Surgical Science Secrets

PreMedEazy

PreClinEazy

ResearchEazy

SurgEazy

FinalsEazy

SCEazy

HEALTHCARE PROTECTION

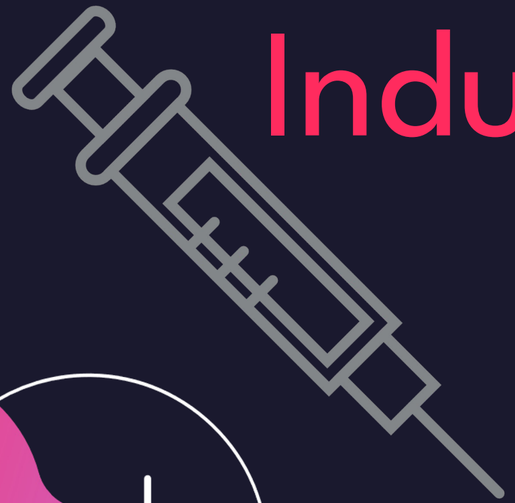
Supported by Royal College of Surgeons of England ADVANCING SURGICAL CARE

WESLEYAN *we are all about you*

QUESMED

ResearchEazy

Induction and Purpose of Research



Introduction and Purpose of Research

- Evidence-based medicine
- What is research
- Why research is done
- Why ResearchEazy
- Recent advances in healthcare due to research

Presenters

Dr Amar Rai MBBS BSc
FY1 SFP Doctor, London

Dr Hasaan Khan MBBS BSc
FY1 SFP Doctor, Thames Valley

Shivani Shukla BA
5th Year Medical Student, University of Cambridge

Evidence Based Medicine

Evidence Based

Medicine

*"the **conscientious**, explicit and judicious use of **current best evidence** in making decisions about the care of **individual patients**. … [It] means **integrating** individual **clinical expertise** with the best available external clinical evidence from **systematic research**."*

Evidence Based

Medicine

The conscientious use of judging current best evidence in an effort to guide clinical decision making which will enhance a patient's care in light of their personal circumstances

Patient presenting with chest pain

Doctor A: Take some aspirin

"It just felt right"

Intuition

Doctor 3: Take some antacids

"The oesophagus is around the area of the pain, so if I give antacids, that should fix the problem"

Pathophysiologic rationale

Doctor B: Advises bed rest

"Oh I've seen this before, most people get better after a while"

Unsystematic clinical experience

Doctor 4: Take some aspirin

"I remember a case like this and my consultant recommended aspirin. I don't know why though"

Word of mouth

Professor Archie Cochrane

- Most treatment related decisions not based on a systematic review
- Proposed that researchers should collaborate internationally to systematically review all the best clinical trials
- This highlighted gaps that existed between research and clinical practice
- started to convince practitioners of the benefits of an evidence-based approach.

Professor Gordon Guyatt

Introduced the term “evidence-based medicine”

Evidence-based clinical decision-making is a combination of:

- research evidence
- clinical expertise
- unique values and circumstances of individual patients

How is this done:

1-Uncertainty to an answerable question

2-Systematic retrieval of the best evidence available

3-Critical appraisal of evidence for internal validity

4-Application of results in practice

5-Evaluation of performance

You are in your psychiatry job:

- **Consultant 1:**

  Prescribes Quetiapine

  to their patient

VS

- **Consultant 1:**

  Prescribes Haloperidol

  to their patient

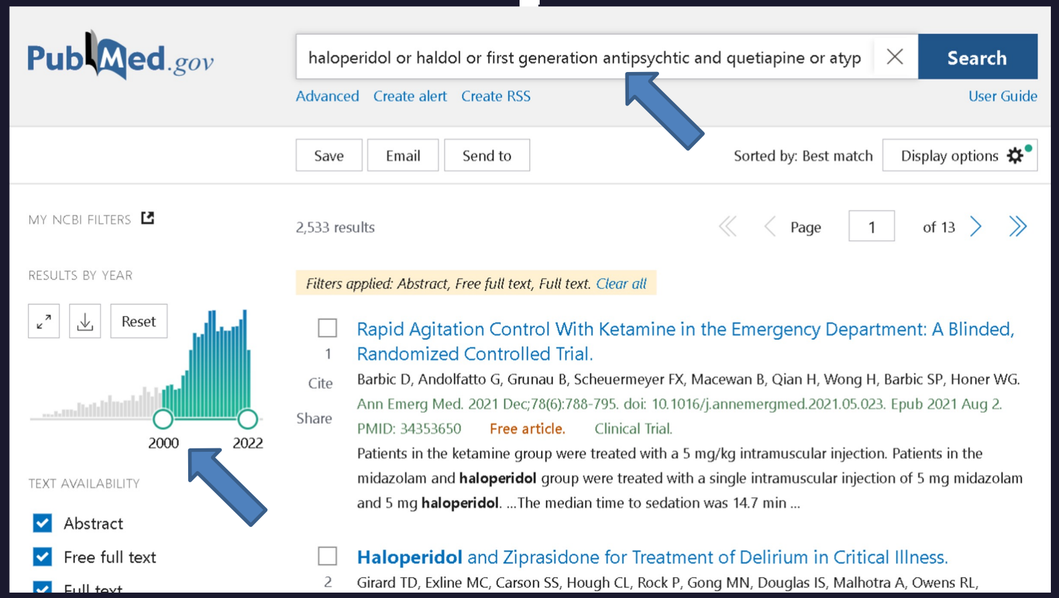
Managing

Which is the best management?

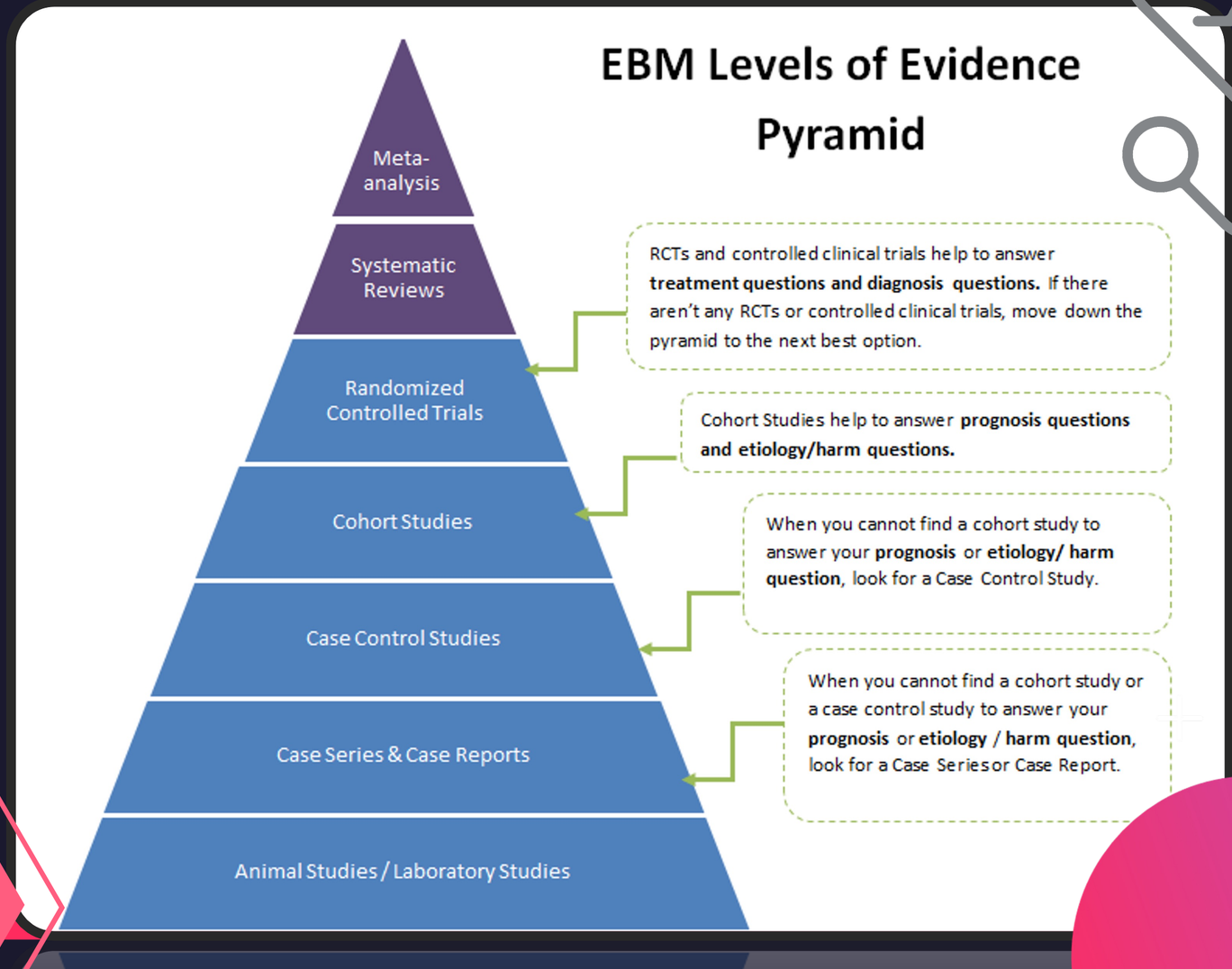
Formulate a research question

What is the efficacy of the use of Quetiapine versus Haloperidol in the management of patients?

Literature Search, use Pubmed



Which research is better ‘quality’?



Why do we do critical appraisal?

Critical appraisal identifies studies to answer your research question which are:

- Relevant
- High quality
- Reputable

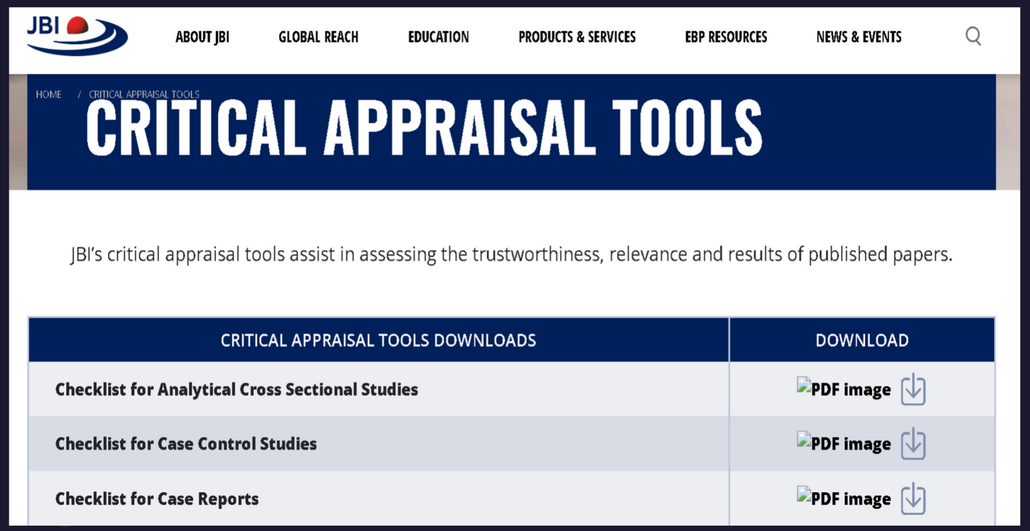
Says who?

NICE
National Institute for Health and Care Excellence

How we use evidence to inform recommendations on health and social care

1. Our independent committees are made up of health and care professionals, people who use services, and carers. They agree review questions important to the topic area.
2. We search for relevant studies that answer the committee's questions.
3. The studies are quality appraised and presented to the committee.
4. The committee reads, discusses and understands the evidence.
5. When forming their recommendations, they consider:
   - the quality of the evidence
   - expert testimony
   - how they will be used in practice.

CA tools



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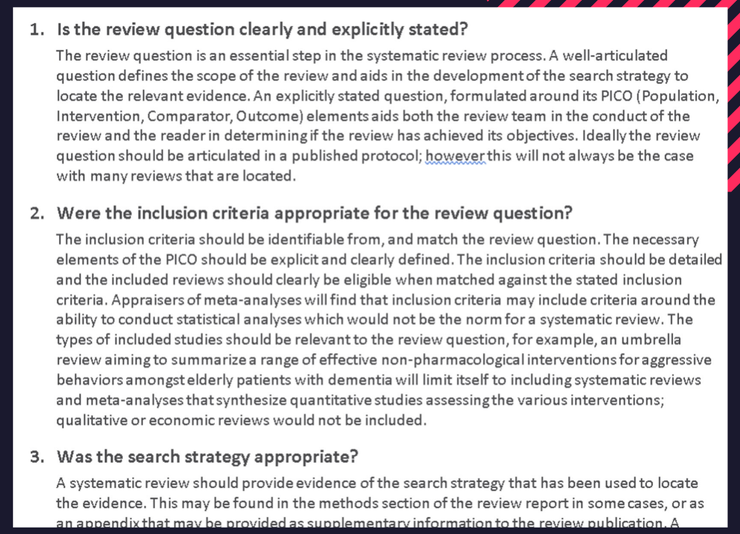
HOME / CRITICAL APPRAISAL TOOLS

CRITICAL APPRAISAL TOOLS

JBI's critical appraisal tools assist in assessing the trustworthiness, relevance and results of published papers.

CRITICAL APPRAISAL TOOLS DOWNLOADS	DOWNLOAD
Checklist for Analytical Cross Sectional Studies	PDF image
Checklist for Case Control Studies	PDF image
Checklist for Case Reports	PDF image



1. **Is the review question clearly and explicitly stated?**

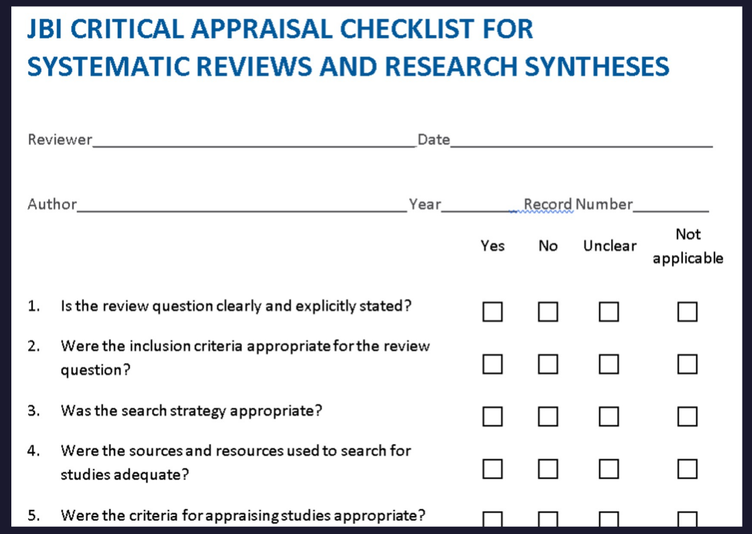
   The review question is an essential step in the systematic review process. A well-articulated question defines the scope of the review and aids in the development of the search strategy to locate the relevant evidence. An explicitly stated question, formulated around its PICO (Population, Intervention, Comparator, Outcome) elements aids both the review team in the conduct of the review and the reader in determining if the review has achieved its objectives. Ideally the review question should be articulated in a published protocol; however this will not always be the case with many reviews that are located.

2. **Were the inclusion criteria appropriate for the review question?**

   The inclusion criteria should be identifiable from, and match the review question. The necessary elements of the PICO should be explicit and clearly defined. The inclusion criteria should be detailed and the included reviews should clearly be eligible when matched against the stated inclusion criteria. Appraisers of meta-analyses will find that inclusion criteria may include criteria around the ability to conduct statistical analyses which would not be the norm for a systematic review. The types of included studies should be relevant to the review question, for example, an umbrella review aiming to summarize a range of effective non-pharmacological interventions for aggressive behaviors amongst elderly patients with dementia will limit itself to including systematic reviews and meta-analyses that synthesize quantitative studies assessing the various interventions; qualitative or economic reviews would not be included.

3. **Was the search strategy appropriate?**

   A systematic review should provide evidence of the search strategy that has been used to locate the evidence. This may be found in the methods section of the review report in some cases, or as an appendix that may be provided as supplementary information to the review publication. A



JBI CRITICAL APPRAISAL CHECKLIST FOR SYSTEMATIC REVIEWS AND RESEARCH SYNTHESES

Reviewer_____ Date_____

Author_____ Year_____ Record Number_____

	Yes	No	Unclear	Not applicable
1. Is the review question clearly and explicitly stated?	☐	☐	☐	☐
2. Were the inclusion criteria appropriate for the review question?	☐	☐	☐	☐
3. Was the search strategy appropriate?	☐	☐	☐	☐
4. Were the sources and resources used to search for studies adequate?	☐	☐	☐	☐
5. Were the criteria for appraising studies appropriate?	☐	☐	☐	☐

Historical events

Maturation

Experimental bias

Critical appraisal

External validity

Confounding

Internal validity

Recent Research

The fuel for progress

Recent Research

Case studies

RECOVERY

TARGIT-IORT

RECOVERY Study

RCT

- Investigating if several agents can reduce death from COVID-19.
- International study
- Combined with the study launching in an unprecedentedly rapid nine days

Clinicaltrials.gov RECOVERY

Findings

- dexamethasone, reduced deaths by up to a third from COVID-19
- Lopinavir-Ritonavir, Azithromycin, Colchicine are not associated with reductions in COVID-19 death
- Hydroxychloroquine did not have a lower incidence of death at 28 days than those who received usual care

TARGIT-IORT Study

RCT

- Single dose intraoperative radiotherapy + lumpectomy vs.
- postoperative whole breast external beam radiotherapy (EBRT)

Clinicaltrials.gov TARGIT-IORT

Findings

- 1140 patients were randomised
- For select eligible patients with early breast cancer, risk adapted immediate single dose TARGIT-IORT during lumpectomy was an effective alternative to EBRT

ResearchEazy

The Teaching Programme

Session
Introduction and Purpose of Research
TASK: Pre-course quiz (Hasaan to organise)
Study Designs
Study Designs
Writing a paper: Methods
Writing a paper: Results
Statistical methods
Statistical methods
Writing a paper: Discussion + Introduction
TASK: statistical methods
Critical appraisal
Critical appraisal
Critical appraisal
Writing a paper: Abstract
How to present research
Poster Mentoring session
TASK: Making a presentation
Poster Submission
Career in academic medicine and surgery
TASK: Post-course quiz

My research journey in Med School

Systematic review

- History of hip arthroscopy
- Virtual exams: has COVID 19 provided the impetus to change assessment methods in medicine?

Cohort study

- Immediate post-operative PDE5i therapy improves early erectile function outcomes after robot assisted radical prostatectomy (RARP)
- National evaluation of Confidence and Preparedness for Surgical Rotations in Medical Students and Foundation Year Doctors > poster presentation

Lab research

- Use of NMPs in mesodermal regenerations (intercalated year)

Good Clinical Practice

International standard

Participant rights, safety and well being in trials

Defines roles and responsibilities

Sign up on NIHR website!

Pre-Course Quiz

QUESMED Medical Protection | WESLEYAN we are all about you

PLEASE FILL OUT THE FEEDBACK FORM

PLEASE TUNE IN TO OUR REMAINING SESSIONS NEXT WEEK

@OSCEazyOfficial @osceazyofficial OSCEazy Osceazy@gmail.com

ResearchEazy

Study Designs I

Study Designs I

- Types of studies:
- Case reports
- *In vitro* studies
- Cross sectional studies
- Qualitative studies

Study Designs II

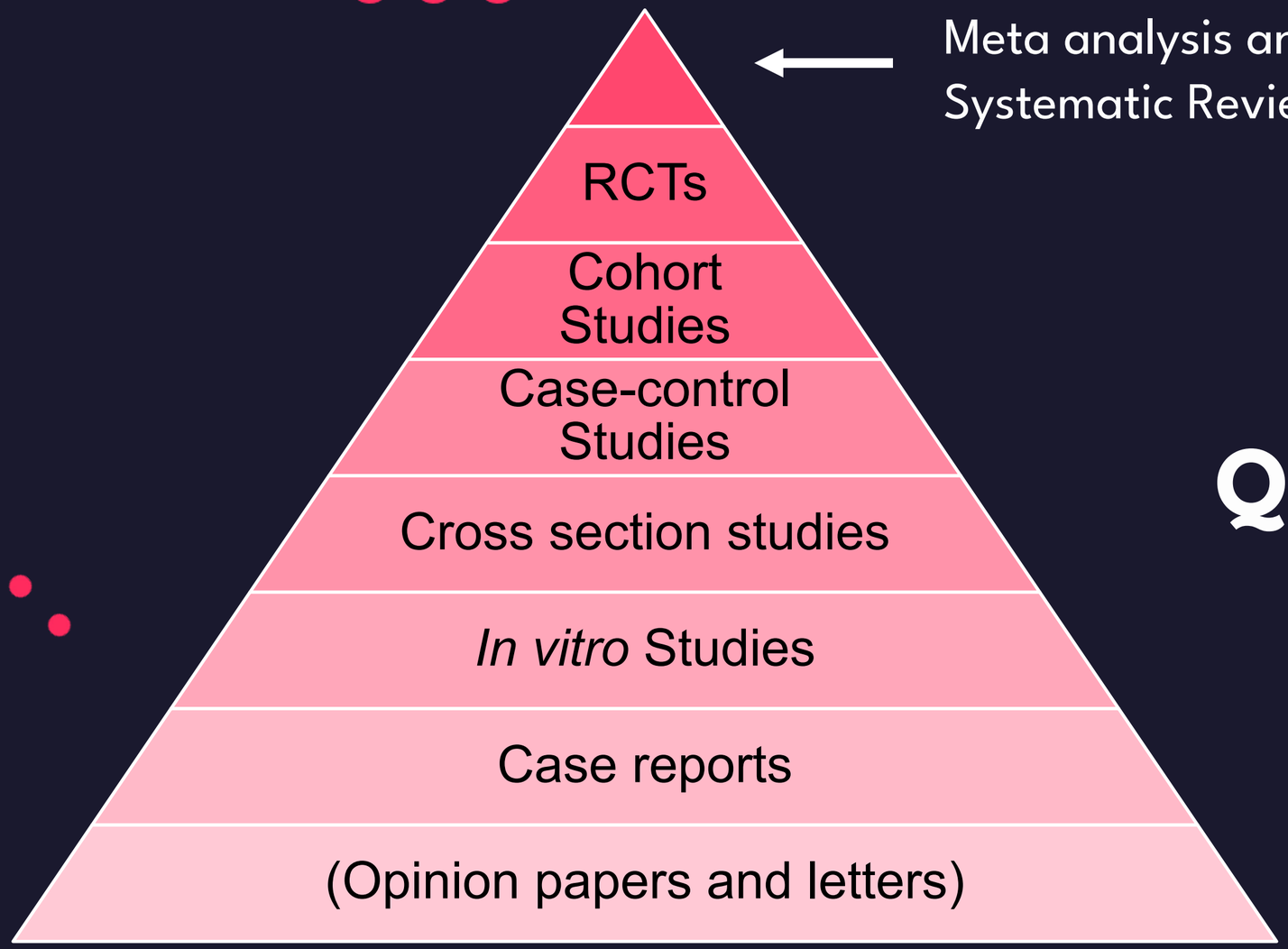
- Types of studies:
- Case Control and Cohort studies
- Randomised control trials
- Systematic reviews and meta-analysis

Presenters

Dr Hasaan Khan MBBS BSc (Hons)
FY1 SFP Doctor, Oxford

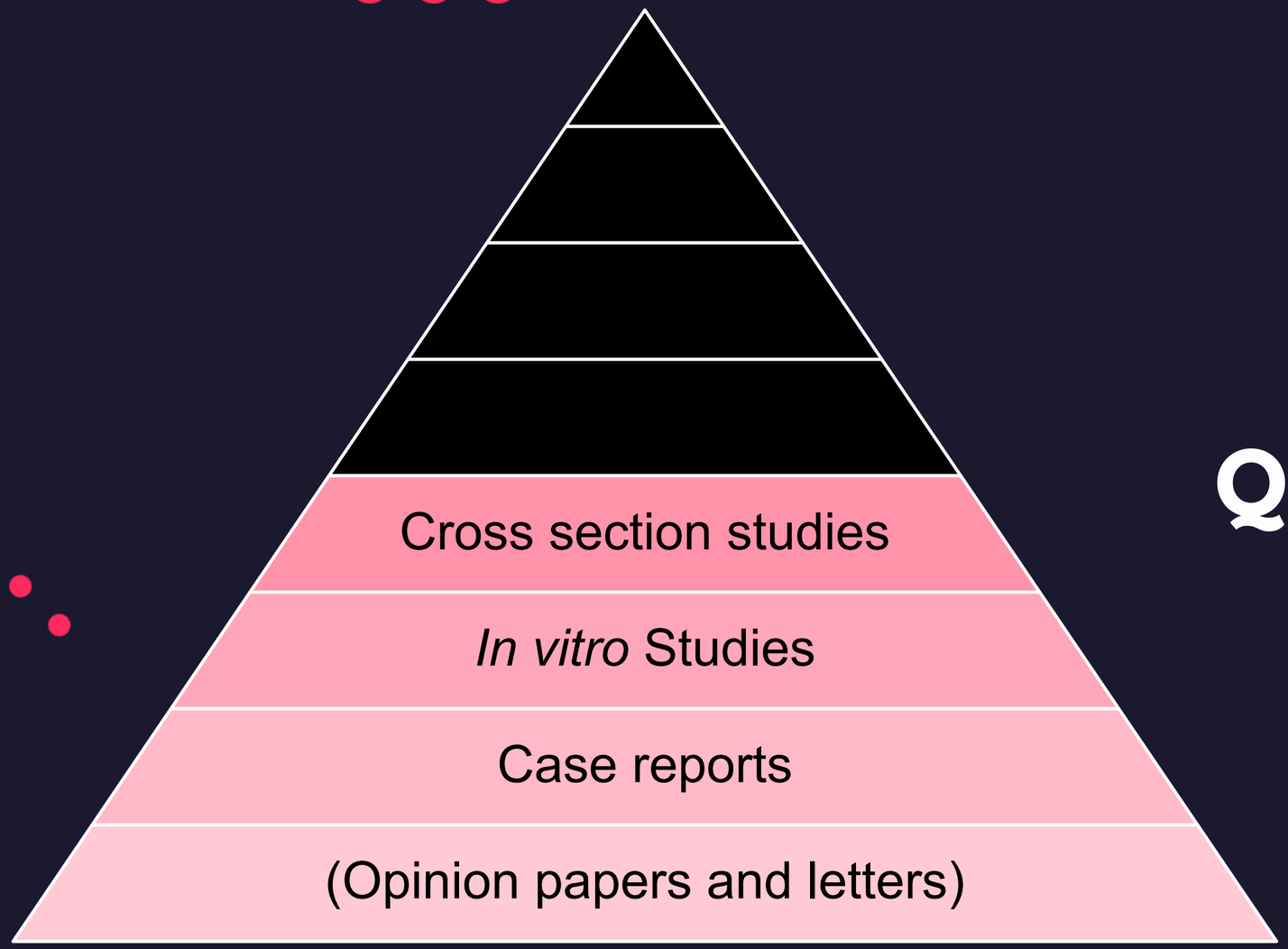
Types of Studies

Evidence Hierarchy



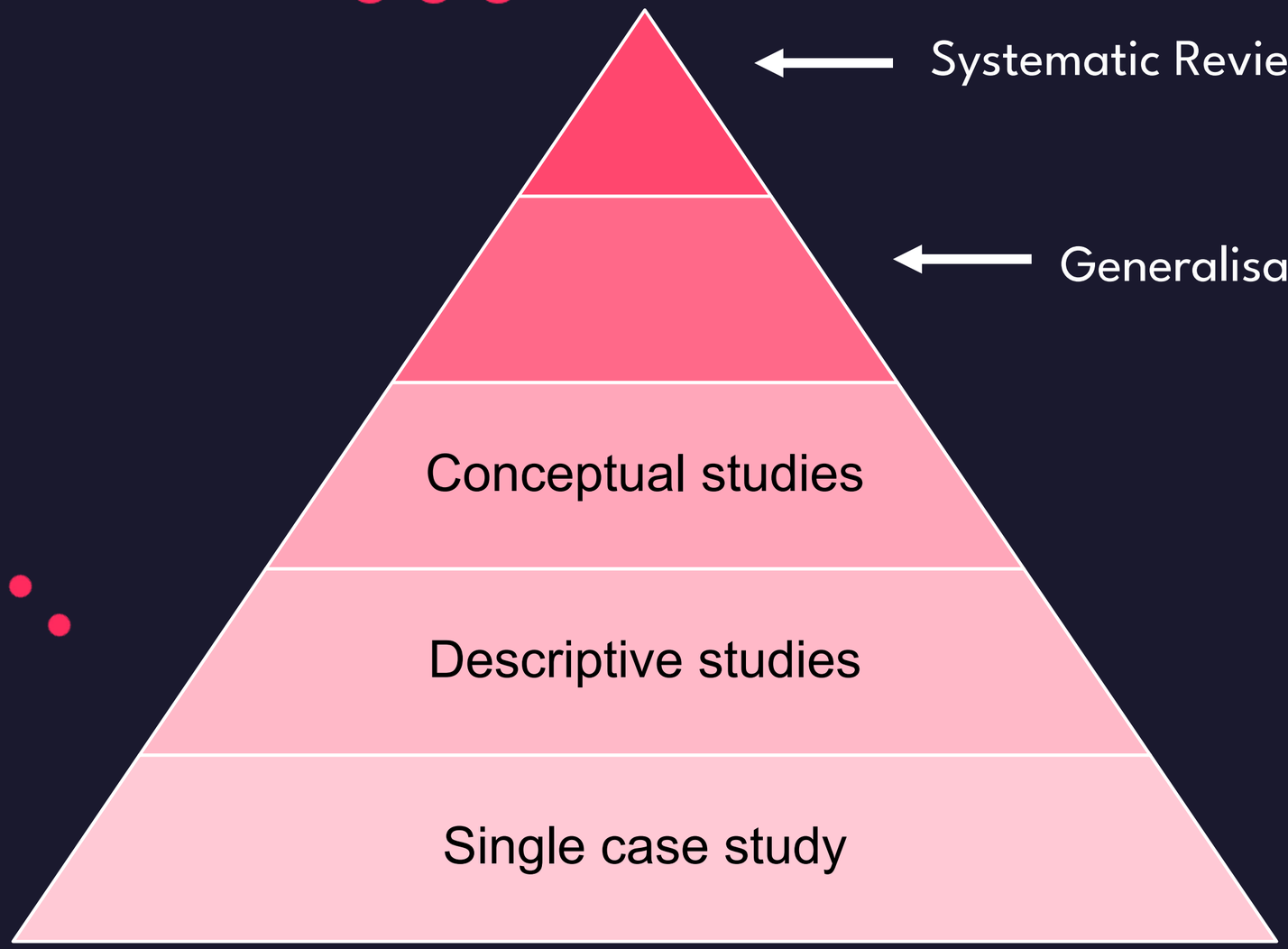
Quantitative

Evidence Hierarchy



Quantitative

Evidence Hierarchy



Qualitative

Opinion Papers and Letters

Opinion Papers

- Opinion from:

- Someone renowned and specialised in a field
- Clinicians sharing their experiences about a by a new phenomenon
- Medical students!

Example

- Ahmed H, Allaf M, Elghazaly H. COVID-19 and medical education. Lancet Infect Dis. 2020 Jul; 20(7): 777–778.

Opinion Papers

The coronavirus disease 2019 (COVID-19) outbreak has rapidly transitioned into a worldwide pandemic. This development has had serious implications for public institutions and raises particular questions for medical schools. Frequent rotations between departments and hospitals make medical students potential vectors for COVID-19. Equally, as trainee doctors we stand to learn a tremendous amount and can contribute to the care of patients. More immediate concerns among medical students centre on the impact of COVID-19 on medical education.

A substantial number of medical students are in the process of preparing for or undertaking assessments that require clinical exposure. The effect of COVID-19 on medical education could therefore be considerable. Several teaching hospitals in the UK have reported cases of COVID-19, with some hospitals suspending medical and observership students from attending clinical attachments. This suspension might extend to more hospitals as the COVID-19 pandemic continues to develop, which could lead to clinical medical students receiving reduced exposure in specific specialties, causing a detrimental effect to exam performance and competency as foundation year 1 doctors.

The situation is more complex for some final year medical students who are in the process of sitting their final assessments. Some medical schools have reduced clinical exposure in the weeks coming up to their final exams to reduce the risk of contracting the virus. Many electives could also be cancelled because of the global prevalence of COVID-19. This situation would not only cause financial losses for students, but also lead to a missed opportunity of working in a health-care system outside of the UK. At this stage, it is difficult to predict what will happen, and most medical schools are following advice from Public Health England to determine how to proceed.

Despite widespread panic and uncertainty, the medical community must ask itself what history has taught us about medical education during pandemics. To answer this question, we reflect on the effects of severe acute respiratory syndrome (SARS) on medical education in China at the turn of the century.[1] Some Chinese medical schools officially cancelled formal teaching on wards and their exams were delayed, hindering the education of medical students in the face of the newly emerging epidemic.[1] Similarly, in Canada, the impact of the SARS restrictions led to the cessation of clinical clerkships and electives for students for up to 6 weeks.[2] The Canadian national residency match felt the effect of these limitations, particularly because electives are one of the most crucial factors determining allocation.[1]

Despite the challenges posed by the SARS epidemic, several resourceful initiatives were implemented, leading to progress in medical education. In one Chinese medical school, online problem-based learning techniques were implemented to complete the curricula; these methods proved incredibly popular, to the extent that they were applied in subsequent years. These impressive feats illuminate how even in times of distress, solace can always be found. We are waiting to see what ingenuities for medical education will emerge in the face of the COVID-19 pandemic.

The topic and its importance

The effect is has had on practice

What literature shows others have done in similiar situations

Emerging ways forward

Letters

- Chance for readers to formally ask researchers more questions and highlight areas of their paper
- Can be an in-course assessment during BScs
- Initial authors will typically reply!
- Previously a quick method of scoring points for UKFPO applications

- Example

- Khan H, Rai A, Irukulla M, Wallace WJ. The Effect of Surgical Video on Resident Performance of Carpal Tunnel Release: A Cadaveric Simulation-Based, Prospective, Randomized, Blinded Pilot Study. Plast Reconstr Surg. 2021 Aug 1;148(2):310e

Letters

Sir:

We have read with great interest the work by Andrew Yee et al. investigating the effect of surgical videos on trainee performance of a cadaveric open carpal tunnel release.[1] Due to the reduction in resident duty hours and concerns over patient safety, innovating studies on how surgical education can be delivered are necessary.

Their study evaluated 22 surgical residents with varied levels of training who were randomly assigned either watching a video, with written instructions on how to conduct an open carpal tunnel release, or written instructions alone. A preintervention skin lesion excision was initially performed to gauge baseline surgical technique. After the intervention, resident performance was judged by three independent hand surgeons. It was identified that junior residents in the video group had significantly fewer operating errors compared with junior students who were provided with only written instructions. This work reinforces Fleming's Visual, Aural, Read/write, and Kinesthetic (or VARK) model, which is widely accepted to illustrate the core learning modalities.[2] In particular, the present study demonstrates how the use of multimodal approaches to learning (with videos being both visual and auditory) is superior to a single-modality approach, such as written instructions.

We commend the authors for exploring the benefit educational videos can have in plastic surgical training. However, we would like to recommend an addition to their current methodology that we hope will facilitate their future work. The authors describe their rationale behind selecting open carpal tunnel release as the procedure of choice. Nevertheless, there were no significant improvements among senior trainees and the majority of junior trainees failed. The authors commented therefore on how the procedure may not have been as appropriate to allow them to truly evaluate the benefits of surgical videos.

We believe future study participants and wider trainees at the institution could be given reflective forms with which they can rank procedures on their perceived difficulty as well as note techniques they find particularly challenging. Gray and Coombs[3] discuss the benefit of reflection into clinical practice for trainees and create a framework that trainees can use which encourages deeper reflection. This would enable the authors to identify key areas to focus on and whether a more suitable procedure is required when creating the initial video. As a result, the video material produced will directly address the concerns of trainees and create a more refined mental visualization of the procedure and relevant anatomy. As medical students actively engaged in peer-to-peer teaching, we have found doing so to be particularly beneficial in creating educational videos covering basic clinical skills, such as venipuncture and suturing.

Reflection has been reported to be valued by students and trainees and is encouraged to be incorporated into the surgical curriculum.[4] Its benefits may extend beyond direct clinical practice and can assist in the tailored creation of educational material. We hope the authors consider the point we raised, and we look forward to reading their future work.

- Variation in structure!
- Summary of the paper and it's results
- Your "take" on the findings and what it means in light of the literature you are exploring
- Critical appraisal
- Questions and recommendations
- Polite thanks to authors

Case reports

Case report

- Detailed report of the symptoms, signs, diagnosis, treatment, and follow-up of an individual patient
- For multiple patients: case series
- unusual or novel occurrence: generating new ideas for research!
- (Also read for fun)

- Unusual observations
- Adverse response to therapies
- Unusual combination of conditions leading to confusion
- Illustration of a new theory/technique
- Question regarding a current theory
- Personal impact.

Case report

Tomoda Y, Miyajima T, Nagasawa C, Awaya Y. Clopidogrel-induced pneumonia. 2021

Prattico F, Mugnai G, Pavan M, Trecco G, Perfetti P, Rocca G. Worsening Dyspnea in a Man with 2 Hearts. Annals of emergency medicine. 2012

- Variations in format:
- Abstract: summary of case, problem addressed and message
- Introduction: overview of problem
- Case: details of patient, history, examination, tests and investigations. Outcome
- Discussion: novelty of case, summary of literature (relavant to challenge in case). How evidence adds value to future clinical practice.
- Conclusion

In vivo studies

In vitro studies

“test-tube” studies – outside of their normal biological context

Massive variation in study design

Major advances in recent times on cell lines

- Assay types by effect observed on:
- - Cellular receptors
- - Ion channel activity (example, QT interval assays)
- - Enzyme activity
- - Genes and Nucleic acids

- Assay type by experimental systems:
- - Isolated tissue
- - Isolated cells

Example:

Viktoria Z, Stefanie D, Rosa B, Cornelia L, Wolfried P, Doris W. ColdZyme® protects airway epithelia from infection with BA.4/5. Respir Res. 2022; 23: 300.

Cross-sectional studies

Cross-sectional studies

Assess the prevalence of disease, attitudes, and knowledge among patients and health personnel. Useful tool in teaching

Aim to provide estimates of prevalence in the entire population under study

Fast and inexpensive

Difficult to establish causal relationships

- Example

- Clement ND, Wickramsinghe NR, Bayram JM, Hughes K, Oag E, Heinz N, et al. Significant deterioration in quality of life and increased frailty in patients waiting more than six months for total hip or knee arthroplasty : a cross-sectional multicentre study. Bone Joint J. 2022 Nov; 104-B(11):1215-1224.

NOTE: Patient involvement are becoming increasingly common in all parts of the research process

Qualitative research

Qualitative Research

Hypothesis generating instead of hypothesis testing

Deeper insights into real-world problems. Gathers participants' experiences, perceptions, and behavior

open-ended questions

- Example

- Lawson-Michod KA, Watt ML, Grieshober L, Green SE, Karabegovic L, Derzon S, et al. Pathways to ovarian cancer diagnosis: a qualitative study. BMC Womens Health
- . 2022 Nov 4;22(1):430

Mixed-model studies

Qualitative Research

Explain processes and patterns of human behavior that can be difficult to quantify

Lots of different approaches:

- Ethnography
- Grounded Theory
- Phenomenology
- Narrative research

Thematic analysis

- Example

- Lawson-Michod KA, Watt ML, Grieshober L, Green SE, Karabegovic L, Derzon S, et al. Pathways to ovarian cancer diagnosis: a qualitative study. BMC Womens Health
- . 2022 Nov 4;22(1):430

QUESMED

Medical Protection

MDU

PLEASE FILL OUT THE FEEDBACK FORM

PLEASE TUNE IN TO THE NEXT SESSION ABOUT STUDY DESIGNS ON 06/11

@OSCEazyOfficial

@osceazyofficial

OSCEazy

Osceazy@gmail.com

ResearchEazy

Study Designs II

Study Designs II

- Types of studies:
- Case Control and Cohort studies
- Randomised control trials
- Systematic reviews and meta-analysis

Presenters

Dr Hasaan Khan MBBS BSc (Hons)
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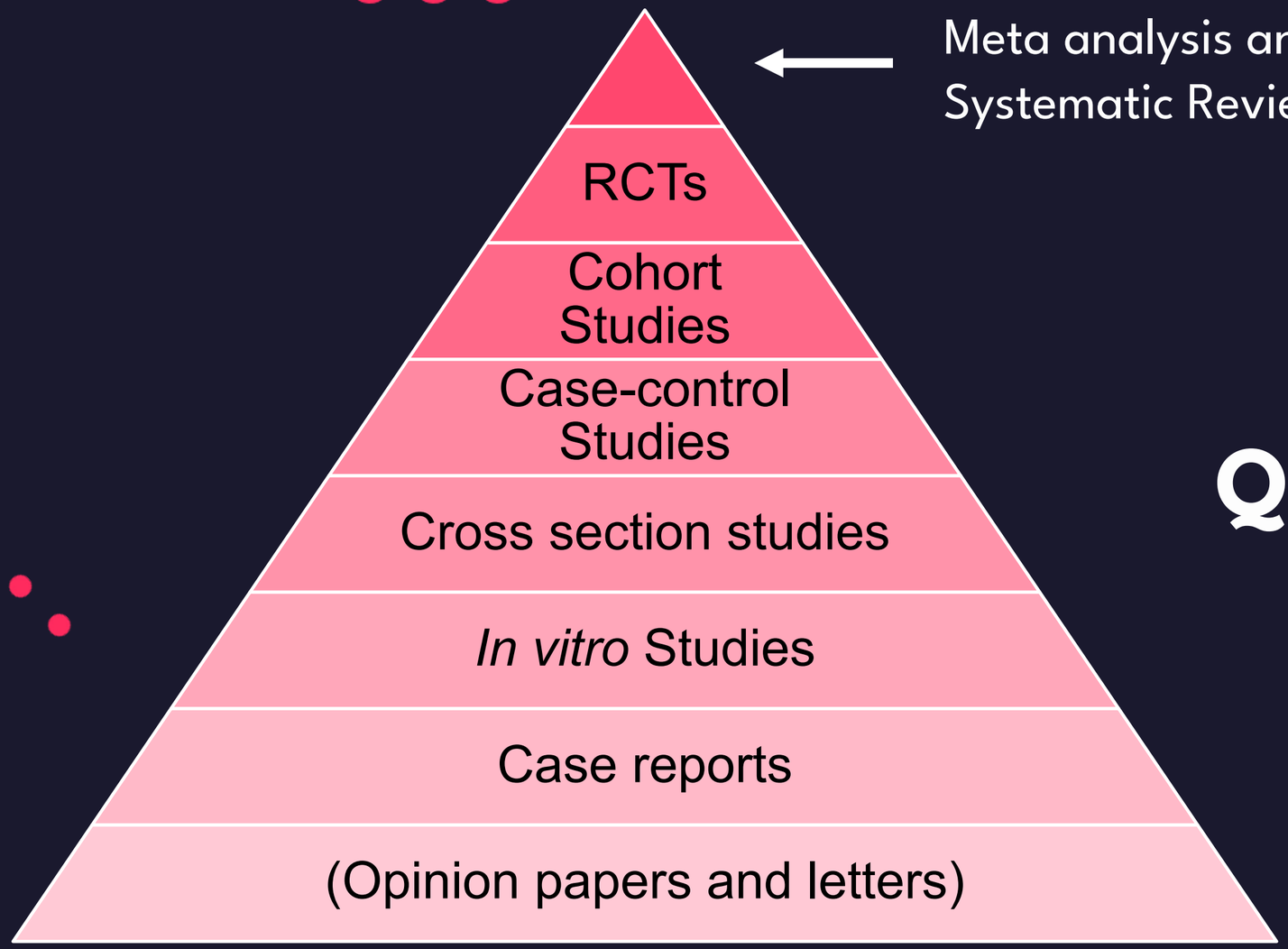
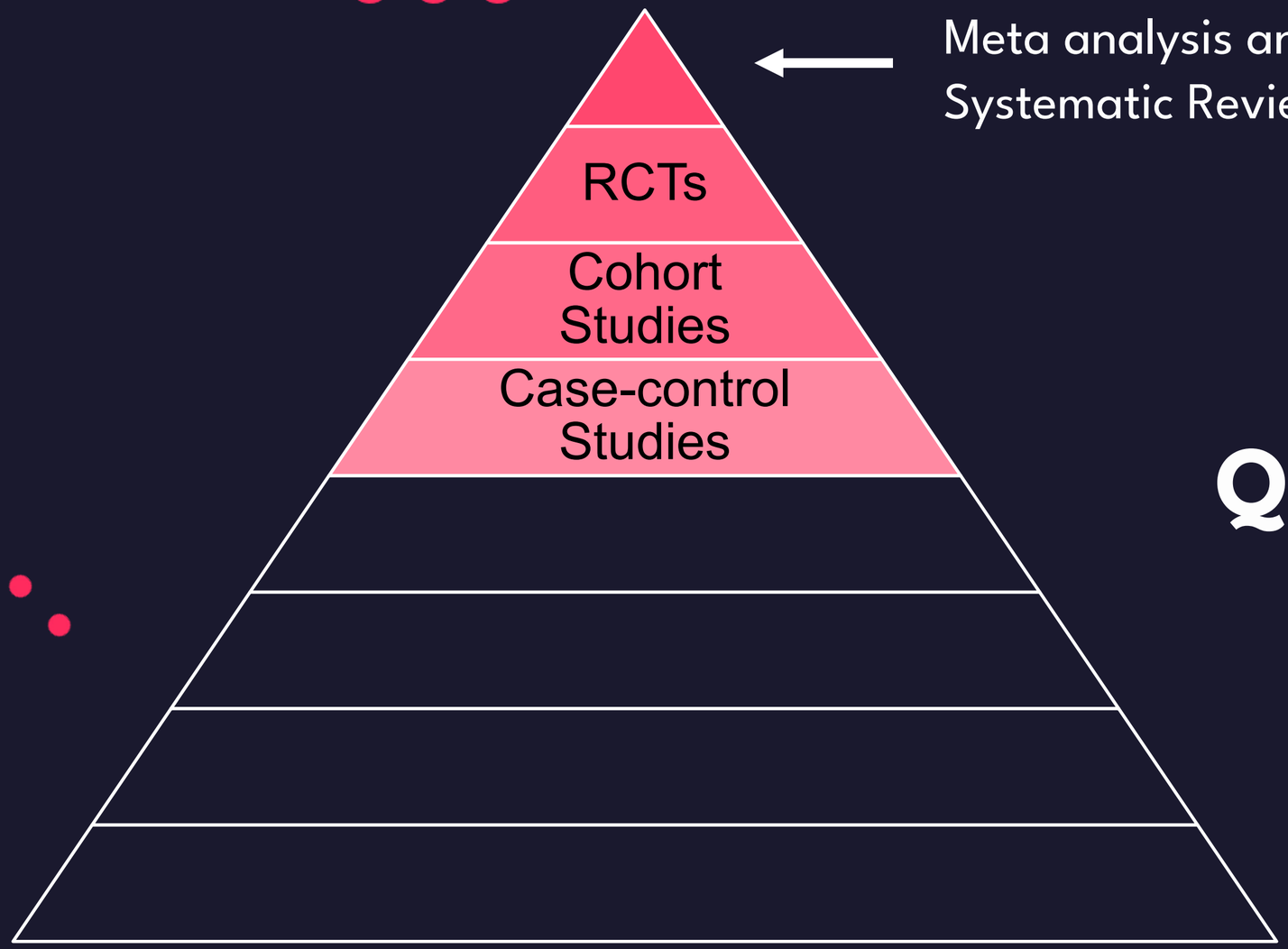
Types of Studies

Evidence Hierarchy



Quantitative

Evidence Hierarchy



Quantitative

Case Control Studies

Case Control Studies

- Majority are retrospective* = looking backwards
- Assess if there is a significant difference in the rate of exposure to a risk factor between a group with a outcome of interest and those without

Example

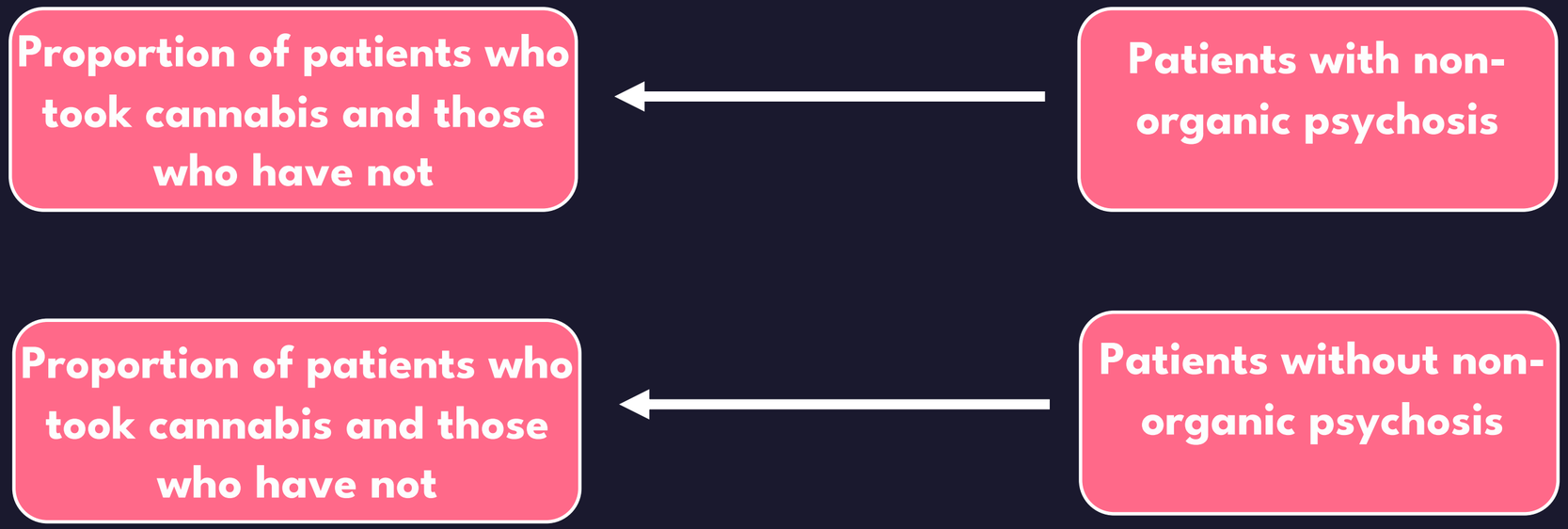
- Al-Obeidi A. Update study on the risk factors of the first simple febrile seizure in children of Mosul, Iraq. *Journal of Pediatric and Neonatal Individualized* Medicine2022;11(2): e110205

- Past
- Present
- Future

Proportion with exposure	With outcome
Proportion with exposure	Without outcome

Case Control Studies (Majority)

- Past
- Present
- Future



Case Control Studies

- outcome is measured before exposure
- controls are selected on the basis of not having the outcome
- good for rare outcomes and conditions that take a long period to develop
- Requires matching

- relatively inexpensive
- smaller numbers required
- quicker to complete
- prone to selection bias
- prone to recall/retrospective bias
- Ineffective for rare exposures

Cohort Studies

Cohort Studies

- Majority are prospective* = going forwards
- Groups are selected on basis of exposure followed over time
- They can be used to determine the prognosis of a disease

Example

- Cho, Hk., Han, J.C., Choi, J.A. et al. Association between atrial fibrillation and the risk of glaucoma development: a 12-year Nationwide cohort study. Eye (2022)

- Past
- Present
- Future

Proportion with exposure

With outcome

Proportion without exposure

With outcome

Cohort Studies (Majority)

- Past
- Present
- Future

Patients who have Atrial fibrillation → Proportion of patients who get glaucoma

Patients who do not have atrial fibrilation → Proportion of patients who get glaucoma

Cohort studies

- outcome is measured after exposure
- yields true incidence rates and relative risks
- may uncover unanticipated associations with outcome

- best for common outcomes
- expensive
- requires large numbers
- takes a long time to complete
- prone to attrition bias (dropouts)

Disclaimer

- Some case-control studies can be prospective (looking at the future)
- Some cohort studies can be retrospective

- Easy way to remember it: if the sample is recruited based on the outcome of interest it is likely a case-control study

- At the start of the study, all cases might have already occurred and then this would be a retrospective case-control study.

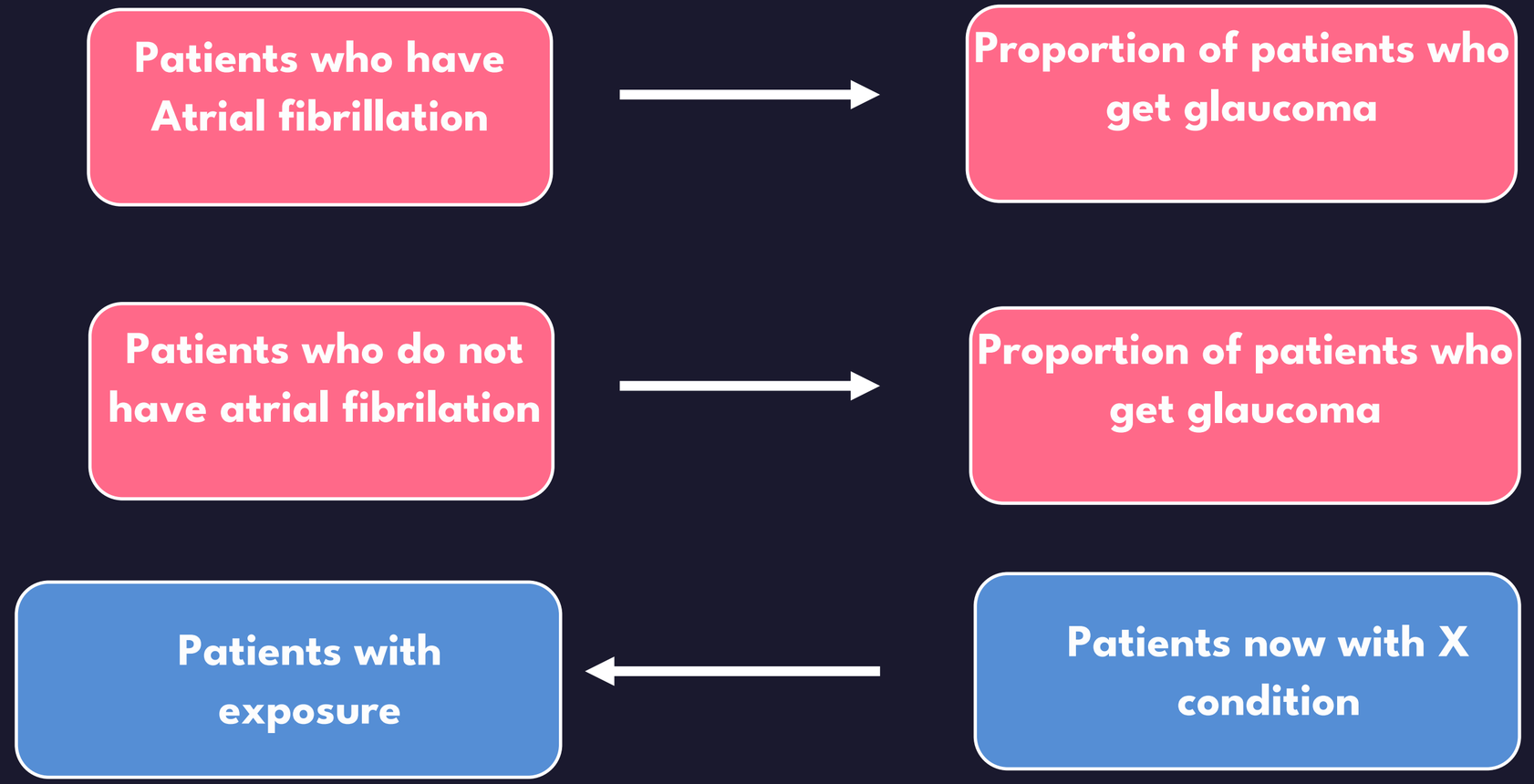
- Alternatively, none of the cases might have already occurred, and new cases will be enrolled prospectively: “Nested case-control”

“Nested Case Control” in Cohort Study

- Past
- Present
- Future

- Possible because of the amount of data collected from cohort study

- Maximizing analysis from data



Disclaimer

- Prospective cohort studies. People are recruited into cohort studies regardless of their exposure or outcome status.

- In retrospective cohort studies, the exposure and outcomes have already happened. They are usually conducted on data that already exists (Patient records)

Prospective cohort study

- Past
- Present
- Future

Proportion with exposure

With outcome

Proportion without exposure

With outcome

Retrospective cohort

- Past
- Present

Proportion with exposure

With outcome

Proportion without exposure

With outcome

- Data is already there

Case-control

- **Typically retrospective**
- **Sample recruited based on disease/outcome and investigated for exposure**

Cohort

- **Typically prospective**
- **Sample recruited based on exposure and investigated for outcome**

Case-control

- Can study rare diseases
- Can study diseases with long latency between exposure and manifestation
- Relatively inexpensive
- Can study multiple potential causes of disease

Cohort

- Temporal relationship
- Investigate multiple outcomes related to specific exposure
- Calculate incidence rate
- Methodology easily understood

Case-control

- Subject to recall bias
- Incomplete control of extraneous variables
- matching with appropriate control group difficult
- Harder to understand methodology for non-epidemiologists

Cohort

- Can’t study rare diseases because a large number of subjects is required
- Not suited when time between exposure and disease manifestation is very long*
- Difficulty in maintaining follow up (expensive)

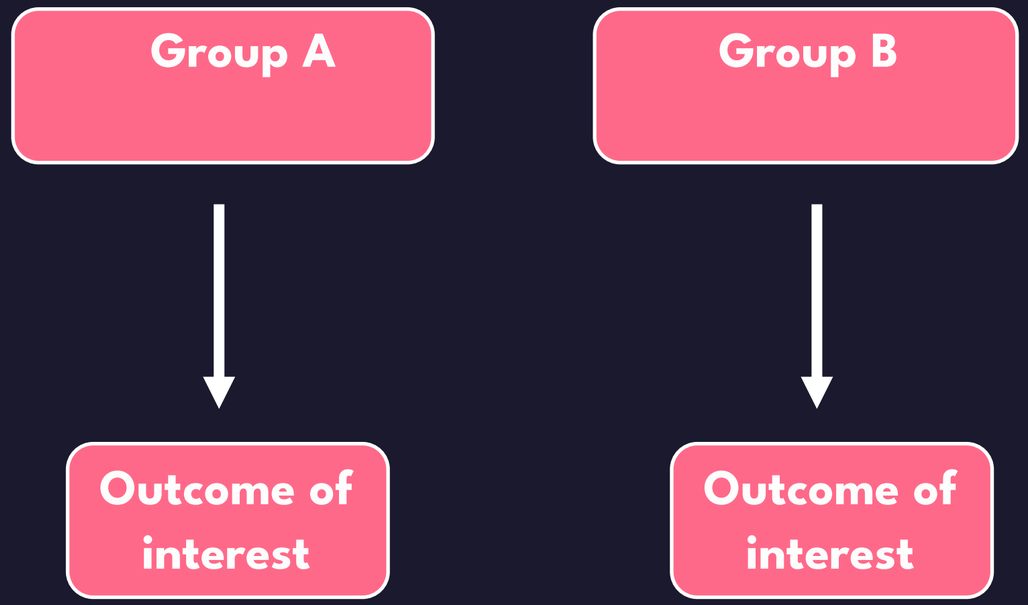
Randomised Control Trials

RCTs

- Gold standard design for studying treatment effects
- An experimental study where subjects are randomly allocated into two groups.
- Typically this can be a treatment against a placebo or a gold standard/current practice

Example

- Mehanna H, McConkey CC, Rahman JK, Wong WL, Smith AF, Nutting C. PET-NECK. Health Technology Assessment. 2017



RCTs – when not to do

- Unnecessary
- Impractical
- Inappropriate

Unnecessary

- Successful intervention for otherwise fatal condition is discovered
- Previous RCT or meta-analysis has given a definitive result

RCTs – when not to do

- Unnecessary
- Impractical
- Inappropriate

Impractical

- Where it would be unethical to seek consent to randomise.
- Where the number of participants needed to demonstrate a significant difference between the groups is prohibitively high.

RCTs – when not to do

- Unnecessary
- Impractical
- Inappropriate

Inappropriate

- Where the study is looking at the prognosis of a disease.
- Where the study is looking at the validity of a diagnostic or screening test.
- Where the study is looking at a ‘quality of care’ issue in which the criteria for ‘success’ have not yet been established.

PROBE

- Prospective randomised open labelled end points, blind whoever is assessing the outcomes, reduces detection bias.
- More feasible and cheaper but performance bias
- THESE ARE NOT RCTs, done more in surgery research

Systematic Reviews

Systematic Reviews

- A protocol-driven literature review that integrates and critically analyses all published findings on a specific research question.

- PRISMA: evidence-based minimum set of items for reporting in systematic reviews and meta-analyses

Meta analysis

- This is the statistical analysis of the results of several trials which are combined in order to:
- - Minimise bias
- - reach a more accurate ‘true’ population effect
- - increase the statistical power of the evidence.

- It is usually a part of systematic reviews.

- These studies may still be subject to publication bias due to the differences between trials leading to some being excluded and the possibility of work that is unpublished due to negative results.

Systematic Reviews

Example

Huang L, Yin Y, Liao Y, Liu J, Zhu K, Yuan X. Risk factors for postoperative urinary retention in patients undergoing colorectal surgery: a systematic review and meta-analysis. Int J Colorectal Dis. 2022

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Study Designs II

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MDU

PLEASE FILL OUT THE FEEDBACK FORM

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Writing a Paper: Methods

Presenter

Dr Amar Rai MBBS BSc (Hons)
FY1 SFP Doctor, Imperial Healthcare Trust

What is methodology?

“Methodology discusses and explains the data collection and analysis methods of your research.

Simplified: Explain what you did and how you did it?

What should it include?

- The TYPE of research conducted
- How you COLLECTED and ANALYSED your data
- TOOLS or MATERIALS used

Critical Appraisal key

BEST PLACE TO EVALUATE RELIABILITY AND VALIDITY OF RESEARCH

RELIABILITY: Consistency of a measure
VALIDITY: Accuracy of a measure

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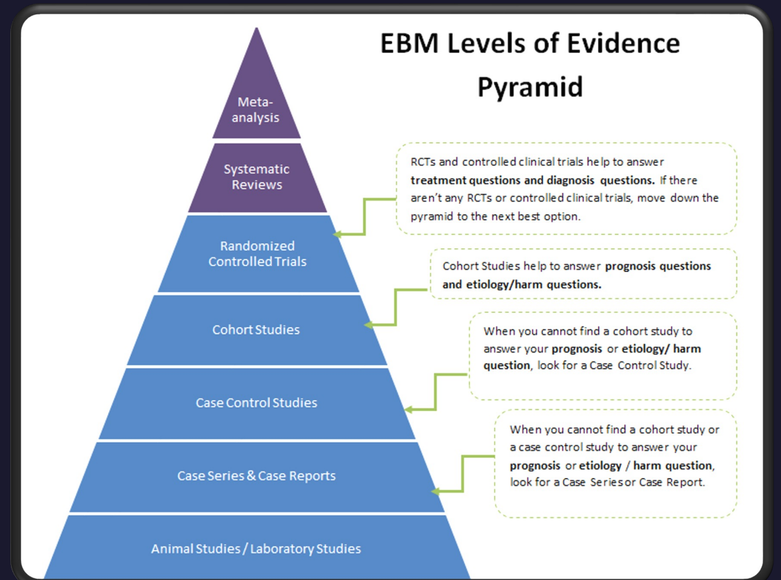
Cross-sectional study



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Evaluating the utility of an international webinar as a platform to educate students and doctors on the UK core surgical training portfolio

Siddarth Raj[1,2†], Harroop Bola[3*†], Amar Rai[3], Sarika Grover[1,2], Anisha Bandyopadhyay[1,2] and Vinci Naruka[4]

STROBE Checklists

- STROBE Checklist:
  cohort, case-control, and cross-sectional studies (combined)
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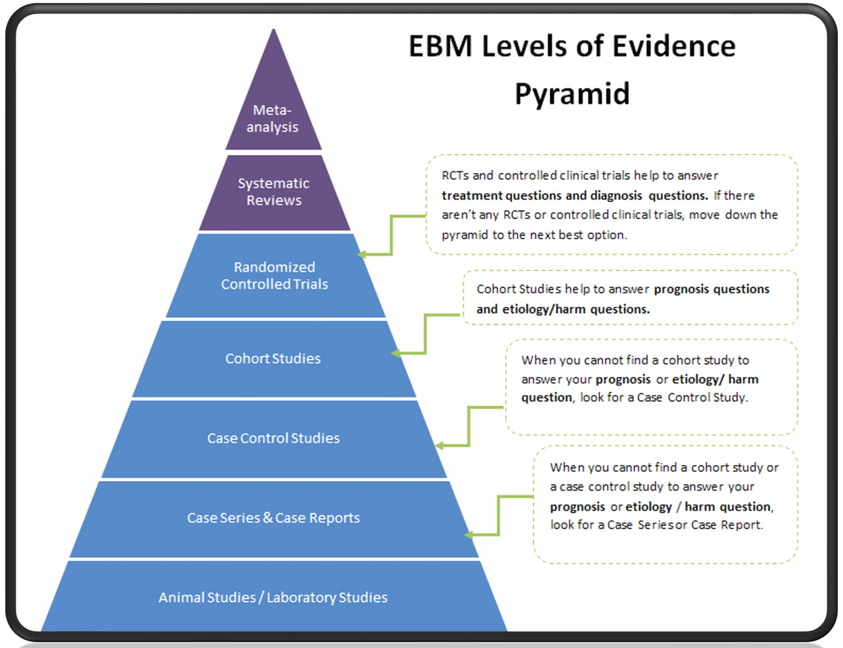

Methods		
Study design	4	Present key elements of study design early in the paper
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection
Participants	6	(*a*) *Cohort study*—Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up *Case-control study*—Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls *Cross-sectional study*—Give the eligibility criteria, and the sources and methods of selection of participants
		(*b*) *Cohort study*—For matched studies, give matching criteria and number of exposed and unexposed *Case-control study*—For matched studies, give matching criteria and the number of controls per case
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group
Bias	9	Describe any efforts to address potential sources of bias
Study size	10	Explain how the study size was arrived at
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding
		(*b*) Describe any methods used to examine subgroups and interactions
		(*c*) Explain how missing data were addressed
		(*d*) *Cohort study*—If applicable, explain how loss to follow-up was addressed *Case-control study*—If applicable, explain how matching of cases and controls was addressed *Cross-sectional study*—If applicable, describe analytical methods taking account of sampling strategy
		(*e*) Describe any sensitivity analyses

Continued on next page

Methods

This study was reported in line with the STROBE guidelines, which includes a checklist for cross-sectional studies [11].

Webinar

A single 90-min free digital webinar session was organised in March 2021. The webinar was designed to educate attendees regarding the CST portfolio and application process. The webinar was designed and delivered by a cardiothoracic surgical trainee in the UK who had prior experience in applying for CST, preparing a CST portfolio, as well as delivering other national webinars. The speaker discussed his own pathway to becoming a surgical trainee, as well as provided an approximate timeline for the application process and provided information on the average number of annually accepted applicants in each deanery of the UK. Most of the webinar then focussed on each domain of the CST application. The speaker offered advice and utilised real-world examples to demonstrate how to score maximum points in each domain. Finally, the speaker offered tips and advice on networking and mentorship. The webinar was conducted over Zoom®(Zoom Video Communications, USA), a video teleconferencing software that is the most frequently used in medical education [12].

The webinar was open to anyone including pre-medical and current medical students as well as foundation doctors and core trainees. In total, there were 257 attendees at the webinar. Participants voluntarily signed up for this event via an online application form that was advertised through social media platforms, there was no limit on the number of attendees.

Feedback

A pre-event questionnaire was distributed to attendees to respond to prior to the event (Additional file 1). This questionnaire included demographic questions on sex, medical school, country of origin and stage of medical training. A 10-point Likert scale was used for statements pertaining to participants' interest in surgery, self-rated awareness of the CST portfolio and each of its domains, and the extent to which their university has provided them with adequate information on how to pursue a career in surgery. "Strongly disagree" was assigned a score of zero and "strongly agree" was assigned a score of 10. This scale was utilised as it effectively enables qualitative information to be quantified for comparison and further statistical analysis.

The post-event questionnaire included 12 of the same questions from the pre-event questionnaire along with feedback on the presenter's knowledge and ability to communicate (Additional file 2). This questionnaire also included questions on how useful participants found the session, which was also scored using a 10-point Likert scale. Participants were also a handful of questions that focused on comparisons between webinars and in-person events to establish their preferences (Additional file 2). The post-event questionnaire was not piloted before being distributed.

Both pre- and post-webinar questionnaires were hosted on Google Forms (Google, USA) and were anonymised after pre- and post-event responses were paired using Google Sheets (Google, USA). Only participants that filled out both the pre- and post-event questionnaires were eligible for inclusion in this study.

Statistical methods

The Shapiro–Wilk test was used to assess whether the data was normally distributed. As the data displayed a nonparametric distribution, a Mann–Whitney U test was used to evaluate whether there was a significant difference between pre- and post-event statements. The statistical analysis was performed using GraphPad Prism 9.0.0 (GraphPad Software, La Jolla California, USA). Thereafter, Cohen's d effect size was calculated to report the standardised difference between the pre- and post-event Likert scores.

Patient and public involvement

No patients were included in this cross-sectional study. All participants in this study provided informed consent for their data to be used anonymously for both research and educational purposes. Participants had the opportunity to opt out of completing either questionnaire at any point. The data collected from both pre- and post-event questionnaires were anonymised prior to data analysis and were stored in password-protected files to comply with General Data Protection Regulation (GDPR).

Methods

Study population

Surveys were administered to community and university-affiliated women 18 years and older on the Emory University campus and in surrounding areas in Atlanta, Georgia, between May 30, 2007, and December 4, 2007. Recruitment locations included dining facilities, common areas, workout facilities, recreational centers, and sorority meeting locations. We recruited in person and asked women 18 years and older to complete a brief tanning survey. We had a raffle for a $50 gift card that anyone could enter, regardless of whether they chose to participate in the study. The only exclusion criteria were male sex, age younger than 18 years, and inability to read the survey. The study was approved by the institutional review board at Emory University, and written informed consent was obtained from all the participants.

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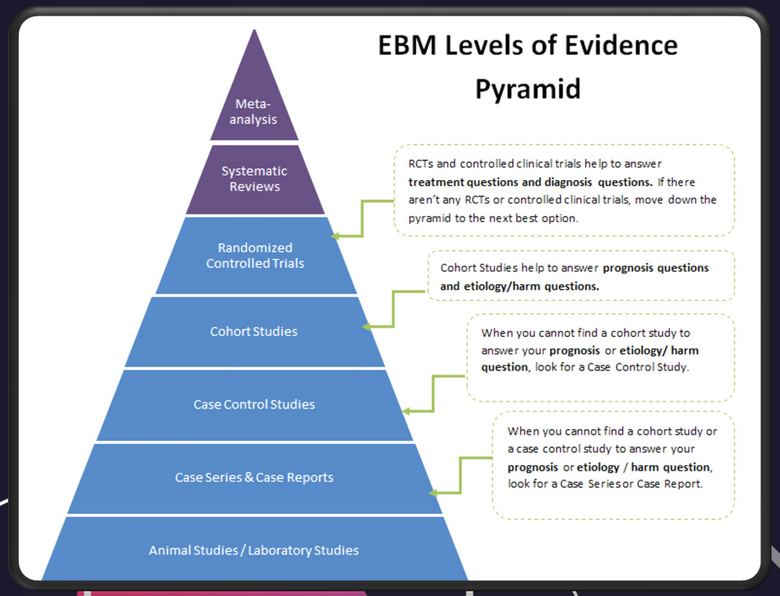
RCT



THE LANCET
Diabetes & Endocrinology

ARTICLES | VOLUME 10, ISSUE 2, P120-128, FEBRUARY 01, 2022

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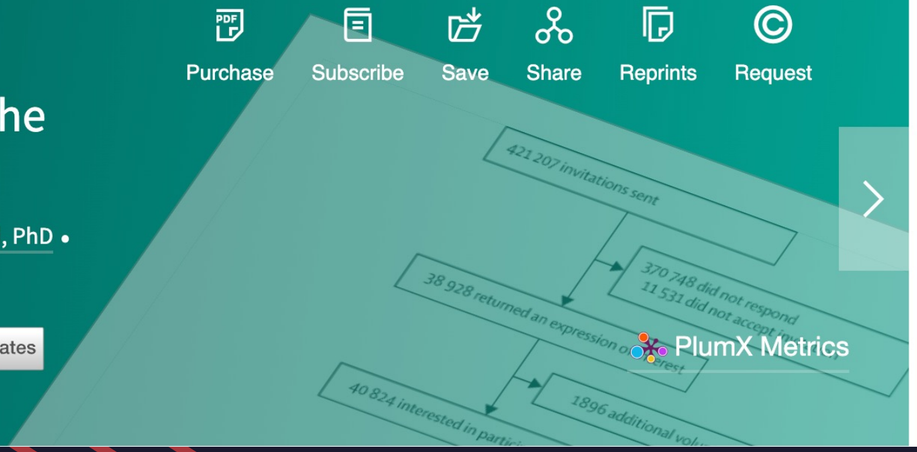
The D-Health Trial: a randomised controlled trial of the effect of vitamin D on mortality

Prof Rachel E Neale, PhD • Catherine Baxter, BA • Briony Duarte Romero, BA • Donald S A McLeod, PhD • Prof Dallas R English, PhD • Prof Bruce K Armstrong, D Phil • et al. Show all authors

Published: January 10, 2022 • DOI: https://doi.org/10.1016/S2213-8587(21)00345-4 • Check for updates



Methods

Study design and participants

The D-Health Trial is a randomised, double-blind, placebo-controlled trial of 5 years of oral supplementation with 60 000 international units (IU) of vitamin D_3 per month in Australians aged 60–84 years. Participants were recruited from across Australia and we used the Commonwealth electoral roll as the sampling frame (enrolment to the electoral roll is compulsory in Australia) using mailed invitations; we also allowed people to volunteer for recruitment. Eligibility criteria were people aged 60–84 years (people selected from the electoral roll were eligible if aged 60–79 years and volunteer participants were eligible if they were aged 60–84 years), who were not taking more than 500 IU of supplemental vitamin D per day and had no self-reported history of kidney stones, hypercalcaemia, hyperparathyroidism, osteomalacia, or sarcoidosis. All participants gave written or online informed consent. The trial was approved by the QIMR Berghofer Medical Research Institute Human Research Ethics Committee and was monitored by an external data and safety monitoring board. The methods[10] and a summary of the statistical analysis plan [11] have been published previously; the detailed statistical analysis plan (version 1.0, March 17, 2021) is available online.

Randomisation and masking

We randomised all participants in a 1:1 ratio to receive either oral vitamin D gel capsules or matching placebo gel capsules. We used automated computer-generated permuted block randomisation stratified by sex, age (in 5-year age groups), and state of residence. The sequence was generated by an external statistician and was concealed within the database. Participants, staff, and investigators were blinded to study group allocation during the intervention. After all participants had completed the intervention, they were notified of their study group allocation, following processes to ensure that this did not result in investigators or staff becoming unblinded (ie, notification letters were prepared by a member of staff not associated with the study team, and the group allocation was removed from the study database and provided to a statistician not involved with the study). Statistical code was prepared using a dataset that did not contain the randomisation group or participant identification code variables. When the code was complete and verified, the external statistician provided a dataset containing coded group allocation. Any analyses done thereafter have been declared as exploratory. After all analyses were complete, staff and investigators were unblinded.

Procedures

All eligible participants received twelve study capsules per year of either vitamin D (60 000 IU per capsule; Lipa Pharmaceuticals, Sydney, Australia) or placebo with their mailed annual surveys for 5 years, and were instructed to take one capsule per month. We sent monthly reminders (by text, email, or landline message), reminding participants to take a capsule.

Study medication ended for each participant 5 years after randomisation (the intervention period), or on Feb 1, 2020, for the participants randomised after February, 2015. We encouraged participants to minimise the use of vitamin D supplement use outside of the trial, but allowed participants to remain in the trial provided they did not take more than 2000 IU per day, as their continued participation enabled us to capture their supplement use and participant-reported outcome information. Participants who reported taking more than 2000 IU of vitamin D per day outside of the trial were withdrawn.

Participants completed baseline questionnaires about sociodemographic and lifestyle factors, pre-existing health conditions, and intake of foods and supplements containing vitamin D. We sent follow-up questionnaires annually for 5 years, including to participants who had ceased study medication, to collect information on adherence, use of vitamin D supplements, and health outcomes. While they were on the trial, participants were asked to contact the trial helpline if they had any health events, which we coded using the Medical Dictionary for Regulatory Activities. We also captured diagnoses of hypercalcaemia, hyperparathyroidism, and kidney stones using annual surveys.

The D-Health Trial was designed to test the hypothesis that supplementing an unscreened elderly population would deliver benefits for mortality and other health benefits. Therefore, blood samples were not collected at baseline. We collected samples, beginning 1 year after recruitment started, from a subgroup of approximately 800 (4–5%) randomly sampled participants each year for 5 years, with selection stratified by age, sex, state, and month of recruitment (appendix p 15). Selected participants were mailed a pathology request form with their annual survey. These participants were asked to go to their local pathology blood collection centre to have blood drawn. We did not require blood be drawn during any specified window after taking a tablet. The serum 25(OH)D concentration was measured annually for 5 years using liquid chromatography tandem mass spectroscopy in a laboratory taking part in the international Vitamin D Standardization Program,[12] including ongoing monitoring using reference samples.[13, 14] The intra-assay and inter-assay coefficients of variation were less than 5%. Laboratory technicians were blinded to study group allocation. We used data from the placebo group to develop and internally validate a model to predict baseline 25(OH)D concentration.[15] The area under the receiver operating characteristic curve was 0·71 for a 25(OH)D cut-point of 50 nmol/L. We linked the cohort to death registers in each Australian state. A small number of deaths included in the analysis were reported to the trial and did not appear in death registers (eg, because they occurred outside Australia or in the Northern Territory or Australian Capital Territory for which linked data were unavailable). The censoring date for people not known to have died was the state-specific date up to which fact of death was available, unless there was evidence that the participant was alive after this date (appendix p 2).

We continued follow-up beyond the intervention period, if data were available, as it is unlikely that any effect of vitamin D supplementation on mortality would end as soon as supplementation ceased, and this approach maximised events and power. In a departure from the protocol, the investigator team made a decision to analyse data with only 6 years of follow-up rather than waiting for the 10 years specified, primarily to aid comparison with other studies and to ensure the study could be completed with the available funding.

When possible, we obtained underlying cause of death International Classification of Diseases 10th edition (ICD-10) codes from death registers. However, coding can occur months or years after the death is reported, so ICD-10 codes were not available for each death that occurred. When the code was not supplied for a death, we used uncoded text descriptions from registers to classify the underlying causes of death as: malignant neoplasm; cardiovascular disease; other external cause (ie, accident, intentional self-harm, or complication of medical and surgical care); or other non-external cause. Three investigators (REN, DM, MW) coded these deaths, blind to study group allocation; cause of death was not coded if consensus was not reached. We did not code deaths that were not ascertained from death registers.

Outcomes

All-cause mortality was the primary endpoint. Secondary endpoints listed in the protocol were total cancer incidence and colorectal cancer incidence. In Australia, availability of cleaned and coded data from cancer registries is delayed considerably after the death; thus, these cancer-specific endpoints will be analysed in the future. Our primary analysis used the intention-to-treat principle: participants were analysed in the study group to which they were assigned, including all participants who were randomly assigned, with the exception of the those who withdrew consent to use their data. Cause-specific mortality was not prespecified in the study protocol but was included in the prespecified statistical analysis plan following emerging reports in the literature.[16]

Statistical analysis

Information about sample size and power is provided in the appendix (p 3). Cumulative incidence of all-cause mortality for each randomisation group was estimated using Kaplan-Meier methods. For our primary analysis of all-cause mortality, we fitted two flexible parametric survival models (appendix p 4). Model one was used to estimate an overall hazard ratio (HR) and 95% CI. Model two allowed the HR to vary with time. Using model two, we plotted the HR, standardised survival curves, and difference in standardised survival curves as functions of time since randomisation. These metrics were also reported at 2, 4, and 6 years post-randomisation.

We investigated whether the effect of vitamin D on all-cause mortality was modified by prespecified baseline characteristics: age (<70 years or ≥70 years); sex (man or women); body mass index (BMI; <25 kg/m^2 or ≥25 kg/m^2); and predicted deseasonalised serum 25(OH)D concentration (<50 nmol/L or ≥50 nmol/L);[15] participants with missing BMI were excluded from BMI-stratified analysis. Kaplan-Meier methods were used to plot cumulative incidence by randomisation group within strata. We used flexible parametric survival modelling, as described above, to estimate the overall HR for each level of the characteristic, and the estimated HR and difference in standardised survival curves as functions of time since randomisation. We analysed cause-specific mortality using flexible parametric modelling. Participants whose underlying cause of death was unknown were censored at the date of death.

To enable comparisons with other studies, particularly the VITamin D and OmegA-3 TriaL (VITAL),[16] analyses were repeated using Cox regression, overall and with the first 1 and 2 years of follow-up excluded. We used inverse probability weighting to estimate the per-protocol effect of vitamin D supplementation on all-cause mortality.[17, 18, 19] We defined adherence as taking at least 80% of the study tablets overall and not taking more than 500 IU of vitamin D supplementation outside of the trial per day at any time during the intervention period, and we artificially censored a participant if and when they first stopped adhering to the protocol (unless they withdrew for a clinical reason). For this analysis, we partitioned each participant's data into intervals of length 1 year. We estimated time-varying stabilised weights for each individual. These weights were then used in a weighted pooled logistic regression to estimate the odds ratio for all-cause mortality. Additional details are provided in the appendix (p 4). The effect of randomisation to vitamin D or placebo on adverse events was analysed using Poisson regression. We used SAS version 9.4, Stata version 15, and R version 4.0.3 for the statistical analysis. This trial is registered with the Australian New Zealand Clinical Trials Registry (ACTRN12613000743763).

Role of the funding source

The funder of the study had no role in study design, data collection, data analysis, data interpretation, or writing of the report.

What should it include?

- The TYPE of research conducted
- How you COLLECTED and ANALYSED your data
- TOOLS or MATERIALS used

Question: Does an application reduce BP?

What are you going to do?

Who are you going to test?

What are you going to measure and how?

How will I analyse my data?

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Writing a Paper: Results

Presenter

Dr Amar Rai MBBS BSc (Hons)
FY1 SFP Doctor, Imperial Healthcare Trust

What is Results?

Report the MAIN FINDINGS of the DATA COLLECTION and ANALYSIS

The Key

- Concise
- Objective
- Logical
- NEVER include SUBJECTIVE opinions

Tips

- Past tense
- Results that ANSWER the question
- Other results?– You have an appendix

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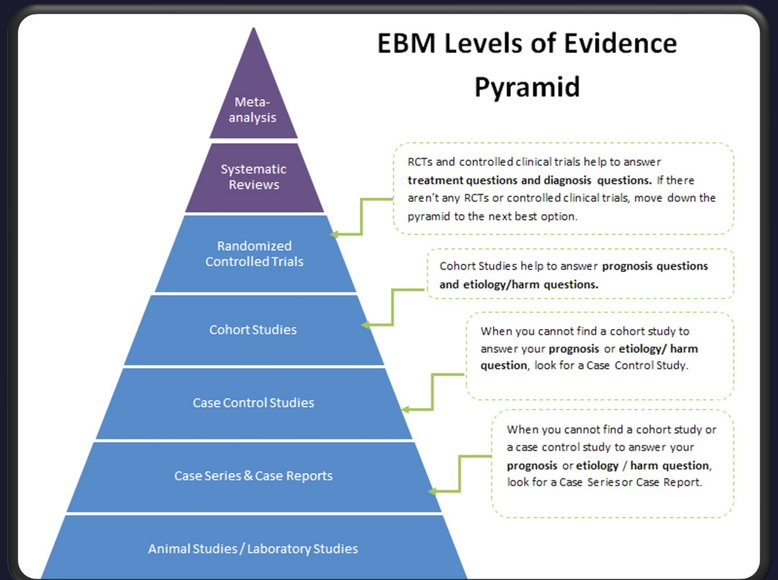
Cross-sectional study



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Evaluating the utility of an international webinar as a platform to educate students and doctors on the UK core surgical training portfolio

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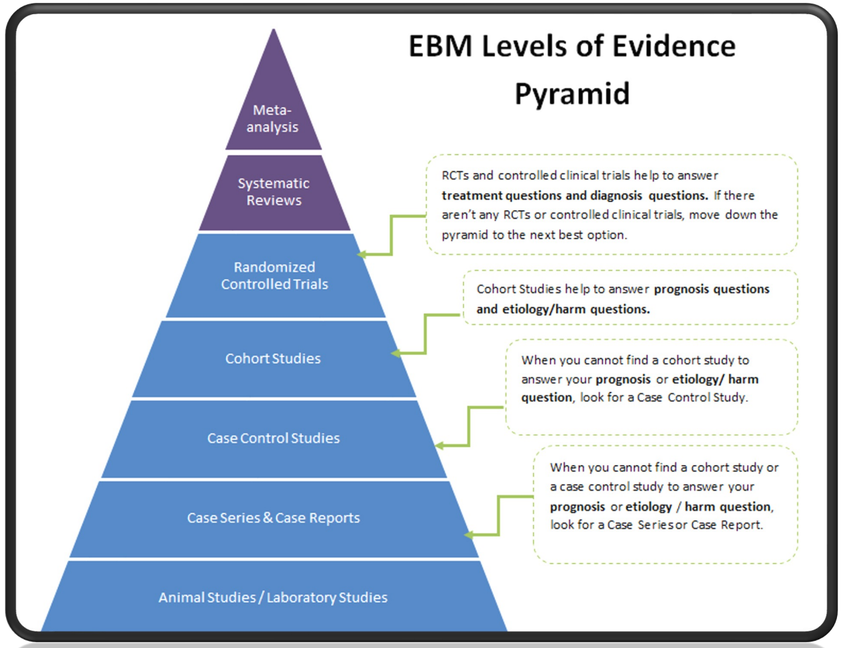


Results		
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed
		(b) Give reasons for non-participation at each stage
		(c) Consider use of a flow diagram
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders
		(b) Indicate number of participants with missing data for each variable of interest
		(c) *Cohort study*—Summarise follow-up time (eg, average and total amount)
Outcome data	15*	*Cohort study*—Report numbers of outcome events or summary measures over time
		Case-control study—Report numbers in each exposure category, or summary measures of exposure
		Cross-sectional study—Report numbers of outcome events or summary measures
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included
		(*b*) Report category boundaries when continuous variables were categorized
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses

Results

A total of 177 attendees completed both the pre- and post-event surveys, 59.9% of which were female. Although participants from 24 countries attended, the majority were predominantly from the UK and were either pre-clinical or clinical medical students (Table 1).

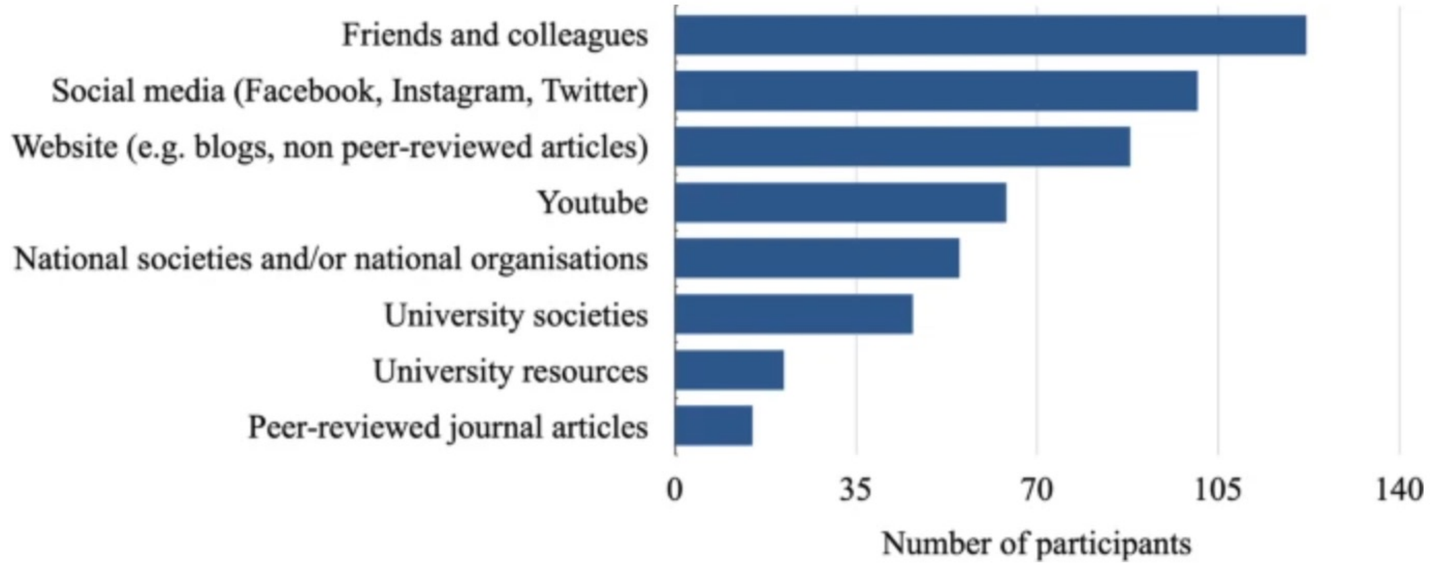
Table 1 Baseline characteristics of attendees

Full size table >

Characteristics	Number of participants (%) *N* = 177
Sex	
Female	106 (59.9%)
Male	70 (39.5%)
Prefer not to say	1 (0.6%)
Stage of Training	
Pre-medical student	3 (1.7%)
Pre-clinical medical student	55 (31.1%)
Clinical medical student	51 (28.8%)
Intercalating	8 (4.5%)
Foundation Doctor	39 (22.0%)
Core Trainee	5 (2.82%)
Speciality Trainee	3 (1.7%)
Physician Associate Student	1 (0.6%)
Other	12 (6.8%)
Region of origin	
United Kingdom	112 (63.3%)
Asia	
India	23 (13.0%)
Pakistan	8 (4.5%)
Bangladesh	1 (0.6%)
China	1 (0.6%)
Malaysia	1 (0.6%)
Nepal	1 (0.6%)
Philippines	1 (0.6%)
Sri-Lanka	1 (0.6%)

Only 51 (28.8%) attendees stated that they were aware of the “2021 Core Surgical Training Self-Assessment Scoring Guidance for Candidates” document and how it is assessed. When asked which resources attendees have used to learn about the CST application process, 122 (68.9%) attendees stated that they referred to ‘friends and colleagues,’ followed by ‘social media’ and ‘websites (e.g. blogs, non-peer-reviewed articles),’ which were selected by 101 (57.1%) and 88 (49.7%) attendees, respectively. In comparison, only 55 (31.1%), 46 (26.0%) and 21 (11.9%) students stated they utilised ‘national societies and/or national organisations’, ‘university societies’ and ‘university resources’, respectively to learn about the CST application (Fig. 1).

Fig. 1



Resources used by attendees to learn about the Core Surgical Training application process. Attendees were allowed to select multiple resources

Full size image >

Most attendees (75.1%) did not agree that their university had provided them with adequate information on how to prepare for a career in surgery with 106 (59.9%) attendees agreeing that they felt they had to attend events organised by external societies or organisations to understand how to prepare for a career in surgery. Furthermore, prior to the event, only 24 (13.6%) attendees strongly agreed that they were aware of what the 2021 CST document entailed and how they could score maximum points overall. After the event, this number increased to 132 (74.6%, $p < 0.0001$). The pre- and post-event median scores for participants' awareness of each domain of the CST portfolio and how to maximise points have been listed in Table 2; a statistically significant improvement in awareness was demonstrated across all nine domains ($p < 0.0001$).

Domains	Pre-event median	Post-event median	*p*-value	Effect size
Interest in pursuing a career in surgery	9	9	0.0591	0.29764
Awareness of the '2021 Core Surgical Training Self-Assessment Scoring Guidance' document and how to potentially score maximum points	3	9	**< 0.0001**	1.75446
Commitment to specialty[a]	3	8	**< 0.0001**	1.60517
Post-graduate degrees and qualifications[a]	4	9	**< 0.0001**	1.63065
Prizes/awards[a]	3	9	**< 0.0001**	1.79296
Quality improvement and clinical audit[a]	4	9	**< 0.0001**	1.65132
Teaching experience[a]	4	9	**< 0.0001**	1.61628
Training in teaching[a]	4	8	**< 0.0001**	1.75193
Presentations[a]	3	8	**< 0.0001**	1.74888
Publications[a]	4	9	**< 0.0001**	1.55544
Leadership and management[a]	4	8	**< 0.0001**	1.62796
Confidence in creating a competitive portfolio for CST	2	8	**< 0.0001**	2.01016

[a]This included awareness of the domain and how to score maximum points

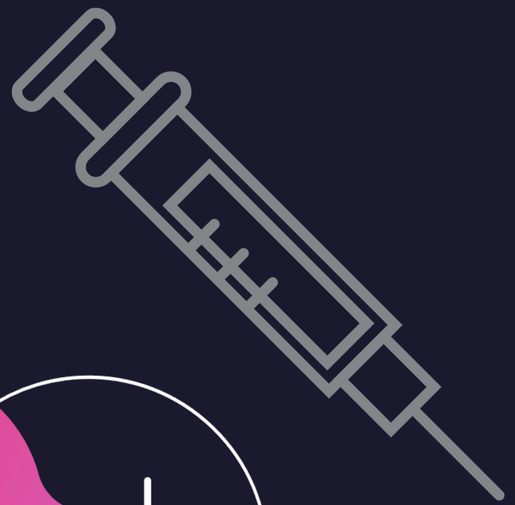
A median score of 10 out of 10 was given from all attendees when asked to rate how knowledgeable the presenter was regarding this subject, how effectively the presenter communicated during the session and how useful the session was overall.

In the post-event questionnaire, 60 (53.6%) UK-based attendees and 28 (43.1%) international attendees declared preference of an online webinar format over an in-person event; only 22 (19.6%) UK-based attendees and 24 (36.9%) international attendees would have preferred an in-person event, the remainder had no preference. Out of all participants, 103 (92.0%) UK-based attendees and 61 (93.8%) international attendees stated that webinars are convenient and make it easier to attend national events such as this. Only 33 (29.5%) UK-based attendees and 21 (32.3%) international attendees stated that webinars limit their ability to network and socialise at events such as these. Out of all the participants, 176 (99.4%) stated that they would both use the tips provided in the session for their own application in the future and recommend this session to others.

Finally, before the event, only 110 (62.1%) strongly agreed that they were interested in pursuing a career in surgery in comparison to 131 (74.0%) of attendees that strongly agreed after the event, however, this difference was statistically insignificant ($p = 0.0591$).

ResearchEazy

Qualitative



'A world of difference': a qualitative study of medical students' views on professionalism and the 'good doctor'

Beatriz Cuesta-Briand ✉, Kirsten Auret, Paula Johnson & Denese Playford

BMC Medical Education **14**, Article number: 77 (2014) | Cite this article

Results

A total of 49 students took part in the focus groups, 10 of whom participated in two sessions. As shown in Table 1, the majority of participants were female (n = 35) and born in Australia (n = 35). There was equal representation from undergraduate and graduate students (n = 22), and the majority of students were in the 20- to 25-year-old age group (n = 27).

Table 1 Sample selected characteristics (n = 49)

Full size table >

Results on the constructs of the 'good' doctor and the 'professional' doctor are presented separately, whilst a final section explores the tensions between the two. All quotes are contextualised by the use of codes identifying the session, year of study and setting.

The ‘good’ doctor

The ‘good’ doctor emerged as a complex and multifaceted construct; students provided long and articulate descriptions, and they often referred to the notions of ‘balance’ and ‘the art and science of medicine’ in their discussions. Three main themes emerged: competent doctor; good communicator; and good teacher.

Competent doctor

Students perceived competence as an essential characteristic of a good doctor, as *‘you can’t be a doctor if you don’t know what you’re talking about’*. In their narratives, clinical competence encompassed possessing academic and clinical knowledge, and applying that knowledge safely. Students spoke at length of the importance of knowledge. However, there was evidence that over the course of their study they increasingly recognised that being aware of one’s limitations was even more critical. Thus, in students’ accounts, self-awareness, humility, and being realistic were perceived as attributes of the good doctor; these attributes stood in sharp contrast to the perceived arrogance of some clinicians who think ‘they know everything’, as the following quote reflects:

> *‘A good doctor is one who knows their boundaries. So if they go ‘this is what I know, this is what I don’t know’, so when to be able to refer, when to be able to ask another clinician or look at your textbooks, and actually to be able to be comfortable in themselves to go to their patient when they don’t completely know something, which is not being arrogant and go ‘I know everything’. Like, it’s OK to actually go, ‘well, I don’t actually know that; that’s not my area of expertise’. […] Good academically, good with the patients, and knowing your boundaries for me is a good doctor.’* (FG05, Y5, Rural).

In students' narratives, a good doctor recognises their own limitations and seeks advice. In contrast, a bad doctor '*will just go ahead with something and try and push through*'. Consistent with these understandings, self-improvement and life-long learning were seen as important characteristics of a competent doctor, especially in the context of evidence-based medicine.

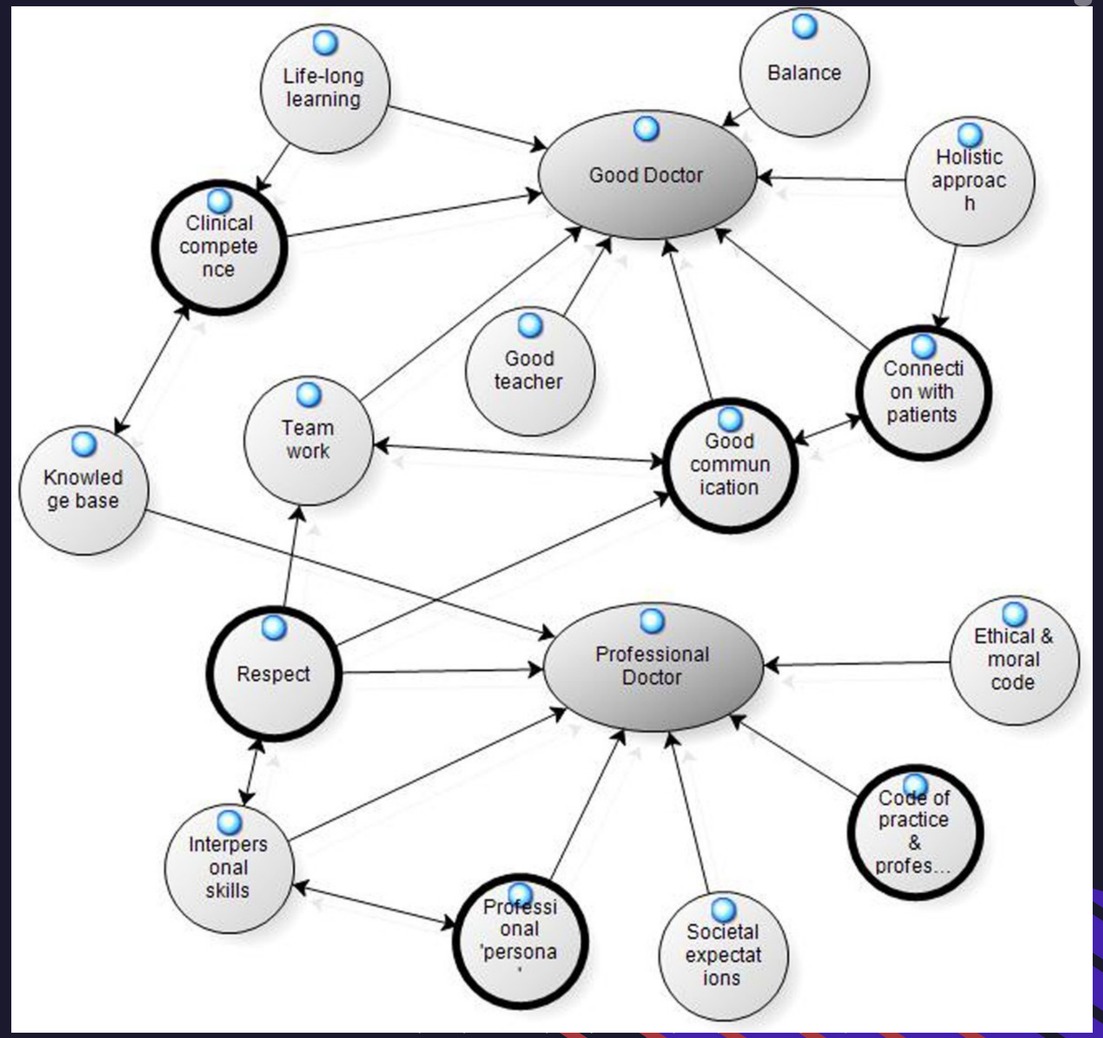
Good communicator

Good doctors were consistently described as good communicators, and there was evidence that over the course of their medical training, students gained a greater insight into the importance of communication. A student spoke of what it means to be a good doctor:

> *'I think it's a balance of being academically smart and knowing what you're doing, as well as being able to establish a relationship and rapport with your patients and your peers, because I've seen plenty of doctors who can be extremely smart and know everything about their field, but if they can't establish that rapport with a patient, then the care isn't as good as it could be.'*

Reflecting on how this view had changed over time, the same student commented:

> *'At the beginning of uni it's all about studying and knowing everything about everything, but as you get into practice into the hospitals, then we can see the importance of actually relating to people around you and establishing those relationships in good solid ways. You see how important that is.'* (FG11, Y5, Urban).


Life-long learning
Balance
Good Doctor
Holistic approac h
Clinical compete nce
Good teacher
Connecti on with patients
Team work
Good commun ication
Knowled ge base
Respect
Professional Doctor
Ethical & moral code
Code of practice & profes...
Interpers onal skills
Professi onal 'persona '
Societal expectat ions

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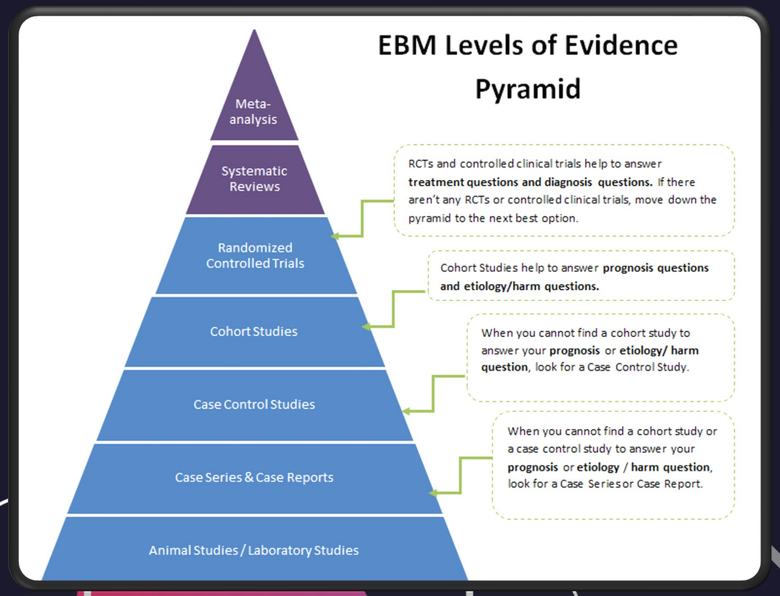
RCT



THE LANCET
Diabetes & Endocrinology

ARTICLES | VOLUME 10, ISSUE 2, P120-128, FEBRUARY 01, 2022

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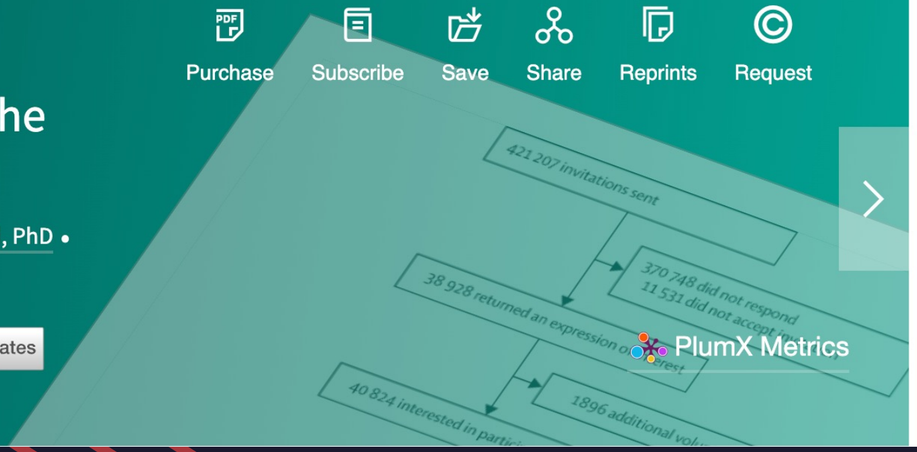
The D-Health Trial: a randomised controlled trial of the effect of vitamin D on mortality

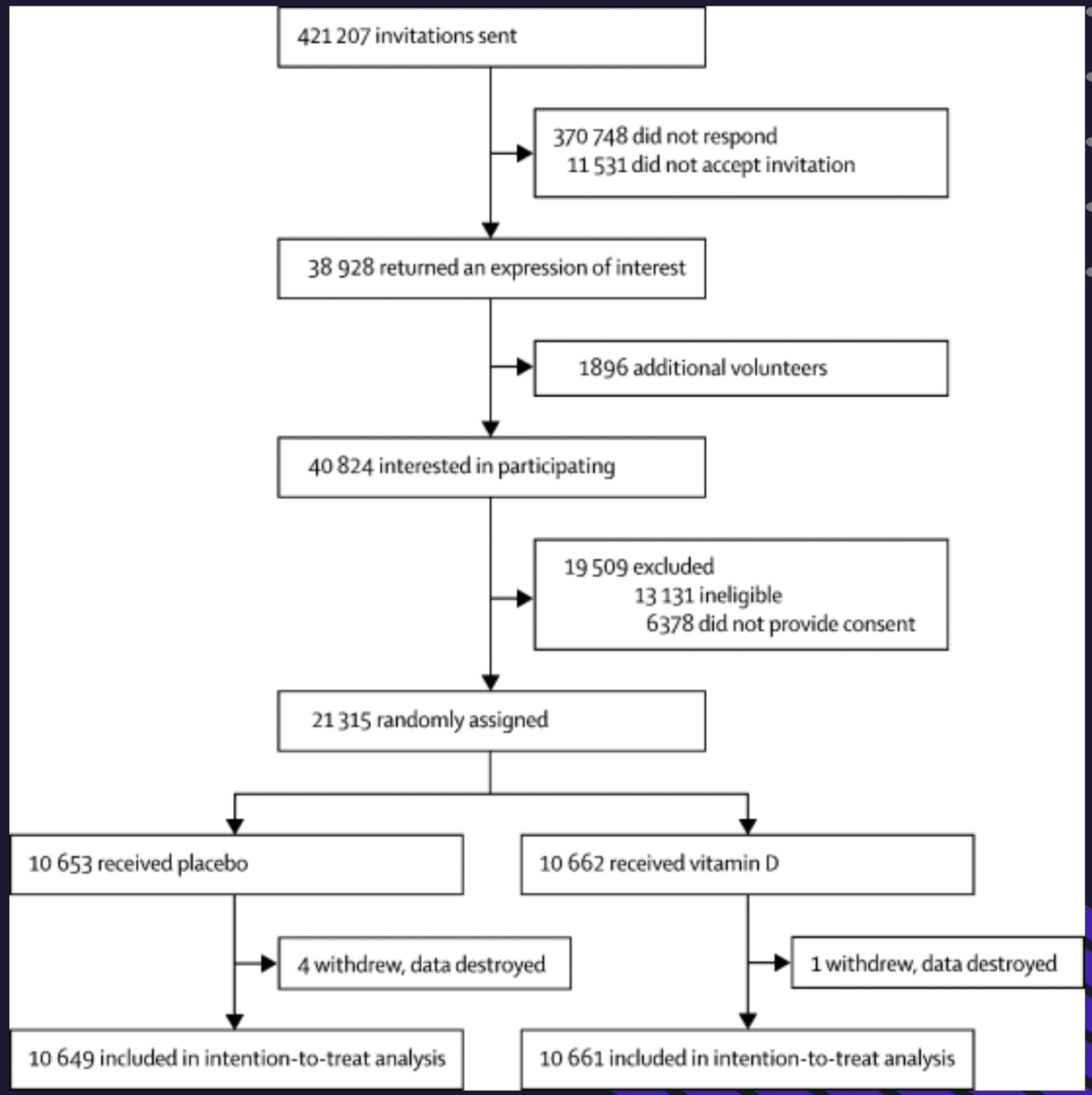
Prof Rachel E Neale, PhD • Catherine Baxter, BA • Briony Duarte Romero, BA • Donald S A McLeod, PhD • Prof Dallas R English, PhD • Prof Bruce K Armstrong, D Phil • et al. Show all authors

Published: January 10, 2022 • DOI: https://doi.org/10.1016/S2213-8587(21)00345-4 • Check for updates



Results

Between Feb 14, 2014, and June 17, 2015, we randomly assigned 21 315 participants; of the 40 824 people who expressed interest in participating, 13 131 (32·2%) were excluded due to ineligibility and 6378 (15·6%) were excluded due to lack of consent; figure 1). 10 662 (50·0%) were assigned to the vitamin D group and 10 653 (50·0%) to the placebo group. 507 (2·4%) participants were randomly assigned after February, 2015, and so study medication for these participants ended on Feb 1, 2020. 10 649 participants in the placebo group and 10 661 participants in the vitamin D group were included in the primary analysis. Five participants (four in the placebo group and one in the vitamin D group) were not included as they requested to be withdrawn and their data to be destroyed (figure 1). Of the 21 310 participants in both groups, 54·1% were men and the mean age was 69·3 years (SD 5·5; table 1). The mean serum 25(OH)D concentration in the placebo group during follow-up was 77 (SD 25) nmol/L and in the vitamin D group it was 115 (30) nmol/L (appendix p 15).


421 207 invitations sent
370 748 did not respond
11 531 did not accept invitation
38 928 returned an expression of interest
1896 additional volunteers
40 824 interested in participating
19 509 excluded
13 131 ineligible
6378 did not provide consent
21 315 randomly assigned
10 653 received placebo
10 662 received vitamin D
4 withdrew, data destroyed
1 withdrew, data destroyed
10 649 included in intention-to-treat analysis
10 661 included in intention-to-treat analysis

We included 1100 deaths (538 [5·1%] in the placebo group and 562 [5·3%] in the vitamin D group; we did not include 23 deaths [15 in the placebo group and eight in the vitamin D group] as they were not ascertained through linkage to death registers and were notified to the study committee after participants had been notified of their study group allocation; all but 14 (1·3%) of the included deaths (six from the vitamin D group and eight from the placebo group) were ascertained through data linkage. The cumulative probability of death (figure 2) and standardised survival (appendix p 15) did not differ between the two groups, and mortality rates were similar (HR 1·04; 95% CI 0·93–1·18; p=0·47). There was no significant effect modification according to baseline age, sex, BMI, or predicted serum 25(OH)D concentration (appendix pp 16–23).

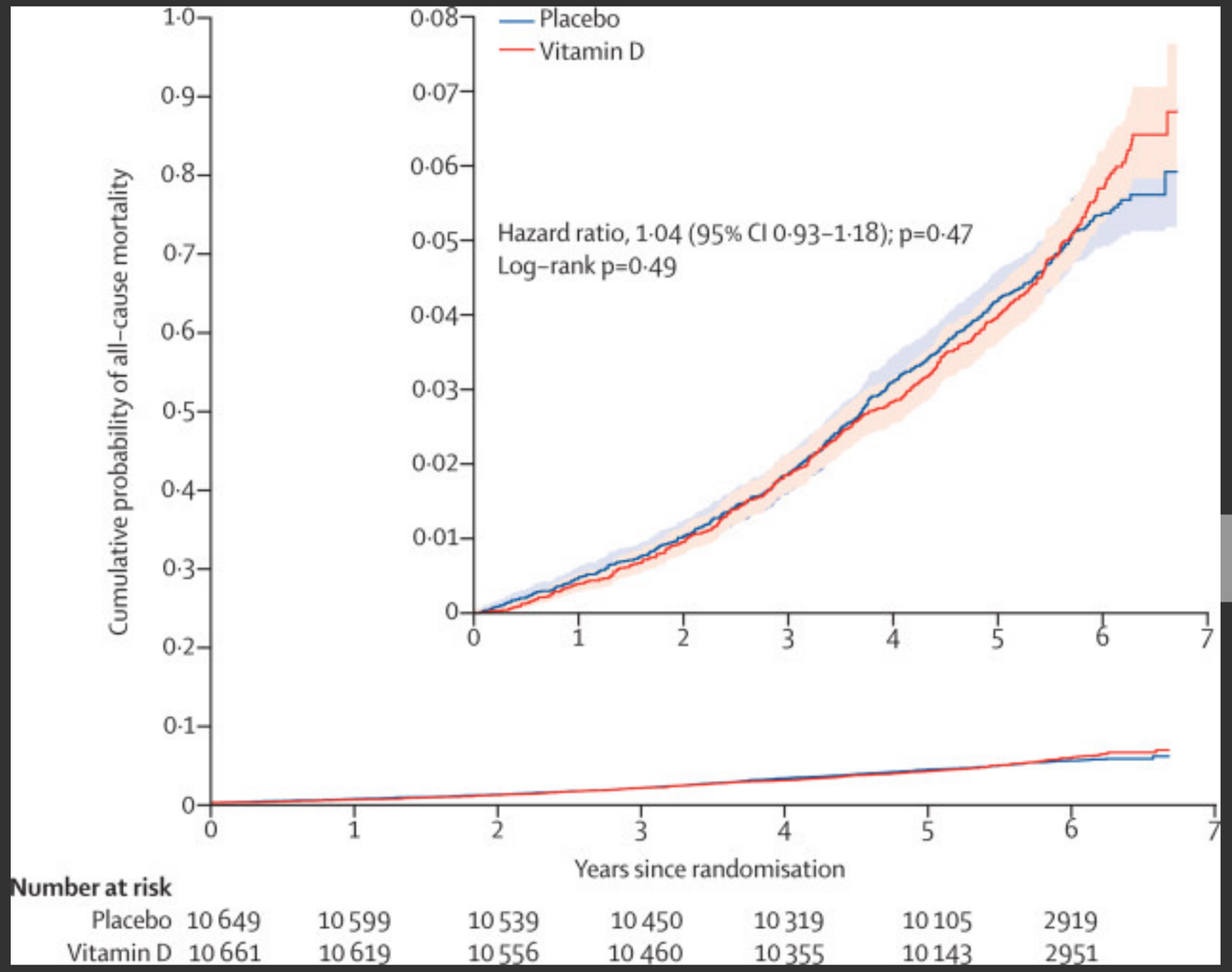


Figure 2. Cumulative probability of all-cause mortality according to time since randomisation in the vitamin D (red) and placebo (blue) groups

Curves estimated using Kaplan-Meier methods and hazard ratio (vitamin D versus placebo) estimated using a flexible parametric survival model that included randomisation group, age, sex, and state of residence at baseline. The inset shows the same data on an enlarged y axis, and shading represents the 95% CI. The following number of participants were censored by 4 years: N=3 (all in the vitamin D group); by 5 years: N=190 (93 in the vitamin D group and 97 in the placebo group); 6 years: N=14 362 (7164 in the vitamin D group and 7198 in the placebo group).

Legends

- Figures
- Tables

Legends

- **Title**

Figure 2. Cumulative probability of all-cause mortality according to time since randomisation in the vitamin D (red) and placebo (blue) groups

Curves estimated using Kaplan-Meier methods and hazard ratio (vitamin D versus placebo) estimated using a flexible parametric survival model that included randomisation group, age, sex, and state of residence at baseline. The inset shows the same data on an enlarged y axis, and shading represents the 95% CI. The following number of participants were censored by 4 years: N=3 (all in the vitamin D group); by 5 years: N=190 (93 in the vitamin D group and 97 in the placebo group); 6 years: N=14 362 (7164 in the vitamin D group and 7198 in the placebo group).

Legends

- What are you looking at?
- What does it represent?
- What are the different aspects?
- What is the data? And stats?

- EXPLAIN it, so that a beginner can grasps the basics

Figure 2. Cumulative probability of all-cause mortality according to time since randomisation in the vitamin D (red) and placebo (blue) groups

Curves estimated using Kaplan-Meier methods and hazard ratio (vitamin D versus placebo) estimated using a flexible parametric survival model that included randomisation group, age, sex, and state of residence at baseline. The inset shows the same data on an enlarged y axis, and shading represents the 95% CI. The following number of participants were censored by 4 years: N=3 (all in the vitamin D group); by 5 years: N=190 (93 in the vitamin D group and 97 in the placebo group); 6 years: N=14 362 (7164 in the vitamin D group and 7198 in the placebo group).

PRISMA 2020 Checklist

Section and Topic	Item #	Checklist item	Location where item is reported
RESULTS			
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	
Study characteristics	17	Cite each included study and present its characteristics.	
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.	
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	
DISCUSSION			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	
	23b	Discuss any limitations of the evidence included in the review.	
	23c	Discuss any limitations of the review processes used.	
	23d	Discuss implications of the results for practice, policy, and future research.	
OTHER INFORMATION			
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	
Competing interests	26	Declare any competing interests of review authors.	
Availability of data, code and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	

From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ 2021;372:n71. doi: 10.1136/bmj.n71

For more information, visit: http://www.prisma-statement.org/

Does an application reduce BP?

Demographics and people involved?

Primary Outcome measures (BP)

Secondary Outcome measures (HR)

Have I answered the question?

Pre-Course Quiz-Released

QUESMED

Medical Protection

MDU

PLEASE FILL OUT THE FEEDBACK FORM

PLEASE TUNE IN TO THE NEXT SESSION ABOUT RESULTS ON 04/12

@OSCEazyOfficial

@osceazyofficial

OSCEazy

Osceazy@gmail.com

FINALSEAZY

Statistical Methods (1)

Statistical Methods (1)

- Normal Distribution
- Normal Distribution tests
- Parametric tests
- Non-parametric tests
- Chi square

Let’s simplify…

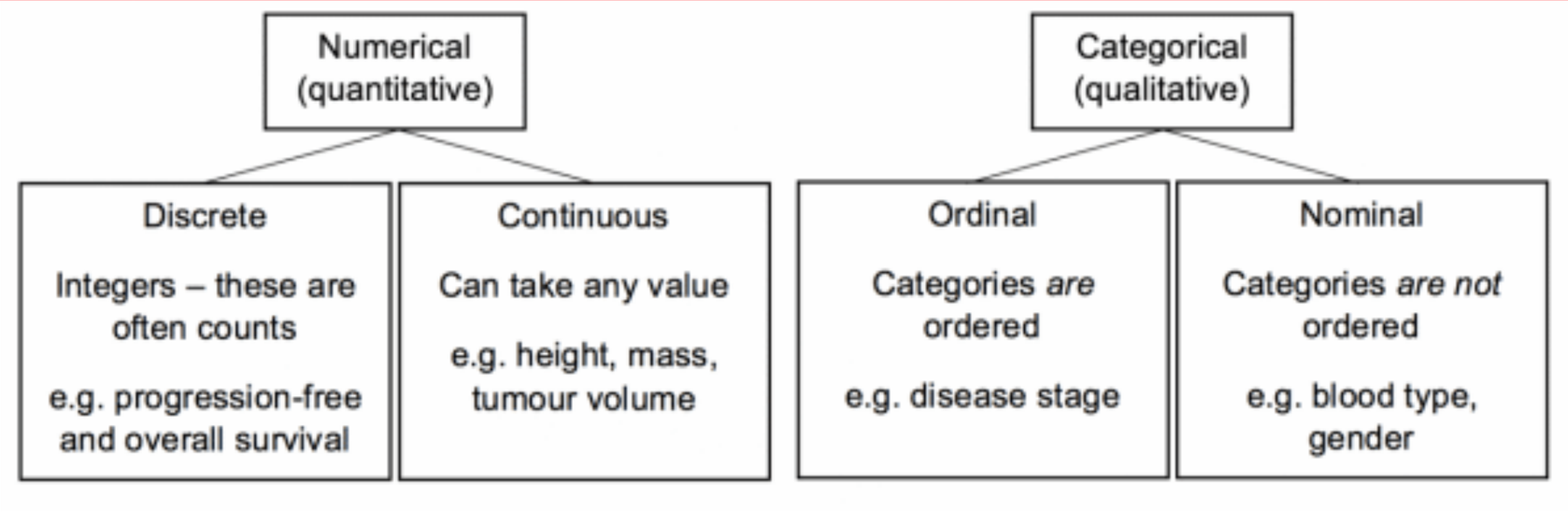
- Let’s create a data set made up of all the medical students in the UK

- Let’s take a random sample of those medical students

- That sample of students will have different attributes that we can study and arrange,
- For example:
  - Sex
  - Age
  - Height
  - Weight
  - Eye colour
  - Disease
  - Alleles

Variables

- Those attributes are the variables we will be using in our studies
- We can categorise those variable (this is important for determining statistical tests)
- Broadly we can differentiate them into numerical (fitting on a range) or categorical (buckets)

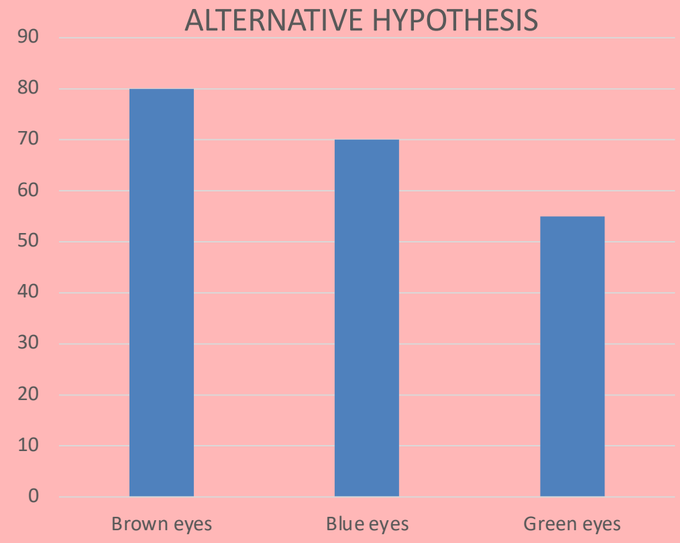


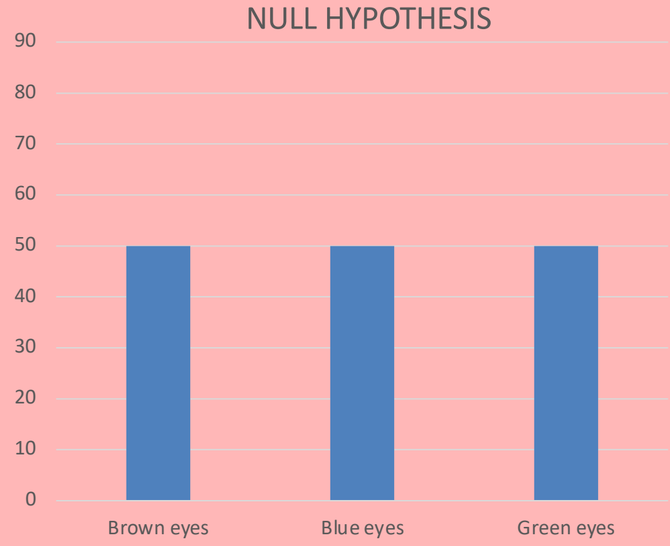
Why should you care?

- With any kind of study you should **not** be trying to keep using statistical tests until you find one that gives a ‘significant difference’
- Rather it is to form a scientific question (hypothesis) and test your data to see whether or not your hypothesis is true
- We do this because samples may not be representative (maybe all the students are from Imperial)

Why should you care?

- Example:
  - Study the association between eye colour and intelligence amongst medical students
  - Alternate hypothesis: Students with brown eyes score higher on final exams
  - Null hypothesis: Students with brown eyes do NOT score higher on final exams
  - Statistical test on that data to determine the ‘p-value’ and the significant difference





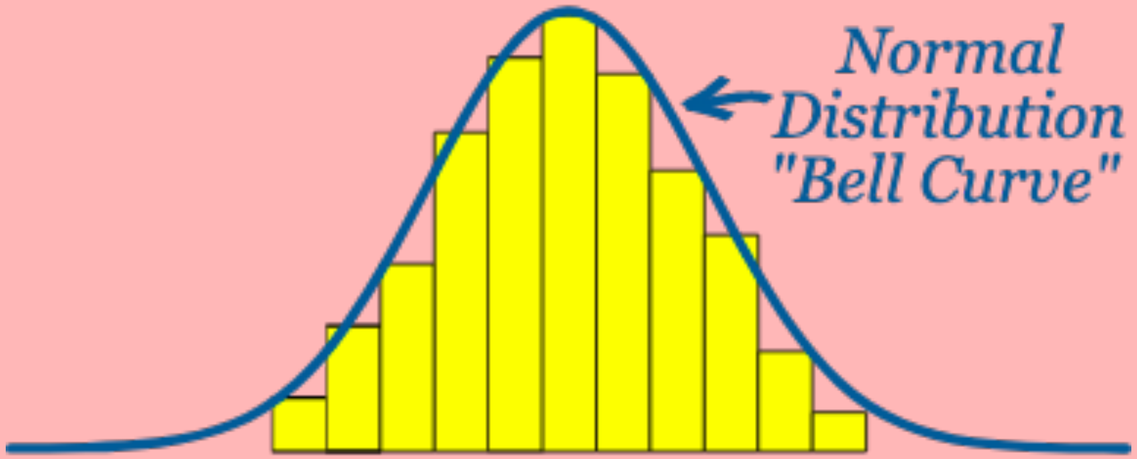
Which test

- There are dozens of statistical tests to use:
  - Kolmogorov-Smirnov
  - Shapiro-Wilks
  - Paired t test
  - Unpaired t test
  - Pearson correlation
  - ANOVA
  - Wilcoxan Rank
  - Mann Whitney
  - Spearman correlation
  - Chi squared test
  - Fischer exact test

Normal Distribution

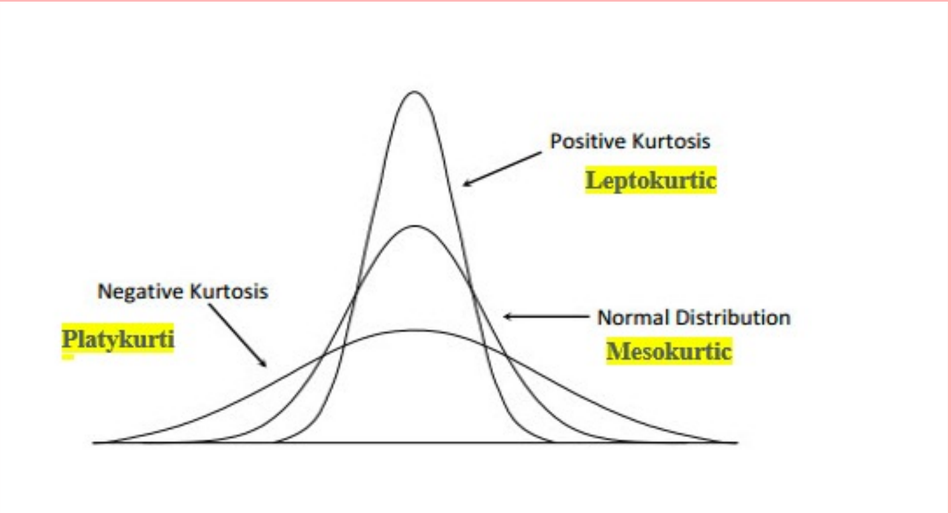
- AKA Gaussian distribution
- Shows the distribution of the probability of an observation to occur in a given class
- Many data sets follow a normal distribution (height, weight, blood pressure)
- 68% of the area under the curve is within 1 significant difference either side of the mean

- Example: Study about weight in medical students
- Relevance: The test you choose will depend on whether the data has a normal distribution



When normal isn’t normal

- There can be two main distortions in distribution of data:
  - Skew
  - Kurtosis



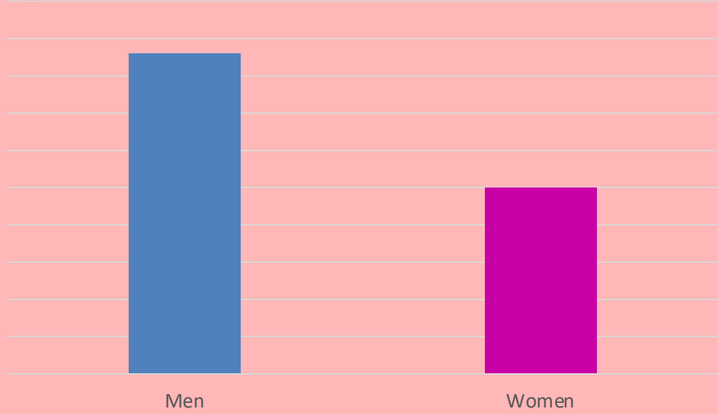
How do you figure it out?

- Tests for normality:
  - Kolmogorov-Smirnov test
  - Shapiro-Wilks test
- Will give you a p-value. If p-value >= 0.05 then you can assume data is normally distributed
- However, these tests are not perfect as p-value depends on sample size. For example, a larger sample size in certain situations can lead to incorrectly assuming that the data set is NOT normally distributed
- Thus, based on these tests we can state that data is either:
  - Parametric
  - Non-parametric

Difference between two groups

- **Study**: The association between height and biological sex in a group of medical students
- **Alternative hypothesis**: Average height of male students is greater than average height of female students
- **Null hypothesis**: There is no difference in the average height of male students and female students

- **Variables:**
  - Sex -> Categorical
  - Height -> Numerical

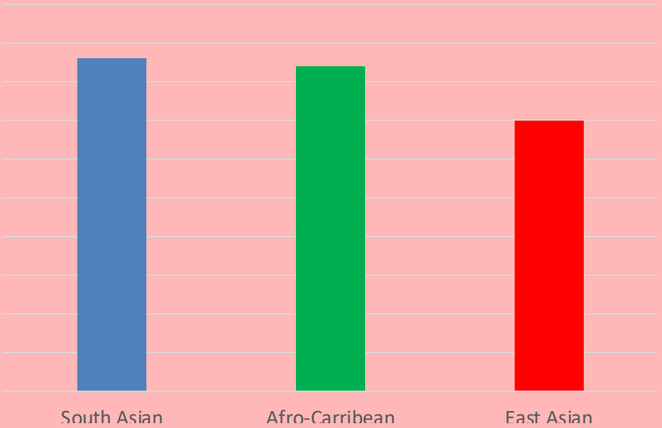


- **PARAMETRIC**: T-test
- **NON-PARAMETRIC**: Wilcoxon rank sum test, Mann-Whitney U test

Difference between multiple groups

- **Study**: Is there an association between ethnicity and blood pressure amongst medical students?
- **Alternative hypothesis**: South Asian students have a tendency to have higher mean systolic blood pressures compared to students of other ethnicities
- **Null hypothesis:** There is no difference in the mean systolic blood pressure of medical students
- **Variables**:
  - Ethnicity -> Categorical (but more than two)
  - SBP -> Numerical

- **PARAMETRIC**: ANOVA
- **NON-PARAMETRIC**: Kruskall-Wallis



Difference between two groups with repeat testing

- **Study**: Is there an association between performance on medical school questions and exercise
- **Alternative hypothesis**: Medical students do better on medical school questions after exercise
- **Null hypothesis**: There is no difference in medical student performance after exercise
- **Study design:**
  - Group of medical students answer test A
  - Group exercises
  - Group answers test B
- **Variables:**
  - Performance -> Categorical (but compared to the same individual)

- **PARAMETRIC**: Paired t-test
- **NON-PARAMETRIC**: Wilcoxon-Signed rank test

Association between two variables

- **Study**: Is there an association between blood pressure and weight amongst medical students
- **Alternative hypothesis**: Medical students who weigh more have higher SBP
- **Null hypothesis**: There is no association between weight and SBP amongst medical students

- **Variables**:
  - Weight -> Numerical
  - SBP -> Numerical

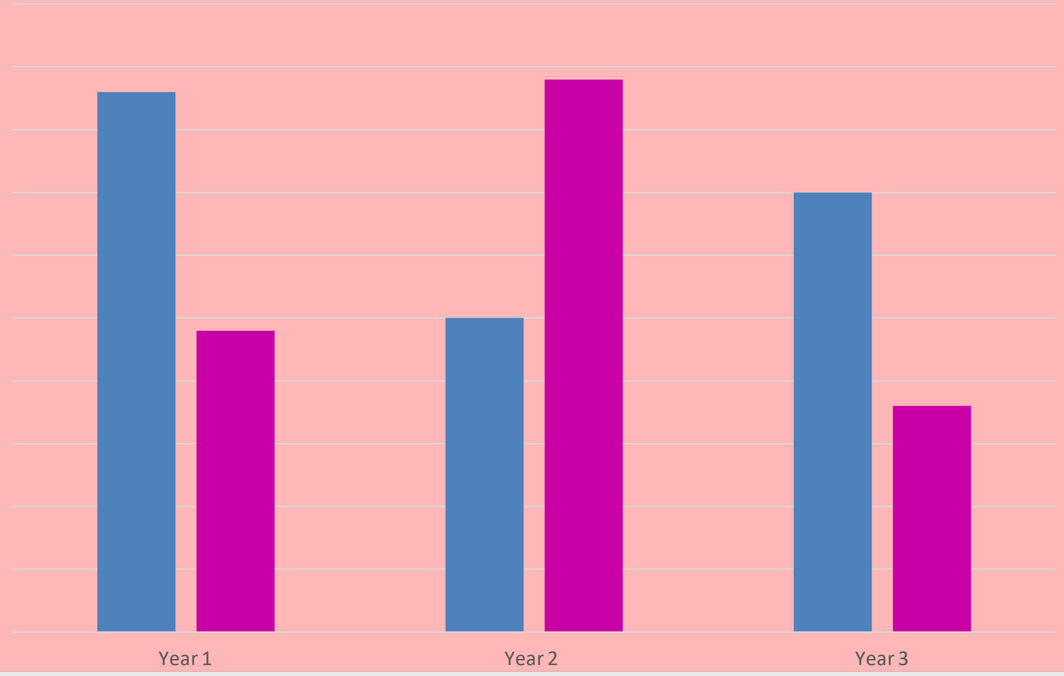
- **PARAMETRIC**: Pearson correlation
- **NON-PARAMETRIC**: Spearman correlation

Association between two variables

- **Study**: Does the proportion of female and male medical students vary by year group
- **Alternative hypothesis**: There is a variation in the proportion of female and male students by year group
- **Null hypothesis**: There is no variation

- **Variables:**
  - Year group -> Categorical
  - Gender -> Categorical

- Chi-Square Test



Summary

VARIABLES	PARAMETRIC TEST	NON-PARAMETRIC EQUIVALENT
DIFFERENCE BETWEEN TWO GROUPS	T-TEST	WILCOXON RANK SUM TEST MANN WHITNEY U TEST
DIFFERENCE BETWEEN MORE THAN TWO GROUPS	ANOVA	KRUSKALL-WALLIS
DIFFERENCE BETWEEN TWO GROUPS WITH REPEAT TESTING	PAIRED T-TEST	WILCOXON-SIGNED RANK TEST
CORRELATION	PEARSON CORRELATION	SPEARMAN CORRELATION
TWO CATEGORIAL VARIABLES	-	CHI-SQUARE

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PLEASE TUNE IN TO OUR REMAINING SESSIONS THIS WEEK

@OSCEazyOfficial

@osceazyofficial

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Osceazy@gmail.com

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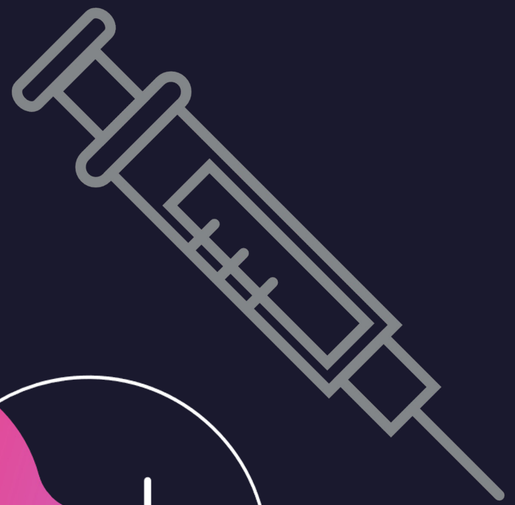
Statistics II



Statistics II

- Type I and Type II Error
- Power Calculation
- Risk, Odds, and Hazard
- Kaplan Meier curves
- Meta-analysis: Forest Plots and Heterogeneity

Presenters

Dr Hasaan Khan MBBS BSc (Hons)
FY1 SFP Doctor, Oxford

Type I and Type II Error

Types of Error

- Null hypothesis (H_0) claims no significant difference between groups

- When p-value is <0.05*, null hypothesis rejected and difference between groups considered to be genuine.

- = or however small it is defined.

- If p-value <0.05
- Reject null hypothesis

- If p-value >0.05
- Accept null hypothesis

	We do not reject H0	We do reject H0
H0 is actually true	Correct decision	Incorrect decision
H0 is actually false	Incorrect decision	Correct decision

	We do not reject H0	We do reject H0
H0 is actually true	Correct decision	False positive **Type I error α**
H0 is actually false	False negative **Type II error β**	Correct decision

	We do not reject H0	We do reject H0
H0 is actually true	Correct decision	Incorrect decision Type I error α
H0 is actually false	Incorrect decision Type II error β	Correct decision

- Type I error is the rejection of a true null hypothesis
- Type II error is when you accept a null hypothesis that is actually false.

	We do not reject H0	We do reject H0
H0 is actually true	Correct decision	Incorrect decision Type I error α
H0 is actually false	Incorrect decision Type II error β	Correct decision

- **Type I error: thinking there is a difference where *there isn't* *(thinking something is true when it isn't)***
- **Type II error: thinking there isn't a difference *when there is* *(thinking something isn't true when it is)***

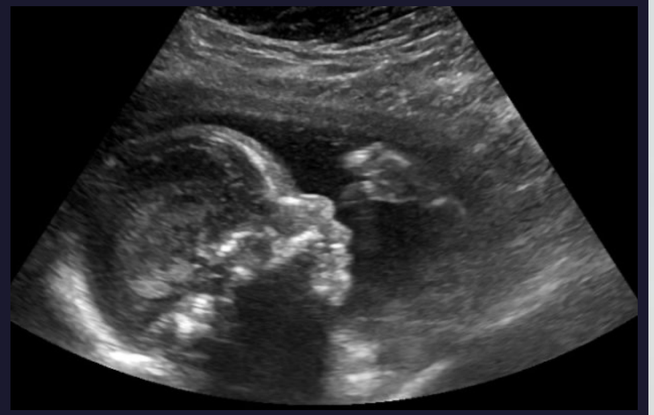
Type I error

You’re pregnant

Not pregnant

Type II error

You’re not pregnant



Very pregnant

Sensitivity and Specificity

	Testing positive	Tested negative
Has COVID-19	True positive	False negative
Doesn’t have COVID-19	False positive	True negative

- Sensitivity: comparing true positive to all COVID patients (higher sensitivity, more patients with covid test positive)
- Specificity: comparing true negative to all non-COVID patients
- (higher specificity, less non-covid patients test test positive)

Power calculation

Power Calculation

- The statistical power of a study is how likely the study is to distinguish an actual effect from one of chance. It is also called:

sensitivity

- Higher statistical power (sensitivity) means there is an increased likelihood that the test results are genuinely valid.
- We are less likely to think something is false when it is true.

Power Calculation

- The statistical power of a study is how likely the study is to distinguish an actual effect from one of chance. It is also called:

sensitivity

- This means we are decreasing the Type II error.
- Higher power means more likely to reject null hypothesis. There is a higher threshold I need to reach before I say something is true.

Power Calculation

- Statistical power helps you to determine if your sample size is large enough.

- It is possible to perform a hypothesis test without calculating the statistical power. This is not good practice however.

- If your sample size is too small, your results may be inconclusive when they may have been conclusive if you had a large enough sample.

- On the other hand, if your sample size is too large, you may find a small difference when there actually isn’t one.

Power Calculation

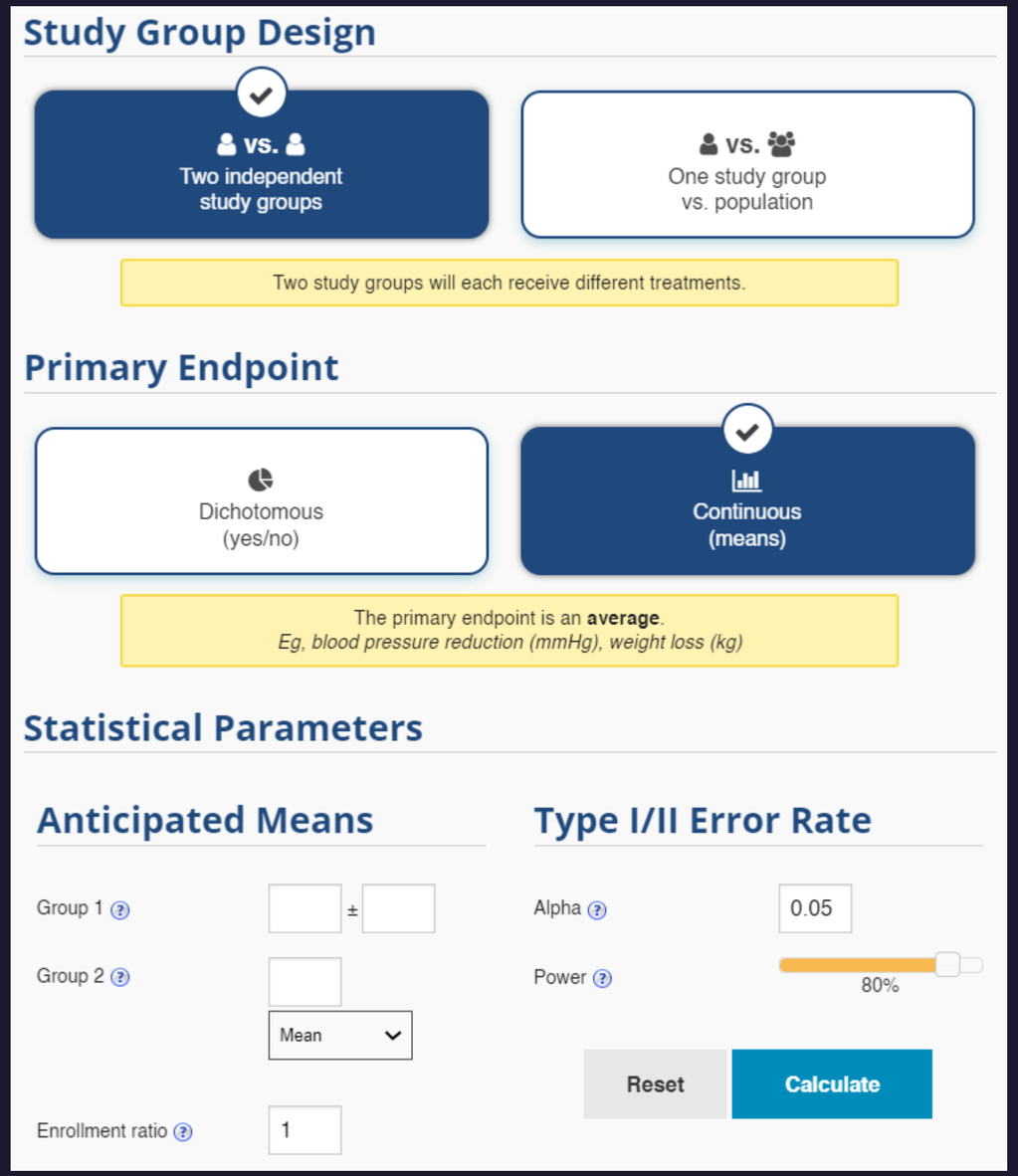
- Power calculations are normally done in practice to find out the minimum number of patients required so you can say the difference is actually due to the treatment and not due to chance.

- Technical terms:
- Power calculation is done to avoid incorrectly rejecting the null hypothesis.

- Lay terms:
- Power calculation is done to avoid saying something is true when it isn’t.

Power Calculation

- How to perform a power calculation.
- Lots of software!
- https://clincalc.com/stats/samplesize.aspx

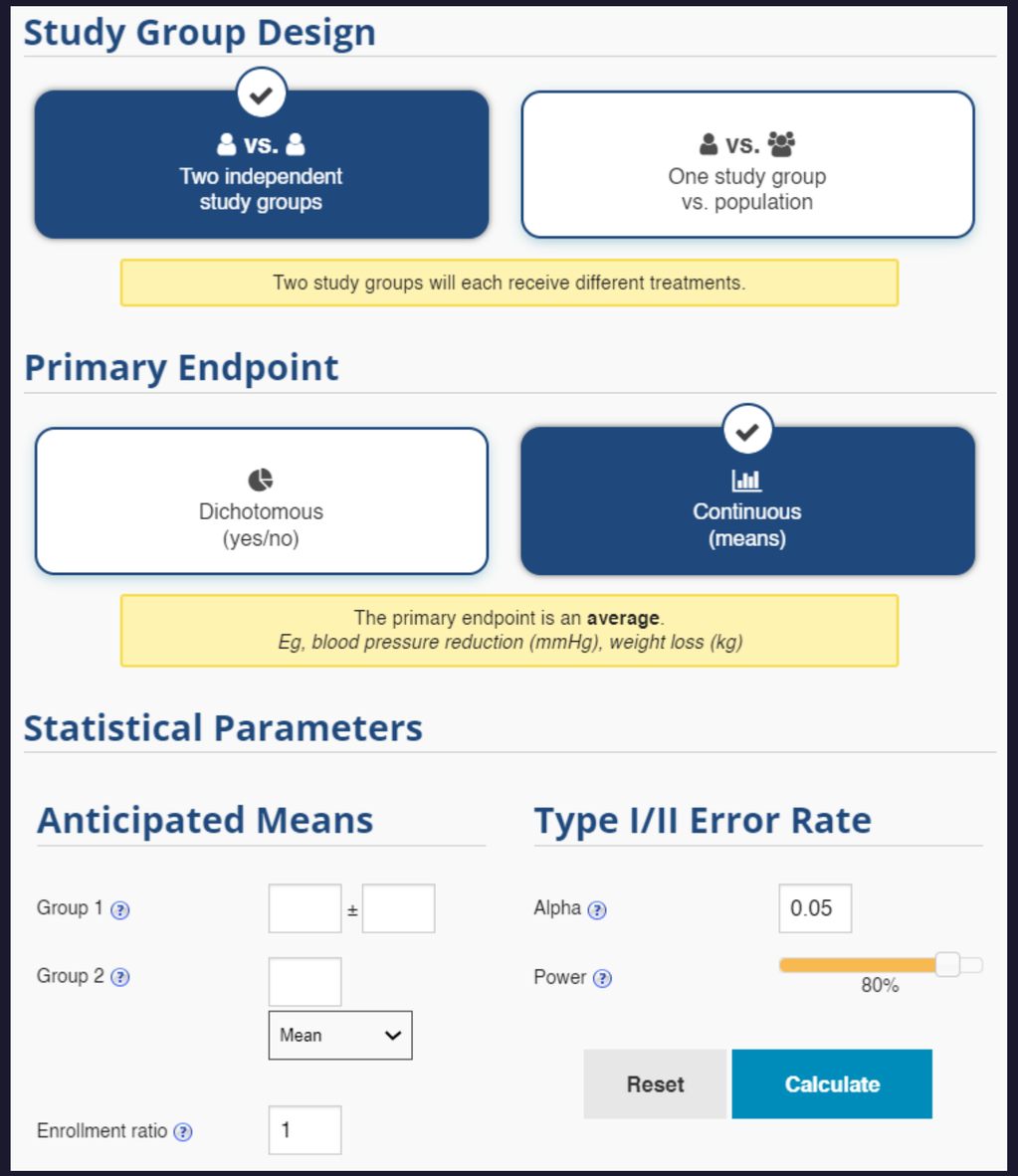


	We do not reject H0	We do reject H0
H0 is actually true	Correct decision	Incorrect decision Type I error α
H0 is actually false	Incorrect decision Type II error β	Correct decision

- **Type I error: thinking there is a difference where *there isn't* *(thinking something is true when it isn't)***
- **Type II error: thinking there isn't a difference *when there is* *(thinking something isn't true when it is)***

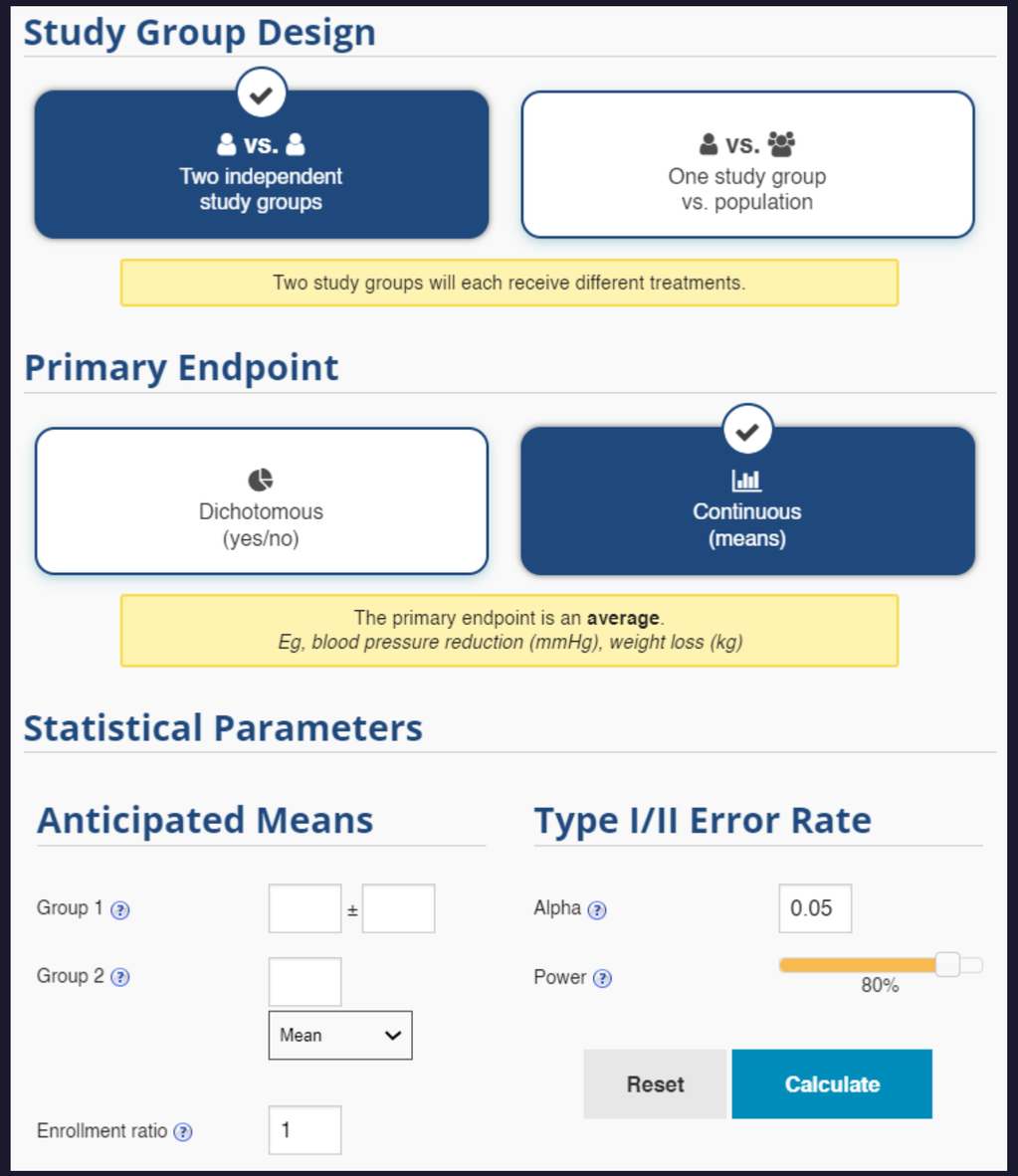
Power Calculation

- P-value is α and our accepted level of Type I error
- Typically considered to be 0.05
- P-value is the chance of us saying there is a difference when there isn’t



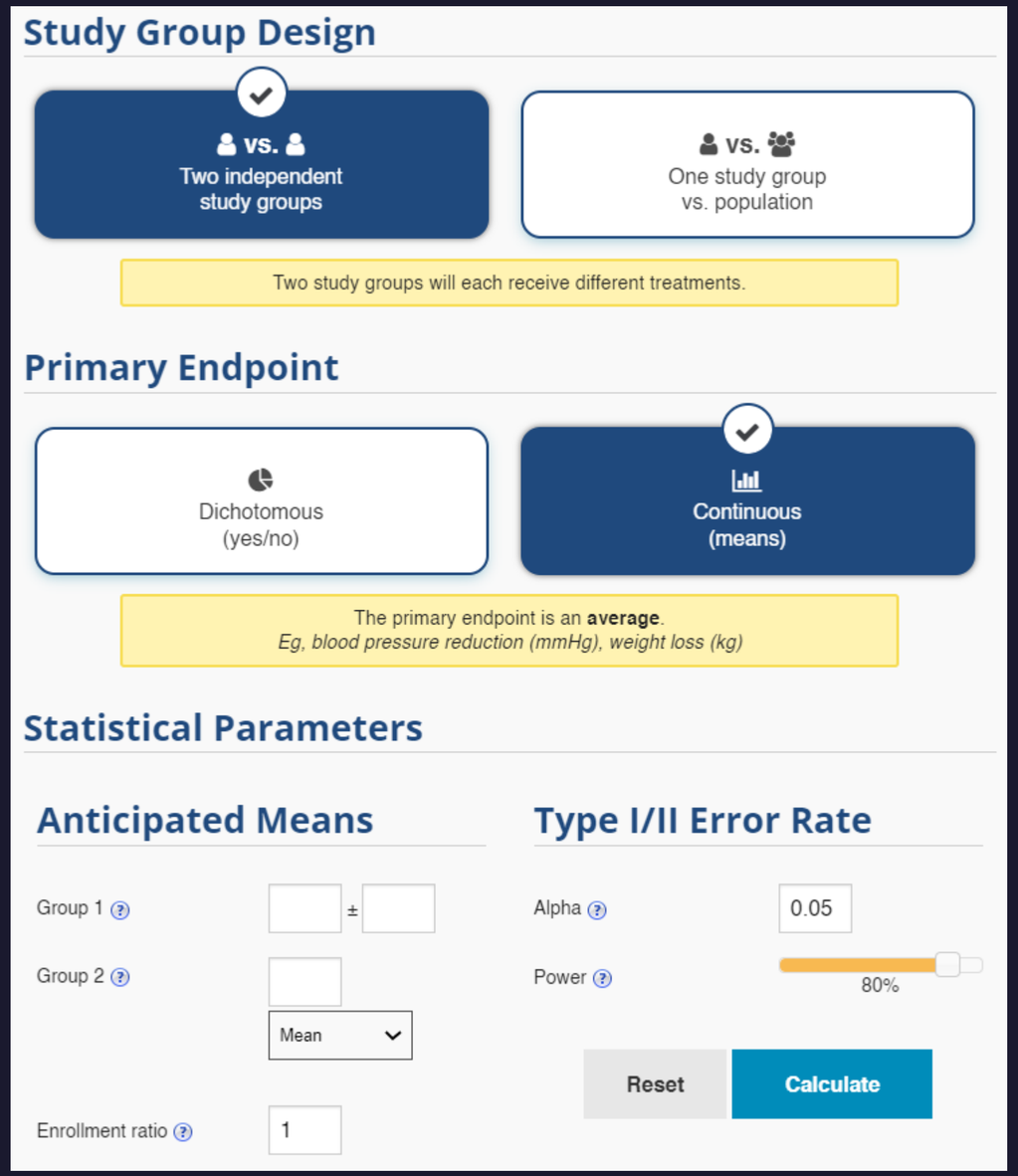
Power Calculation

- β is our accepted level of Type II error (thinking something isn't true when it is)
- Power is calculated as: 1- β
- Typically power is considered appropriate if it is 80-90%
- By reducing the type II error and being more sensitive (and less specific), the power increases and we are more likely to notice a difference.



Power Calculation

- Things that increase the sample size required:
- Small difference in anticipated means
- Increased standard deviation
- Decreasing α (p-value)
- Increasing power
- Enrollment ratio



Risk, Odds, and Hazards

Risk, Odds and Hazard

- Risk = chance of the outcome of interest/all possible outcomes for that group

- As a percentage, what is the risk of Smokers getting AF?

	- Smokers	- Non-smokers
- Patients with AF	200	50
- Patients without AF	100	250

Risk, Odds and Hazard

- Risk = chance of the outcome of interest/all possible outcomes for that group

- As a percentage, what is the risk of Smokers getting AF? (Absolute risk)

- (200/(200+100)*100) = 66.6

66.6%

	- Smokers	- Non-smokers
- Patients with AF	200	50
- Patients without AF	100	250

Absolute risk is the actual risk of some event happening given the current exposure

Risk, Odds and Hazard

- Risk = chance of the outcome of interest/all possible outcomes for that group

- As a percentage, what is the risk of non-smokers getting AF?

	- Smokers	- Non-smokers
- Patients with AF	200	50
- Patients without AF	100	250

Risk, Odds and Hazard

- Risk = chance of the outcome of interest/all possible outcomes for that group

- As a percentage, what is the risk of non-smokers getting AF?

- (200/(200+100)*100) = 16.6

16.6%

	- Smokers	- Non-smokers
- Patients with AF	200	50
- Patients without AF	100	250

Risk, Odds and Hazard

- Risk = Relative risk is the ratio of the risks for an event for the exposure group to the risks for the non-exposure group.

- What is the relative risk of smokers getting AF compared to non-smokers?

	Smokers	Non-smokers
Patients with AF	200	50
Patients without AF	100	250

Risk, Odds and Hazard

- **Risk = Relative risk is the ratio of the risks for an event for the exposure group to the risks for the non-exposure group.**

- **What is the relative risk of smokers getting AF compared to non-smokers?**

- **66.6/16.6 = 4**

	- Smokers	- Non-smokers
- Patients with AF	200	50
- Patients without AF	100	250

- **people who smoke are 4 times more likely to get AF compared to non-smokers**

Risk, Odds and Hazard

- If relative risk is > 1, one group has a higher risk of getting the outcome compared to the other.
- If relative risk is 1, both groups have the same level of risk
- Risk is reported with confidence intervals

- Statistical tests and p-values should also be calculated but as a general rule, if confidence intervals for a relative risk crosses 1, there is a chance that the groups have similar risk and therefore the relative risk is not significant.

- Examples:

- Case 1: 5 (4-6) = significant

- Case 2: 3 (0.7-4.3) = not significant

Risk, Odds and Hazard

- Odds = the number of events / the number of non-events

- What are the odds of patients with AF being smokers?

- 200/50 = 4

	Smokers	Non-smokers
Patients with AF	200	50
Patients without AF	100	250

- Unlike in risk where I look at the exposed group and seeing if they get the disease, in odds I am looking at the disease and seeing who was exposed!

Risk, Odds and Hazard

- Odds = the number of events / the number of non-events

- What are the odds of patients without AF being smokers?

- 100/250 = 0.4

	- Smokers	- Non-smokers
- Patients with AF	200	50
- Patients without AF	100	250

- Unlike in risk where I look at the exposed group and seeing if they get the disease, in odds I am looking at the disease and seeing who was exposed!

Risk, Odds and Hazard

- Odds = the number of events / the number of non-events

- What is the odds ratio of patients with AF being smokers compared to non-smokers

- 4/0.4 = 10

	- Smokers	- Non-smokers
- Patients with AF	200	50
- Patients without AF	100	250

- Patients with AF are more likely to be smokers compared to patients without AF by 10-fold.

- Still need to calculate confidence interval and p-value!

Risk, Odds and Hazard

- When to do relative risk and when to do odds ratio?
- Depends on study design, research question, and how common the disease is.

- If the disease condition (event) is rare, then the odds ratio and relative risk may be similar.,

	Smokers	Non-smokers
Patients with AF	200	50
Patients without AF	100	250

- Odds ratio will overestimate the risk if the disease is more common. In such cases, the relative risk will be a more accurate estimation of risk.
- Odds ratios are used in cross sectional and case-control studies

Risk, Odds and Hazard

- **Hazard rate = is the probability of an endpoint in a time interval divided by the duration of the time interval**

- **The hazard ratio is used to see if patients receiving a treatment progress *faster (or slower)* than those not receiving treatment.**

- **It factors in time.**

Risk, Odds and Hazard

- When used:

- Show whether a treatment shortens an illness duration.
- Show which individuals are more likely to experience an event first.
- Not the same as relative risk.

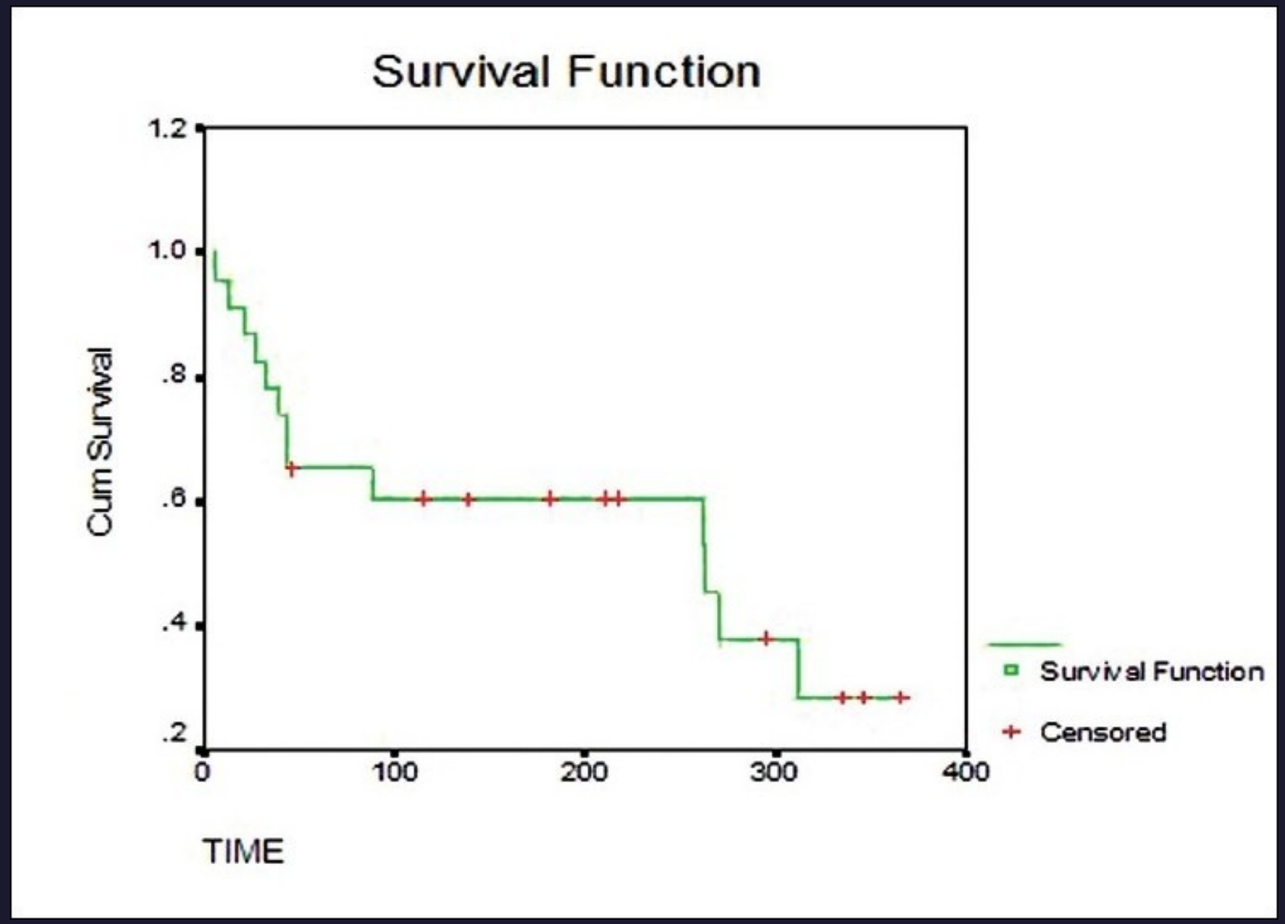
Risk, Odds and Hazard

- While a hazard ratio is similar to a relative risk ratio, it isn't exactly the same.
- Let's say a clinical trial investigated survival rates for two drugs (A and B) and the reported hazard ratios and relative risk ratios were both 3:

- The relative risk ratio: risk of death is three times higher with drug A than with drug B over the entire period of the study *(i.e. it's cumulative).*
- The hazard ratio tells you that the risk of death is three times higher with drug A than with drug B *at any particular point in time.*

Risk, Odds and Hazard

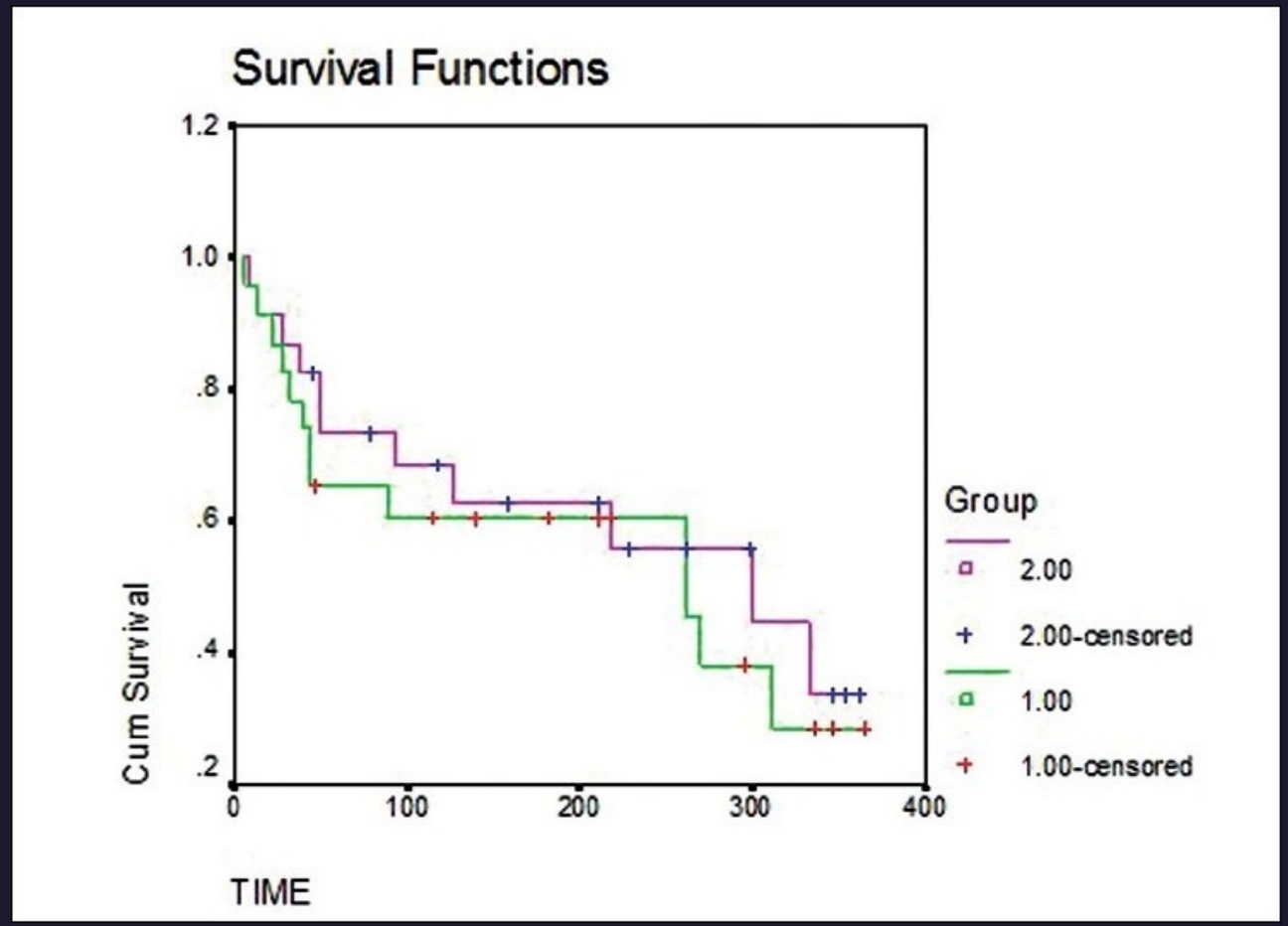
- Hazard ratios are used in survival analysis
- Kaplan-Meier curves are used to illustrate survival



Risk, Odds and Hazard

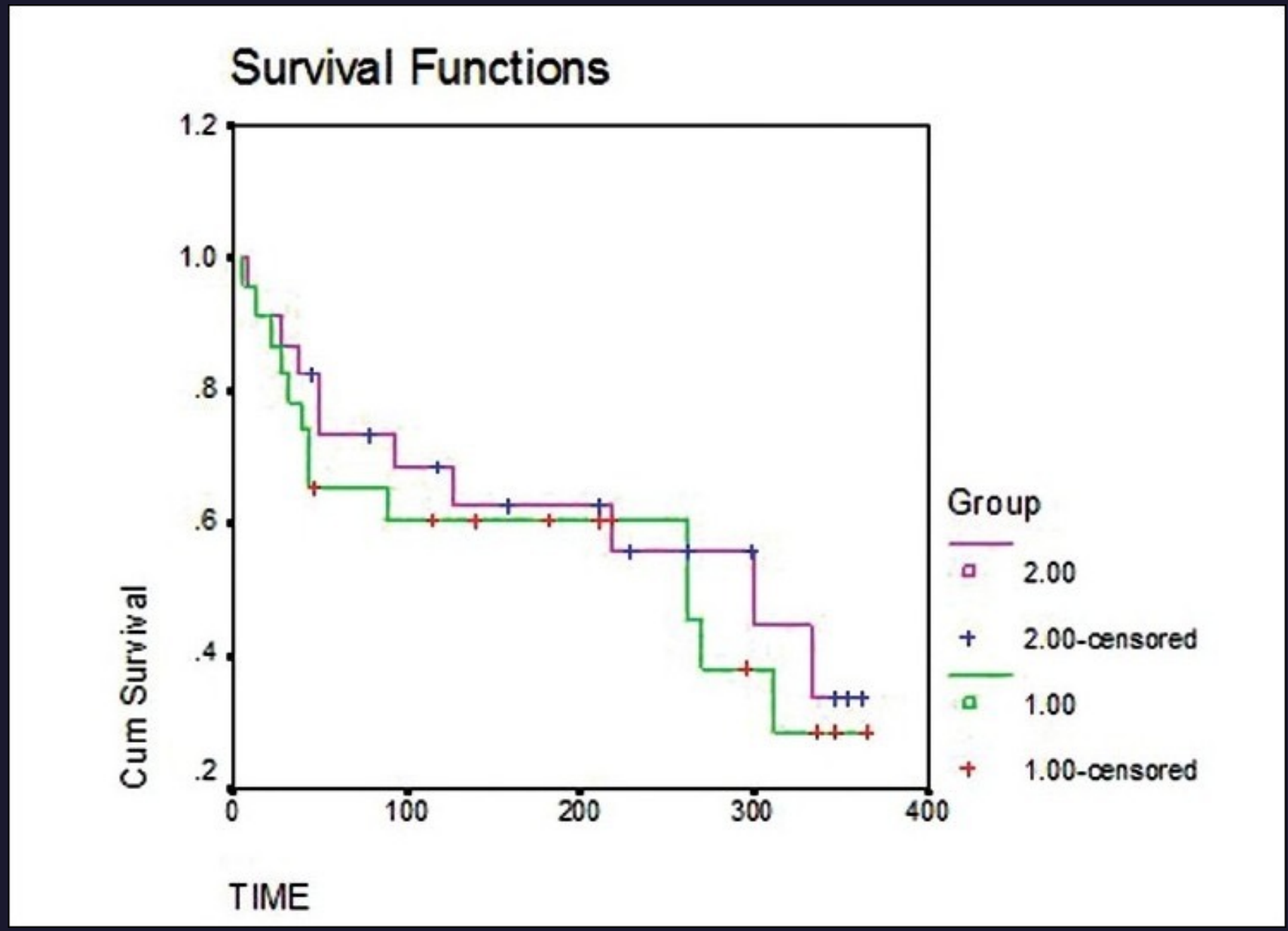
- Hazard ratios are used in survival analysis
- Kaplan-Meier curves are used to illustrate survival

- Don’t worry on how to calculate this, but be familiar on how to interpret!



Risk, Odds and Hazard

- HR = 0.5: at any particular time, half as many patients in the treatment group are experiencing an event compared to the control group.
- HR = 1: at any particular time, event rates are the same in both groups,
- HR = 2: at any particular time, twice as many patients in the treatment group are experiencing an event compared to the control group.



Risk, Odds and Hazard

- In the results, the authors reported that the hazard ratio for death with the new treatment = 0.38 (95% CI, 0.28-0.53; P<0.0001).

- What does that mean?

Risk, Odds and Hazard

- In the results, the authors reported that the hazard ratio for death with the new treatment = 0.38 (95% CI, 0.28-0.53; P<0.0001).

- What does that mean?

- Patients in the new treatment group at any time point during the study period were 62% less likely to die than patients in the control group,

- we are 95% confident that the true value is lying between 47%-72%. (i.e. we are 95% sure that patients in the new treatment group were between 47% and 72% less likely to die than patients in the control group).

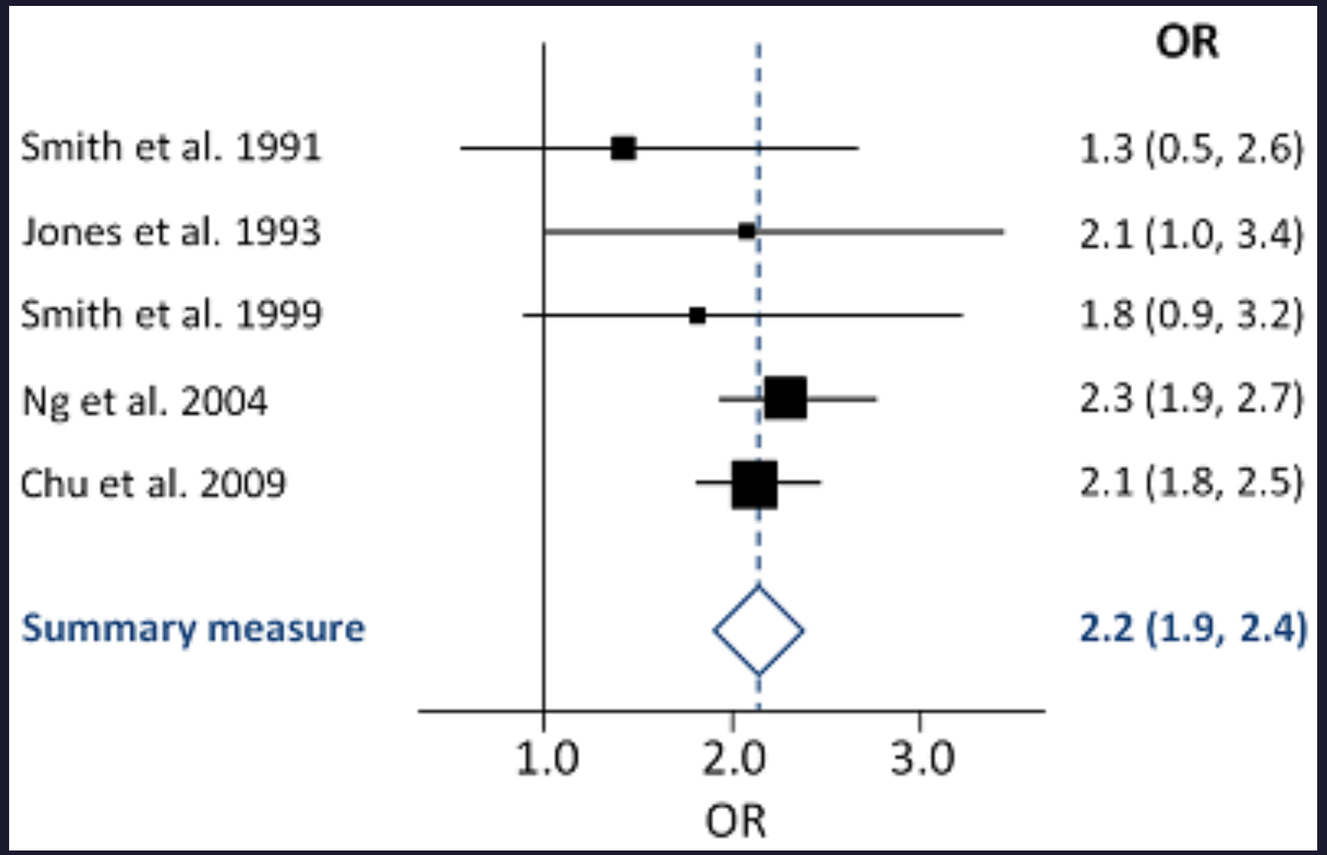
- The difference between the groups is statistically significant.

Meta analysis

Meta analysis

- Will not be covering how to perform this. Will be going over how to interpret blobbograms (more commonly called forest plots in medical literature).

- A fairly recent invention and have only been around for a couple of decades.

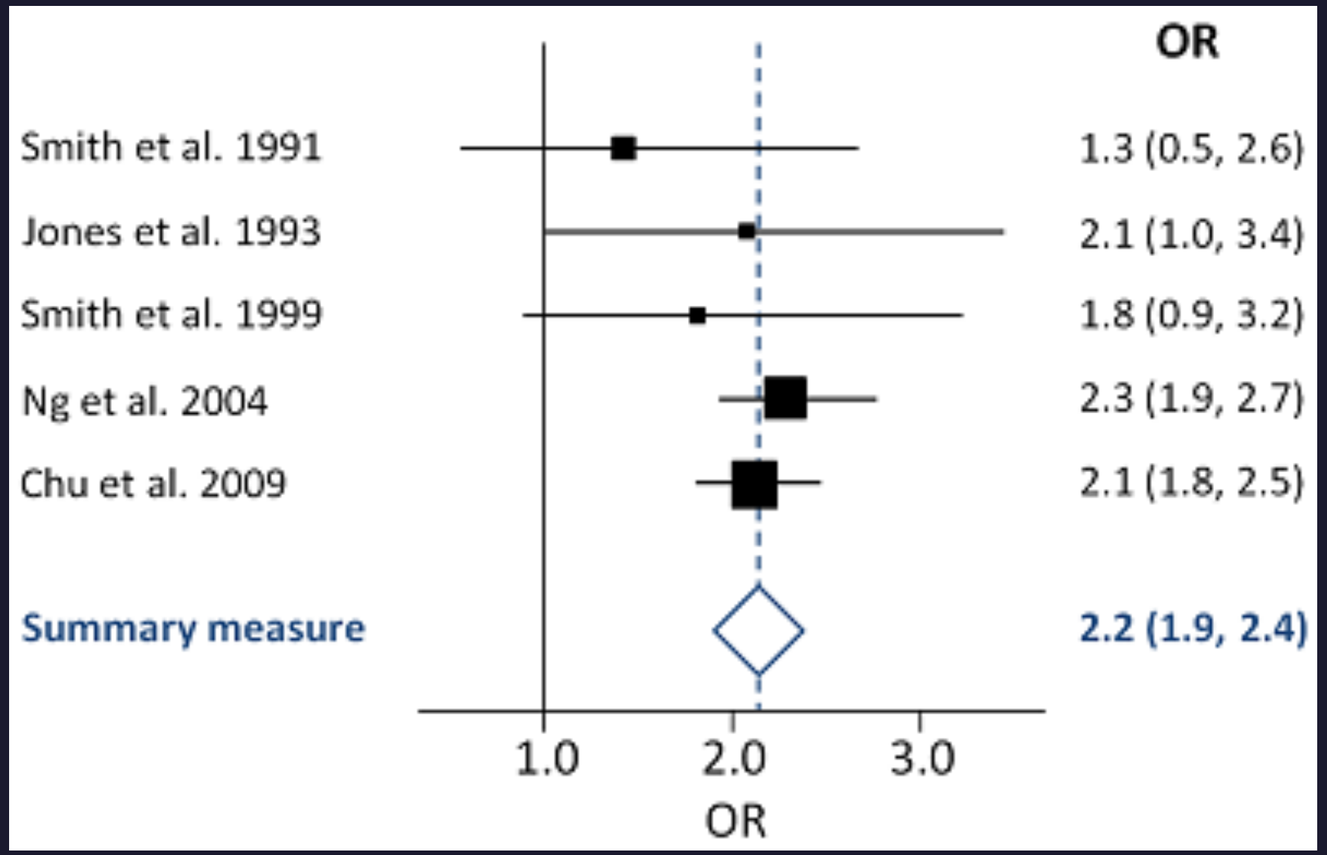


Meta analysis

- Parts of a forest plot:

- Vertical line of no effect
- Each square is a separate study with its confidence interval.
- Larger the square, the larger the sample size

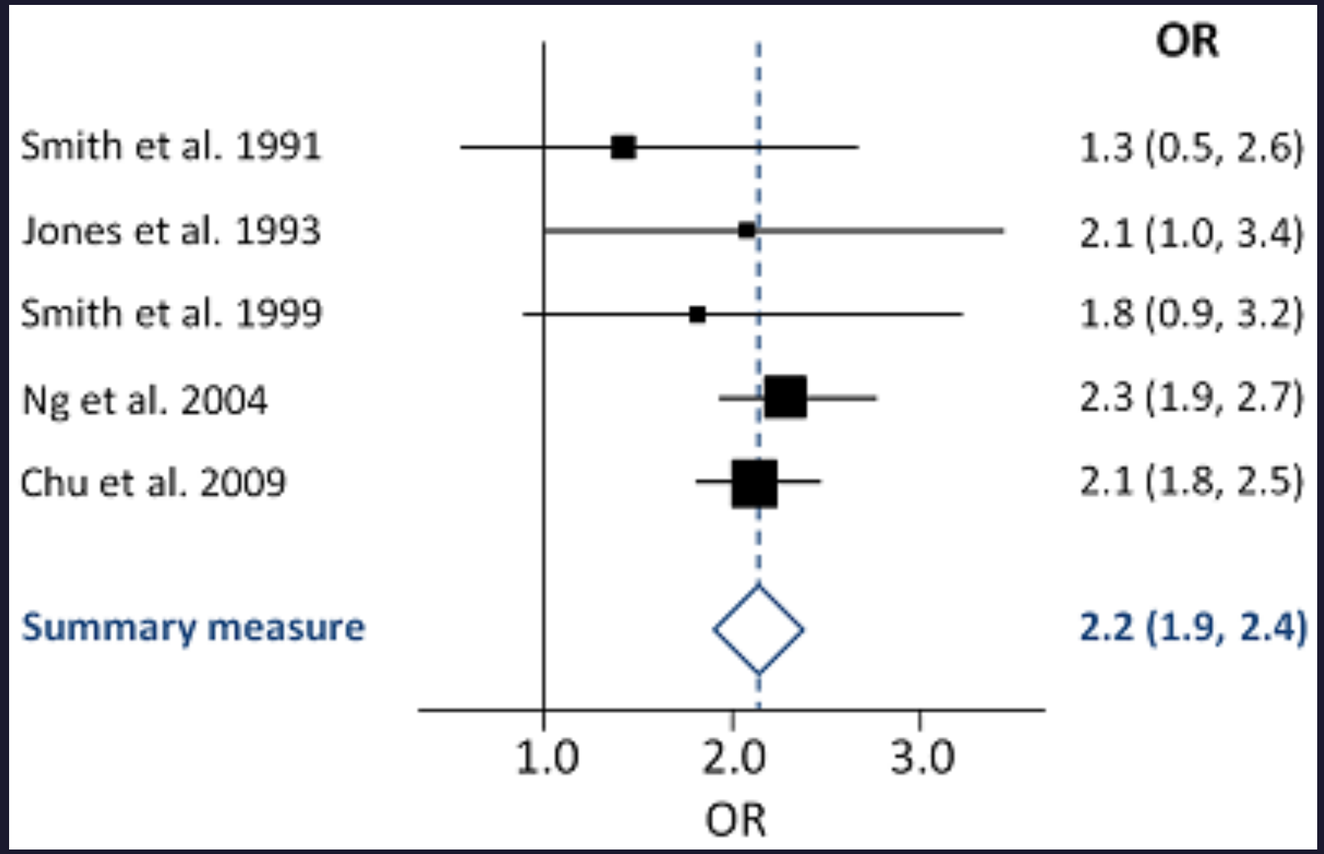
- Diamond at the bottom representing the weighted average. Width is confidence interval.



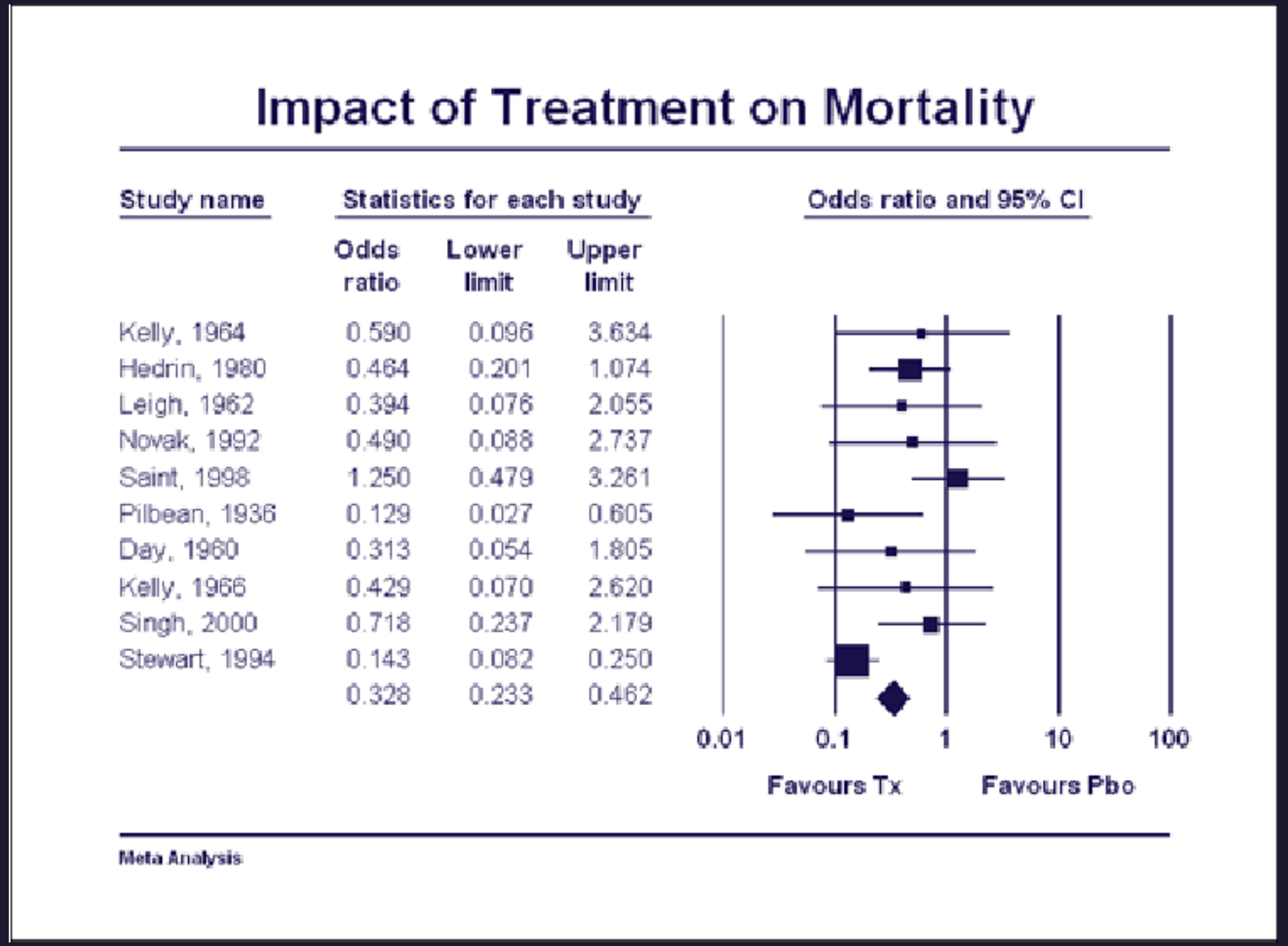
Meta analysis

- If the diamond’s width crosses the vertical line, you can conclude that the results of the study overall are not significant.

- If it doesn’t there is a significant difference.



Meta analysis



Any ideas?

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Winter Break Task Statistics

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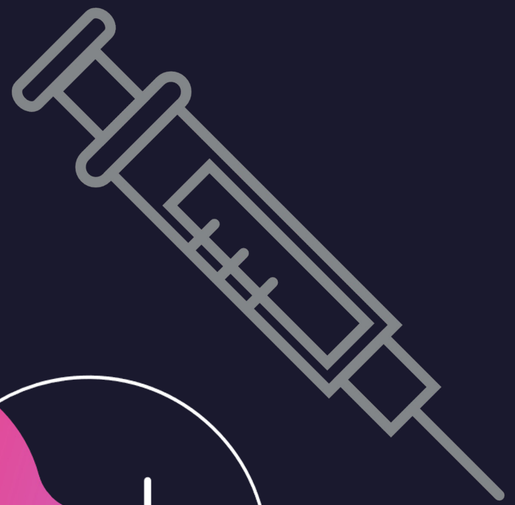
Statistics II



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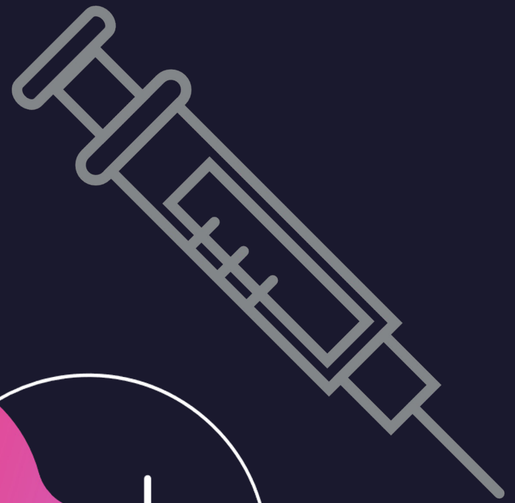
Statistics III



Statistics II

- Confidence Intervals
- Example on how to perform statistics (Graphpad Prism)
- Anything you would like to be recapped!

Presenters

Dr Hasaan Khan MBBS BSc (Hons)
FY1 SFP Doctor, Oxford

Confidence Intervals

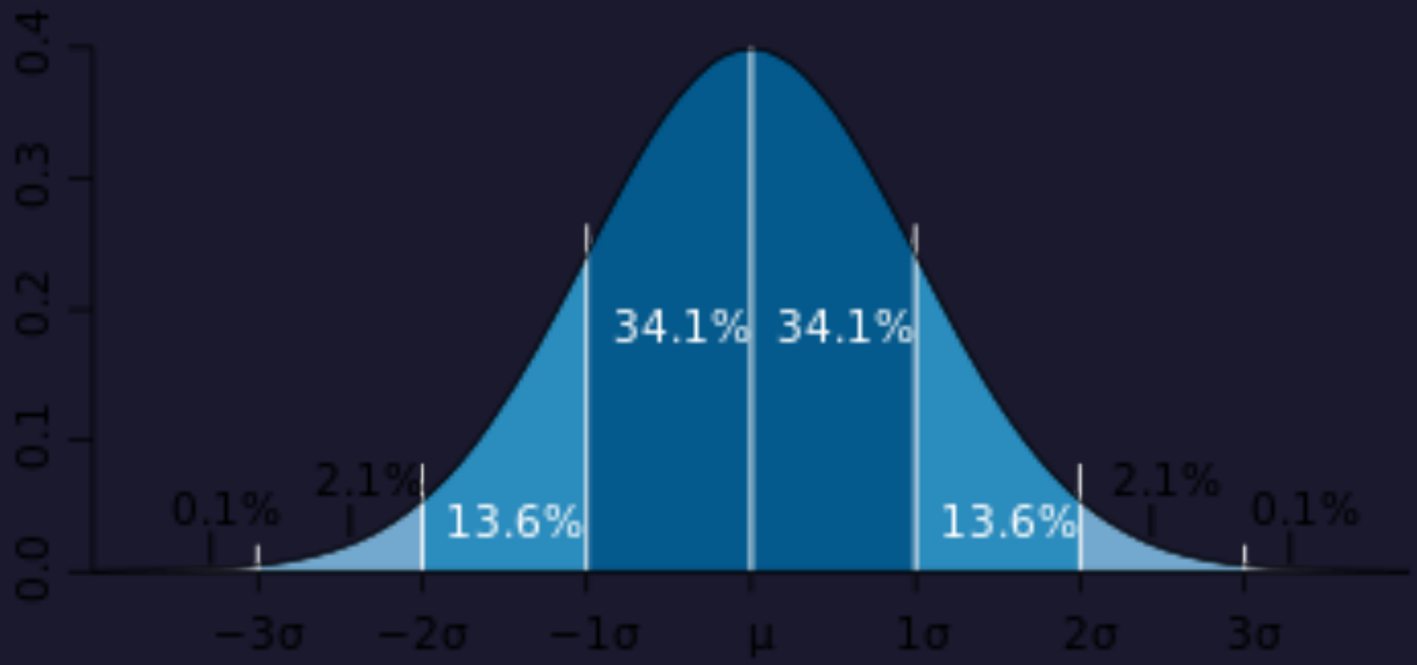
Confidence Intervals

- The “true value” is confounded by variables we cannot control.
- These variables cause natural variations in the data.
- There are different ways of commenting on this.

- Standard Deviation
- Standard Error of the Mean
- 95% Confidence Intervals

Confidence Intervals

- Standard deviation is one way of commenting on the spread/variability of the data.



Confidence Intervals

- A sample’s mean may not reflect the full population’s mean.

- Standard error of the mean (SEM) comments on how the sample’s mean compares to the actual theoretical population.

- SEM is equal to the standard deviation divided by the square root of the sample size

- As the size of the sample data grows larger, the SEM decreases

- This is because the sample is more representative of the population

- It tells us how certain we are of the mean

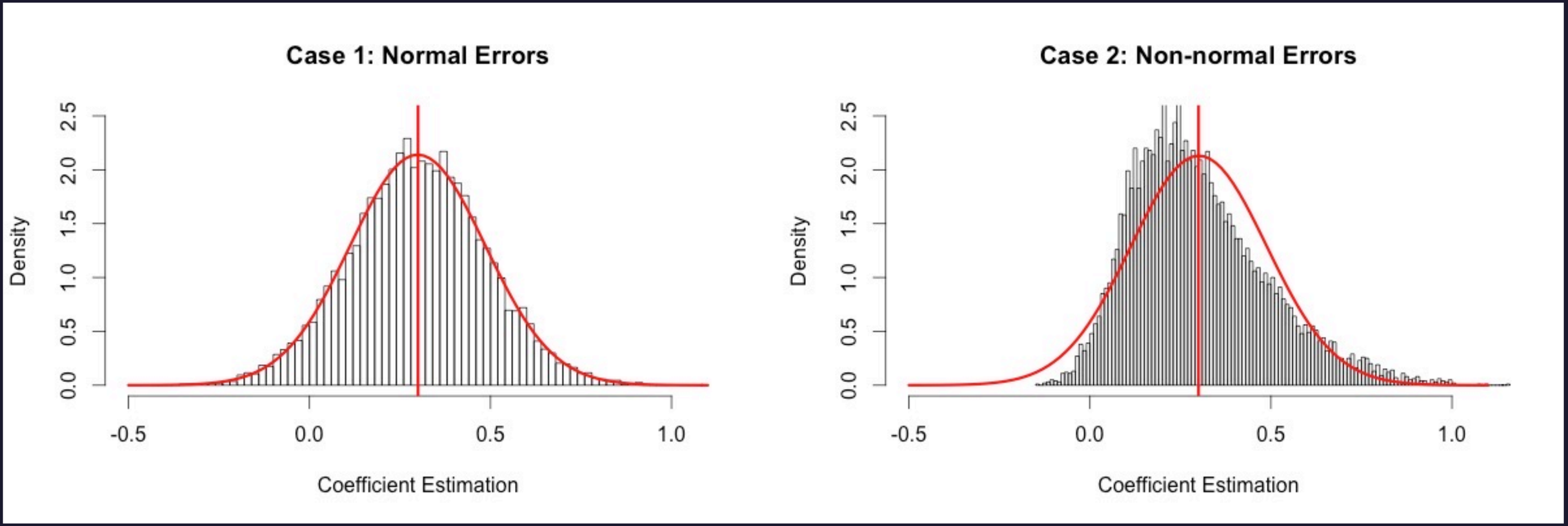
Confidence Intervals

- A 95% confidence interval is a range that we can say we are 95% sure that the true value is within the range.

- If we did an experiment 100 times:
- 95% will include the true value
- 5% wont

- A 95% confidence interval is calculated from the standard error of the mean.

Recap of statistics



- **For us to use parametric tests, the data has to be normally distributed**
- **If it is not, non-parametric tests are used**

Data setup	Parametric	Non-Parametric	Examples
1 variable (Continuous) 2 groups Between subjects	Independent t-test	Mann-Whitney U test	Difference in scores between two classes?
1 variable (Continuous) 2 groups Within the same subjects	Paired t-test	Wilcoxon Signed Rank Test	Difference in scores in students before and after a revision session?
1 Variable (Continuous) >2 groups Between subjects	One-way ANOVA	Kruskal Wallis Test	Difference in scores between three classes?
1 variable (Continuous) Looking at correlation	Pearson's R	Spearman's P	Is attendance over the year and test scores related?
1 variable (Categoric) Between two groups	Chi Squared Test Fischer's exact test		Is there a difference between the classes in the number of students who failed?

Interactive Task

Task

- I have some data of orthopaedic procedures done normally and with a robot.
- I want to answer the following questions:
- Does the robot group have less blood loss?
- Does the robot group require less transfusions?
- Do the procedures take the same amount of time?

Resources

Statistics How To

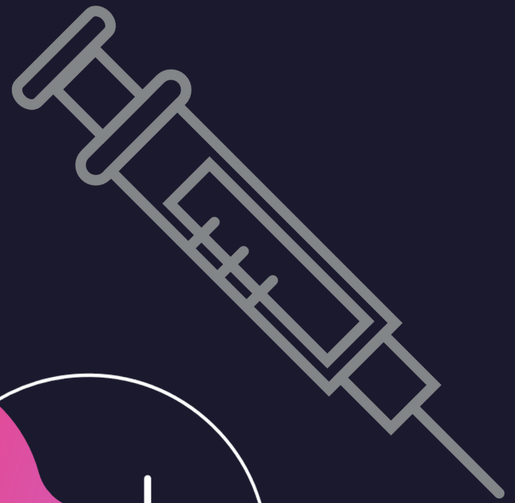
Statistics for the rest of us!

YouTube

GraphPad

ResearchEazy

Statistics III



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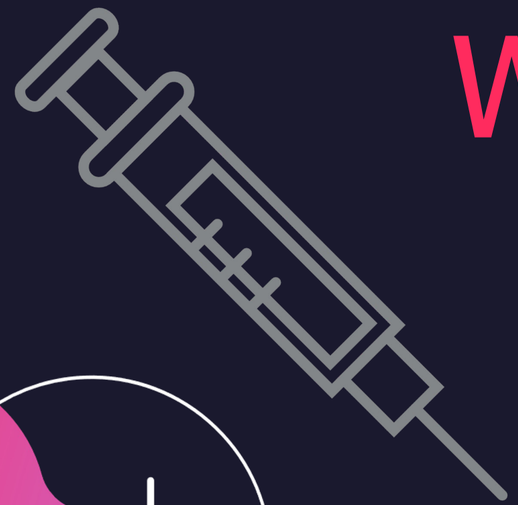
Writing a Paper: Abstract



Presenters

Dr Amar Rai MBBS BSc (Hons)
FY1 SFP Doctor, Imperial Healthcare Trust

Shivani Shukla BA (Hons)
5th Year Medical Student, University of Cambridge

What is an abstract ?

*A **summary** of your project/ work*
Usually about –one- paragraph

The Key

Understand the whole project from abstract (which is a summary)
Reports:
- The aim
- Methods
- Results
- Outcome and conclusion
- Keywords

When

- Complete a project
- Submit a research paper
- Research grants

Tips

- Abstract should be non-technical and make sense to readers not familiar with the field (non medics)
- Do no use abbreviations before defining them first
- Do not overthink
- Write in the flow then edit and cut down, most journals will have a pre-defined word count for the abstract
- Utilise the past or present tense

The aim/ introduction

- State the objective of the paper
- Explain the research question and your hypothesis
- Key points only! Should be 1-2 sentences

Methodology

- How did you collect the data in 2 lines
- Reader needs to understand the approach

Results

- Summarise the main results that answer the question
- No need to include all results
- Results should address the research question

Conclusion/ outcomes

- Now directly answer the initial research question
- Can mention a limitation/ impact on further research in this field

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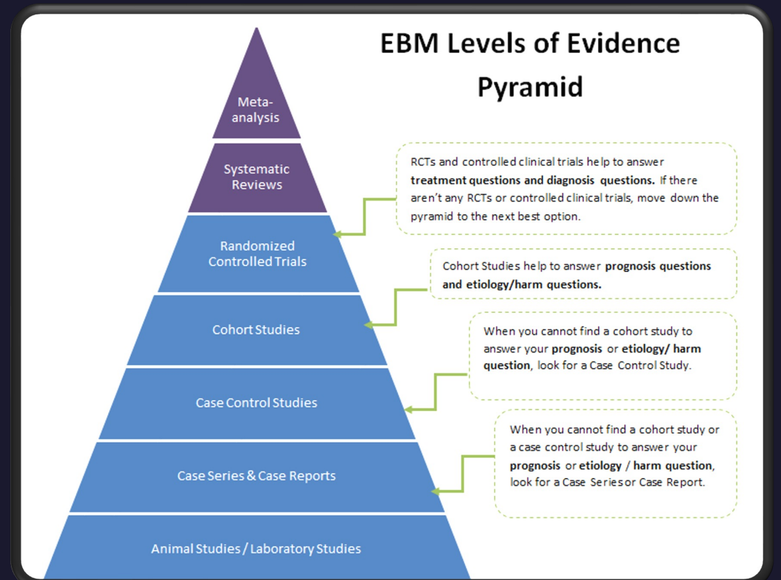
Cross-sectional study



RESEARCH Open Access

Evaluating the utility of an international webinar as a platform to educate students and doctors on the UK core surgical training portfolio

Siddarth Raj[1,2†], Harroop Bola[3*†], Amar Rai[3], Sarika Grover[1,2], Anisha Bandyopadhyay[1,2] and Vinci Naruka[4]

Abstract

Background: Core Surgical Training (CST) is a competitive two-year postgraduate training program in the UK that is scored based on three equally weighted stations: management, clinical and portfolio. Preparing a surgical portfolio can start in medical school, however, there is limited guidance on what forms a competitive portfolio with the majority of advice coming from university resources and national societies which are variable throughout the country. Our aim was to assess the utility of a webinar to educate students and doctors on the CST portfolio to address this disparity.

Methods: Pre- and post-event questionnaires that included demographic data, 10-point Likert scales to self-report confidence on the understanding of the CST portfolio and its domains, and questions on utilising webinars were distributed to attendees. Pre- and post-event responses were paired, and scores were assessed for normality via the Shapiro-Wilk test; the Mann-Whitney U test was used to assess statistical significance. Cohen's d effect sizes were calculated to report standardised differences between pre-and post-event scores.

Results: A total of 177 participants from over 24 countries responded to both questionnaires. A statistically significant improvement in awareness of how to score maximum points was demonstrated across all nine CST domains ($p < 0.0001$). Regardless of whether they were UK-based or international, approximately half of the participants stated a preference for a webinar over an in-person format. Interestingly, most attendees did not feel that their university had provided them with adequate information on preparing for a surgical career with over half of the attendees stating that they had to attend events by external organisations to obtain such information.

Conclusions: This study has demonstrated that a webinar can be effectively utilised to educate students and doctors on the various domains of the CST portfolio and how to maximise points in each section. Such events could address the variability of university resources and national societies across the country and provide equal opportunities for students. Further studies that directly compare webinars with in-person events and investigate long-term outcomes, such as success in CST applications, are required.

Keywords: Core Surgical Training; Portfolio; Webinar.

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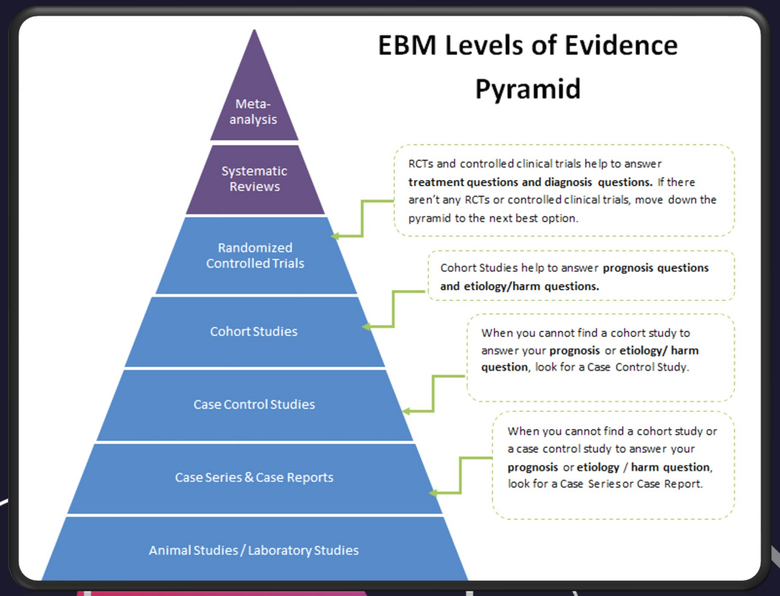
RCT



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The D-Health Trial: a randomised controlled trial of the effect of vitamin D on mortality

Prof Rachel E Neale, PhD • Catherine Baxter, BA • Briony Duarte Romero, BA • Donald S A McLeod, PhD • Prof Dallas R English, PhD • Prof Bruce K Armstrong, D Phil • et al. Show all authors

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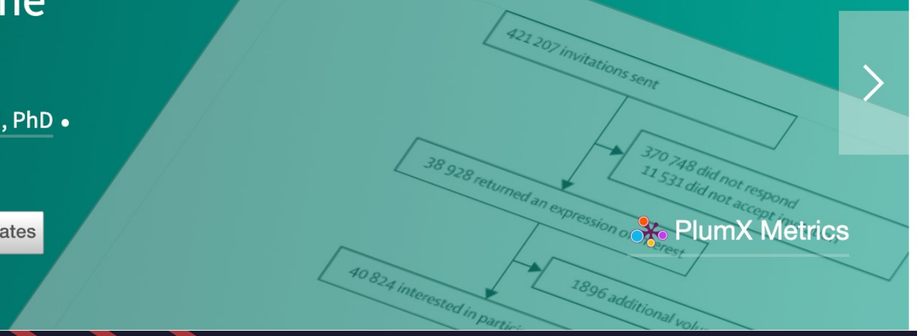

Abstract

Background: The effect of supplementing unscreened adults with vitamin D_3 on mortality is unclear. We aimed to determine whether monthly doses of vitamin D_3 influenced mortality in older Australians.

Methods: We did a randomised, double-blind, placebo-controlled trial of oral vitamin D_3 supplementation (60 000 IU per month) in Australians 60 years or older who were recruited across the country via the Commonwealth electoral roll. Participants were randomly assigned (1:1), using automated computer-generated permuted block randomisation, to receive one oral gel capsule of either 60 000 IU vitamin D_3 or placebo once a month for 5 years. Participants, staff, and investigators were blinded to study group allocation. The primary endpoint was all-cause mortality assessed in all participants who were randomly assigned. We also analysed mortality from cancer, cardiovascular disease, and other causes. Hazard ratios (HRs) and 95% CIs were generated using flexible parametric survival models. This trial is registered with the Australian New Zealand Clinical Trials Registry, ACTRN12613000743763.

Findings: Between Feb 14, 2014, and June 17, 2015, we randomly assigned 21 315 participants, including 10 662 to the vitamin D group and 10 653 to the placebo group. In 4441 blood samples collected from randomly sampled participants (N=3943) during follow-up, mean serum 25-hydroxy-vitamin D concentrations were 77 (SD 25) in the placebo group and 115 (SD 30) nmol/L in the vitamin D group. Following 5 years of intervention (median follow-up 5·7 years [IQR 5·4-6·7]), 1100 deaths were recorded (placebo 538 [5·1%]; vitamin D 562 [5·3%]). 10 661 participants in the vitamin D group and 10 649 participants in the placebo group were included in the primary analysis. Five participants (one in the vitamin D group and four in the placebo group) were not included as they requested to be withdrawn and their data to be destroyed. The HR of vitamin D_3 effect on all-cause mortality was 1.04 [95% CI 0·93 to 1·18]; p=0·47)and the HR of vitamin D_3 effect on cardiovascular disease mortality was 0·96 (95% CI 0·72 to 1·28; p=0·77). The HR for cancer mortality was 1·15 (95% CI 0·96 to 1·39; p=0·13) and for mortality from other causes it was 0·83 (95% CI 0·65 to 1·07; p=0·15). The odds ratio for the per-protocol analysis was OR 1·18 (95% CI 1·00 to 1·40; p=0·06). In exploratory analyses excluding the first 2 years of follow-up, those randomly assigned to receive vitamin D had a numerically higher hazard of cancer mortality than those in the placebo group (HR 1·24 [95% CI 1·01-1·54]; p=0·05).

Interpretation: Administering vitamin D_3 monthly to unscreened older people did not reduce all-cause mortality. Point estimates and exploratory analyses excluding the early follow-up period were consistent with an increased risk of death from cancer. Pending further evidence, the precautionary principle would suggest that this dosing regimen might not be appropriate in people who are vitamin D-replete.

Funding: The D-Health Trial is funded by National Health and Medical Research Council.

Does an application reduce BP?

Introduction

Methods

Results

Discussion

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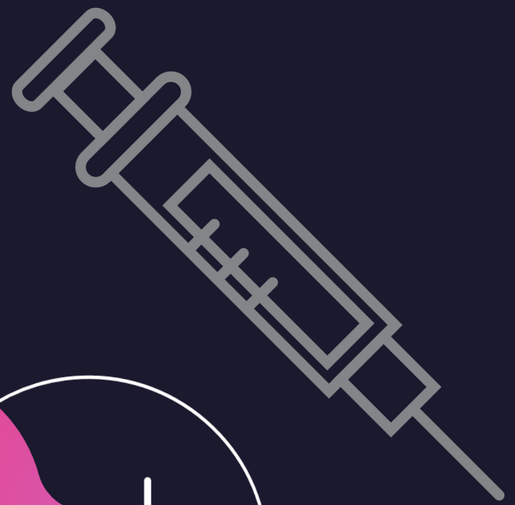
Your turn!

Read the paper and plan your own abstract

Surgical Boot Camps Increases Confidence for Residents Transitioning to Senior Responsibilities



Aim: Surgical residents face limited autonomy and duty hour restrictions, which makes training them for senior roles with additional responsibilies challenging. Surgical bootcamps are known to increase the confidence of medical students and interns, but their impact on PGY2 trainees is unknown. We hypothesised that a bootcamp would improve the confidence of PGY-2 residents entering new clinical roles.

Methods: A one off bootcamp was implemented for PGY2 residents (n=31) between 2016 and 2017. Pre and post bootcamp confidence was measured for surgical scenarious using a 1-5 Likert Scale. A 3 month follow up survey was recorded.

Results: Partipants reported increased confidence in placing central lines ($p < 0.001$), chest tubes ($p = 0.01$), managing emergency airways ($p < 0.001$), running a code ($p = 0.03$), and senior resident responsibilites ($p < 0.001$). Three-month followup in 2017 ($n = 10$) demonstrated no difference in confidence compared to postboot camp results

Conclusion: Bootcamps provide residents increased confidence in assuming senior roles. Further research can be carried out to understand the longterm influence of bootcamps on confidence and whether this translated to improved clinical proficiency.

Key words:

Medical Protection

GEEKY MEDICS

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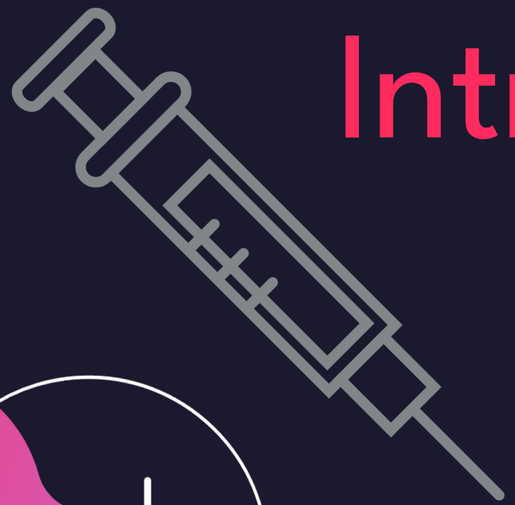
Intro and Discussion



Intro and Discussion

- Structure of discussion
- Structure of Introduction

Presenters

Dr Hasaan Khan MBBS BSc (Hons)
FY1 SFP Doctor, Oxford

Discussion

Discussion

- Summarise the results

- What are the main results in your study
- Is this significant?
- How does your study compare to the literature?

Discussion

- How does your study compare to the literature

- make a table on excel containing the DOI, year of paper, methods, results and how it adds to your study.

- Seminal and recent literature

Discussion

- Critical appraisal

- https://www.equator-network.org/

- jbi.global/critical-appraisal-tools

Discussion

- Compare with other literature

- P.E.E.D.C = point, evidence, explanation, detail, contrast

- Difference in methodologies, samples, definitions + effect

Discussion

- Discuss strengths and limitations

- Not just “more research” or “larger sample”

- Future directions of your study

Conclusion

- Conclusion

- 4-5 lines

- Importance of study

  What was found

- What can be learnt from this

Introduction

Introduction

- What is the condition

- Epidemiology
- Current information
- Gaps in knowledge

Introduction

- Purpose of study

- Aims of study

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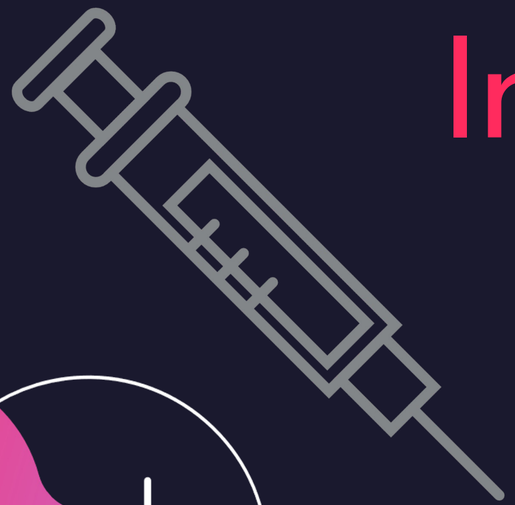
Introduction and Discussion



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Appraising Clinical Research

Dr Talal Fazmin

FY2 at Royal Papworth Hospital, Cambridge
Teaching By-Fellow at Churchill College, University of Cambridge

Appraising clinical research

- Cohort studies vs. randomised controlled trials
- Assessing the validity of a study
- Brief introduction to statistics
- Randomisation and confounding factors
- Real life research examples

Validity

- Internal validity
  - Is the study designed appropriately to answer the question it is asking?
  - Have bias and confounders been accounted for?
  - Have appropriate sample sizes been chosen?
- External validity
  - Is the studied sample comparable to the whole population?
  - How generalisable is the result to the general population (of the country/world)?

RCTs vs Cohort Studies

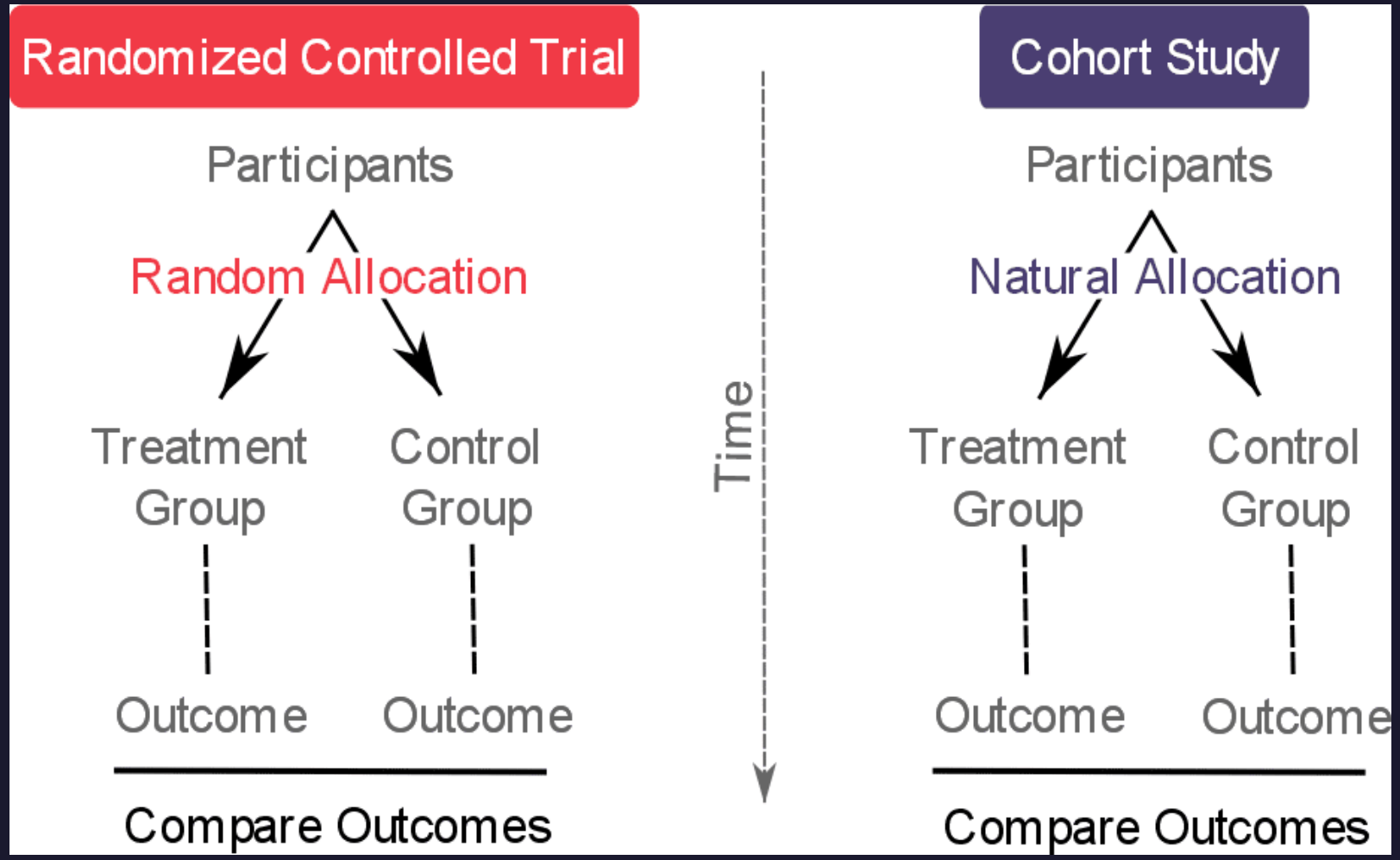
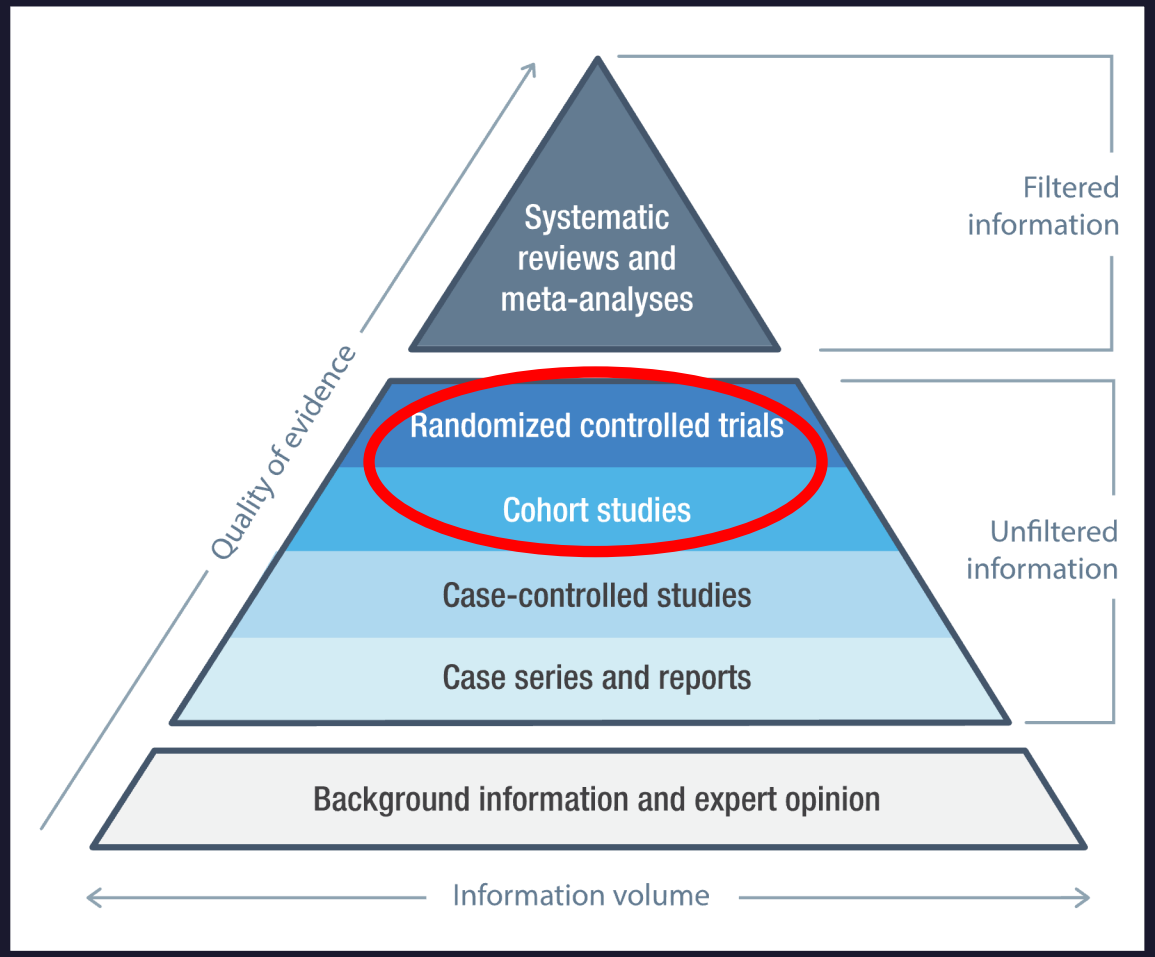


Image source: https://quantifyinghealth.com/cohort-vs-randomized-controlled-trials/

Pyramid of Evidence



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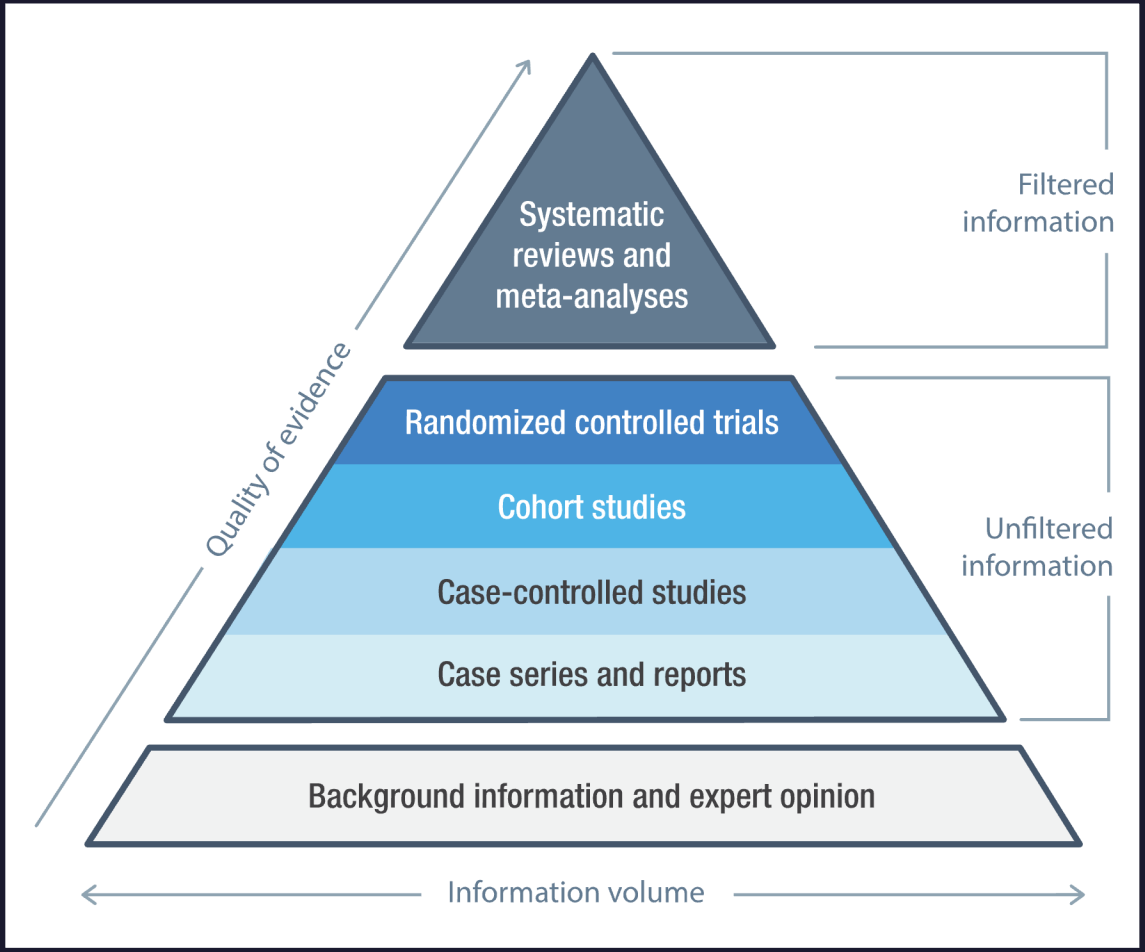

Randomised controlled studies

Cohort studies

Randomised controlled studies

THE LANCET

Volume 400, Issue 10367, 3–9 December 2022, Pages 1938-1952

Articles

Safety, tolerability and efficacy of up-titration of guideline-directed medical therapies for acute heart failure (STRONG-HF): a multinational, open-label, randomised, trial

Cohort studies

Original Investigation | Oncology

November 21, 2022

Colorectal Cancer Stage at Diagnosis Before vs During the COVID-19 Pandemic in Italy

Matteo Rottoli, MD, PhD[1,2]; Alice Gori, MD[1,2]; Gianluca Pellino, MD, PhD[3,4]; et al

Author Affiliations | Article Information

JAMA Netw Open. 2022;5(11):e2243119. doi:10.1001/jamanetworkopen.2022.43119

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Primary outcome: readmission to hospital with heart failure or all cause mortality

Randomised controlled studies

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Retrospectively looked at patients undergoing surgery for colorectal cancer before and during the pandemic

Primary outcome: advanced cancer stage

Randomised controlled studies

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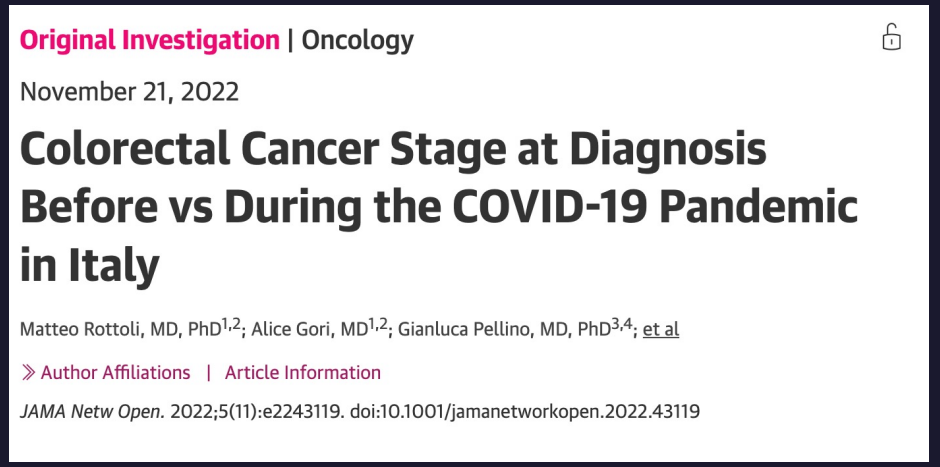
Safety, tolerability and efficacy of up-titration of guideline-directed medical therapies for acute heart failure (STRONG-HF): a multinational, open-label, randomised, trial

- Interventional
- Can be blinded
- ”Gold standard” of clinical research

Cohort studies



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- Observational
- Work well for exposures with high prevalence
- Use when randomisation is unethical / impossible

Randomised controlled studies

Study design:

- Randomisation
- Blinding
- Intention to treat vs per protocol analysis

Randomised controlled studies

Blinding

- Unblinded
- Single-blinded
- Double-blinded

Helps reduce bias

Randomised controlled studies

Randomisation

- Random allocation of patients into intervention or control group

Randomisation and masking

Eligible patients were randomly assigned (1:1) to usual care or intensification of treatment with β blocker, and ACE inhibitor (or ARB) or ARN inhibitor, and a mineralocorticoid receptor antagonist (ie, high-intensity care). A central statistician generated the randomisation scheme, which was stratified by LVEF (≤40% *vs* >40%) and country, with blocks of size 30 within strata, with randomly ordered sub-blocks of size 2, 4, and 6. A central interactive web response system was used so that investigators had no knowledge of upcoming treatment assignments. Because of the nature of the interventions, the investigators and patients were not masked to treatment allocation. However, the investigators and monitors at the sites had no access to aggregate data in any stage of the study. Members of the DSMB were not masked to treatment assignment.

Helps reduce confounding

Randomised controlled studies

STRONG-HF

Central statistician generated randomisation

A web portal was used to allocate patients when enrolling patients

Investigators at each centre did now know which arm a patient would be allocated to

Randomisation and masking

Eligible patients were randomly assigned (1:1) to usual care or intensification of treatment with β blocker, and ACE inhibitor (or ARB) or ARN inhibitor, and a mineralocorticoid receptor antagonist (ie, high-intensity care). A central statistician generated the randomisation scheme, which was stratified by LVEF (≤40% *vs* >40%) and country, with blocks of size 30 within strata, with randomly ordered sub-blocks of size 2, 4, and 6. A central interactive web response system was used so that investigators had no knowledge of upcoming treatment assignments. Because of the nature of the interventions, the investigators and patients were not masked to treatment allocation. However, the investigators and monitors at the sites had no access to aggregate data in any stage of the study. Members of the DSMB were not masked to treatment assignment.

Randomised controlled studies

Intention to treat vs per protocol analysis

- ITT – include all patients who are randomised to a group
- Per protocol analysis – include only patients who actually had treatment

Choice of protocol impacts external validity

A brief intro to statistics

- Statistics enable us to:
  - estimate the magnitude of associations
  - test hypotheses

- The appropriate statistical test must be used
  - Each test has certain assumptions to be met
  - For example, a common test is the *Students T-test* which is only valid for normally distributed data
  - For non-normally distributed data, the *Mann-Whitney U-test* must be used

A brief intro to statistics

- Statistics help compare groups and accept or reject hypotheses

- For example:

Table 1 from the Covid-CRC study

Table 1. Characteristics of the Sample, Overall and by Period of Surgery

Variable	Overall sample (N = 17 938)	Prepandemic period (January 2018 to February 2020) (n = 10 142)	Pandemic period (March 2020 to December 2021) (n = 7796)	Difference between prepandemic and pandemic periods (95% CI)	*P* value[a]
Age, mean (SD), y	70.6 (12.2)	70.5 (12.0)	70.7 (14.0)	−0.2 (−0.5 to 0.2)	.40
Age class, No. (%)					.048[b]
<60 y	3437 (19.2)	1950 (19.2)	1487 (19.1)	0.1 (−1.0 to 1.3)	.80
60-69 y	3969 (22.1)	2286 (22.5)	1683 (21.6)	0.9 (0.3 to 2.2)	.13
70-79 y	5766 (32.1)	3296 (32.5)	2470 (31.7)	0.8 (−0.6 to 2.2)	.25
≥80 y	4766 (26.6)	2610 (25.7)	2156 (27.7)	−1.9 (−3.2 to −0.6)	.004
Sex, No. (%)					
Men	10 007 (55.8)	5724 (56.4)	4283 (54.9)	−1.5 (−3.0 to 0.0)	.045
Women	7931 (44.2)	4418 (43.6)	3513 (45.1)		
Asymptomatic disease, No. (%)	3153 (17.6)	1941 (19.1)	1212 (15.6)	3.6 (2.5 to 4.7)	<.001
Positive fecal occult blood test screening result, No./total No. (%)	4529/17 174 (26.4)	2583/9694 (26.6)	1946/7480 (26.0)	0.6 (−0.7 to 2.0)	.35
Location, No. (%)					
Right or transverse colon	7750 (43.2)	4387 (43.3)	3363 (43.1)	0.1 (−1.3 to 1.6)	.87
Left colon	5253 (29.3)	2932 (28.9)	2321 (29.8)	−0.9 (−2.2 to 0.5)	.21
Rectum	4935 (27.5)	2823 (27.8)	2112 (27.1)	0.7 (−0.6 to 2.1)	.27
Tumor histologic type					
Adenocarcinoma	17 626 (98.3)	9992 (98.5)	7634 (97.9)	0.6 (0.2 to 1.0)	.002
Squamous cell carcinoma	145 (0.8)	76 (0.8)	69 (0.9)	−0.1 (−0.4 to 0.1)	.31
No histology (palliative surgery)	167 (0.9)	74 (0.7)	93 (1.2)	−0.5 (−0.7 to −0.2)	.001
AJCC tumor stage, No. (%)					.005[b]
0	523 (2.9)	302 (3.0)	221 (2.8)	0.1 (−0.4 to 0.6)	.57
1	3976 (22.2)	2361 (23.3)	1615 (20.7)	2.6 (1.3 to 3.8)	<.001
2a	4598 (25.6)	2550 (25.1)	2048 (26.3)	−1.1 (−2.4 to 0.2)	.09
2b-c	764 (4.3)	408 (4.0)	356 (4.6)	−0.5 (−1.1 to 0.1)	.07
3a	568 (3.2)	342 (3.4)	226 (2.9)	0.5 (0.0 to 1.0)	.07
3b	3351 (18.7)	1908 (18.8)	1443 (18.5)	0.3 (−0.8 to 1.5)	.61
3c	1083 (6.0)	592 (5.8)	491 (6.3)	−0.5 (−1.2 to 0.2)	.20
4	2583 (14.4)	1411 (13.9)	1172 (15.0)	−1.1 (−2.2 to −0.1)	.03
No stage[c]	492 (2.7)	268 (2.6)	224 (2.9)	−0.2 (−0.7 to 0.3)	.35
Synchronous cancers, No./total No. (%)	545/15 710 (3.5)	273/8903 (3.1)	272/6807 (4.0)	−0.9 (−1.5 to −0.4)	.002
Synchronous adenomas, No./total No. (%)	3372/15 684 (21.5)	1825/8869 (20.6)	1547/6815 (22.7)	−2.1 (−3.4 to −0.8)	.001
BMI, mean (SD)	25.6 (4.8)	25.6 (4.8)	25.5 (4.9)	0.1 (0.0 to 0.3)	.09
BMI category, No./total No. (%)					.02[b]
<18	218/14 295 (1.5)	120/8067 (1.5)	98/6228 (1.6)	−0.1 (−0.5 to 0.3)	.68
18-24	5976/14 295 (41.8)	3312/8067 (41.1)	2664/6228 (42.8)	−1.7 (−3.3 to −0.1)	.04
25-29	5909/14 295 (41.3)	3362/8067 (41.7)	2547/6228 (40.9)	0.8 (−0.1 to 2.4)	.35
30-34	1680/14 295 (11.8)	976/8067 (12.1)	704/6228 (11.3)	0.8 (−0.3 to 1.9)	.14
≥35	512/14 295 (3.6)	297/8067 (3.7)	215/6228 (3.5)	0.2 (−0.4 to 0.8)	.46
Primary outcome, No. (%)					
Advanced stage	8841 (49.3)	4929 (48.6)	3912 (50.2)	−1.5 (−3.1 to −0.1)	.04
Secondary outcomes, No. (%)					
Distant metastasis	2583 (14.4)	1411 (13.9)	1172 (15.0)	−1.1 (−2.2 to −0.1)	.03
T4	1450 (8.1)	758 (7.5)	692 (8.9)	−1.4 (−2.2 to −0.6)	.001
Stenotic lesion	2611 (14.6)	1396 (13.8)	1215 (15.6)	−1.8 (−2.9 to −0.8)	.001
Urgent surgery	2025 (11.3)	1076 (10.6)	949 (12.2)	−1.6 (−2.5 to −0.6)	.001
Palliative surgery	1379 (7.7)	735 (7.3)	644 (8.3)	−1.0 (−1.8 to −0.2)	.01
Aggressive biology, No./total No. (%)	12 207/17 446 (70.0)	6656/9874 (67.4)	5551/7572 (73.3)	−5.9 (−7.3 to −4.5)	<.001

Abbreviations: AJCC, American Joint Committee on Cancer; BMI, body mass index (calculated as weight in kilograms divided by height in meters squared).

[a] *t* Test and χ^2 test for continuous and categorical variables, respectively.

[b] *P* value for trend.

[c] No stage included cancers that were not removed by palliative surgery or that had a pathologic complete response after neoadjuvant therapy.

A brief intro to statistics

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4	2583 (14.4)	1411 (13.9)	1172 (15.0)	−1.1 (−2.2 to −0.1)	.03
No stage[c]	492 (2.7)	268 (2.6)	224 (2.9)	−0.2 (−0.7 to 0.3)	.35
Synchronous cancers, No./total No. (%)	545/15 710 (3.5)	273/8903 (3.1)	272/6807 (4.0)	−0.9 (−1.5 to −0.4)	.002
Synchronous adenomas, No./total No. (%)	3372/15 684 (21.5)	1825/8869 (20.6)	1547/6815 (22.7)	−2.1 (−3.4 to −0.8)	.001
BMI, mean (SD)	25.6 (4.8)	25.6 (4.8)	25.5 (4.9)	0.1 (0.0 to 0.3)	.09
BMI category, No./total No. (%)					.02[b]
<18	218/14 295 (1.5)	120/8067 (1.5)	98/6228 (1.6)	−0.1 (−0.5 to 0.3)	.68
18-24	5976/14 295 (41.8)	3312/8067 (41.1)	2664/6228 (42.8)	−1.7 (−3.3 to −0.1)	.04
25-29	5909/14 295 (41.3)	3362/8067 (41.7)	2547/6228 (40.9)	0.8 (−0.1 to 2.4)	.35
30-34	1680/14 295 (11.8)	976/8067 (12.1)	704/6228 (11.3)	0.8 (−0.3 to 1.9)	.14
≥35	512/14 295 (3.6)	297/8067 (3.7)	215/6228 (3.5)	0.2 (−0.4 to 0.8)	.46
Primary outcome, No. (%)					
Advanced stage	8841 (49.3)	4929 (48.6)	3912 (50.2)	−1.5 (−3.1 to −0.1)	.04
Secondary outcomes, No. (%)					
Distant metastasis	2583 (14.4)	1411 (13.9)	1172 (15.0)	−1.1 (−2.2 to −0.1)	.03
T4	1450 (8.1)	758 (7.5)	692 (8.9)	−1.4 (−2.2 to −0.6)	.001
Stenotic lesion	2611 (14.6)	1396 (13.8)	1215 (15.6)	−1.8 (−2.9 to −0.8)	.001
Urgent surgery	2025 (11.3)	1076 (10.6)	949 (12.2)	−1.6 (−2.5 to −0.6)	.001
Palliative surgery	1379 (7.7)	735 (7.3)	644 (8.3)	−1.0 (−1.8 to −0.2)	.01
Aggressive biology, No./total No. (%)	12 207/17 446 (70.0)	6656/9874 (67.4)	5551/7572 (73.3)	−5.9 (−7.3 to −4.5)	<.001

Abbreviations: AJCC, American Joint Committee on Cancer; BMI, body mass index (calculated as weight in kilograms divided by height in meters squared).

[a] *t* Test and χ^2 test for continuous and categorical variables, respectively.

[b] *P* value for trend.

[c] No stage included cancers that were not removed by palliative surgery or that had a pathologic complete response after neoadjuvant therapy.

A brief intro to statistics

Table 1 from the Covid-CRC study

Table 1. Characteristics of the Sample, Overall and by Period of Surgery

Variable	Overall sample (N = 17 938)	Prepandemic period (January 2018 to February 2020) (n = 10 142)	Pandemic period (March 2020 to December 2021) (n = 7796)	Difference between prepandemic and pandemic periods (95% CI)	*P* value[a]
Age, mean (SD), y	70.6 (12.2)	70.5 (12.0)	70.7 (14.0)	−0.2 (−0.5 to 0.2)	.40
Age class, No. (%)					.048[b]
<60 y	3437 (19.2)	1950 (19.2)	1487 (19.1)	0.1 (−1.0 to 1.3)	.80
60-69 y	3969 (22.1)	2286 (22.5)	1683 (21.6)	0.9 (0.3 to 2.2)	.13
70-79 y	5766 (32.1)	3296 (32.5)	2470 (31.7)	0.8 (−0.6 to 2.2)	.25
≥80 y	4766 (26.6)	2610 (25.7)	2156 (27.7)	−1.9 (−3.2 to −0.6)	.004
Sex, No. (%)					
Men	10 007 (55.8)	5724 (56.4)	4283 (54.9)	−1.5 (−3.0 to 0.0)	.045
Women	7931 (44.2)	4418 (43.6)	3513 (45.1)		

Age is compared using the Students T Test (continuous data, normal distribution)

Sex is compared using the Chi-square test (categorical data, large sample size)

A brief intro to statistics

- Statistics can also be used to adjust for confounding variables

- In the Covid-CRC study:
  - Patients with advanced colorectal cancer tended to be younger, have disease of the rectum or left colon

- So, perhaps during the pandemic, the patients who underwent surgery were younger / had left sided disease?
  - I.e. the pandemic was confounded by patient selection

A brief intro to statistics

- So, perhaps during the pandemic, the patients who underwent surgery were younger / had left sided disease?
  - I.e. the pandemic was confounded by patient selection
- They used a multivariable logistic regression model
  - Used variables of age, sex, location of tumour, and pandemic period
- Even with the inclusion of the other variables, the pandemic period was still associated with advanced cancer stage at time of operation

Power calculations

How do you decide how many patients to enrol in a study?

Power calculations

- Let's think of an example study:
- Drug X claims to reduce risk of death from myocardial infarctions
- RCT: Drug X vs placebo in the ED for STEMI patients
- There are two hypotheses to test:
  - Null hypothesis (Drug X is no different to placebo)
  - Alternative hypothesis (Drug X is different to placebo)

Power calculations

- There are two types of errors we can make:
  - Type I error: rejecting the null hypothesis when it is true – FALSE POSITIVE
  - Type II error: rejecting the alternative hypothesis when it is true – FALSE NEGATIVE

- Power calculations help you decide how big of a sample size to choose to avoid a type II error

Power calculations

- Why is sample size important?
- Too low a sample size – may unnecessarily conclude that there is no effect of Drug X
- Too high a sample size – increased costs, longer time to recruit, more likely to get a false positive

Power calculations

- Power calculations are determined by:
  - Level of significance set by the researcher
  - The effect size

- In our example of Drug X
  - Assume the background mortality rate of untreated STEMI is 75%
  - Propose that Drug X reduces mortality by 10%
  - What number of patients will give the study an 80% chance of detecting this difference

Power calculations

- Example from the STRONG-HF study:

Sample size calculation

Based on prior studies, a 90-day event rate of 20% for death or readmission in patients admitted for AHF and receiving usual care was assumed in this study.[19–21] With an exponential dropout of < 1%, and assuming constant and proportional hazards (i.e. exponential survival), 450 patients per study arm provides approximately 80% power for the log-rank test to detect a relative risk reduction of 35% (13% vs. 20%, or a hazard ratio of 0.624) at the two-sided 0.05 significance level. Power was estimated using SAS Proc Power (SAS Institute Inc., Cary, NC, USA).

Power calculations

- Example from the STRONG-HF study:

- Based on an assumed event rate of 20% in the usual treatment group
- Assuming a relative risk reduction of 35% (i.e. 13% vs 20%)
- And aiming for 80% detection chance

- Sample size of 450 patients per group

Sample size calculation

Based on prior studies, a 90-day event rate of 20% for death or readmission in patients admitted for AHF and receiving usual care was assumed in this study.[19–21] With an exponential dropout of < 1%, and assuming constant and proportional hazards (i.e. exponential survival), 450 patients per study arm provides approximately 80% power for the log-rank test to detect a relative risk reduction of 35% (13% vs. 20%, or a hazard ratio of 0.624) at the two-sided 0.05 significance level. Power was estimated using SAS Proc Power (SAS Institute Inc., Cary, NC, USA).

Example critique

STRONG-HF

Key results: 8% absolute risk reduction of primary endpoint (readmission with heart failure or all-cause mortality) in high intensity group (17%) vs usual therapy (25%)

Strong points: multicentre study – 81 hospitals across 14 countries, central randomisation, study design published before recruitment (Eur Heart Journal)

Weak points:

- Non blinded
- limited generalisability to UK population due to:
  - intensive nature of follow up (lack of resources in the NHS)
  - population studied (90% of the study sample was from Africa / Russia) - e.g. TOPCAT study showed wide geographical variation in outcomes

Example critique

COVID-CRC

Key finding: 7% higher odds of having advanced stage colorectal cancer when operated on during the pandemic vs during the pre-pandemic period

- Strong points: multicentre trial, large sample size, logistic regression model to account for any confounders

- Weak points: did not explicit mention power calculation but large sample size, cannot comment on mortality as this was not accounted for, only 30 day follow up

In summary

1. Randomised controlled trials are the gold standard of *unfiltered* clinical research
2. Randomisation helps overcome confounding and bias
3. Cohort studies are the next best option when randomisation is impossible / unethical
4. Paying attention to the statistical methods and power calculations helps appraise the validity of the study
5. External validity is equally important

Further reading

- Coursera: Epidemiology for Public Health https://www.coursera.org/specializations/public-health-epidemiology
- Intention to treat vs per protocol analyses https://doi.org/10.1111/nep.13709
- Clinical trial design (superiority vs inferiority vs non-inferiority) https://www.certara.com/knowledge-base/trial-designs-non-inferiority-vs-superiority-vs-equivalence/
- Relative risk vs odds ratio https://doi.org/10.1136/bmj.g1407 and https://doi.org/10.4103/2229-3485.167092
- Textbook: *An Introduction to Medical Statistics* – Martin Brand (Published by Oxford University Press)

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Literature Reviews

Dr Talal Fazmin

FY2 at Royal Papworth Hospital, Cambridge
Teaching By-Fellow at Churchill College, University of Cambridge

Literature reviews

- Introduction
- Systematic review
- Searching for studies
- Bias and quality
- Interpreting findings
- Writing up

Narrative reviews

Like an essay on the topic

Use informal and subjective methods to collect and interpret information

Systematic review

A review of the evidence on a clearly formulated question that uses systematic and explicit methods to identify, select and critically appraise relevant primary research, and to extract and analyse data from the studies that are included in the review*

* NHS Centre for Reviews and Dissemination

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Systematic review

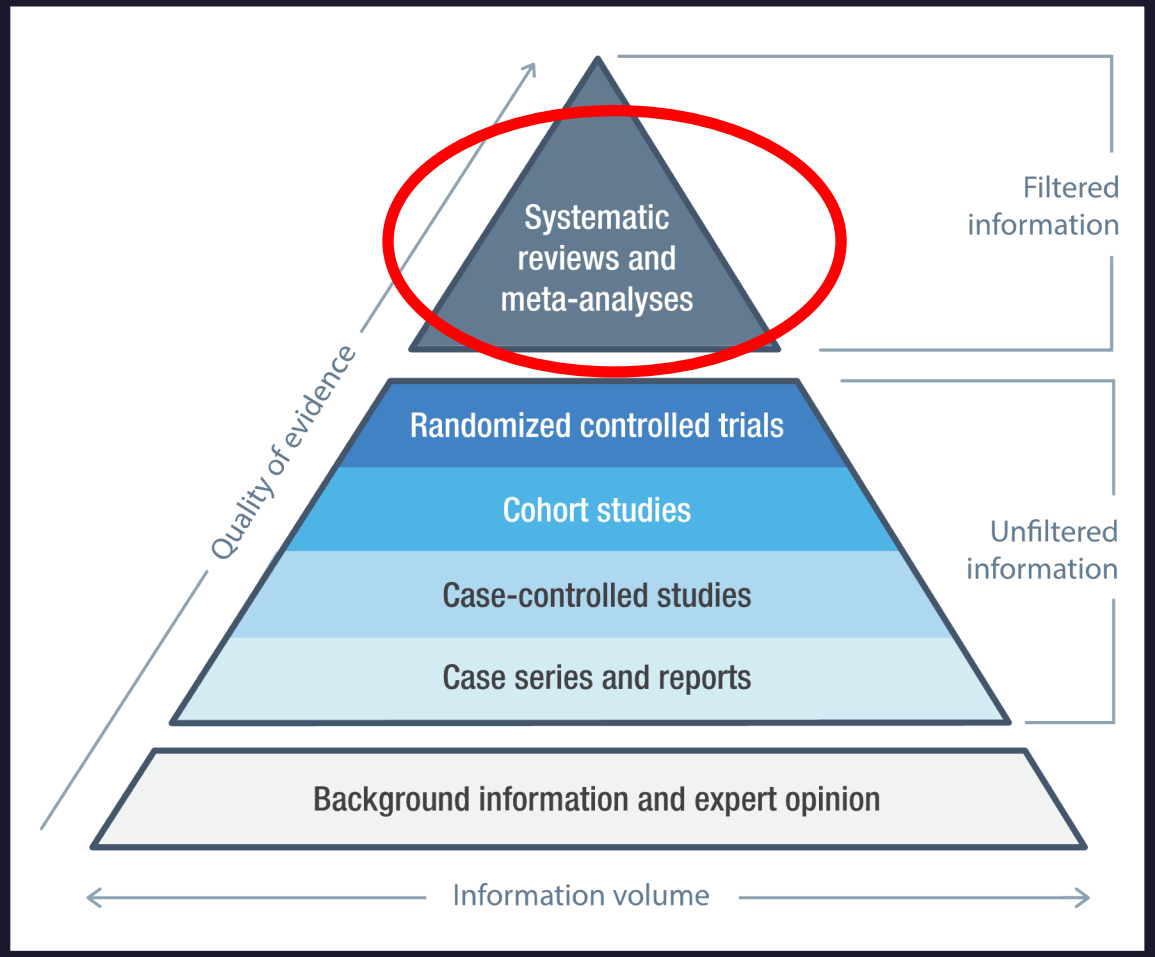
Clearly formulated question

Systematic and explicit methods

Identify, select and critically appraise relevant research

Extract and analyse data from included studies

Pyramid of Evidence



Systematic vs. Narrative reviews

- Scientific approach to a review article
- Criteria determined at outset
- Comprehensive search for relevant articles
- Explicit methods of appraisal and synthesis
- Meta-analysis may be used to combine data

- Depend on authors' inclination (bias)
- Author gets to pick any criteria
- Search any databases

- Methods not usually specified
- Vote count or narrative summary
- Can't replicate review

Advantages of systematic reviews

- Reduce bias
- Replicability
- Resolve controversy between conflicting studies
- Identify gaps in current research
- Provide reliable basis for decision making

Limitations of systematic reviews

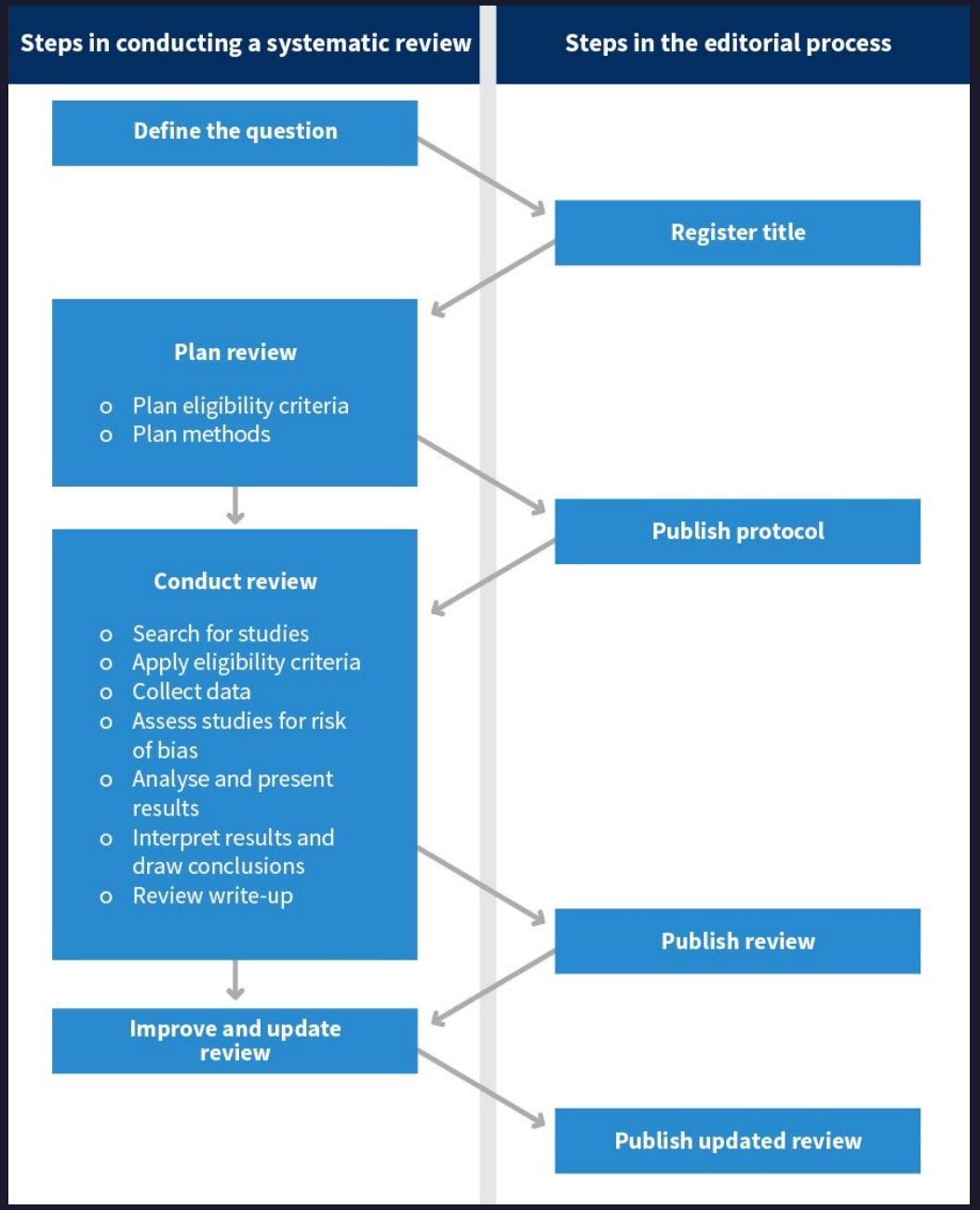
- Results may still be inconclusive
- There may be no trials/evidence
- The trials may be of poor quality
- The intervention may be too complex to be tested by a trial
- Practice does not change just because you have the evidence of effect/effectiveness

Designing a systematic review

Structured, systematic process involving several steps :

1. Formulate the question
2. Plan the review
3. Comprehensive search
4. Unbiased selection and abstraction process
5. Critical appraisal of data
6. Synthesis of data (may include meta-analysis)
7. Interpretation of results
8. Reporting the review
9. All steps described explicitly in the review

The (ideal) process



Asking questions

- Intervention review
- Diagnostic test accuracy review
- Prognostic review
- Methodological review
- Qualitative review

Asking questions

Effectiveness:

- Does the intervention work/not work?
- Who does it work/not work for?

Other important questions:

- How does the intervention work?
- Is the intervention appropriate?
- Is the intervention feasible?
- Is the intervention and comparison relevant?

The PICO framework

A description of the populations	P
An identified intervention	I
An explicit comparison	C
Relevant outcomes	O

An example of PICO (T)

Problem, population	Intervention	Comparison	Outcome	Types of studies
Patients aged 18-65 with coronary artery disease of the left main stem	a) Coronary artery bypass grafting surgery b) Percutaneous coronary intervention	a) Surgery vs b) PCI	a) Major adverse cardiac events b) Death	a) RCT

Designing the protocol

Study selection

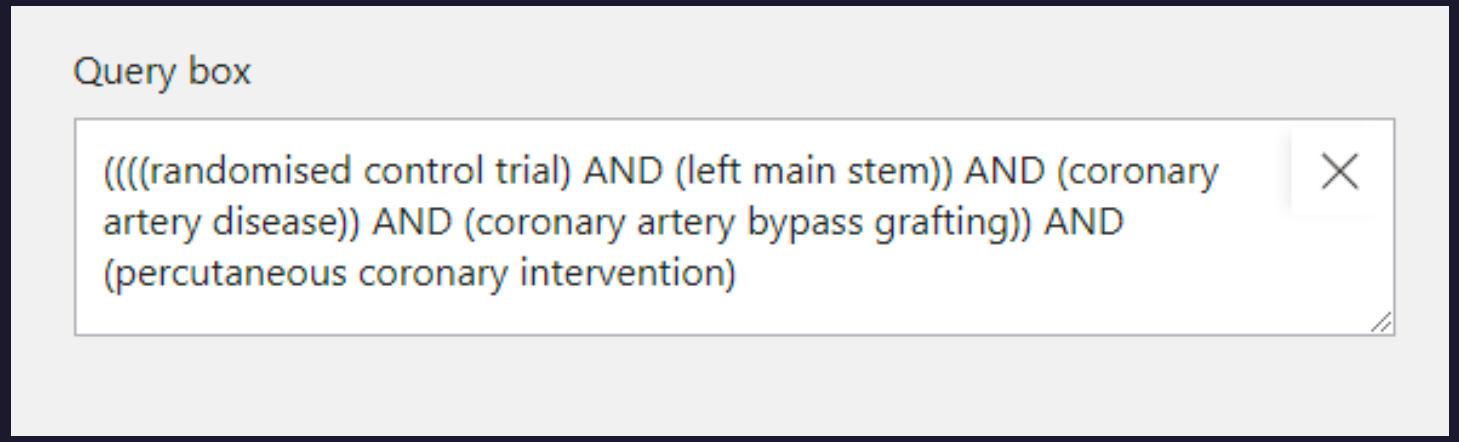
- whether two authors will independently assess studies;
- process of assessment (e.g., screening abstracts, then full text);
- how disagreements will be managed;
- any other methods used to select the studies (including the use of software).

Data collection

- data categories to be collected;
- whether two authors will independently collect data;
- piloting and use of instructions for data collection form;
- how disagreements will be managed;
- what attempts will be made to obtain or clarify data from study authors;
- processes for managing missing data

Searching the literature

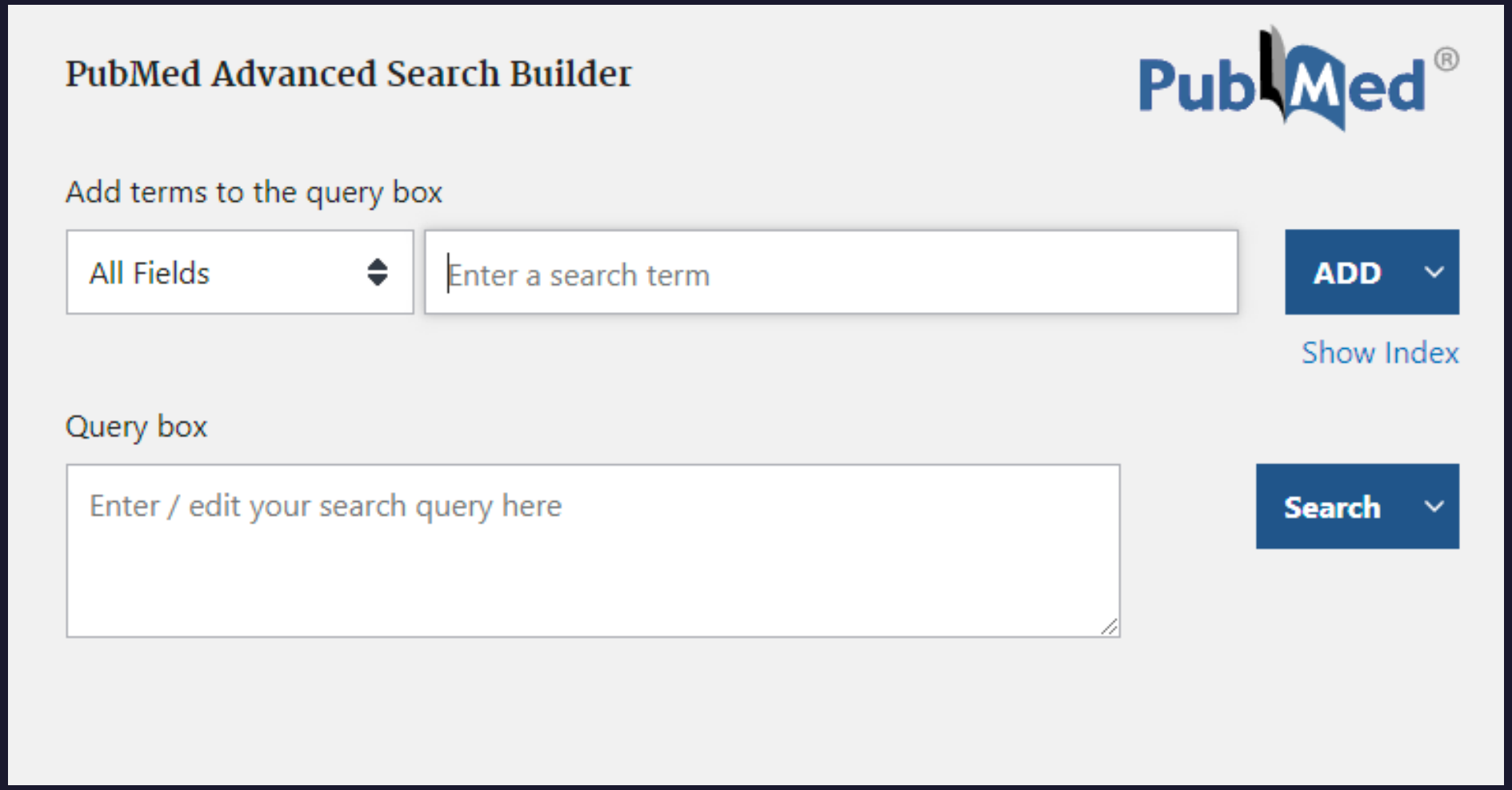
- Clear research question
- Comprehensive search
- Decide on: language restriction, unpublished and published literature, timeframe
- Document the search (replicability)



Searching the literature

1. Describe each PICO component
2. Start with one database (e.g. PubMed, EMBASE)
3. Find synonyms
    a) Identify MeSH / descriptors / subject headings
    b) Add textwords
4. Examine abstracts
5. Use search strategy in other databases (may need adapting)

Searching the literature

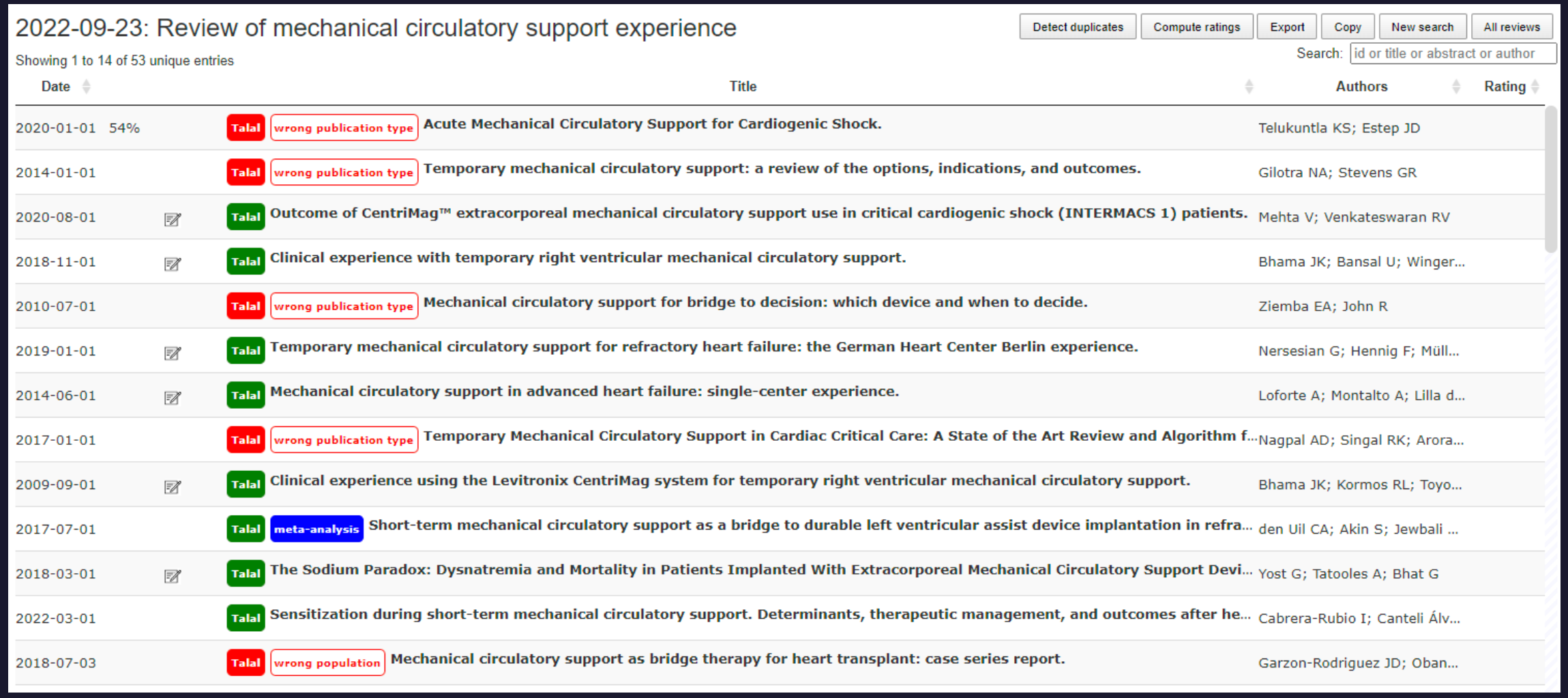


Selecting studies

- Keep accurate records and track
- Summarise total number of records identified in your search
- Identify the number excluded at each stage of the screening process
- Provide reasons for exclusions
- Present a PRISMA flow diagram.
- Keeping records complete

Selecting studies

Recommended resource: rayyan.ai



2022-09-23: Review of mechanical circulatory support experience

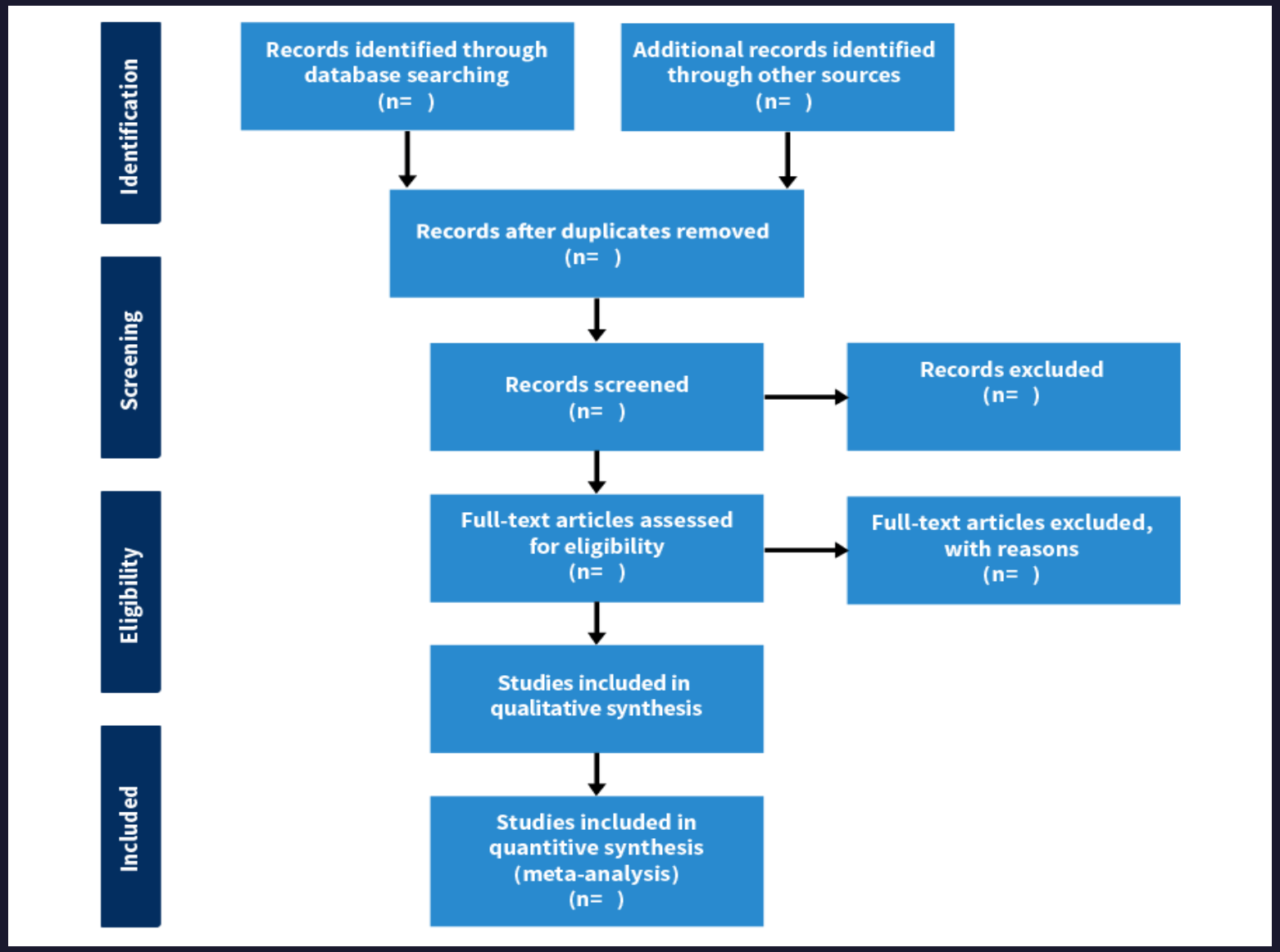
Detect duplicates | Compute ratings | Export | Copy | New search | All reviews

Showing 1 to 14 of 53 unique entries

Search: id or title or abstract or author

Date	Title	Authors	Rating
2020-01-01 54%	Talal wrong publication type Acute Mechanical Circulatory Support for Cardiogenic Shock.	Telukuntla KS; Estep JD	
2014-01-01	Talal wrong publication type Temporary mechanical circulatory support: a review of the options, indications, and outcomes.	Gilotra NA; Stevens GR	
2020-08-01	Talal Outcome of CentriMag™ extracorporeal mechanical circulatory support use in critical cardiogenic shock (INTERMACS 1) patients.	Mehta V; Venkateswaran RV	
2018-11-01	Talal Clinical experience with temporary right ventricular mechanical circulatory support.	Bhama JK; Bansal U; Winger...	
2010-07-01	Talal wrong publication type Mechanical circulatory support for bridge to decision: which device and when to decide.	Ziemba EA; John R	
2019-01-01	Talal Temporary mechanical circulatory support for refractory heart failure: the German Heart Center Berlin experience.	Nersesian G; Hennig F; Müll...	
2014-06-01	Talal Mechanical circulatory support in advanced heart failure: single-center experience.	Loforte A; Montalto A; Lilla d...	
2017-01-01	Talal wrong publication type Temporary Mechanical Circulatory Support in Cardiac Critical Care: A State of the Art Review and Algorithm f...	Nagpal AD; Singal RK; Arora...	
2009-09-01	Talal Clinical experience using the Levitronix CentriMag system for temporary right ventricular mechanical circulatory support.	Bhama JK; Kormos RL; Toyo...	
2017-07-01	Talal meta-analysis Short-term mechanical circulatory support as a bridge to durable left ventricular assist device implantation in refra...	den Uil CA; Akin S; Jewbali ...	
2018-03-01	Talal The Sodium Paradox: Dysnatremia and Mortality in Patients Implanted With Extracorporeal Mechanical Circulatory Support Devi...	Yost G; Tatooles A; Bhat G	
2022-03-01	Talal Sensitization during short-term mechanical circulatory support. Determinants, therapeutic management, and outcomes after he...	Cabrera-Rubio I; Canteli Álv...	
2018-07-03	Talal wrong population Mechanical circulatory support as bridge therapy for heart transplant: case series report.	Garzon-Rodriguez JD; Oban...	

The PRISMA statement



Minimizing bias in selection

- Pre-specified inclusion criteria
- Considering study design as inclusion criterion
- Independent study selection
- At least two people
- Statistical analysis of inter-observer reliability

Assessing risk of bias in included studies

Type of bias	Description
Selection bias.	Systematic differences between baseline characteristics of the groups that are compared.
Performance bias.	Systematic differences between groups in the care that is provided, or in exposure to factors other than the interventions of interest.
Detection bias.	Systematic differences between groups in how outcomes are determined.
Attrition bias.	Systematic differences between groups in withdrawals from a study.
Reporting bias.	Systematic differences between reported and unreported findings.

Analysing the data

- Three of the most common effect measures for a dichotomous outcome are:
- risk ratios (also known as relative risk);
- odds ratios;
- risk difference (also known as absolute risk reduction).

Risk ratio

- To calculate the risk ratio (RR), take the risk in the intervention group, and divide it by the risk in the control group.
- Risk is calculated by dividing the number of events by the total number of people in a group.

- Example: Intervention group deaths 3/10 -> 30%
- Control group deaths 5/10 -> 50%
- Risk ratio = 30/50 = 60%

Odds ratio

- The odds ratio (OR) takes the odds of an event in the intervention group and divides them by the odds in the control group.
- Odds are calculated by dividing the number of events by the number of non-events.

- Example: Intervention group deaths 3/10 -> 30%
- Control group deaths 5/10 -> 50%
- Odds ratio = 3 to 7 versus 5 to 5 odds -> 42%

Risk difference

- RD is an absolute measure, giving you the absolute difference between the risks in each group.
- Assess risk (events/total no. of population) in the intervention group and subtract the risk in the control group.

- Example: Intervention group deaths 3/10 -> 30%
- Control group deaths 5/10 -> 50%
- Absolute risk reduction = 50 – 30 = 20%

Analysis

- Other forms of analysis after combining studies include subgroup analysis if the studies are quite heterogenous (different)
- In any case, it is worth consulting a medical statistician when designing your meta analysis protocl

Writing the review

Background

Objectives

Methods

Results

The Background section of the protocol should put your review in the context of what you already know, and the questions you want to answer.

Writing the review

Background	Single sentence Derived from the research question
Objectives	Should relate to the PICO elements In particular the population, intervention and comparison
Methods	Stay focused on the question
Results	

Writing the review

Background

Objectives

Methods

Results

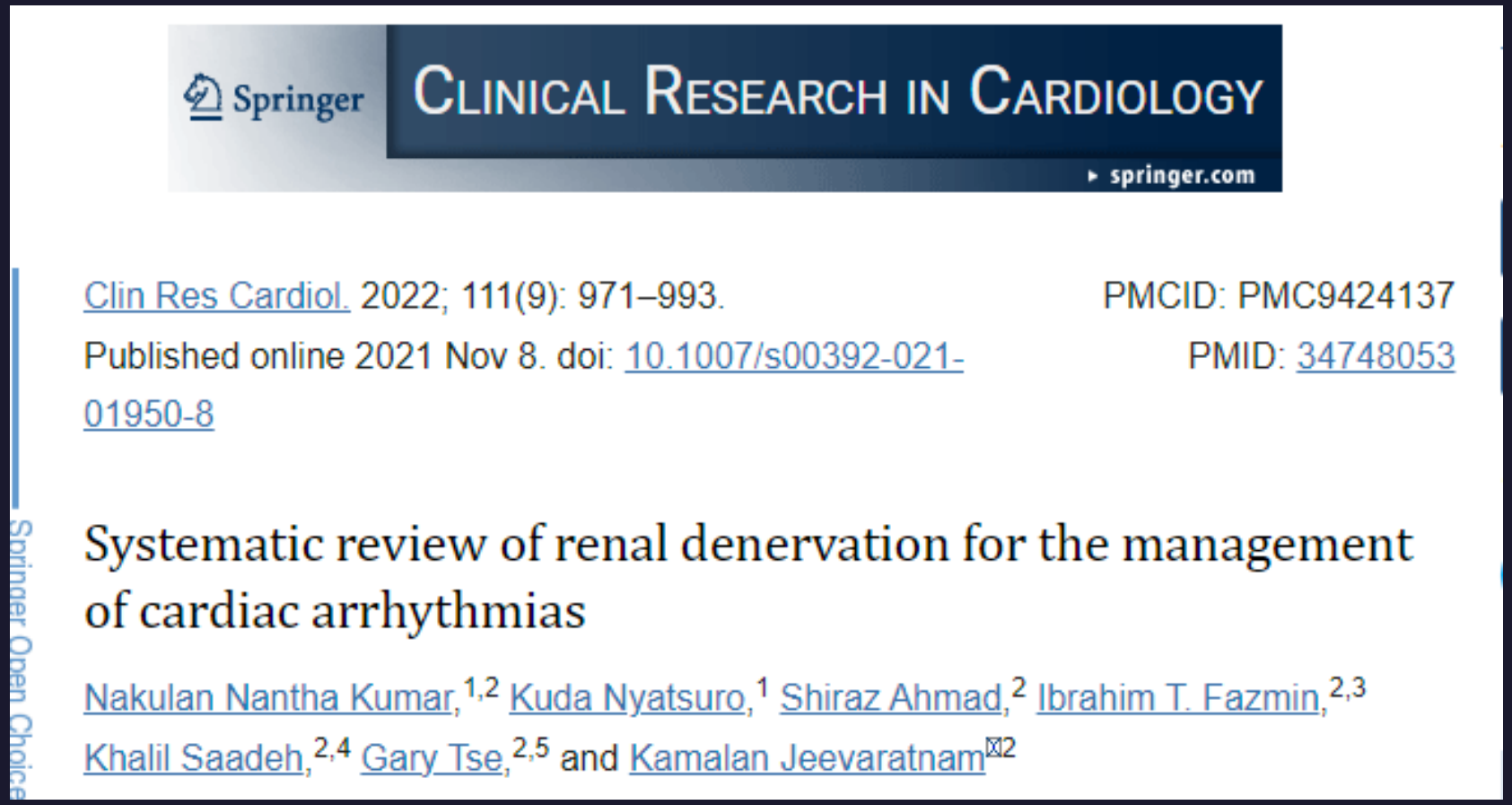
Describe planned methods in details but keep it short

Use the Cochrane Handbook, and it's guidance based on the latest methodological research

Anticipate finding sufficient studies

Keep broad inclusion criteria, and rationale for exclusion

An example



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Clin Res Cardiol. 2022; 111(9): 971–993.
Published online 2021 Nov 8. doi: 10.1007/s00392-021-01950-8

PMCID: PMC9424137
PMID: 34748053

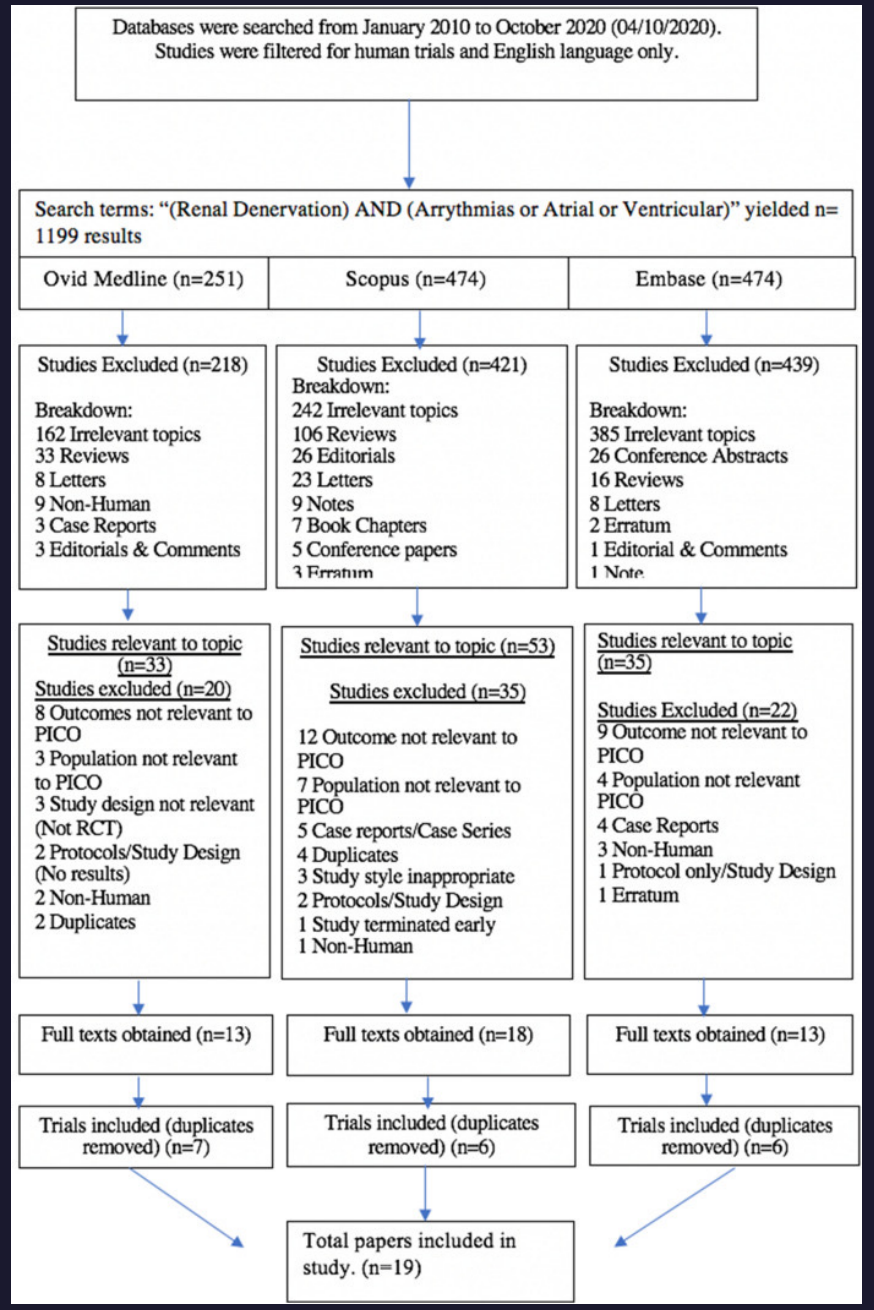
Springer Open Choice

Systematic review of renal denervation for the management of cardiac arrhythmias

Nakulan Nantha Kumar,[1,2] Kuda Nyatsuro,[1] Shiraz Ahmad,[2] Ibrahim T. Fazmin,[2,3] Khalil Saadeh,[2,4] Gary Tse,[2,5] and Kamalan Jeevaratnam[2]

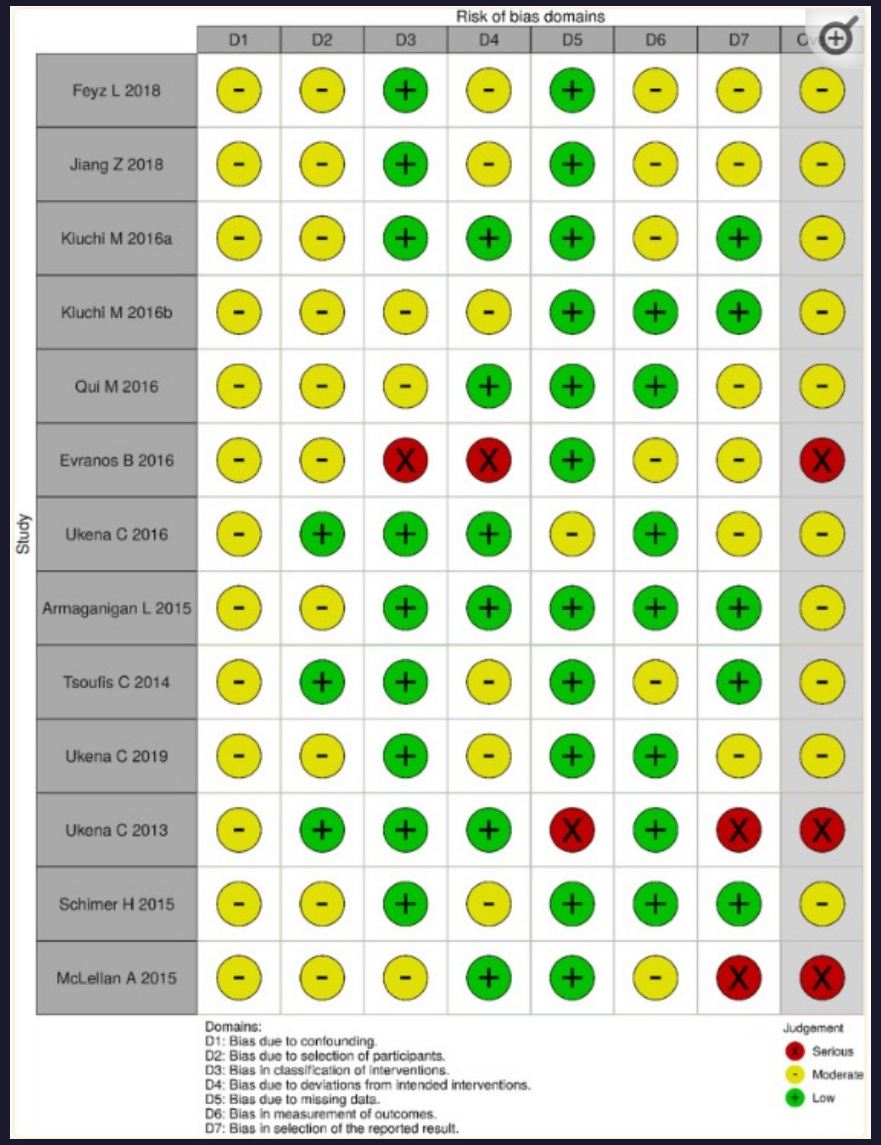
An example

The search was conducted on the fourth of October 2020 and yielded a total of 1199 results across the Ovid Medline, Scopus and Embase databases. 1078 studies were excluded after screening of titles and abstracts due to irrelevant study design or topic. Of the remaining n = 121 studies, n = 77 were excluded (n = 29 due to irrelevant outcomes, n = 14 irrelevant population, n = 11 irrelevant study design or had no results published at the time of search, n = 9 case reports, n = 6 duplicates, n = 1 study was terminated early, and n = 1 erratum). Forty-four full-text studies were obtained and assessed by 2 reviewers (NNK, KN). A further 25 studies were excluded as duplicates, resulting in a total of 19 studies included in this review (Fig. 1). These 19 studies comprised 6 randomised controlled trials (RCTs) and 13 were non-randomised cohort studies. The population across all 19 studies was 783 participants of which 505 (64.5%) were male and 278 (35.5%) were female. The age across the studies included ranged from 47 to 81 years (Table 1). Risk of bias was assessed using the Risk of Bias in Non-randomised Studies—of Interventions (ROBINS-I) tool for non-randomised studies (Fig. 2) and the Revised Cochrane risk of bias tool for randomised trails (RoB-2) for randomised trials (Fig. 3).



An example


Risk of bias domains
D1
D2
D3
D4
D5
Ove
Study
Steinberg J 2020
Kiuchi M 2018
Romanov A 2016
Kiuchi M 2016
Pokushalov E 2014
Pokushalov E 2012
Domains:
D1: Bias arising from the randomization process
D2: Bias due to deviations from intended intervention.
D3: Bias due to missing outcome data.
D4: Bias in measurement of the outcome.
D5: Bias in selection of the reported result.
Judgement
High
Some concerns
Low


Risk of bias domains
D1
D2
D3
D4
D5
D6
D7
Study
Feyz L 2018
Jiang Z 2018
Kiuchi M 2016a
Kiuchi M 2016b
Qui M 2016
Evranos B 2016
Ukena C 2016
Armaganigan L 2015
Tsoufis C 2014
Ukena C 2019
Ukena C 2013
Schimer H 2015
McLellan A 2015
Domains:
D1: Bias due to confounding.
D2: Bias due to selection of participants.
D3: Bias in classification of interventions.
D4: Bias due to deviations from intended interventions.
D5: Bias due to missing data.
D6: Bias in measurement of outcomes.
D7: Bias in selection of the reported result.
Judgement
Serious
Moderate
Low

Conclusion

- Systematic reviews filtered sources of scientific evidence
- They synthesise knowledge from many individual studies
- Study protocols are vital to ensure reproducibility
- Meta analysis require careful statistical planning

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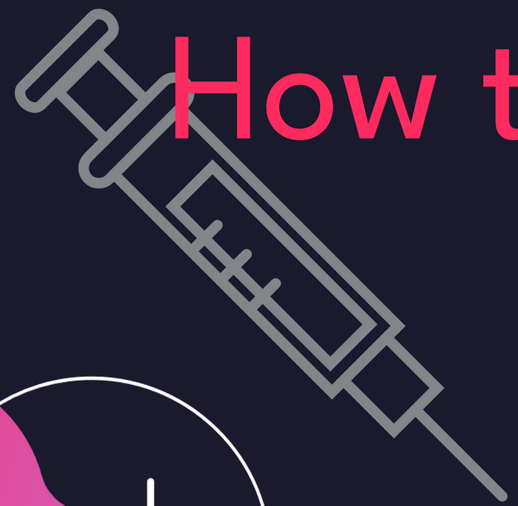
we are all about you

ResearchEazy

How to Present Research



Presenters

Dr Amar Rai MBBS BSc (Hons)
FY1 SFP Doctor, Imperial Health Care Trust

Shivani Shukla BA (Hons)
5th Year Medical Student, University of Cambridge

How to Present Research

- When would you present research
- Why is it important
- Poster presentation
- Oral presentation
- Summary and task

When do you present research?

PhD student: Viva voce/ defending a PhD thesis

2-4 hour long oral examination with 2 examiners

Medical Student: Poster/ oral presentation

Published a paper and now presenting the findings at a national/ international medical conference

Geneticist: COVID-19 drug

Reporting ground-breaking research findings at a press conference

Surgeon: Department meeting

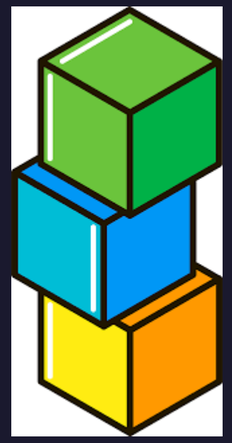
New surgical technique that improves patient outcomes- presents patient outcome data to other surgical departments that might benefit

Why is this important?

EBM research pipeline: question > hypothesise > research > data > accept or reject the hypothesis > ?

Disseminate findings to the wider scientific community

- Challenge
- Feedback
- Take your work further
- Medical Education



Poster Presentation

- Completed research (published/unpublished)
- Present at a conference, condense your findings to a page!
- Why? At present: Specialised Foundation Programme, Specialty Applications (points accumulated)

NEW VIRTUAL FORMAT

PRE-CONFERENCE COURSE 5TH MARCH 2

EXCELLING IN ADVERSITY

45TH INTERNATIONAL SURGICAL CONFERENCE

5-7 MARCH 2021

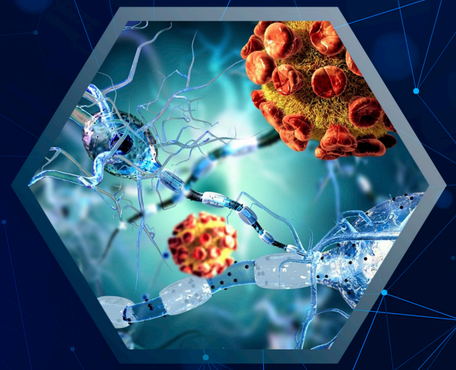
ASiT

SCAN TO REGISTER

@ASITOFFICIAL #EXCELLINGINADVERSITY #ASIT2021

NEURO 202

THE 4TH ANNUAL MEETING OF INTERNATIONA
CENTER FOR NEUROSCIENCE RESEARCH



INTERNATIONAL IBR
RESEARCH ORGAN

JÜLICH
FORSCHUNGSZENTRUM

MAIN THEMES

- Recent Advances in Brain Disorders and Therapy
- How does COVID 19 affect the brain
- Digital Health in Neuroscience

SUBMISSION DEADLINE
30 AUGUST 2023
SUBMISSION DEADLINE

10-12 SEPTEMBER 2023

International Center for Neuroscience Research, Tbilisi, Georgia

https://georgianeuroscience.com

neurogeorgia@gmail.com

+995568950771

How to make a poster

Posters must be A3 landscape and submitted in PDF format (other formats will not be presented)

ASiT: “Whilst we don’t prescribe the exact content for your poster we encourage you to be as creative and engaging as possible.”

May have to deliver 1-2 minute oral presentation alongside

Structure

- Aim
- Introduction
- Methods
- Results
- Conclusion

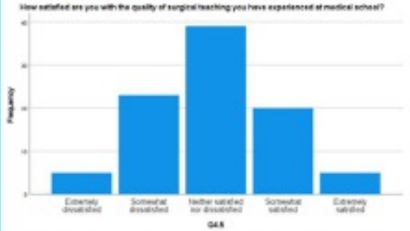
Evaluation of a webinar baseD sUrgiCAl Teaching coursE (EDUCATE) - a prospective cohort study

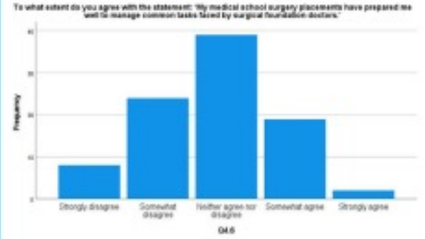
Lawrence Tan[1], William Mullins[1], Kate Gargan[1], James Brice[1], Jessie Shea[1], Alice Gargan[2], Jennifer Townsend[3], Claire Jang[1], Shivani Shukla[1], Aqua Asif[4], Monty Fricker[5], Midhun Mohan[6], Arjun Nathan[7]
1. University of Cambridge School of Clinical Medicine, Cambridge 2. Imperial College Healthcare NHS Trust, London 3. Harrogate and District NHS Foundation Trust, Leeds 4. Leicester University Medical School, Leicester 5. Newcastle University Medical School, Newcastle 6. University of Cambridge, Department of Clinical Neurosciences, Cambridge 7. Royal Free Hospital NHS Foundation Trust, London

INTRODUCTION

Evidence shows UK medical students feel:

- Their undergraduate surgical teaching is insufficient
- Under-prepared for practical surgical tasks during Foundation Year (FY)





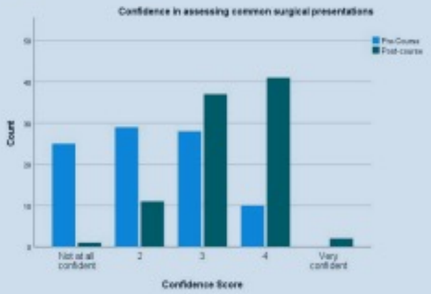
- The majority of medical students and FY doctors strongly agree they should be taught about the management of common FY surgical tasks (97.8%).

METHOD

- Participants were recruited from either a UK-based medical school or FY programme.
- A STROBE validated questionnaire was distributed to assess their confidence regarding practical surgical tasks before and after a webinar course.
- The course entailed a series of 15 free-access webinars based on the Royal College of Surgeons Undergraduate Curriculum.
- We compared 92 matched questionnaires.

QUESTIONNAIRE RESULTS- confidence in surgical tasks before and after the webinar course

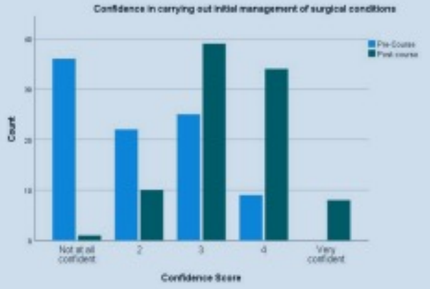
Surgical assessment



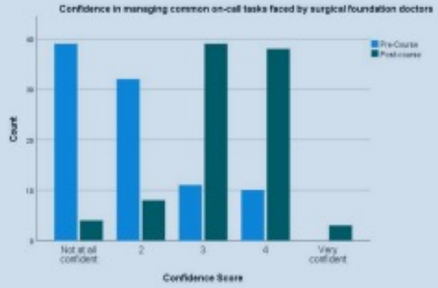
- The paired results of each participant's confidence in assessing common surgical presentations was compared before and after the course.
- A mean increase of 1.10 (22%) in confidence score was seen after the webinar course, p-value <0.001.

- A mean increase of 1.13 (23%) in confidence score was seen after the webinar course, p-value <0.001.

Surgical management

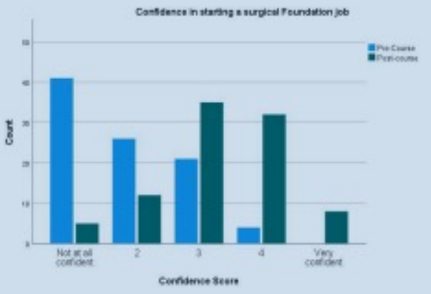


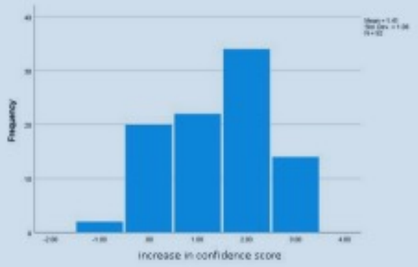
- A mean increase of 1.34 (27%) in confidence score was seen after the webinar course, p-value <0.001.



- A mean increase of 1.39 (28%) in confidence score was seen after the webinar course, p-value <0.001.

Overall confidence in starting a surgical FY job





- A mean increase of 1.41 (28%) in confidence score was seen after the webinar course, p-value <0.001.

AIM

To evaluate:

- The effect of a national webinar-based surgical teaching course on participants' confidence.

CONCLUSION

- **Medical students and FY doctors report low confidence and feel unprepared in managing surgical tasks.**
- **Additionally, they report poor satisfaction with undergraduate surgical education.**
- **This shortfall may be improved through delivery of high-quality, accessible online educational courses, such as the National Surgical Teaching Society (NSTS) curriculum.**
- **Further research evaluating the benefits of such courses is warranted.**

CONTACT INFORMATION

ss2551@cam.ac.uk

‘Letter to the Editor’ Scheme to Develop Critical Appraisal Skills in Medical Students

Imperial College London

MHF. Khan[1], A. Rai[1]

1, Imperial College School of Medicine, Imperial College London, London, UK,

Background

Enriching undergraduate medical students with critical appraisal skills supports their future evidence-based approach to patient care and is a requirement by the General Medical Council[1].

Publishing letters assists students in scoring higher in the educational performance component of the UK Foundation Programme application[2].

Current literature supports the use of letters to teach academic writing skills however no student-led scheme currently exists[3,4].

Aim

This preliminary study evaluated whether a student-led educational scheme of generating letters was able to subjectively improve student confidence in the following:

- Reading medical literature
- Critically appraising published medical literature
- Academic writing

Accompanying video (6 mins)

SCAN ME

Methods

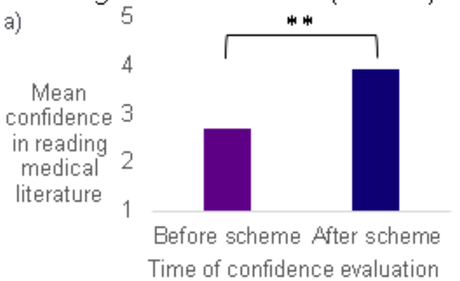
Medical students put into groups of 3 and paired with a senior medical student with prior publications → Pre-scheme survey assessed student confidence using a Likert scale ranging from 1-5, with higher scores signifying greater confidence → 1-month scheme began comprised of an initial online tutorial on critical appraisal, random allocation of article and group led letter writing → Participants completed post-scheme questionnaire. Likert scale scores were treated as interval data. Statistical significance was investigated with the Student's t-test and Mann-Whitney U test

Figure 1. Flowchart summarising the letter writing scheme

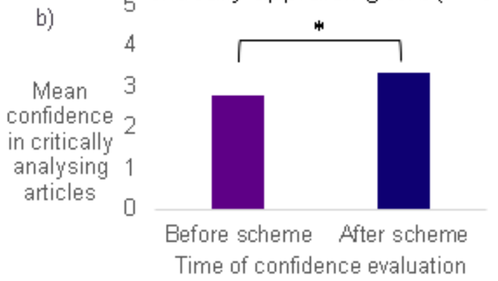
Exclusion criteria: participants with previous publications or undertaking/have a BSc

Results

46.3% Increased confidence in reading medical literature (P<0.01)



19.6% Increased confidence in critically appraising text (P=0.02)



19.6% Increased confidence in writing medical literature (P<0.01)

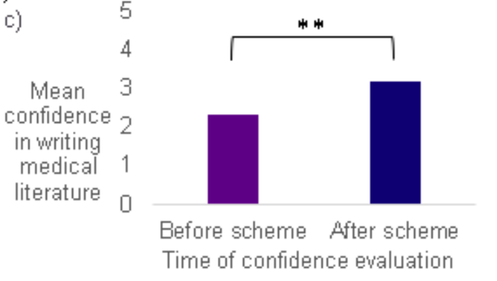


Figure 2. The change in confidence in participants under the scheme in: a) reading medical literature, b) critically analysing articles, c) writing medical literature. Single asterix (*) denotes significance of less than 0.05 and double Asterix (**) denotes significance of less than 0.01.

Conclusion

A student-led letter writing scheme can successfully be run to improve confidence in critical appraisal skills and support students with no publications in their Foundation Programme applications.

Going forward

Widening and refining scheme with support of the local university's medical education society.

Identifying whether past tutees under the scheme can tutor critical appraisal skills to future participants

To date, 57.1% of students (n=12) have successfully published their letters.

SCAN ME

References

Oral Presentation

Session
How to present research
Poster Mentoring session
TASK: Making a presentation
Poster Submission
Career in academic medicine and surgery
TASK: Post-course quiz

Task!

- Task: Statistics and Poster Presentation Task
- 12/02: Mentoring Session
- 15/02: Poster Deadline
- 19/02: Top few poster selected to present in a ResearchEazy Conference- receive personalised feedback from Academic Clinicians

Medical Protection

GEEKY MEDICS

Royal College of Surgeons of England

lecturio

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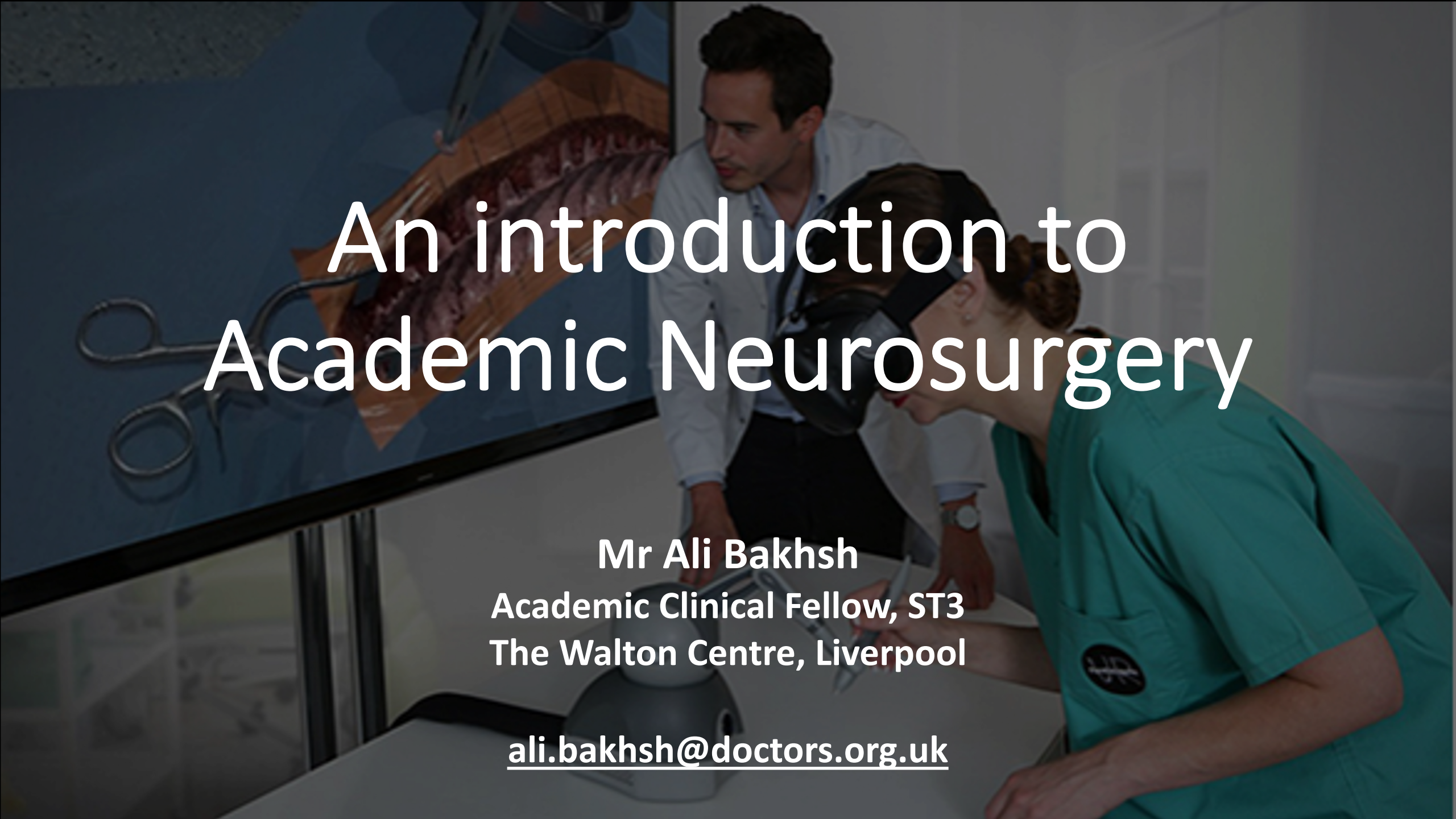
WESLEYAN
we are all about you

OSMOSIS.org

PLEASE FILL OUT THE FEEDBACK FORM

PLEASE TUNE IN TO OUR REMAINING SESSIONS THIS WEEK

@OSCEazyOfficial @osceazyofficial OSCEazy Osceazy@gmail.com



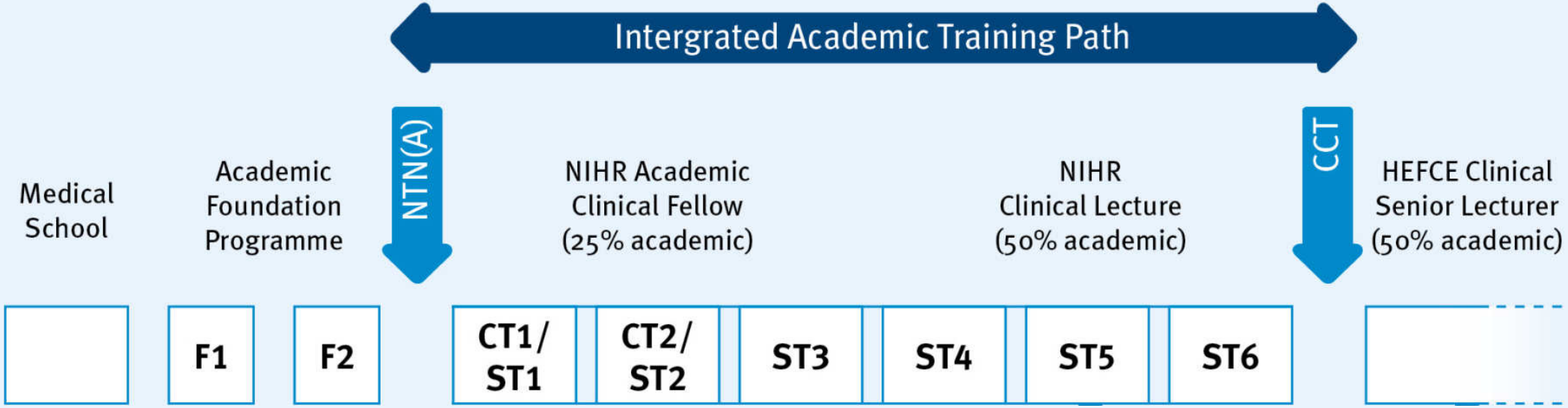
An introduction to Academic Neurosurgery

Mr Ali Bakhsh
Academic Clinical Fellow, ST3
The Walton Centre, Liverpool

ali.bakhsh@doctors.org.uk

What we will cover

1. The ICAT pathway
2. Life as an academic neurosurgeon
3. The ACF interview process


Intergrated Academic Training Path
Medical School
Academic Foundation Programme
NTN(A)
NIHR Academic Clinical Fellow (25% academic)
NIHR Clinical Lecture (50% academic)
CCT
HEFCE Clinical Senior Lecturer (50% academic)
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CT2/ ST2
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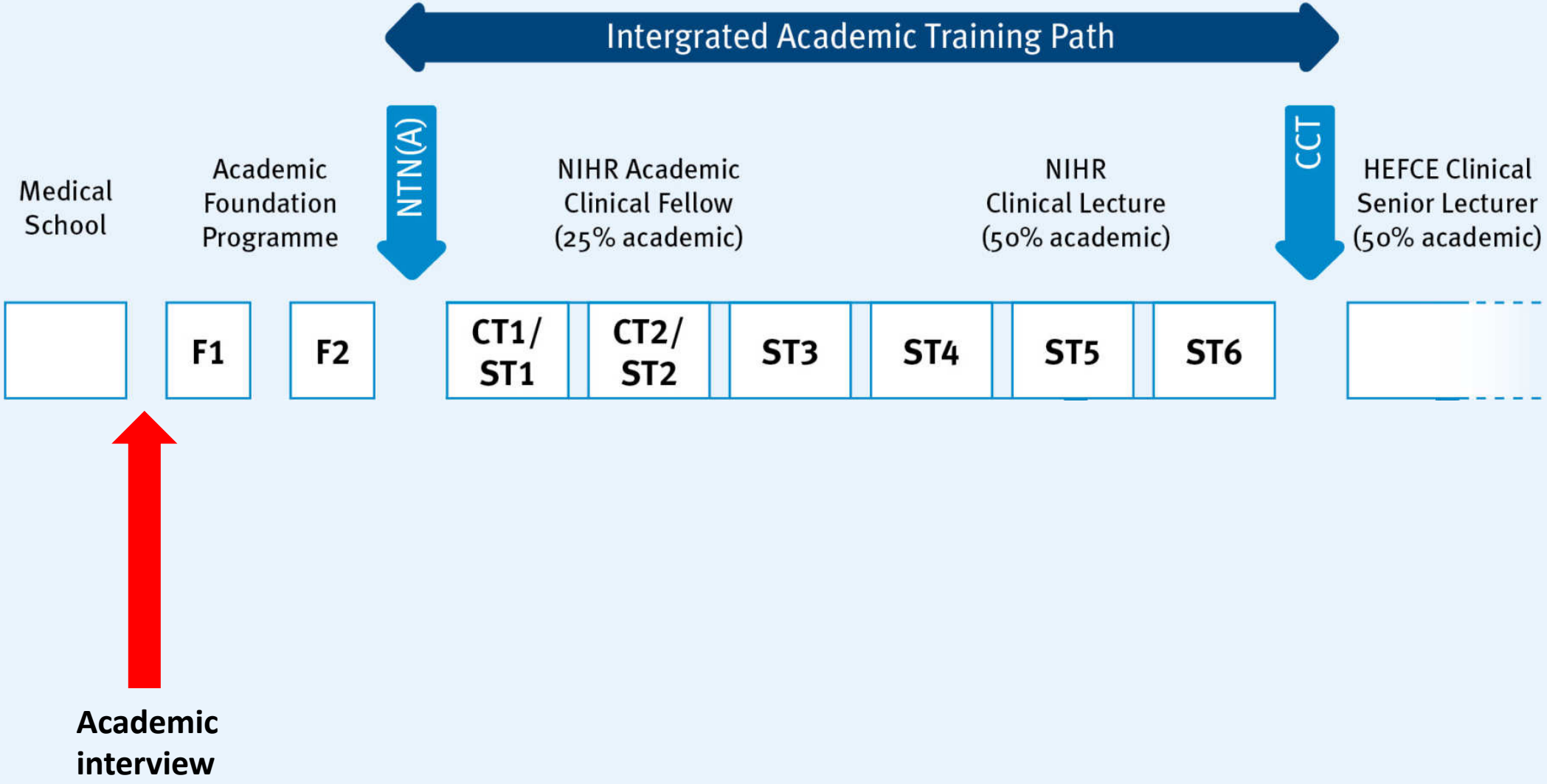
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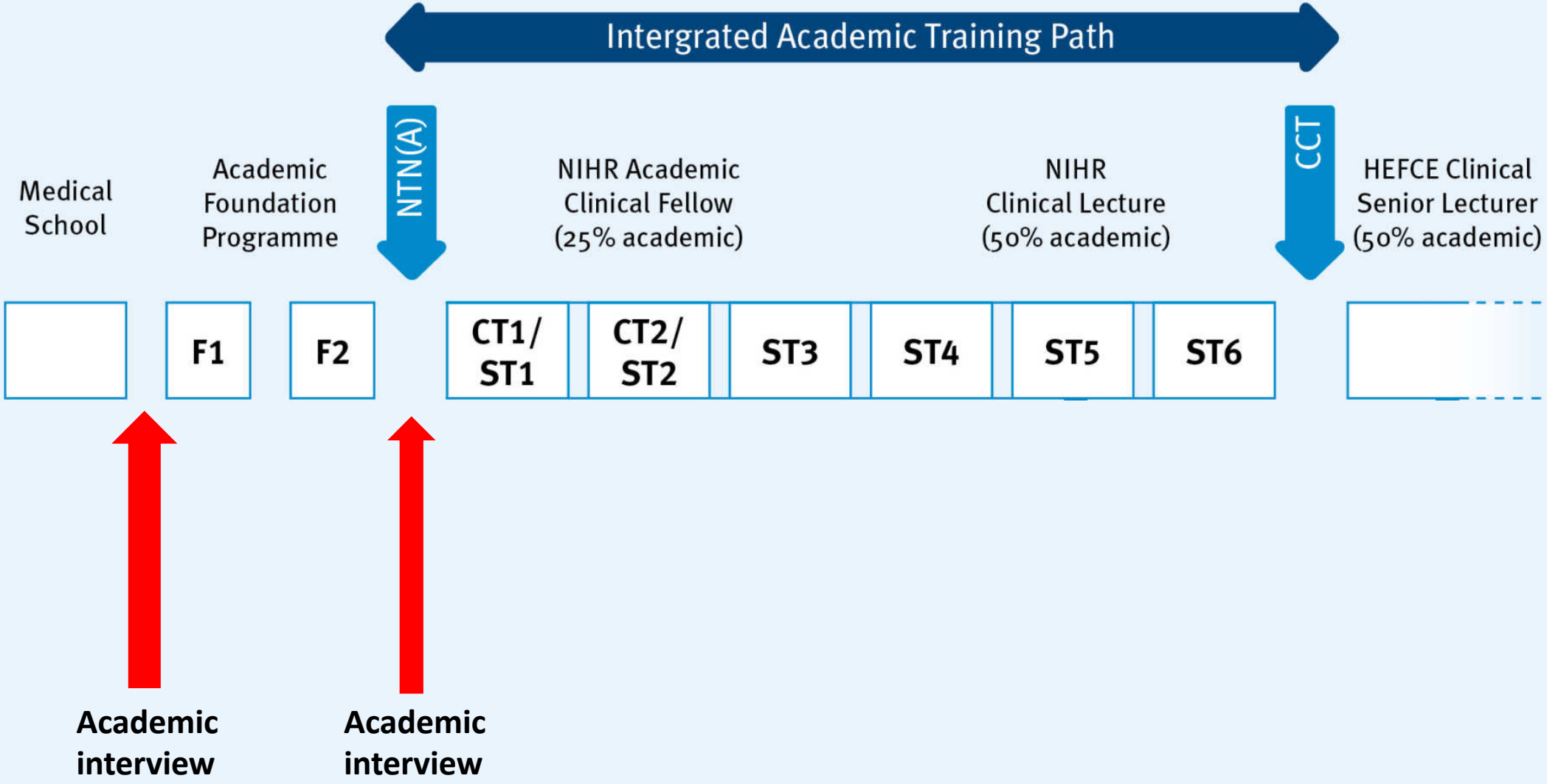
Academic interview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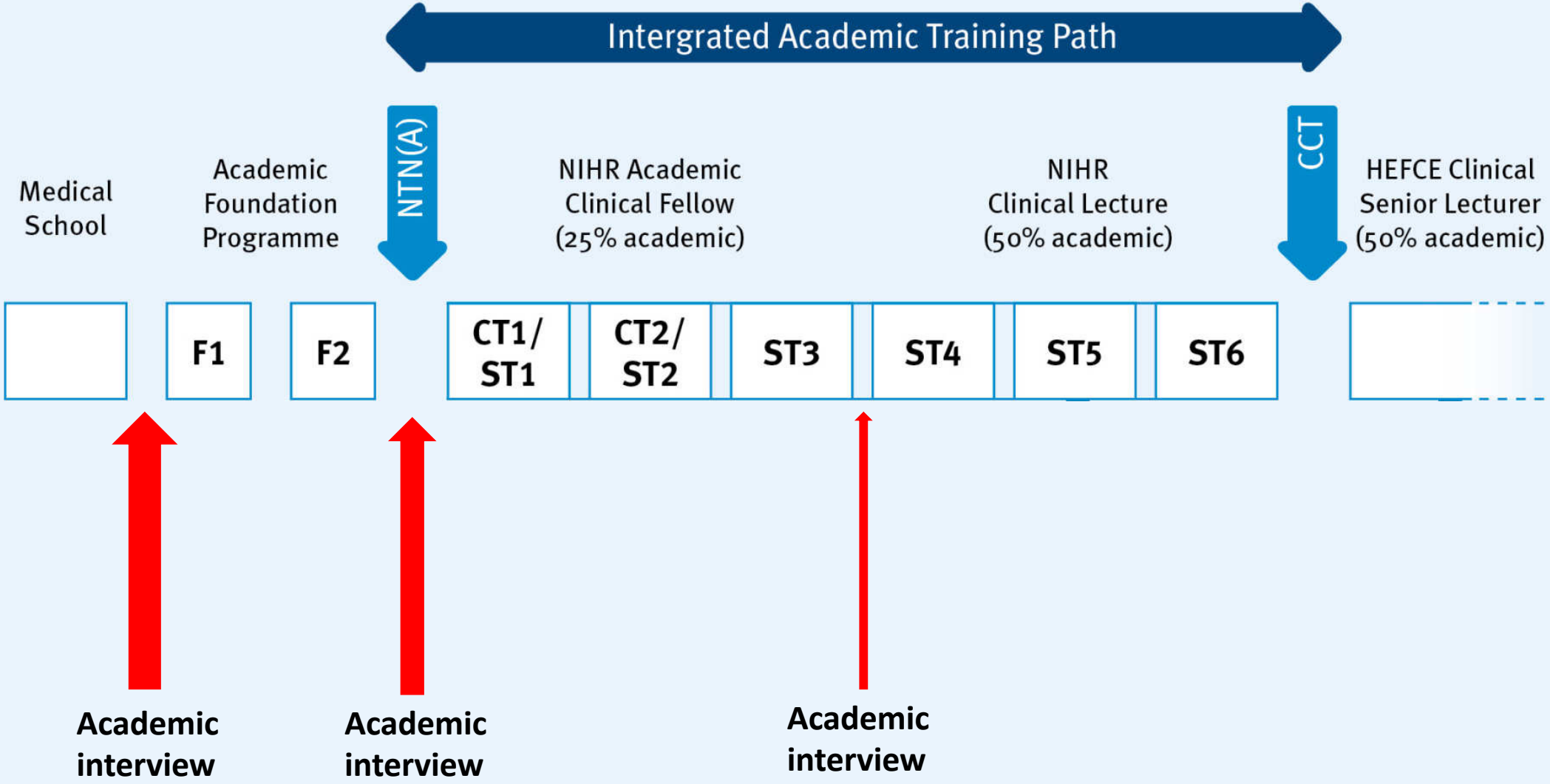
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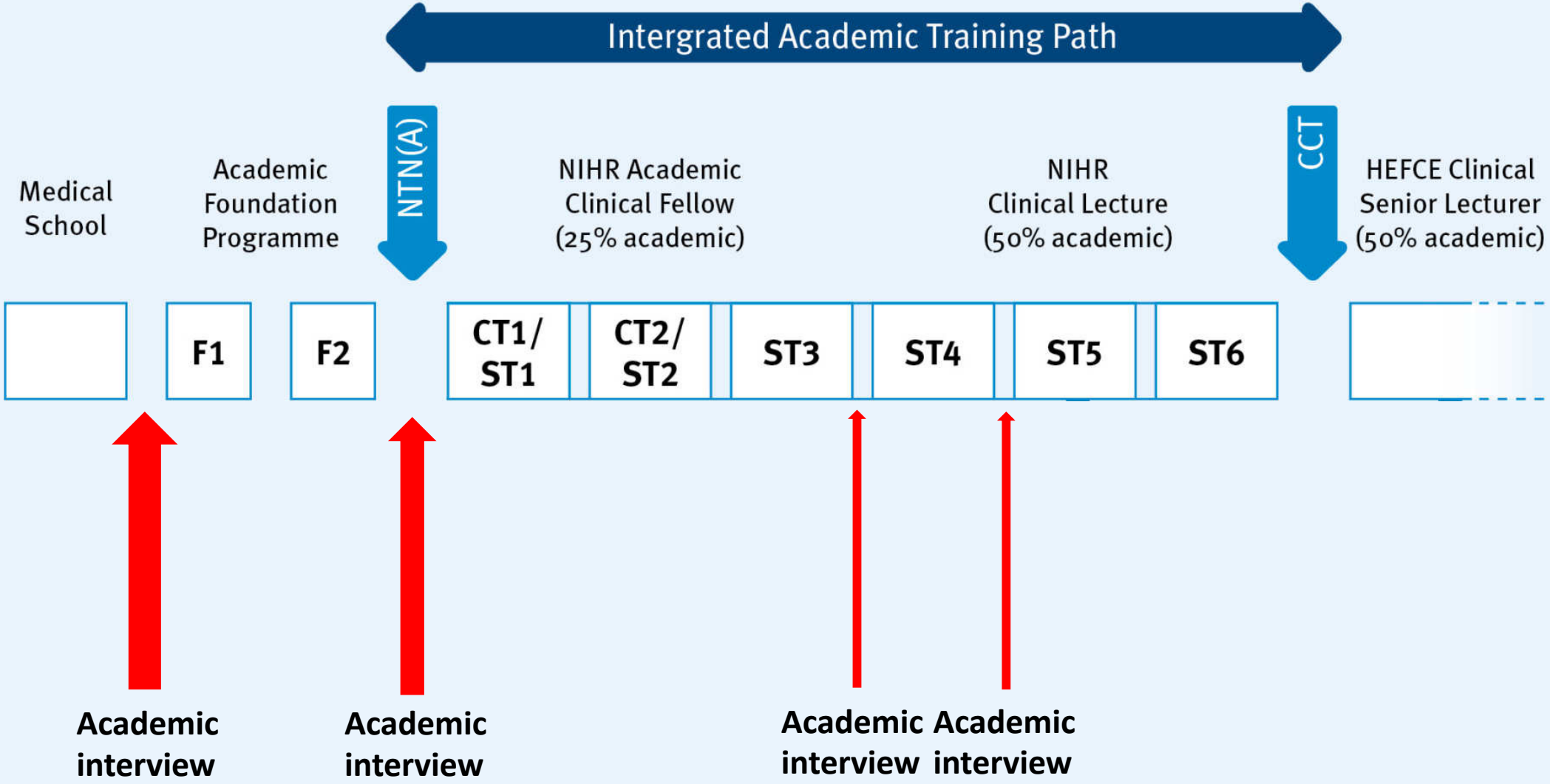
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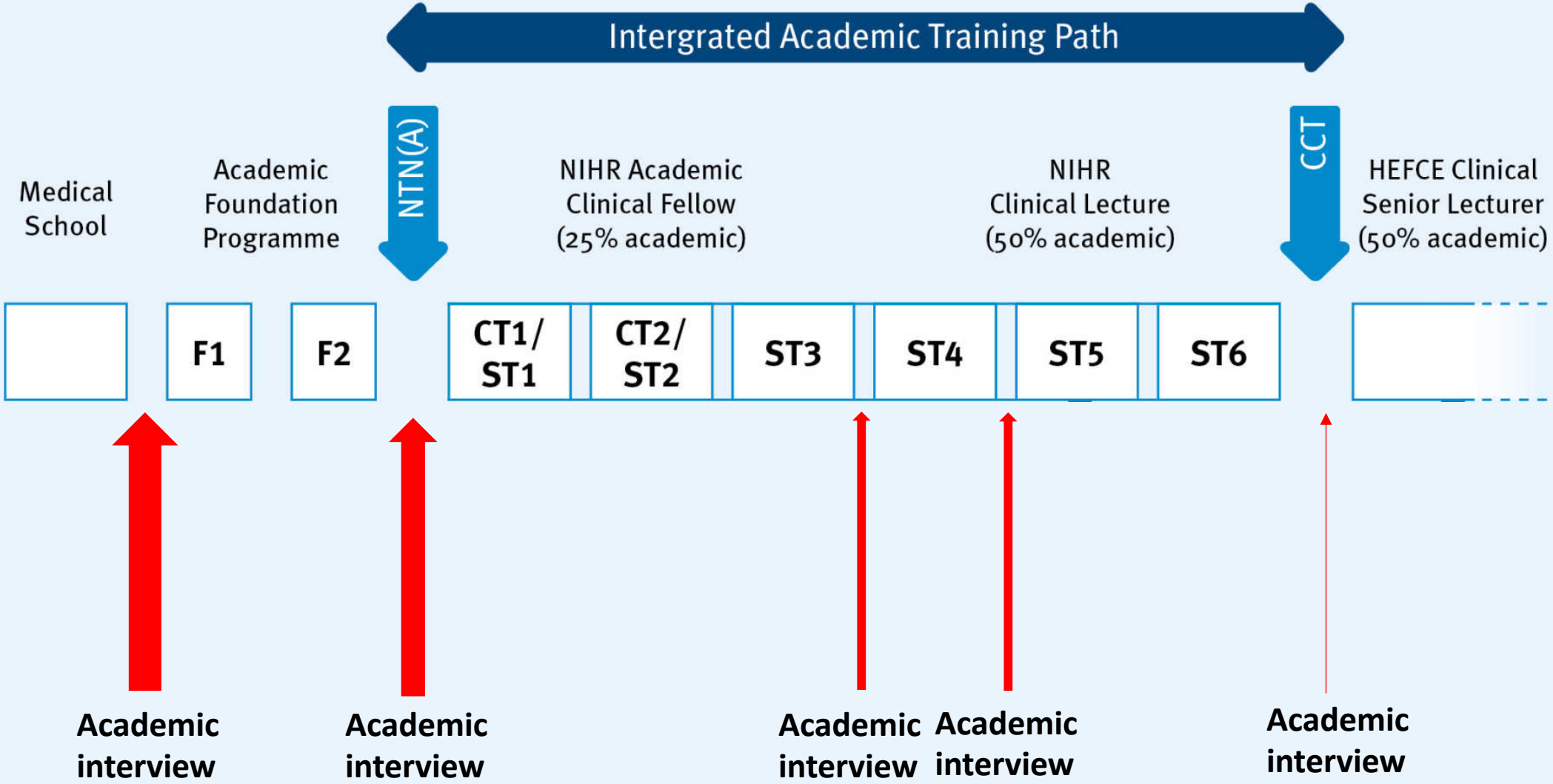
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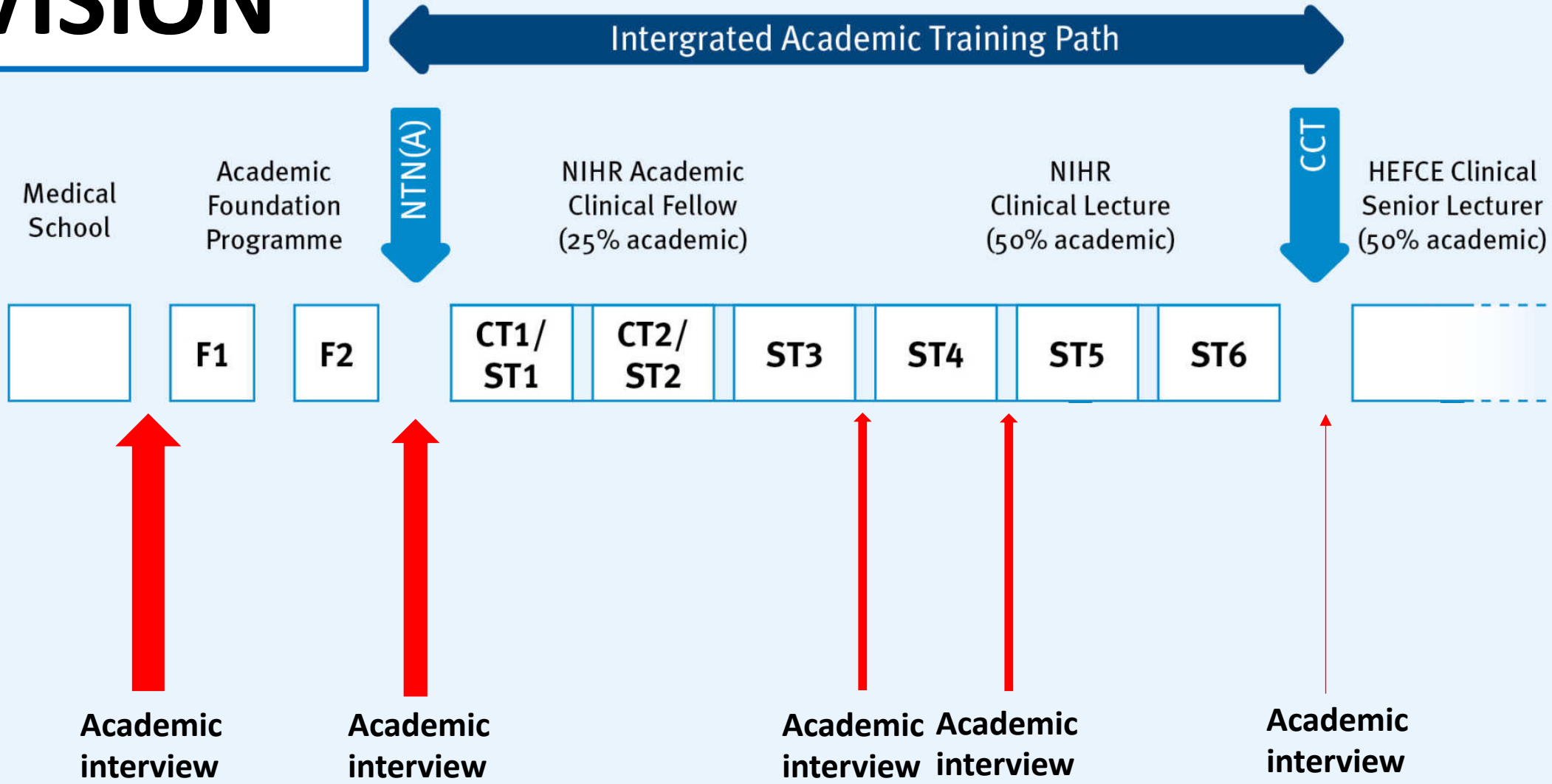
VISION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Academic interview
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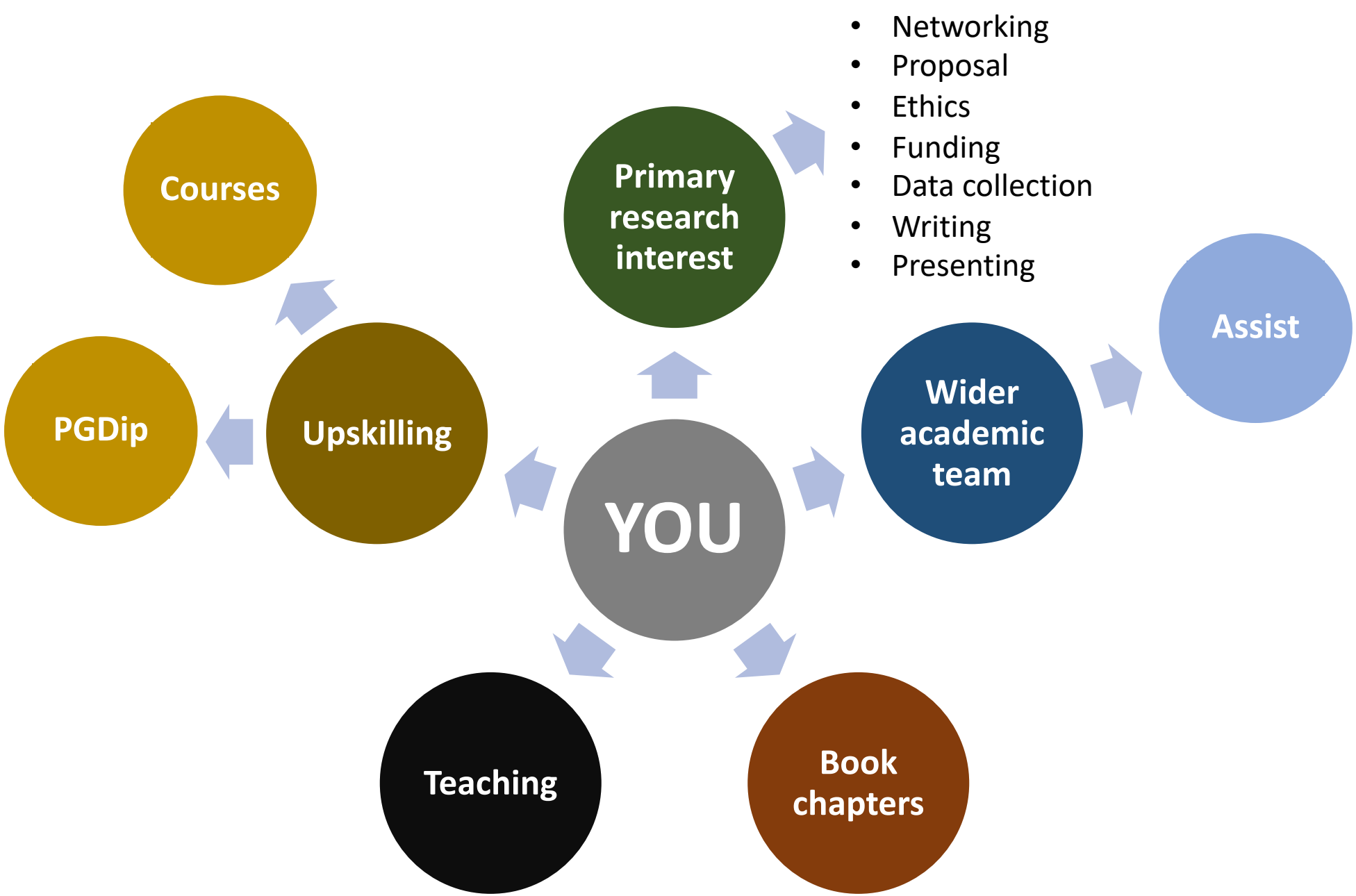
Academic interview


Primary research interest
Wider academic team
Book chapters
Teaching
Upskilling
Clinical skill
YOU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Upskilling
Primary research interest
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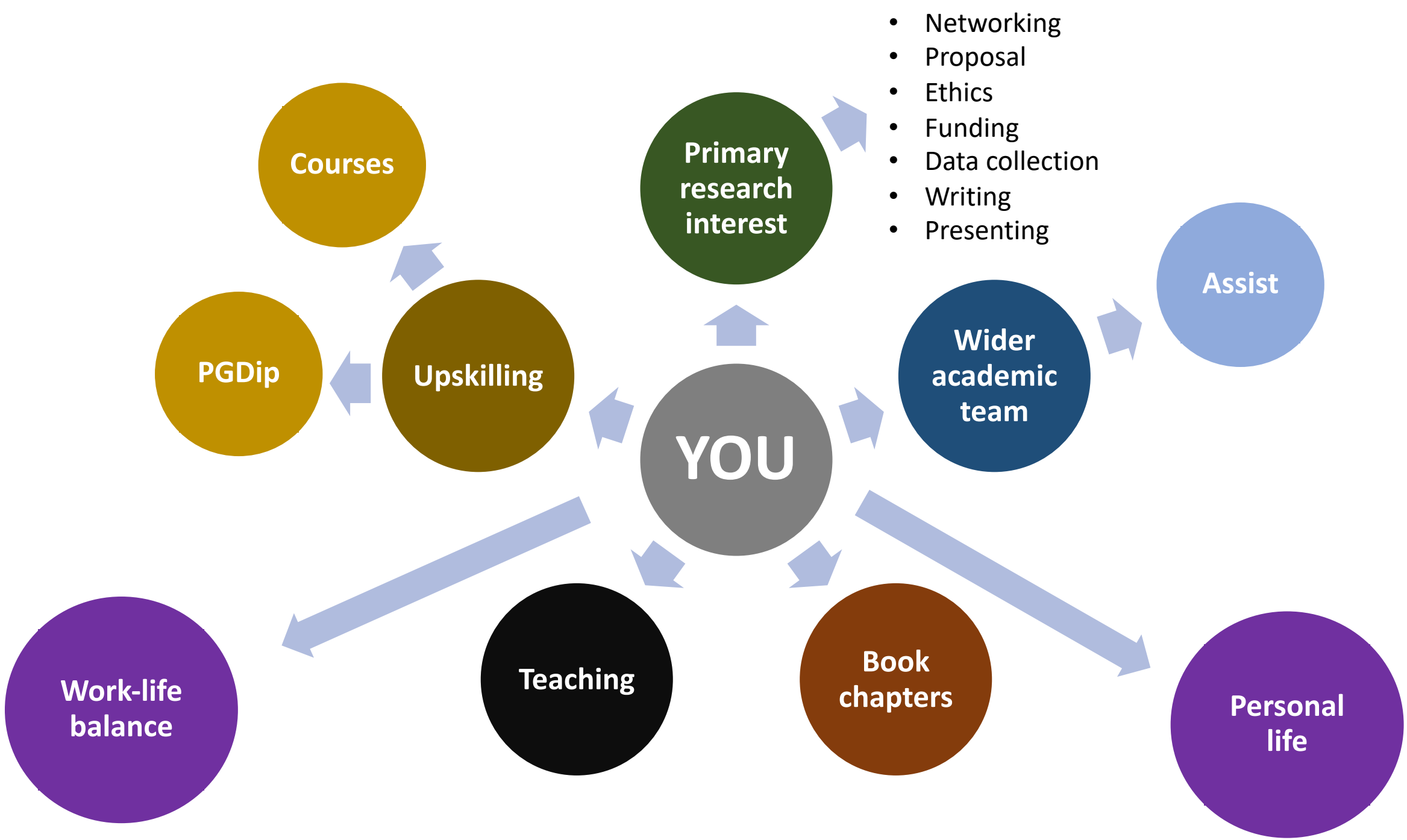
Writing
Presenting
YOU
Wider academic team
Assist
Teaching
Book chapters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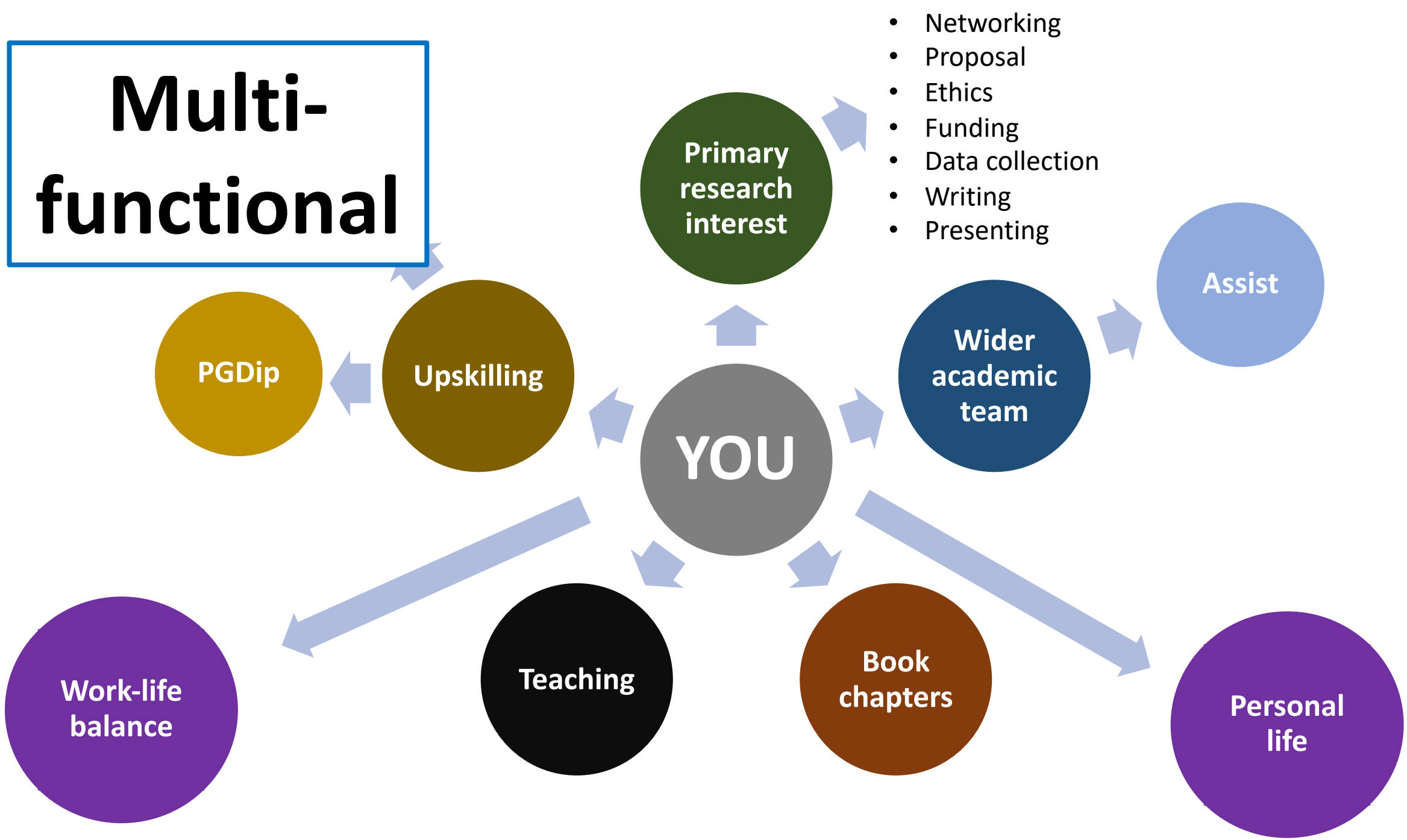
Data collection
Writing
Presenting
Assist
Wider academic team
YOU
Work-life balance
Teaching
Book chapters
Personal life

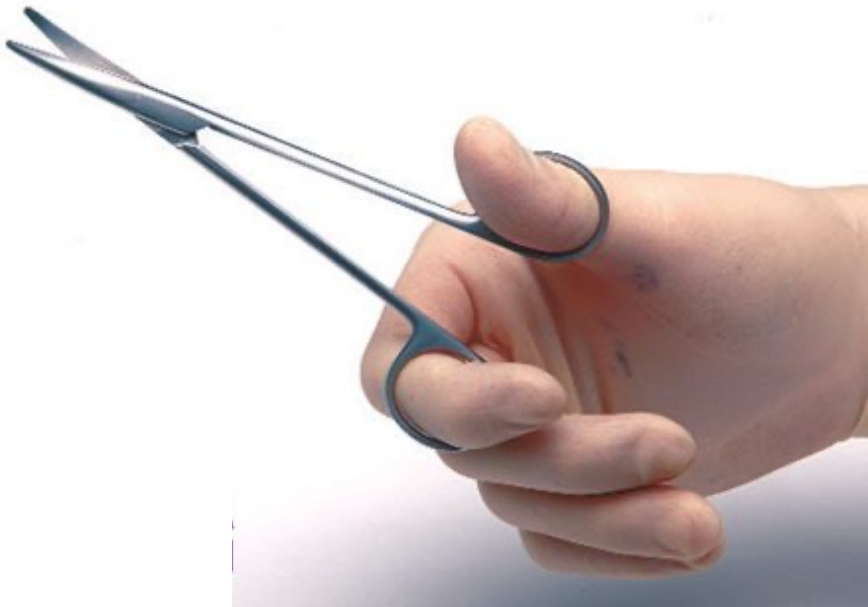
Multi-functional



Structure

Pay

Operating time

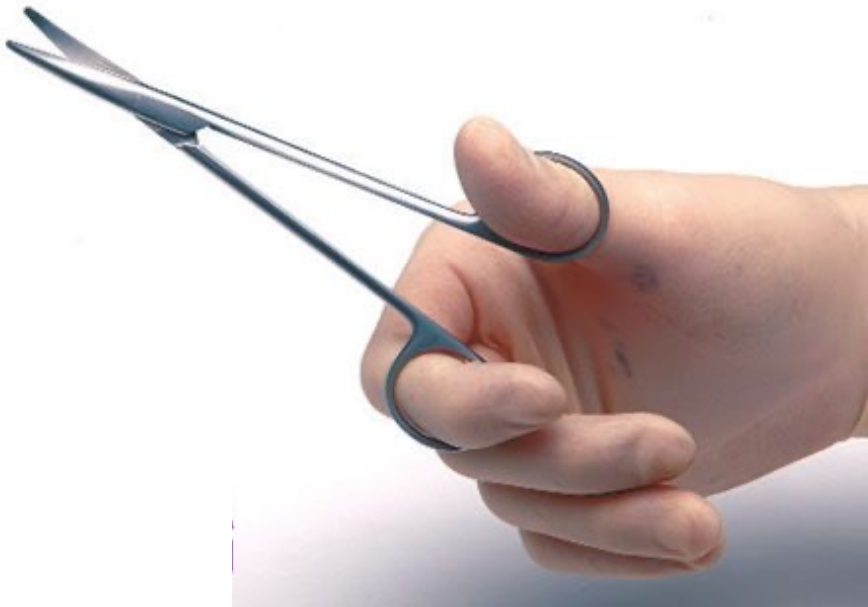


PLAN

Structure

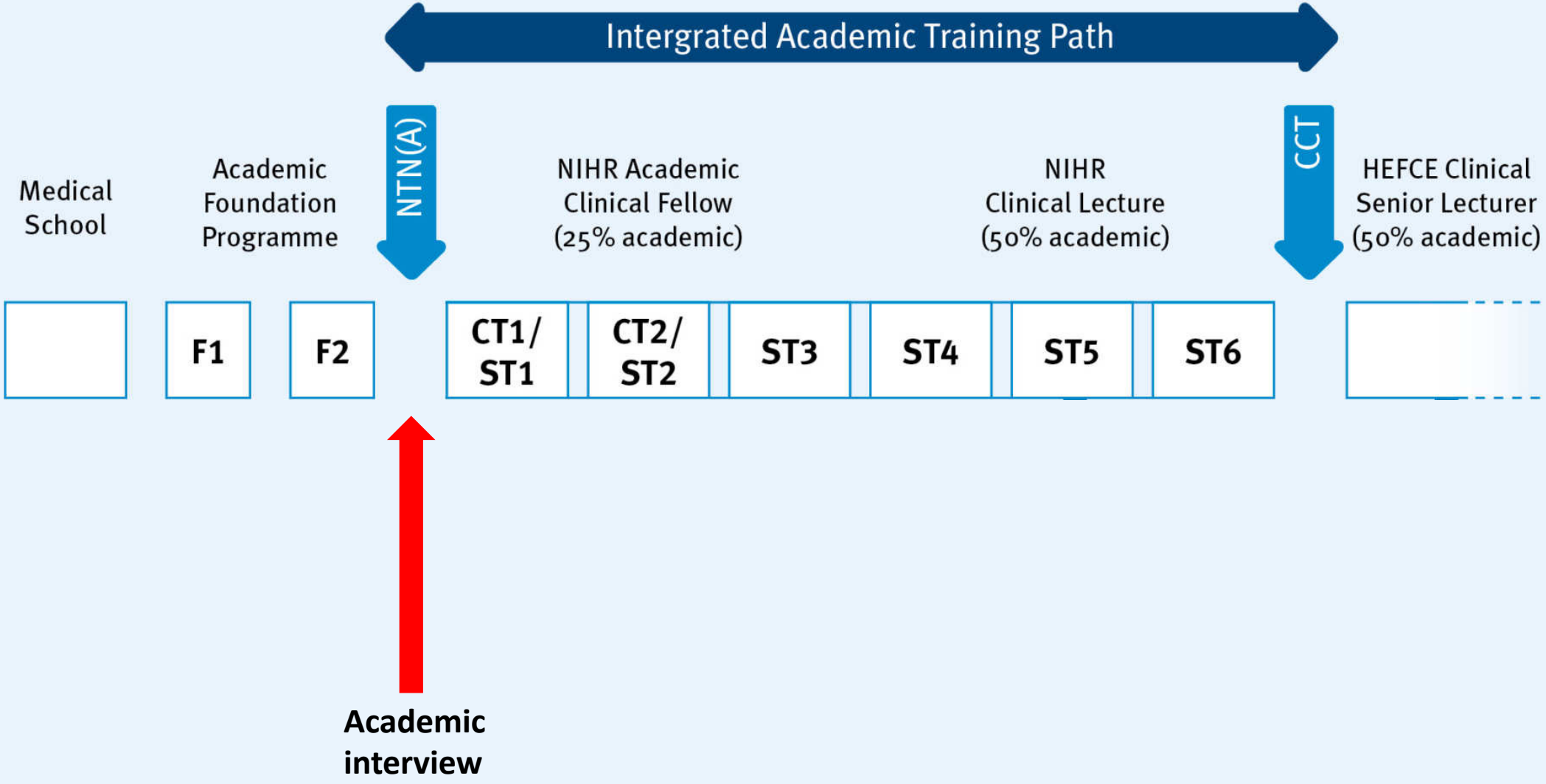
Pay

Operating time



Application stage

Academic Clinical Fellowship (ACF)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CT1/ ST1
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ST3
ST4
ST5
ST6
Academic interview

Academic Clinical Fellowship

- 3 year programme from ST1 to ST3
- 25% dedicated to research
- Attracts an NTN(a)
- Dedicated supervisor and research team
- Flexible research interests

ACF process

Activity	Date(s)	(NTN)
Applications Open	1 October	5 November
Application Deadline	4 November	1 December
Interviews	December	Feb-March
Initial Offers Released	21 January	April
Hold Deadline	28 January	April

Shortlisting criteria

*Detailed guidance found on ***NIHR- ACF (medical) shortlisting****

9 domains- Total score /29

Clinical experience	/3
Additional degree	/3
Prizes	/3
Teaching	/2
Scientific publications	/4
Scientific presentations	/4
Language skills	/3
Academic experience	/3
Academic potential	/4

Shortlisting criteria

Academic potential

Rate a subjective assessment of academic potential balancing achievements with career stage.

Criteria	Score
i) No evidence of relevant academic potential	0
ii) Evidence weak	1
iii) Evidence limited	2
iv) Evidence ample	3
v) Evidence outstanding	4

/4

ACF Interview overview

Location	Hosted by local deanery
Panel	Professor of Neurosurgery ICAT lead Lay member
Layout	Prep- 10-minutes data (x2 A4) 30 minutes approx.

ACF Interview assessment themes

i) High-level interest
ii) PhD potential
iii) Long-term academic path

4 parts to ACF interview

1. Data interpretation (prep)
2. Data presentation
3. Academic experience
4. Research proposal

1. Data interpretation

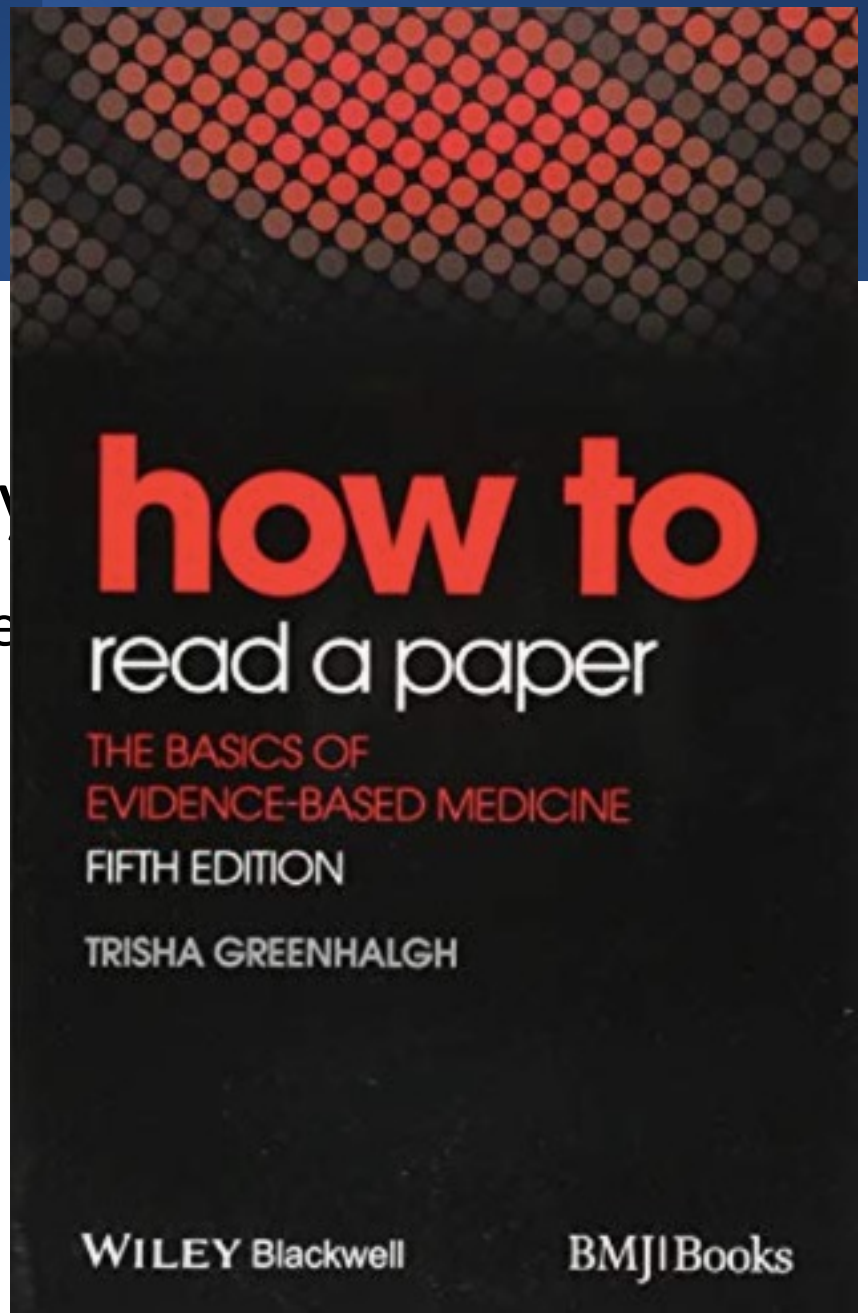
1. Your ***critical evaluation*** of methodology
    - Is this the most appropriate study design for the question being asked?
    - Is this the most appropriate statistical analysis?

2. Statistics knowledge
    - Parametric vs. non-parametric tests
    - P-value, CI, NNT, ARR, RRR, OR interpretation

1. Data interpretation

1. Your ***critical evaluation*** of methodology
    - Is this the most appropriate study design for the
    - Is this the most appropriate statistical analysis?

2. Statistics knowledge
    - Parametric vs. non-parametric tests
    - P-value, CI, NNT, ARR, RRR, OR interpretation



2. Data presentation

1. Practice summarizing

2. Critical appraisal of methodology and appropriateness of conclusions

3. Lay summary

3. Academic experience

Less structured

Don’t be shy

4. Research proposal

Every ACF post is themed (*old age, bioinformatics etc*)

Make contact with research team 6-months before

Visit institute

Have a water-tight proposal

Questions