Learn & Create Workshops

Comprehensive Literature Reviews

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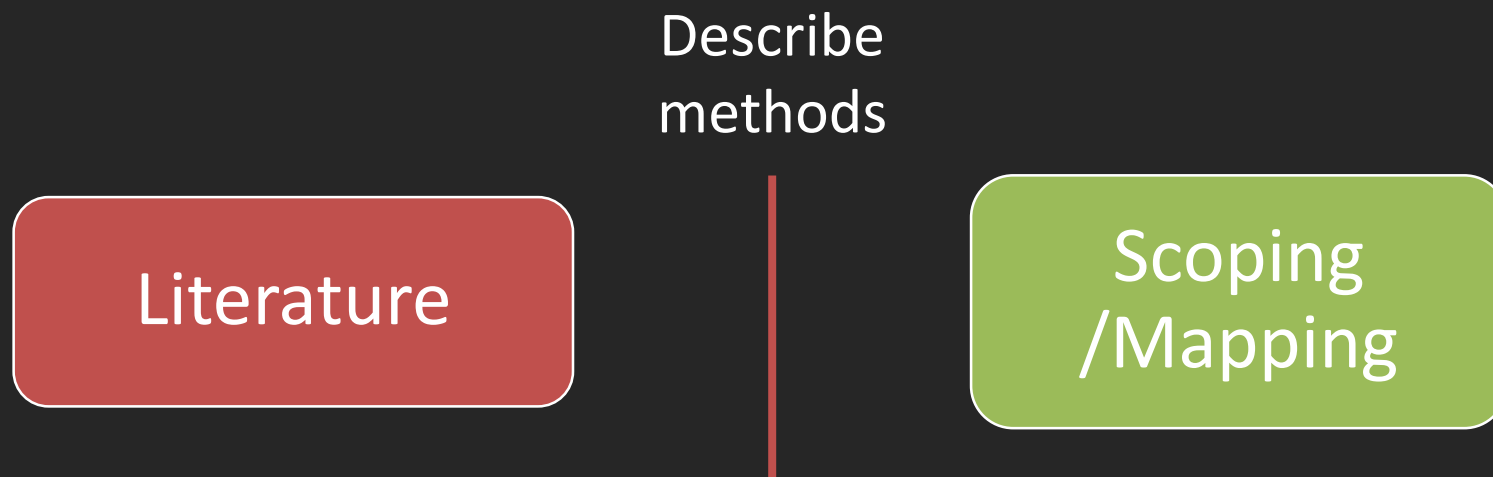# Learning Objectives

After this presentation, you will be able to

- Decide the types of reviews that would be appropriate for your research topic

- Describe the main stages of the review process

- Select an appropriate framework to specify your research question

Literature versus Scoping/Mapping Reviews

- Literature Reviews: Aim to summarize the critical points of current knowledge of a particular topic.

- Scoping/Mapping Reviews: Aim to address an exploratory research question by mapping key concepts, types of evidence, and gaps in research related to a defined area or field.

Describe
methods

Literature

Scoping
/Mapping

Systematic Reviews

- A research method that aims to answer question(s) by analyzing studies meeting a specified criteria.
  - ➢An explicit, reproducible methodology that aims to minimize publication bias
  - ➢Contains clearly defined eligibility criteria
  - ➢A systematic search to identify all related studies
  - ➢An assessment of the validity of the findings
- Meta-analysis: A statistical method to summarize the results of independent studies
  - ➢Better estimate effects
  - ➢Investigate consistency and explore discrepancies

Which review?

- A review of the last 10 years of literature on machine learning models for detection and diagnosis of cancer.

- As machine learning models are emerging, what does this mean for detection and diagnosis of cancer?

- To assess the effectiveness of machine learning models for detection and diagnosis of cancer.

Literature Review

Scoping/Mapping Review

Systematic Review

Which review?

- A review of remediation methods for PCBs in school buildings

- A review of adverse human health effects of exposure to environmentally relevant PCB mixtures

- To assess the effectiveness of the PCB cleanup and disposal methods for environmentally relevant PCB mixtures

Literature Review

Scoping/Mapping Review

Systematic Review

Which review?

- To assess the effectiveness of library instruction on students scores on a standardized test

- As more universities strive to support open access efforts, what does this mean for students?

- A review on the efficacy and safety of chloroquine for the treatment of COVID-19
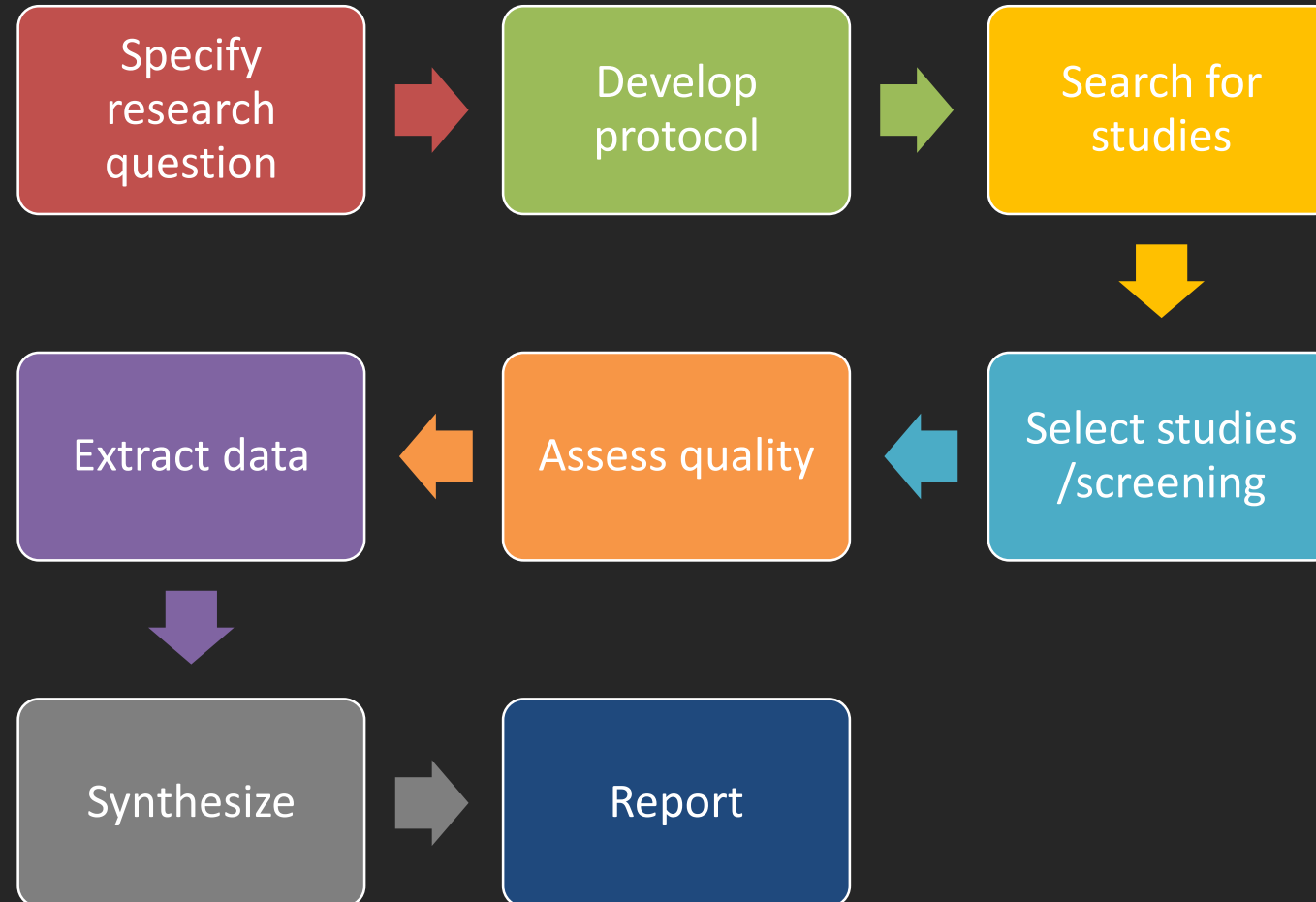
Literature Review

Scoping/Mapping Review

Systematic Review

Team & Timeline

- A team of 3 or more with sufficient expertise, time and ability to work together
  - ✓ Subject expert(s)
  - ✓ Search expert/ librarian
  - ✓ Statistician/ biostatistician
- Gaining familiarity with software (citation management, statistical) prior to beginning the project
- The entire project may take up to half a year or longer depending on topic

Specify Research Questions

- Research Question Frameworks

PICO	PECO/PEO	SPICE	WWH
• Population • Intervention • Comparison • Outcome	• Population • Exposure • Comparator • Outcome	• Setting • Perspective • Intervention or interest • Comparison • Evaluation	• Who • What • How

PICO

Population	What are the characteristics of the population including animal species?
Intervention	What therapy or intervention do you want to investigate exposing the population to?
Comparison	What is alternative therapy or intervention do you want to compare the primary intervention?
Outcome	What are the possible outcomes?

What are the main elements using PICO?

- Research Question: Does moderate alcohol consumption have favorable effects on reduced risk of coronary heart disease in adults without known cardiovascular disease?

Population — Adults without pre-existing cardiovascular disease

Intervention — Moderate alcohol consumption

Comparison — Those after a period of no alcohol use

Outcome — Reduced risk of coronary heart disease

PECO/PEO (risk or protective factors)

Population — What are the characteristics of the population including animal species?

Exposure — what pre-existing conditions does the population have or what has the population been exposed to?

Comparator — What are the characteristics of the population who do not have pre-existing conditions or exposure?

Outcome — What are the possible outcomes?

What are the main elements using PECO?

- Research Question: Evaluate the adverse children health effects of exposure to environmentally relevant PCB mixtures

Population — Children

Exposure — Exposure to PCBs

Comparator — Children exposed to lower levels (or no exposure/exposure below detection limits) of PCBs

Outcome — Any examination of survival, body weight, or development, or of the structure or function of dermatologic etc.

What are the main elements using PEO?

- Research Question: In infants, is there an association between exposure to soy milk and the subsequent development of peanut allergy?

Population	Infants
Exposure	Soy milk
Outcome	Peanut allergy

SPICE (social sciences)

Setting	Where? In what context?
Population or perspective	for whom?
Intervention	What intervention do you want to do with the population?
Comparison	What is alternative intervention do you want to compare the primary intervention?
Evaluation	How well? What are possible outcomes?

What are the main elements using SPICE?

- Research Question: In which way (providing in-person progress report versus providing pagers or a phone call) would effectively reduce family members' anxiety while their relatives are undergoing surgery?

Setting	Surgical waiting room
Population or perspective	Family members of patients
Intervention	Providing in-person progress report
Comparison	Providing pagers or a phone call
Evaluation	Anxiety

WWH (interdisciplinary)

Who — What are the characteristics of the population?

What — What was done? (intervention, exposure, policy, phenomenon, etc.)

How — How does the what affect the who?

What are the main elements using WWH?

- Research Question: The effects of alcohol consumption on biological markers associated with risk of coronary heart disease in adults without known cardiovascular disease.
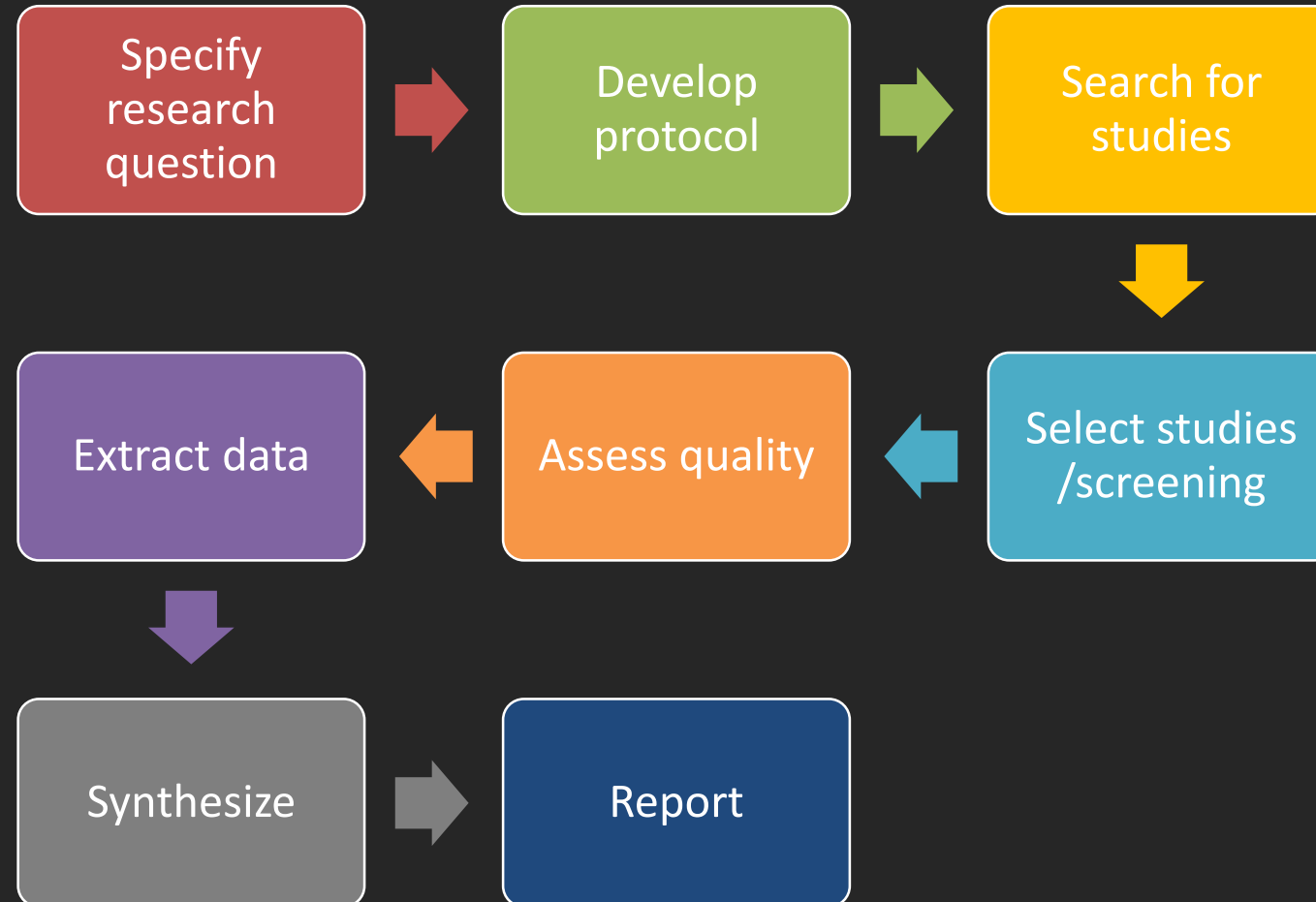
Who	Adults without known cardiovascular disease
What	Protective association of alcohol on coronary heart disease
How	Examine biological markers

Activity – Q1 & Q2

The effectiveness of interventions using computer, mobile or wearable technologies aimed at reducing sedentary behavior (SB).

- High levels of sedentary behavior (SB) are associated with negative health consequences. While technological advancements have contributed to a rise in SB, they are also being harnessed to reduce SB. Digital tools such as mobile phones, internet, text-messaging and wearable sensors can provide a platform to intervene to change health behavior. However, there is a lack of evidence examining their role in reducing SB.

Review Process

Develop A Protocol

- Reduce the probability of reviewer bias

- Project management
  - ✓ allocation of roles
  - ✓ mechanisms for resolving disagreements
  - ✓ project schedule

- Be evaluated by your advisor or others for feedback

- Form the basis of the introduction and method sections of a report of a review

Search Strategies

- Literature databases
  - ✓ Library Guides http://www.lib.uiowa.edu/eng/
  - ✓ Theses and dissertations
  - ✓ Technical reports

- Manual search
  - ✓ Specific journals and conference proceedings
  - ✓ Grey literature if possible

- Snowballing
  - ✓ Reference lists from relevant papers
  - ✓ Scopus, Web of Science and Google Scholar for citing reference search

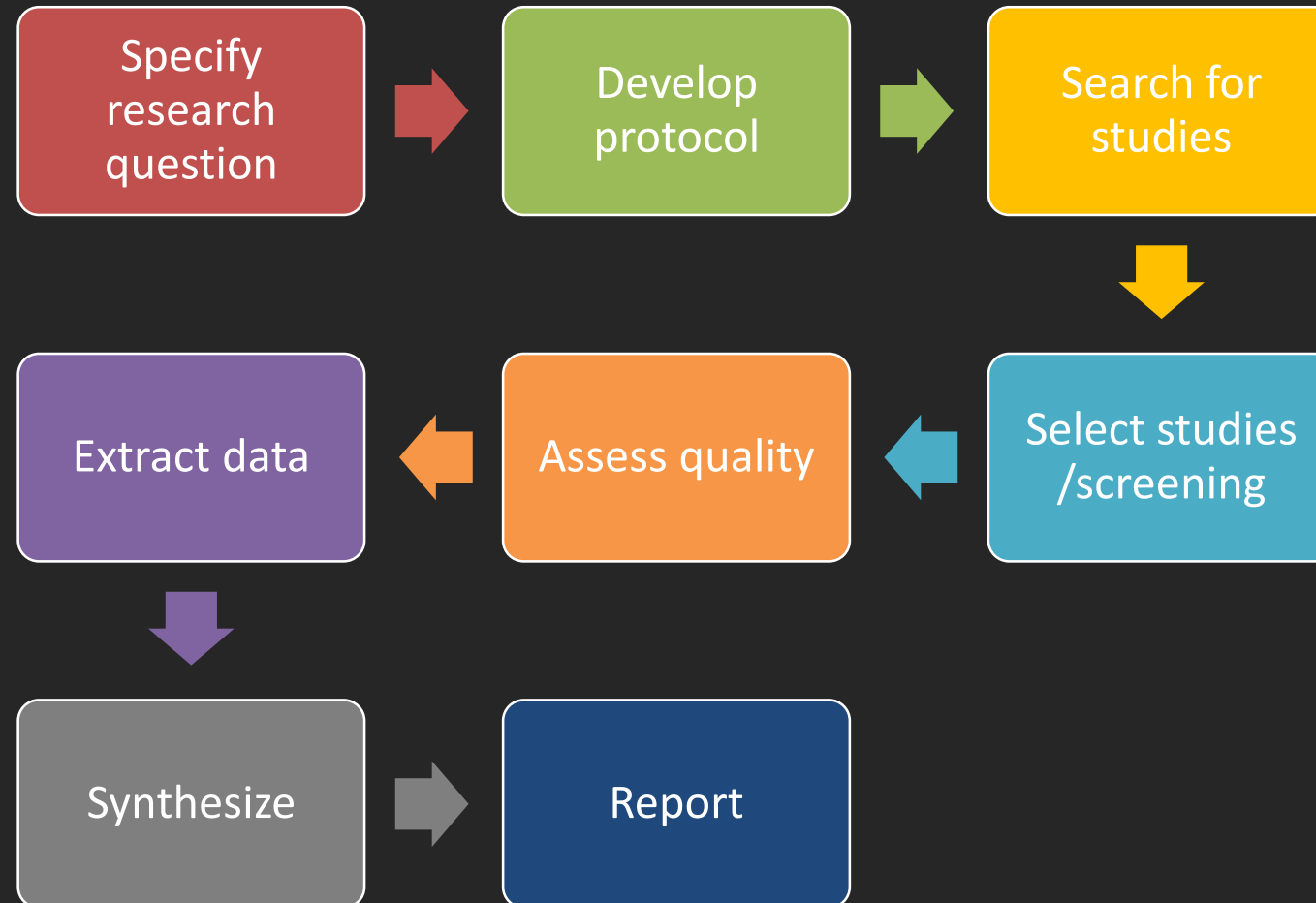- Contact key researchers

Search Literature Databases

- Translate a focused research question into its relevant search concepts
  - ✓The question matches the search strategy.
  - ✓Search concepts are clear.
  - ✓Search concepts are not too broad or too narrow.
  - ✓Revise search concepts if retrieve too many or too few search results
- Boolean (AND, OR, NOT) and proximity operators
- Subject headings: i.e., MeSH
- Synonyms, acronyms or abbreviations
- Filters: i.e., RCT (randomized controlled trials) filter

Activity - Q3

- Research Question: How effective is artificial intelligence in predicting organ transplantation outcomes?

	Concept 1	Concept 2
Main concepts	Artificial intelligence Machine Learning	Organ Transplantation
Synonyms, Acronyms, Abbreviations	Prediction Model Simulation Model Intelligent Computing Intelligent System Intelligent Agent	Organ Transplant Transplant Failure
Subject Headings: MeSH Terms	"Artificial Intelligence"[Mesh] "Machine Learning"[Mesh] "Decision Support Techniques" [Mesh] "Computer Simulation" [Mesh]	"Organ Transplantation" [Mesh] Transplantation [Mesh] Transplants [Mesh] "Transplant Recipients" [Mesh]

Systematic Reviews Process

Select Studies / Screening

- De-duplicating: EndNote http://guides.lib.uiowa.edu/citations
- Sorting
  - ➢Eligibility criteria (example on the next slide)
    - ✓Specific
    - ✓Definitions
    - ✓Determine if an article will be included or not
    - ✓For exclusions, provide reasons
  - ➢Rayyan – free software to manage the sorting process
- More SR software http://systematicreviewtools.com

Example of Criteria

- Research Question: The effectiveness of interventions using computer, mobile or wearable technologies aimed at reducing sedentary behavior (SB)

Inclusion criteria:
- Adults aged 18 years and over
- Published RCTs of any duration with a main aim of reducing SB and with computer, mobile or wearable technology as any part of the intervention
- RCTs with a comparison or control arm that consisted of no intervention control, usual care, or alternative treatment conditions
- Pre-post objective, subjective or proxy measure of SB

Exclusion criteria:
- RCTs not published in English
- Comparator intervention using computer, mobile or wearable technology to reduce SB or increase physical activity
- RCTs where the main aim of the intervention was to increase physical activity
- Interventions delivered in a hospital setting
- Clinically diagnosed populations, with the exception of those who are overweight or obese

Report

- A review is reported as
  - ✓ Detailed technical report
  - ✓ Conference or journal paper
  - ✓ Chapter in a thesis or dissertation.
- Can provide traceability from individual primary studies to the results and conclusions of a review
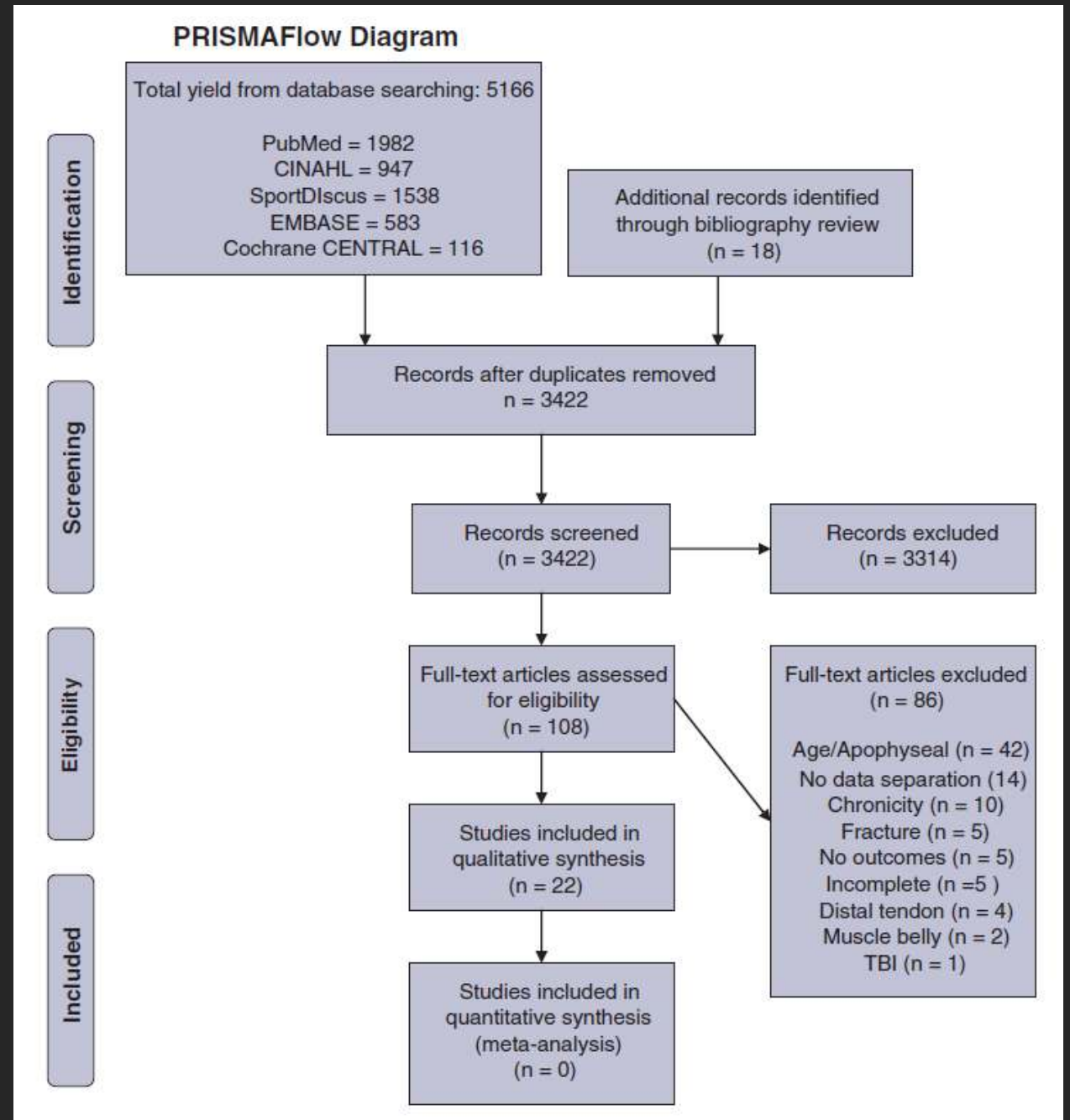- Can demonstrate rigor in applying the review process.

Methods

- Resources including interface
  - Databases
  - Grey literature
- Date that search conducted
- Describe search overall, which concepts were included
- Describe filters
- Describe additional search strategies

Comprehensive search strategies,

Database	Abbreviated search strategy (full results available on request or in appendix)	Result #'s (October 2015)
PubMed	("Ischium"[Mesh] OR hamstring*[Text Word] OR semitend*[Text Word] OR…) **AND** ("Tendon Injuries"[Mesh] OR "Rupture"[Mesh] OR "Athletic Injuries"[Mesh] OR "Muscle, Skeletal/injuries"[Mesh] OR avulsion*[Text Word] OR…) **AND** ("surgery" [Subheading] OR "therapy" [Subheading] OR "rehabilitation" [Subheading] OR "Surgical Procedures, Operative"[Mesh] OR "Physical Therapy Modalities"[Mesh] OR management[Text Word] OR…) **AND** ("Treatment Outcome"[Mesh] OR "Recovery of Function"[Mesh]OR "Patient Satisfaction"[Mesh] OR "Sports"[Mesh] OR "Exercise"[Mesh] OR "Athletes" [Mesh] OR sport*[Text Word] OR athlet* [Text Word] OR ….)	1982
CINAHL	(MH "Hamstring Muscles" OR "biceps femoris" OR ….) **AND** (MH "Tendon Injuries+" OR MH "Athletic Injuries+" OR injur* OR rupture*OR …) **AND** (MW "TH" OR "RH" OR "SU" OR MH "Surgery, Operative +" OR MH "Physical Therapy+" OR nonoperative OR non operative OR nonsurgical OR…) **AND** (MH "Treatment Outcome+" OR MH "Recovery" OR MH "Functional Status" OR quality of life" OR outcome* OR…)	947
SportDiscus	(DE "HAMSTRING muscle" OR DE "BICEPS femoris" OR TX semitendion* OR…) **AND** (DE "HAMSTRING muscle" OR DE "BICEPS femoris" OR TX semitendion* OR…) **AND** (DE "SURGERY"[exploded] OR DE "Physical Therapy" [exploded] OR TX conservative OR…) **AND** (DE "TREATMENT effectiveness" OR DE"Exercise" [exploded] OR TX outcome* OR….)	1538
Embase	('biceps femoris muscle'/exp OR 'hamstring'/exp OR 'semitendinous muscle'/exp OR hamstring*:ab,ti OR…) **AND** ('tendon rupture'/exp OR 'avulsion injury'/exp OR 'sport injury'/exp OR avulsion*:ab,ti OR…) **AND** ('surgery':lnk OR 'therapy':lnk OR 'rehabilitation':lnk OR 'surgery'/exp OR 'physiotherapy'/exp OR surgical:ab,ti OR….) **AND** ('self report'/exp OR 'treatment outcome'/exp OR 'functional assessment'/exp OR….) **NOT** [medline]/lim	583
Cochrane (CENTRAL)	(ti,ab,kw "ischial tuberosity" OR ti,ab,kw hamstring OR …) **AND** (MeSH Tendon injuries [exploded] OR MeSH Skeletal Muscle/IN [exploded] OR ti,ab,kw avulsion* OR…) **AND**(MeSH Surgical Procedures, Operative [exploded] OR MeSH Physical Therapy Modalities [exploded] OR ti,ab,kw surgical OR…) **AND** MeSH Treatment Outcome [exploded] OR ti,ab,kw recover* OR outcome* OR….)	119

Methods

- PRISMA flow diagram

- PRISMA Guidelines for Reporting

http://prisma-statement.org/

PRISMAFlow Diagram

Total yield from database searching: 5166

PubMed = 1982
CINAHL = 947
SportDIscus = 1538
EMBASE = 583
Cochrane CENTRAL = 116

Additional records identified through bibliography review (n = 18)

Identification

Records after duplicates removed n = 3422

Screening

Records screened (n = 3422)

Records excluded (n = 3314)

Eligibility

Full-text articles assessed for eligibility (n = 108)

Full-text articles excluded (n = 86)

Age/Apophyseal (n = 42)
No data separation (14)
Chronicity (n = 10)
Fracture (n = 5)
No outcomes (n = 5)
Incomplete (n =5)
Distal tendon (n = 4)
Muscle belly (n = 2)
TBI (n = 1)

Studies included in qualitative synthesis (n = 22)

Included

Studies included in quantitative synthesis (meta-analysis) (n = 0)

Guidelines & Standards

- PRISMA Guidelines for Reporting http://prisma-statement.org/

- Cochrane Handbook for Systematic Reviews of Interventions http://handbook.cochrane.org/

- Joanna Briggs Reviewers' Manual http://joannabriggs.org/assets/docs/sumari/ReviewersManual-2014.pdf

- Finding What Works in Healthcare: Standards for Systematic Reviews http://www.nationalacademies.org/hmd/Reports/2011/Finding-What-Works-in-Health-Care-Standards-for-Systematic-Reviews/Standards.aspx

Resources

- Kitchenham, B. A., Budgen, D. & Brereton, P. (2015). *Evidence-Based Software Engineering and Systematic Reviews*. Boca Raton, FL: CRC Press, Taylor & Francis Group

- Foster, M. J. (2017). Systematic Literature Reviews: Role of librarians to support engineering education [PowerPoint Slides]. Retrieved from http://tamu.libguides.com/systematicreviews/eld

- Jewell, S. T. & Foster, M. J. (2018). Matching review type to research question: which review is right for you? [PowerPoint Slides]. MLA Webinar.

- Deberg, J. (2017). Systematic Reviews: Nuts and Bolts [PowerPoint Slides].

- Folb, B., Ketchum, A. M., Klem, M.L. etc. (2017). Systematic Review Workshop: The Nuts and Bolts for Librarians. Retrieved from https://www.hsls.pitt.edu/systematicreview/

- Hardin Library guide for Systematic Reviews: http://guides.lib.uiowa.edu/systematicreviews

- U.S. EPA. Systematic Review Protocol for the Polychlorinated Biphenyls (PCBs) Noncancer IRIS Assessment (Preliminary Assessment Materials). U.S. Environmental Protection Agency, Washington, DC, EPA/635/R-19/201, 2019.