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Hypothesis and Study Design

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Disclosures

- No relevant financial disclosures

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…

Stanford Business
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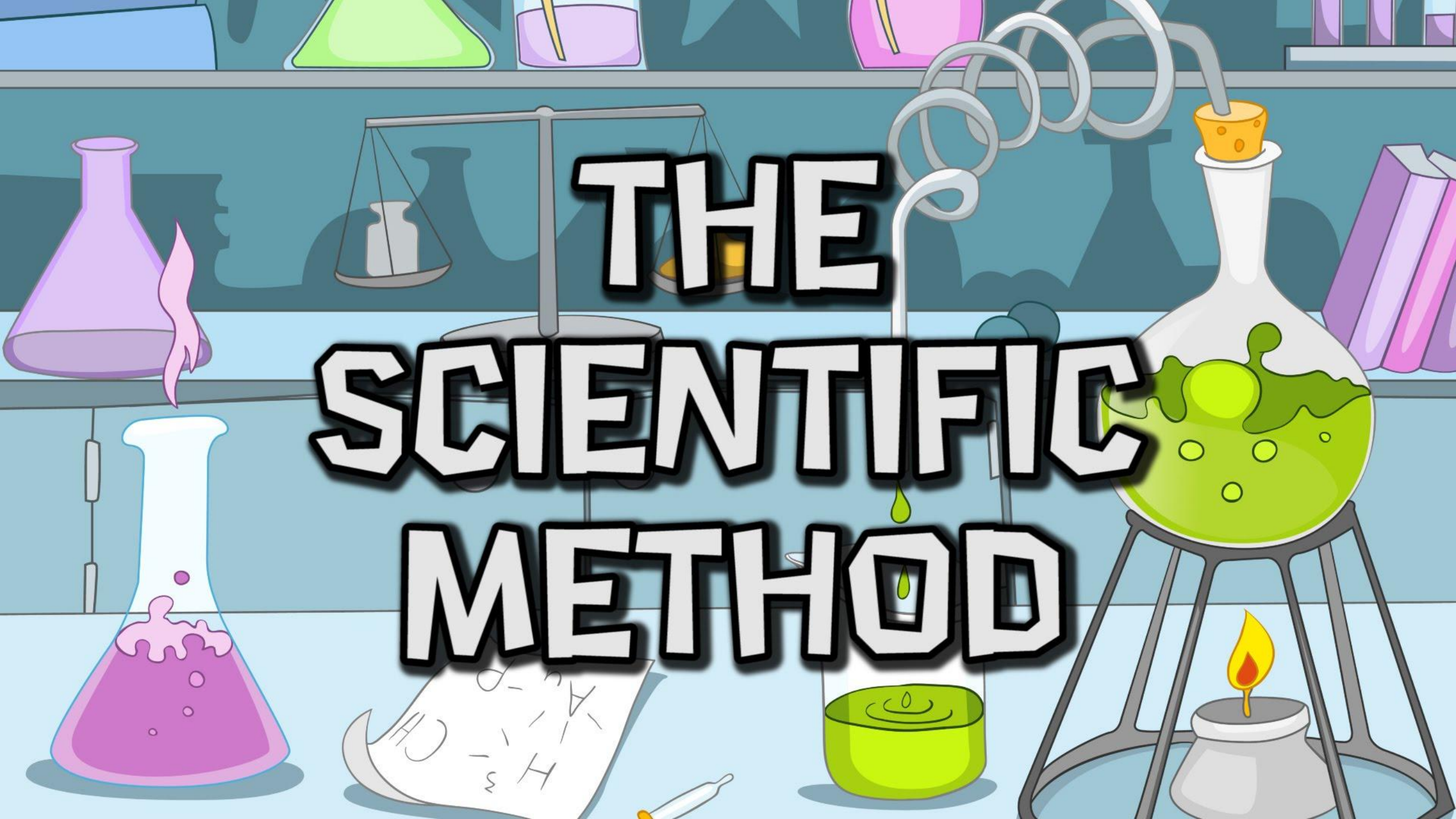
Audiences begin to lose attention after roughly 10 minutes of hearing the same presenter stanford.io/2e9VxYb

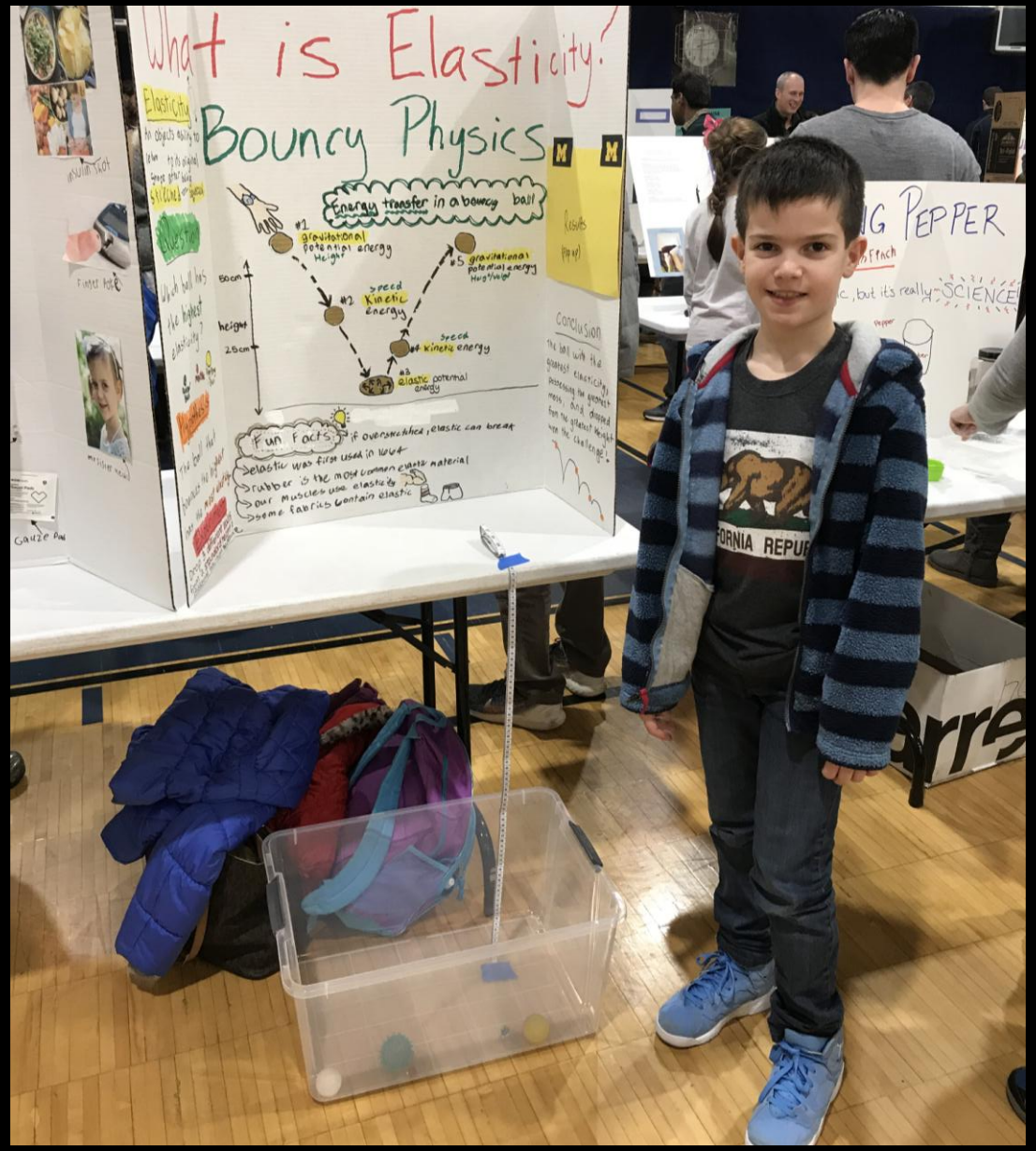
10 Tips For Giving Effective Virtual Presentations

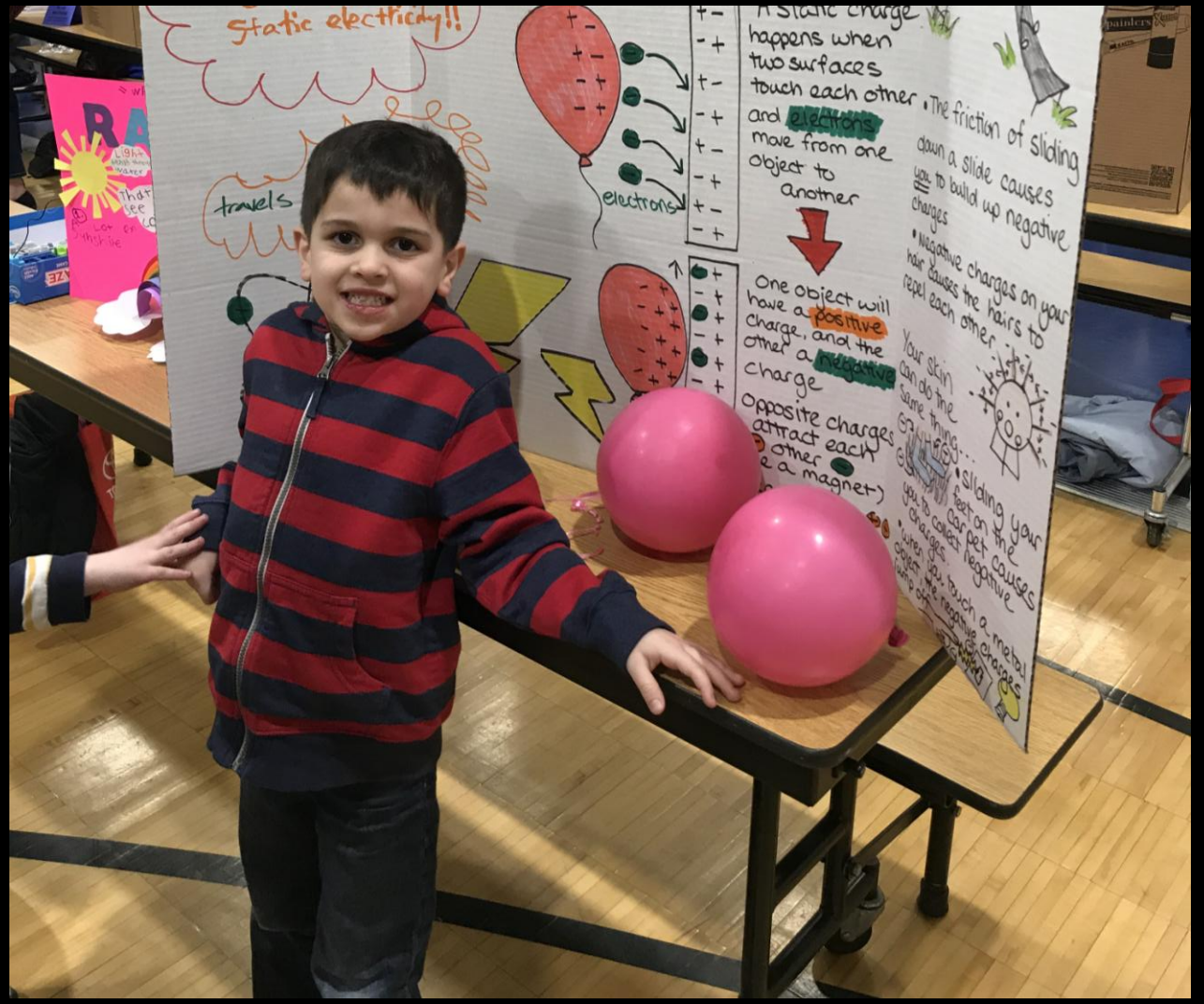
What to know before you go live.

Outline

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


THE
SCIENTIFIC
METHOD


What is Elasticity?
Bouncy Physics
Elasticity
Energy transfer in a bouncy ball
#1 gravitational potential energy
Height
#2 speed
Kinetic energy
#3 elastic potential energy
#4 speed
kinetic energy
#5 gravitational potential energy
Height
80cm
height
20cm
Conclusion
Fun Facts
if overstretched, elastic can break
Rubber is the most common elastic material
Your muscles use elasticity
Some fabrics contain elastic
Gauze Pad


Static electricity!!
travels
electrons
A static charge happens when two surfaces touch each other and electrons move from one object to another
One object will have a positive charge, and the other a negative charge
Opposite charges attract each other (like a magnet)
The friction of sliding down a slide causes you to build up negative charges
Negative charges on your hair causes the hairs to repel each other
Your skin can do the same thing...
Sliding your feet on the carpet causes you to collect negative charges
When you touch a metal object the negative charges

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

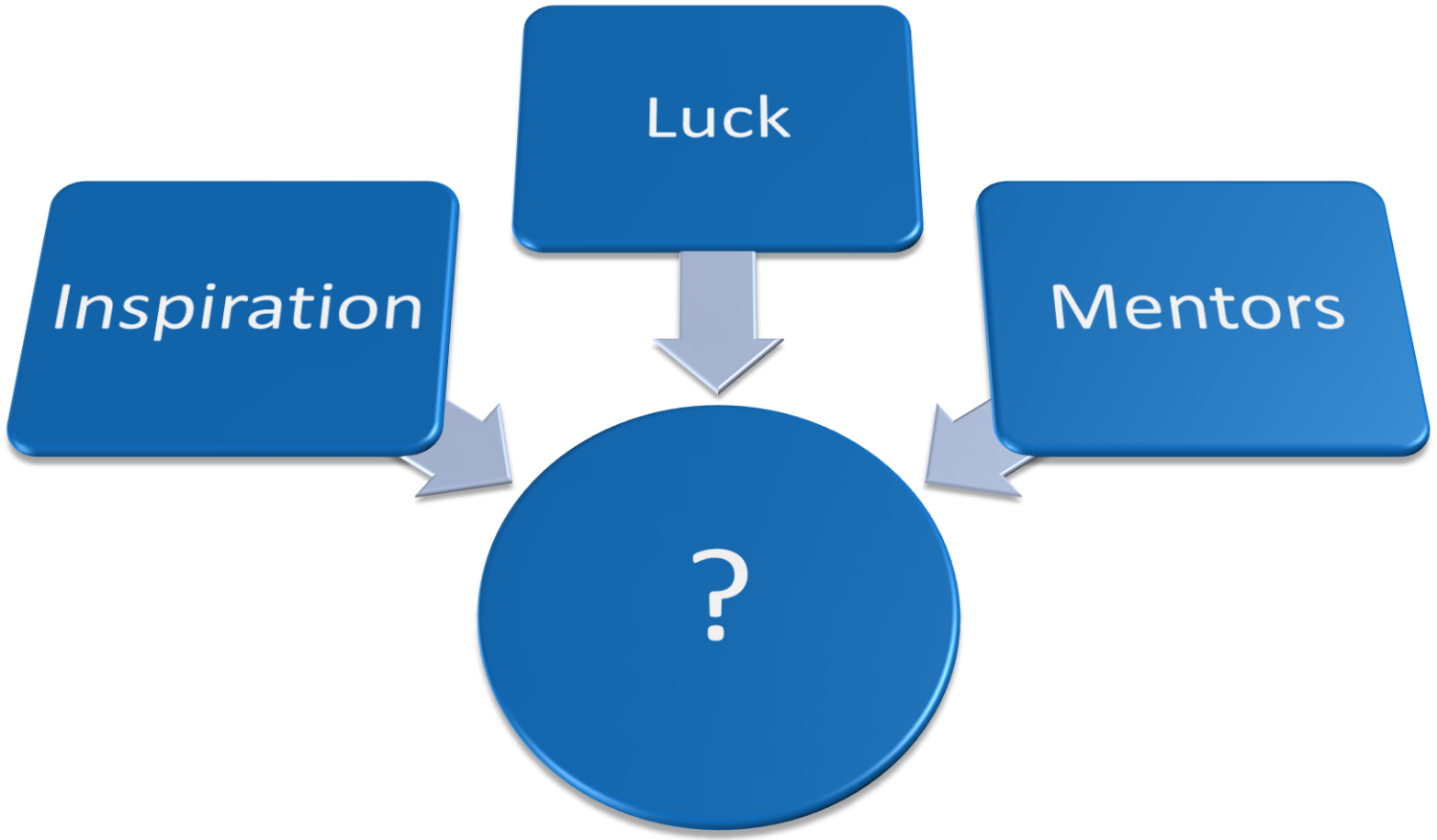
Design a test to confirm or disprove your hypothesis.

ANALYSIS

Record what happened during the experiment.

CONCLUSION

Was my hypothesis correct?


Luck
Inspiration
Mentors
?

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?

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PubMed Tools

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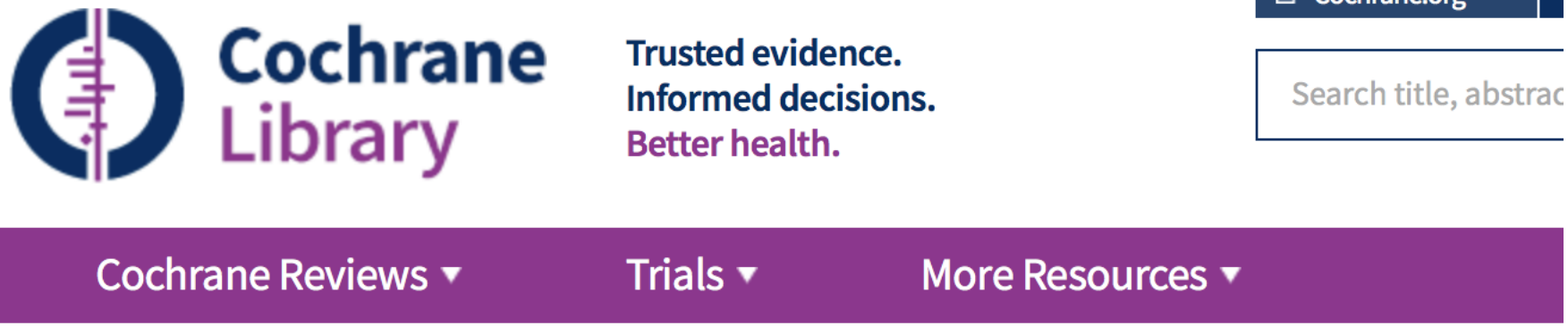
- Batch Citation Matcher
- Clinical Queries
- Topic-Specific Queries

More Resources

- MeSH Database
- Journals in NCBI Databases
- Clinical Trials
- E-Utilities (API)
- LinkOut



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Author	Year	Title	Journal	Last Updated
		ACS NSQIP: Data Collection Overview		6/1/10
Ajzen, I.	1991	The Theory of Planned Behavior	Organizational Behavior and Hu...	6/1/10
Birkmeyer, N. J.; Birkmeyer,...	2006	Strategies for improving surgical quality--should payers reward excell...	N Engl J Med	6/1/10
Birkmeyer, N. J.; Share, D.;...	2005	Partnering with payers to improve surgical quality: the Michigan plan	Surgery	6/1/10
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Bognar, A.; Barach, P.; John...	2008	Errors and the burden of errors: attitudes, perceptions, and the cultur...	Ann Thorac Surg	6/1/10
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Campbell, D. A., Jr.; Hender...	2008	Surgical site infection prevention: the importance of operative duratio...	J Am Coll Surg	6/1/10
Christensen, E.; Sutcliffe, K....	2009	Sensemaking, high-reliability organizing, and resilience	Patient safety in emergency med...	6/1/10
Cooper, J. B.	2003	Developing a culture of safety	Biomed Instrum Technol	6/1/10
Davenport, D. L.; Henderson...	2007	Risk-adjusted morbidity in teaching hospitals correlates with reported...	J Am Coll Surg	6/1/10
Ghaferi, A. A.; Birkmeyer, J....	2009	Variation in hospital mortality associated with inpatient surgery	N Engl J Med	11/25/09
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Hannan, E. L.; Kilburn, H., Jr...	1990	Adult open heart surgery in New York State. An analysis of risk factors...	JAMA	6/1/10
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Jha, A. K.; Li, Z.; Orav, E. J.;...	2005	Care in U.S. hospitals--the Hospital Quality Alliance program	N Engl J Med	6/1/10
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Leach, L. S.; Mayo, A.; O'Ro...	2010	How RNs rescue patients: a qualitative study of RNs' perceived involv...	Qual Saf Health Care	6/1/10
McKeon, L. M.; Cunningham...	2009	Improving patient safety: patient-focused, high-reliability team training	J Nurs Care Qual	6/1/10
Page, Ann; Institute of Medi...	2004	Keeping patients safe : transforming the work environment of nurses		6/1/10
Ramanujam, R.; Rousseau,...	2006	Organizational behavior in healthcare- the challenges are organizatio...	Journal of Organizational Behavior	6/1/10
Ritchie, J. W.; Spencer, L.	1994	Qualitative data analysis for applied policy research	Analyzing qualitative data	6/1/10
Rosenthal, M. B.; Fernandop...	2004	Paying for quality: providers' incentives for quality improvement	Health Aff (Millwood)	6/1/10
Sexton, J. B.; Helmreich, R....	2006	The Safety Attitudes Questionnaire: psychometric properties, benchm...	BMC Health Serv Res	6/1/10
Sexton, J. B.; Holzmueller, C...	2006	Variation in caregiver perceptions of teamwork climate in labor and de...	J Perinatol	6/1/10
Sexton, J. B.; Makary, M. A.;...	2006	Teamwork in the operating room: frontline perspectives among hospit...	Anesthesiology	6/1/10
Sexton, J. B.; Paine, L. A.; M...	2007	A check-up for safety culture in "my patient care area"	Jt Comm J Qual Patient Saf	6/1/10
Shortell, S. M.; Zimmerman,...	1994	The performance of intensive care units: does good management mak...	Med Care	6/1/10
Silber, J. H.; Williams, S. V.;...	1992	Hospital and patient characteristics associated with death after surger...	Med Care	9/14/17
Strauss, Anselm L.; Corbin,...	1998	Basics of qualitative research : techniques and procedures for develo...		6/1/10
Turrentine, F. E.; Wang, H.; S...	2006	Surgical risk factors, morbidity, and mortality in elderly patients	J Am Coll Surg	11/4/13
Vogus, T. J.; Sutcliffe, K. M.	2007	The impact of safety organizing, trusted leadership, and care pathway...	Med Care	6/1/10
Vogus, T. J.; Sutcliffe, K. M.	2007	The Safety Organizing Scale: development and validation of a behavio...	Med Care	6/1/10
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Zhan, C.; Miller, M. R.	2003	Excess length of stay, charges, and mortality attributable to medical in...	JAMA	6/1/10


Hospital and Patient Characteristics Associated With Death After Surgery

A Study of Adverse Occurrence and Failure to Rescue


1


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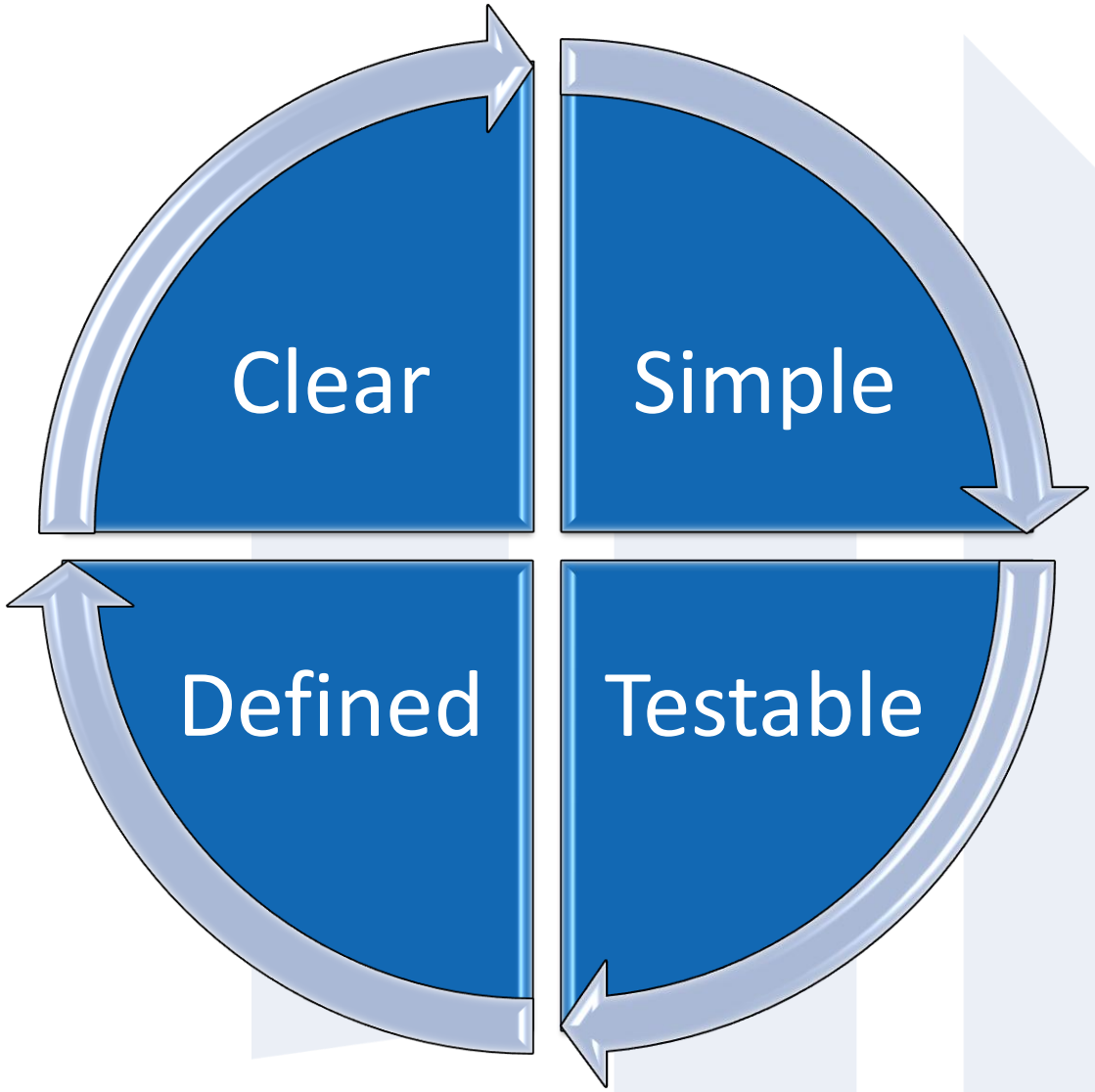
Formulate a hypothesis



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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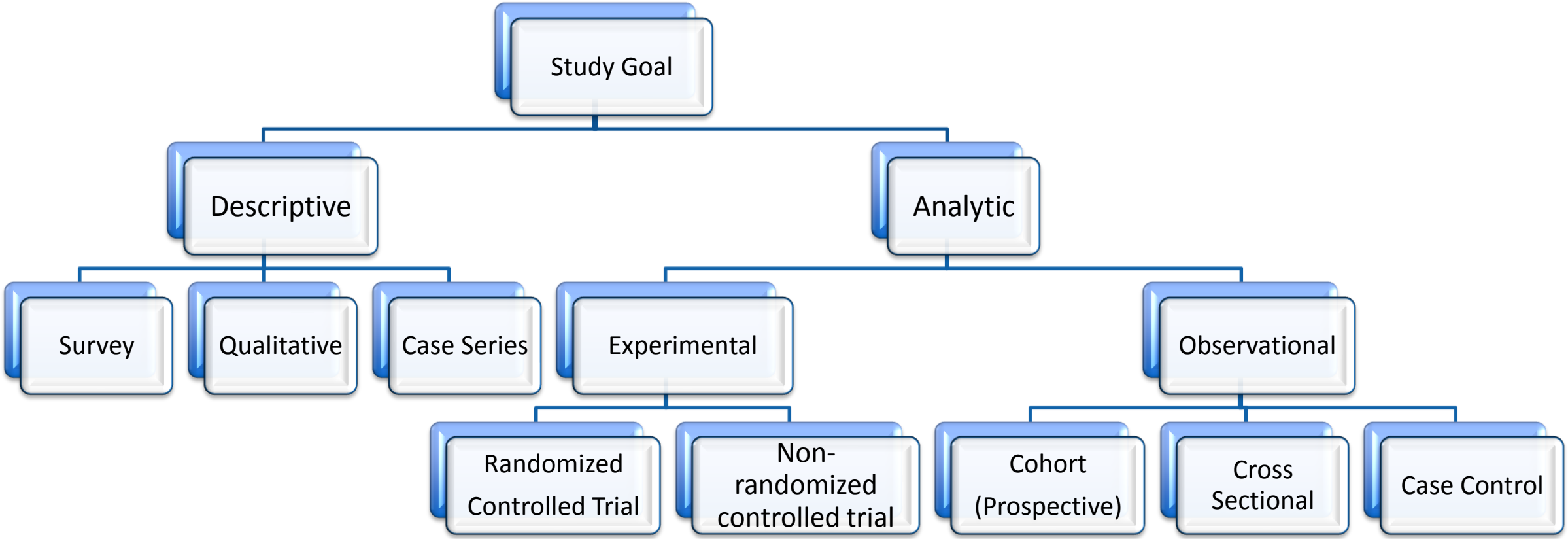
Study Types


Study Goal
Descriptive
Analytic
Survey
Qualitative
Case Series
Experimental
Observational
Randomized Controlled Trial
Non-randomized controlled trial
Cohort (Prospective)
Cross Sectional
Case Control

Outline

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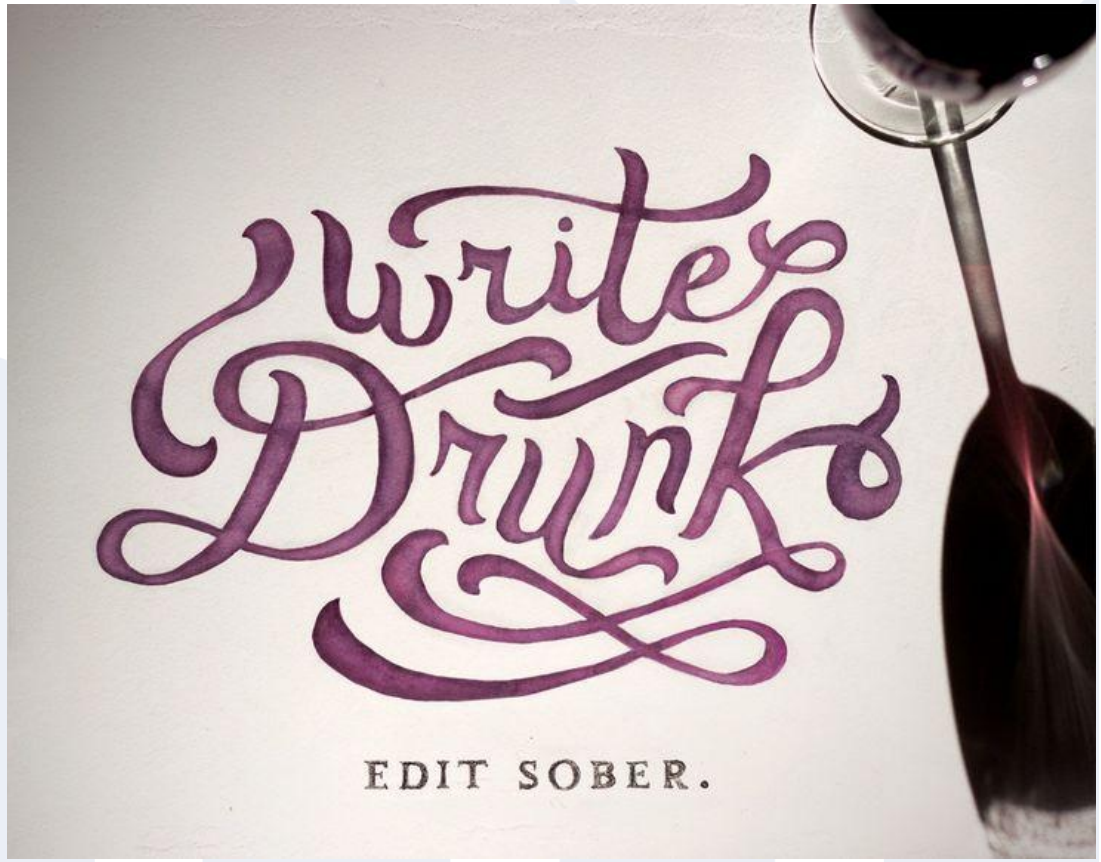
Write… something

- 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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