in your talks. I know these talks are tough - which is why I asked the two of you to give them. I know it is nearly impossible to make these fun, but if anyone can do it…
Audiences begin to lose attention after roughly 10 minutes of hearing the same presenter stanford.io/2e9VxYb

10 Tips For Giving Effective Virtual Presentations
What to know before you go live.
Finding your inspiration
Understand what’s known and unknown
Formulate a hypothesis
Choose a study design
Write
THE SCIENTIFIC METHOD
Scientific Method

Purpose
What do I want to learn?

Research
Find out as much about your topic as you can.

Hypothesis
Predict what the answer to the problem is.

Experiment
Design a test to confirm or disprove your hypothesis.

Analysis
Record what happened during the experiment.

Conclusion
Was my hypothesis correct?
Research questions

• What is the role of NK cells in regulating macrophage-mediated adipose tissue inflammation?
• Do we prescribe too many opioids after surgery?
• What are main drivers of variations in hospital mortality rates following high risk surgery?
• Are laparoscopic simulators useful in improving technical skills amongst residents?
Outline

• Finding your inspiration
• Understand what’s known and unknown
• Formulate a hypothesis
• Choose a study design
• Write
Finding your inspiration
Understand what’s known and unknown
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Formulate a hypothesis

- Clear
- Defined
- Simple
- Testable
Hypotheses

- Systemic NK cell ablation attenuates intra-abdominal adipose tissue macrophage infiltration in murine obesity
- Following laparoscopic cholecystectomy, patients have >50% of their opioid pills left over
- Failure to rescue is the main driver of variation in hospital mortality after pancreatectomy
- Structured, weekly practice on laparoscopic simulators improves resident OSATS scores more than OR cases alone
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Study Types

Study Goal

Descriptive
- Survey
- Qualitative
- Case Series

Analytic
- Experimental
  - Randomized Controlled Trial
  - Non-randomized controlled trial
- Observational
  - Cohort (Prospective)
  - Cross Sectional
  - Case Control
Finding your inspiration
Understand what’s known and unknown
Formulate a hypothesis
Design your study
Write
Write… something

- Review article
- Methods paper
- Research paper
- Pilot grant
- Large grant proposal
Summary

• Find something you are passionate about
• Ask an interesting question
• Do your research
• Run with it
Thank you!

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