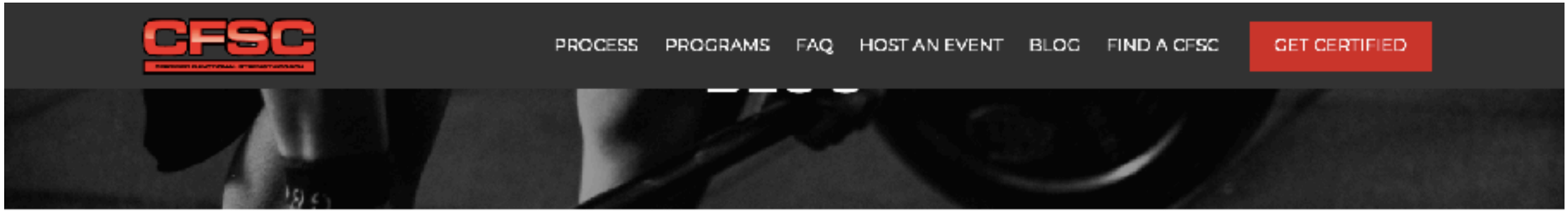
Welcome to:

How to Read Research *w/ Brendon Rearick, Kevin Carr, and Damion Perry*

- **Translation offered tonight** - hello to our Brazilian friends!
- **Use the Q&A box <u>only</u>** (Do not use: chat, raise your hand, text, email)
- **Brendon:** Facilitator & Student
- **Damion:** Teacher & webinar leader
- **Kevin:** Emotional support & analyst
- **Questions -** Why should I read studies? Where do I find good studies? How do I know it's a good study? How do I know if it's biased? How do I decipher the statistics? Can I just read the abstract?
- **Post Email w/ Recording & PDF**

Our 6 other recorded webinars in case you missed them:



10+ HOURS OF FREE WEBINARS! (SUPPORTING DOCUMENTS INCLUDED)

MAY 17, 2020

1. **Using Your Assessment to Build Out A Training Program**

https://www.certifiedfsc.com/10-hours-of-continuing-education-webinars-for-free-supporting-documents-included/

Critical Appraisal

Reading & Applying Evidence

Damion Perry B.S., CFSC

Acknowledgment of Limitations

- We are not eminently qualified to dissect scientific literature or confirm/deny statistical analyses
- This will be about the art of learning and our personal processes


Journal of
Physical
Therapy
JAMA
American Medical Association
The NEW ENGLAND
JOURNAL of MEDICIN
THE
JOURNAL-LANCET
Minnesota, North Dakota, South Dakota, and Montana
Journal of Applied
PHYSIOLOGY
Medicine & Science
IN
Sports & Exercise
The Official Journal of the American College of Sports Medicine
OVID
50
nal of Strength and Conditioning Research
Bridging the Gap between Science and Practical Applications
NSCA
NATIONAL STRENGTH AND

Evidence-Based Medicine Paradigm

- *"Critical appraisal exercise" (Guyatt et al.,1992)*

1. Define a problem

2. Conduct search of the literature, select relevant studies & determine validity

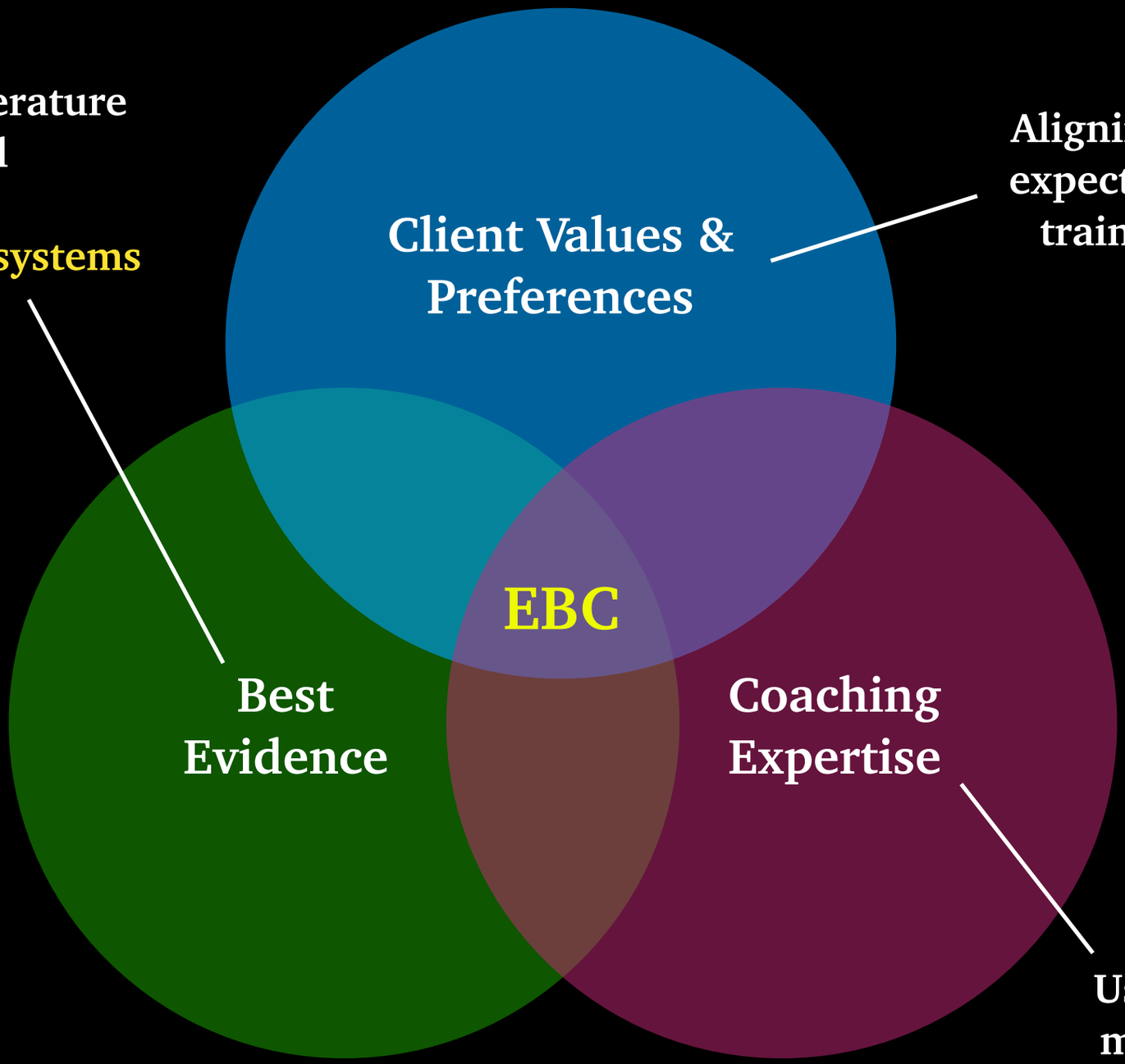
3. Present content of article(s) to colleagues & extract the clinical messages

4. Apply to the patient problem

Evidence Based *Coaching*

Integrating individual expertise & best external evidence

Critical appraisal of literature to investigate empirical patterns in order to create evidence-based systems



Aligning client goals & expectations with your training philosophy

Using past experience to make decisions that are in client's best interest

(Adapted from Sackett et al. 1996)

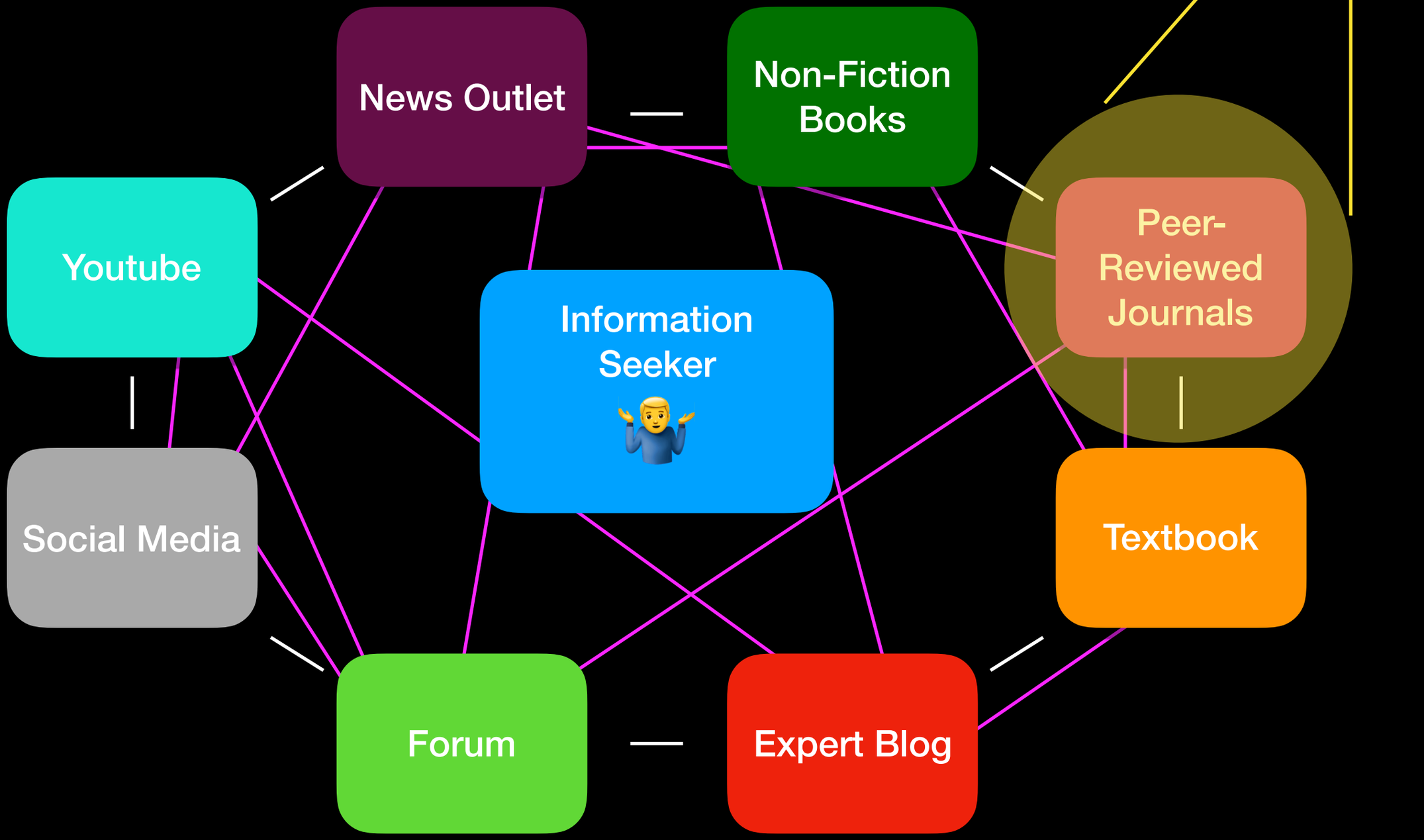
Evidence based medicine: what it is and what it isn't

“EBM is not "cookbook" medicine. Because it requires a bottom up approach that integrates the best external evidence with individual clinical expertise and patients' choice, it cannot result in slavish, cookbook approaches to individual patient care.

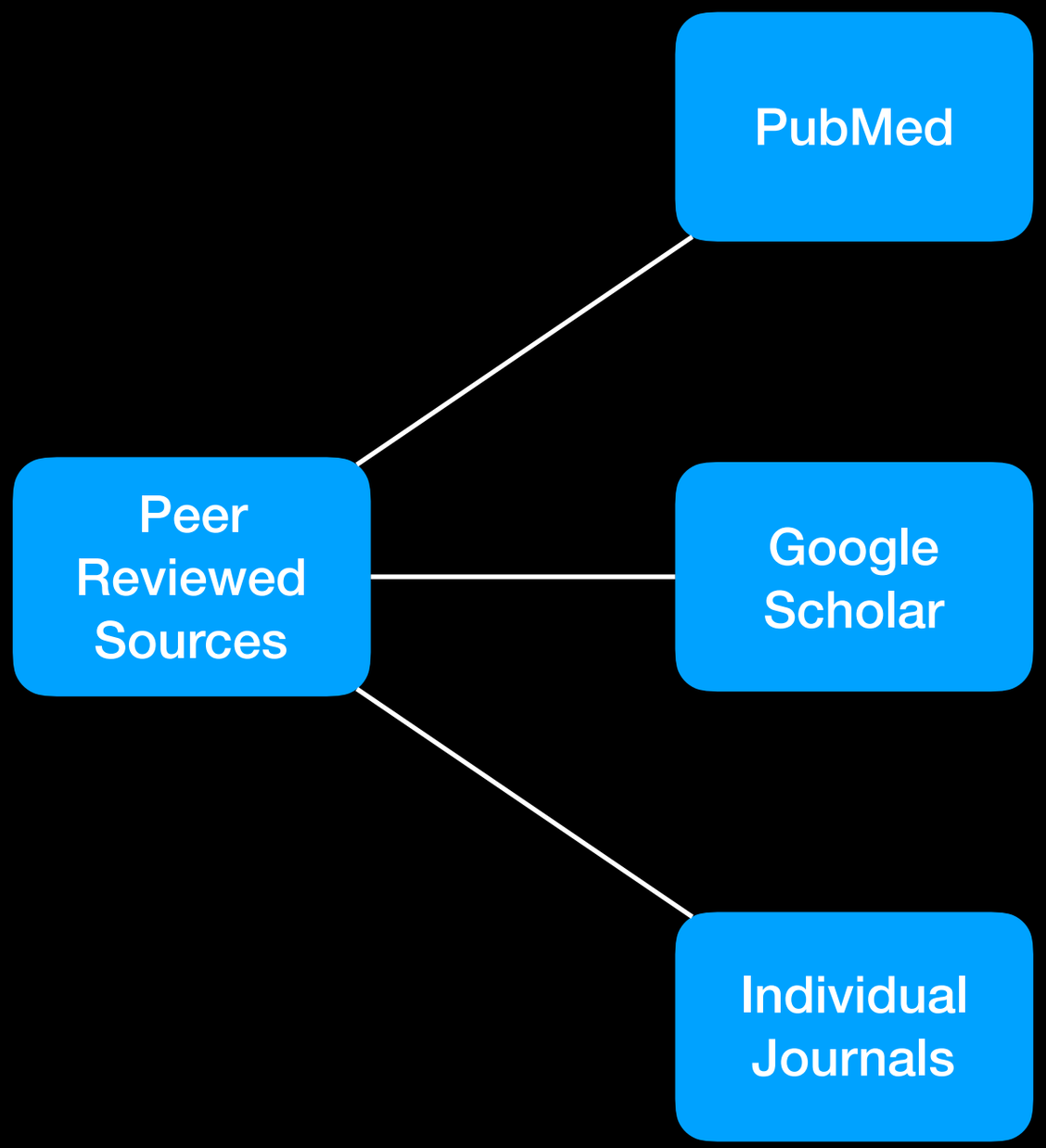
External clinical evidence can inform, but can never replace, individual clinical expertise, and it is this expertise that decides whether the external evidence applies to the individual patient at all and, if so, how it should be integrated into a clinical decision.”

(Sackett et. al. 1996)

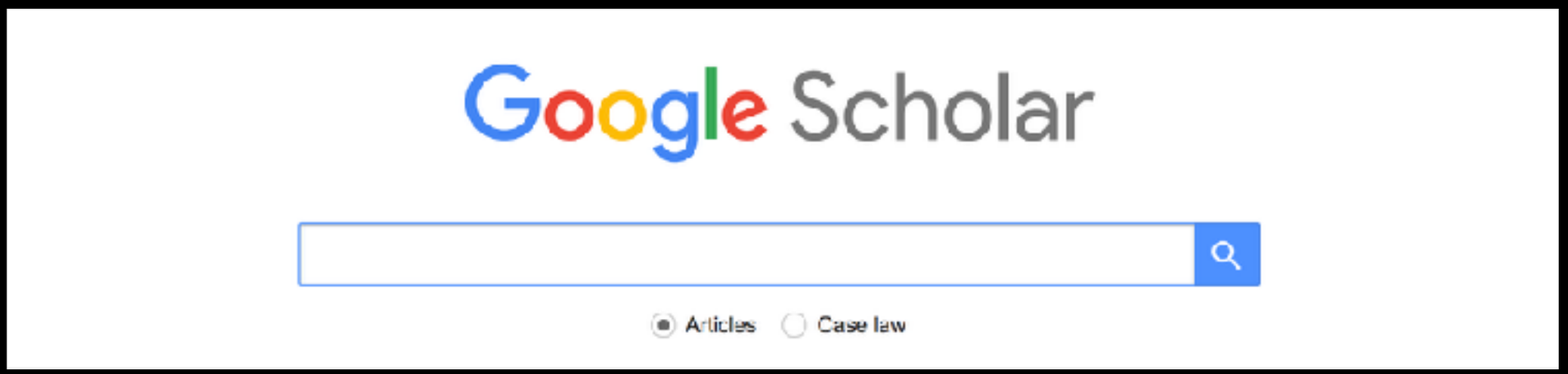
Selecting Sources



Searching for studies: Databases

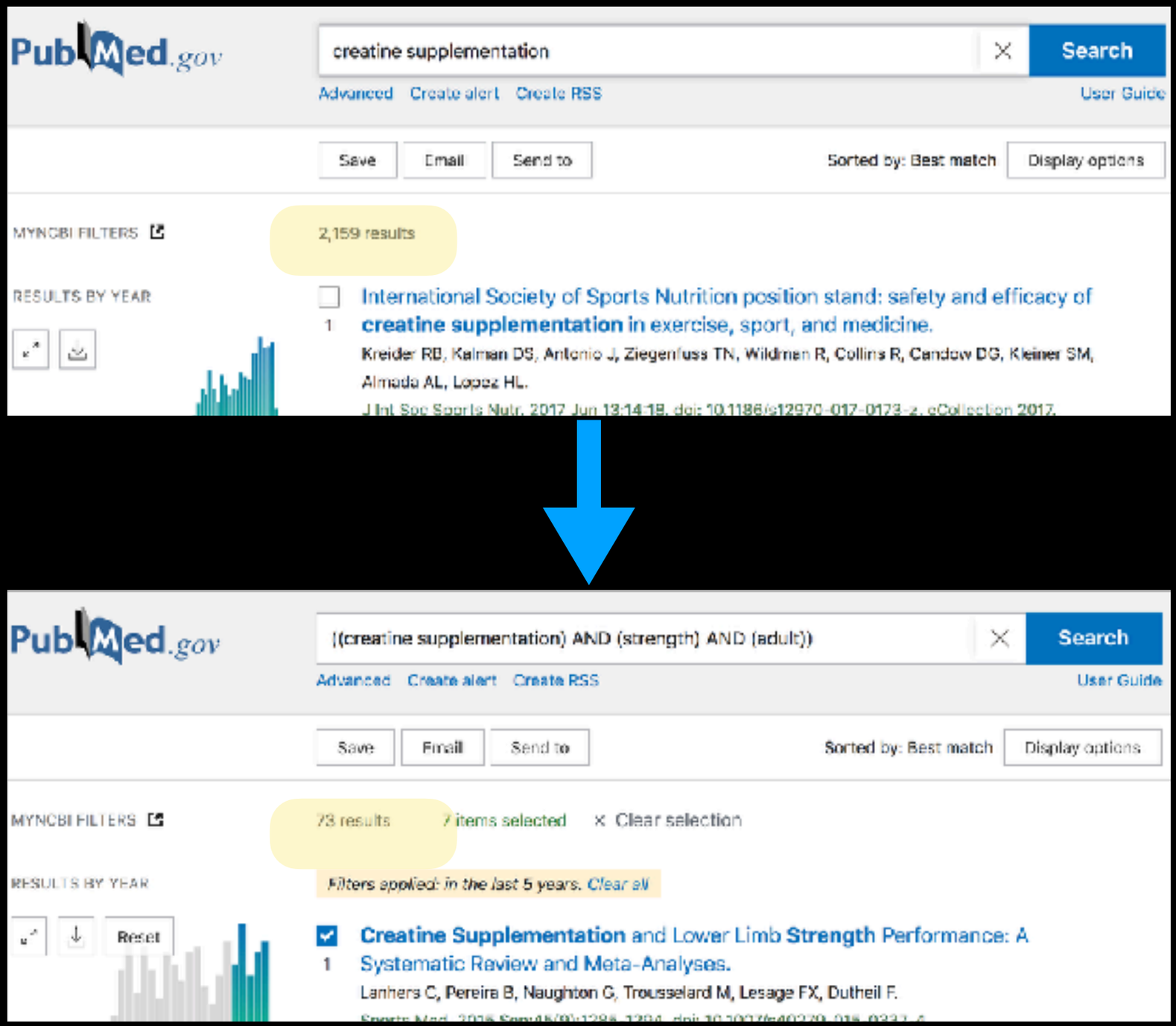


Searching for studies: Databases



Searching for studies: Databases

Limit your search terms!



Searching for studies: Databases

First Pass: What to download

Considerations

- Journal Published
- Type of Study
- Year Published
  - Newer doesn't necessarily mean "better"
- Does study title match your question

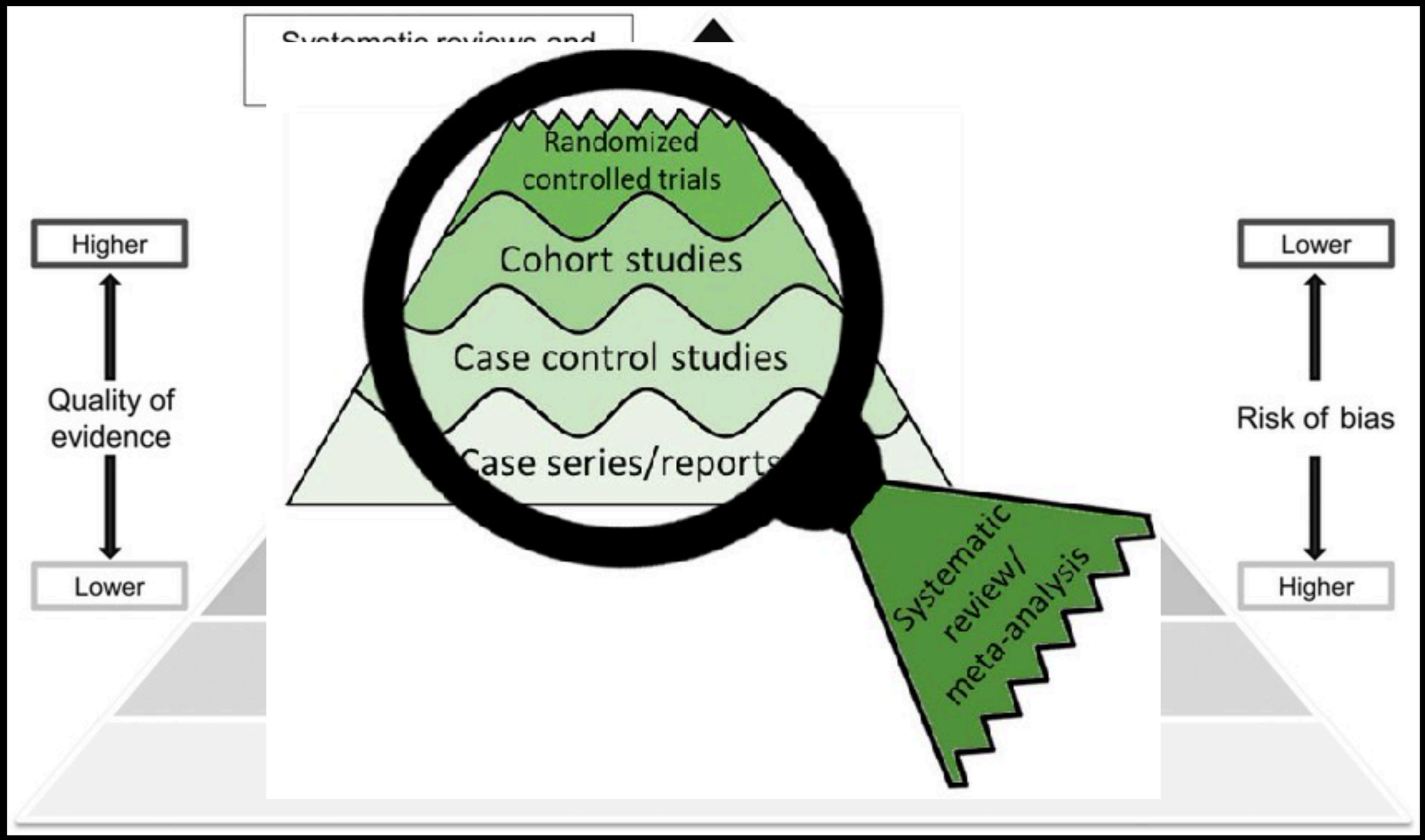
1. Creatine Supplementation and Lower Limb Strength Performance: A Systematic Review and Meta-Analyses.
   Lanhers C, Pereira B, Naughton G, Trousselard M, Lesage FX, Dutheil F.
   Sports Med. 2015 Sep;45(9):1285-1294. doi: 10.1007/s40279-015-0337-4.
   PMID: 25946994 Review.

2. Effects of 4-Week Creatine Supplementation Combined with Complex Training on Muscle Damage and Sport Performance.
   Wang CC, Fang CC, Lee YH, Yang MT, Chan KH.
   Nutrients. 2018 Nov 2;10(11):1640. doi: 10.3390/nu10111640.
   PMID: 30400221 Free PMC article. Clinical Trial.

3. Effectiveness of Creatine Supplementation on Aging Muscle and Bone: Focus on Falls Prevention and Inflammation.
   Candow DG, Forbes SC, Chilibeck PD, Cornish SM, Antonio J, Kreider RB.
   J Clin Med. 2019 Apr 11;8(4):488. doi: 10.3390/jcm8040488.
   PMID: 30978926 Free PMC article. Review.

4. Strategic creatine supplementation and resistance training in healthy older adults.
   Candow DG, Vogt E, Johannsmeyer S, Forbes SC, Farthing JP.
   Appl Physiol Nutr Metab. 2015 Jul;40(7):689-94. doi: 10.1139/apnm-2014-0498. Epub 2015 Feb 26.
   PMID: 25993883 Clinical Trial.

Hierarchy of Evidence



Systematic Review/Meta Analysis

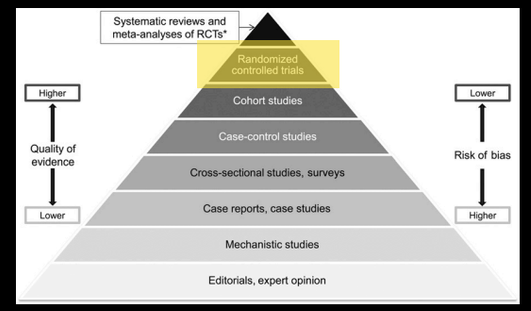
Systematic Review

Identify, appraise and synthesize evidence from multiple studies of the same research question

Meta-analyses

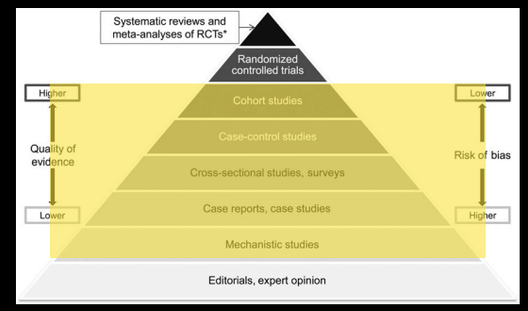
Contained within systematic reviews, offer a means of statistically summarizing the body of evidence identified.

Randomized Controlled Trials



- Prospective studies that measure the effectiveness of a new intervention or treatment.
- Considered the gold standard to determine the risk or benefit of a particular intervention.
- No one study can prove causality, but randomization reduces bias and provides a rigorous tool to examine cause-effect

Observational Studies



- “Observational” because the investigator observes without manipulation
- Associations discovered in these studies help to formulate hypotheses to be tested in subsequent controlled experiments
- Observational studies are a fundamental part of epidemiological research
- E.g. Cross-sectional studies, case-control studies, & cohort studies

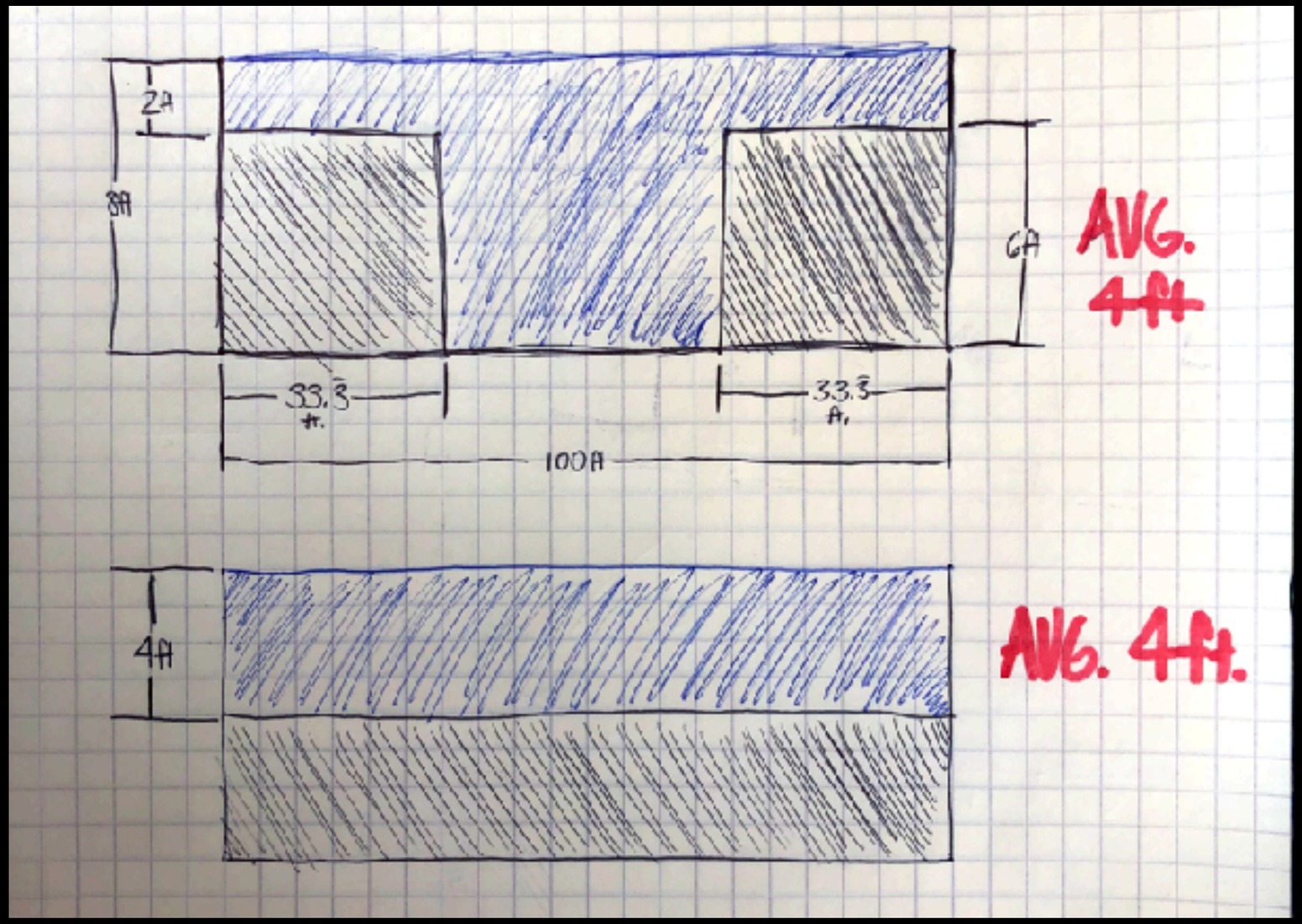
Bias & Confounding Factors

"Data are data. It is the intellectual framework with which one deals with the data that is at fault"-Robert Pirsig

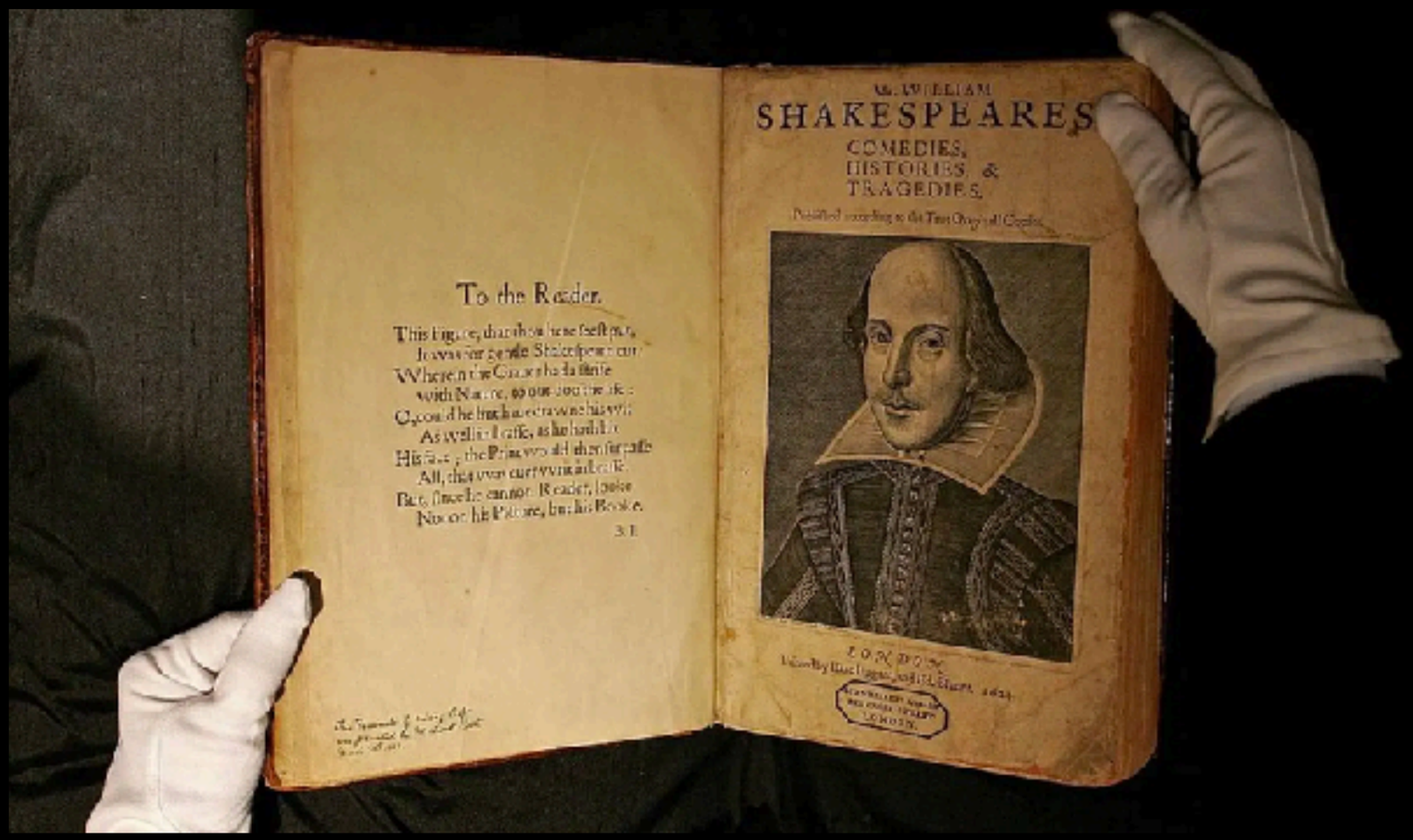
- Absence of evidence is not evidence of absence
  - Null hypothesis
- Bias
  - Scientists are human
  - Studies (often) have bias' embedded
- Attention to detail
  - Importance of reading body of evidence
  - Statistical analysis
  - Lab, funding, etc.

Playing with statistics

- You’re out for a hike and can choose to cross a river or go a few miles around to a bridge
- You are told the river is 100ft wide and an average of 4ft deep with very little current today.


2A
8A
6A
AVG. 4A
33.3 A.
33.3 A.
100A
4A
AVG. 4A.

Reading Research
…a lot like reading Shakespeare



“that thou hast forgotten to demand that truly which thou wouldst truly know.”

-Prince Henry, Henry IV Scene II (1H4.1.2.2-5)

Speaking in Tongues

- "Blind”
  - Researchers and subjects are “blinded" to the protocol.
  - Double, Triple, etc. increase “blind”
- Statistical Significance
  - Quantifies probability of occurrence
  - $p<.05 = 5\%$, marker for “significance”
  - Higher the p-value, the greater the chance that the effect you are seeing is not real
- Confidence Interval
  - Flip of $p<.05$ value…Confidence Interval of 95%
  - A 95% CI says: 95% of experiments exactly like this one will include the true mean, but 5% won’t.

Rules of Reading

Rule 1: Know the Question

What are your looking for?

- Beware of Bias
- Having a question will act as a roadmap

Rules of Reading

Rule 2: Read What Matters

- **Don’t get bogged down with one paper**
- **Order of Reading**
  - Abstract
  - Introduction
  - Discussion
  - Methods
  - Results

Rules of Reading

Rule 3: Engage with yourself

Be an active reader

- Make the article yours
  - Write in margins, highlight, etc.
- Keep a “journal”
  - Paper or electronic
  - Ask questions
    - Do I agree w/this?
    - How can this apply to my model?

Rules of Reading

Rule 4: Engage with others

Apply your learning!

- Discuss w/colleagues
- Journal clubs
- Social Media
- Write Articles

Anatomy of a Paper

- **Abstract**
  - Summary of article topic & findings
- **Introduction**
  - Current knowledge in the pertinent research
  - Hypothesis being tested
- **Methods**
  - Key techniques used in the experiment
- **Results**
  - Data obtained in the study
- **Discussion**
  - Conclusions drawn by the authors from their data
- **Acknowledgments & COI**
  - Source of funding and potential conflicts of interest
- **References**
  - List of articles cited

Research Question Walk-Through

"A middle-aged male client asks you during a training session if you think that creatine would be a good supplement for him to take.

He read somewhere online that it helps you get stronger and put on more muscle mass, and wants to know what you think”

Take Home Points

- You don’t have to work in a lab to be scientific or ask research questions
- Don't feel that you have to understand an entire paper from one read
- Get your reps in. With more experience reading articles, you will get better at interpreting them
- Being widely read in a variety of topics is important to developing your own model
- Trust no one

Contact Us

Brendon Rearick
IG: @coachbrendonrearick
Website: www.brendonrearick.com
Email: brendonrearick@gmail.com

Kevin Carr
IG: @kev_in_carr
Website: www.movement-as-medicine.com
Email: coachkevincarr@gmail.com

Damion Perry
IG: @damion_perry
Email: damionperry3@gmail.com

CFSC $150 OFF of the Online Certification Right Now
https://cfsc.inspire360.com/cfsc/cfsconline

50% OFF Building Exercise Checklists Code: ZoomWebinar
www.exercisechecklists.com/p/exercise-checklists