# Introduction to Literature Screening for Systematic Reviews

Canadian Chiropractic Guideline Initiative

UOIT-CMCC Centre for Disability Prevention and Rehabilitation

Systematic Review Workshop 2019

# CCGI Workshops

1. Introduction to research questions and the PICO framework
2. **Systematic review screening of literature**
3. Critical appraisal/risk of bias assessment of studies
4. Data extraction from studies

# Outline of Screening Workshop

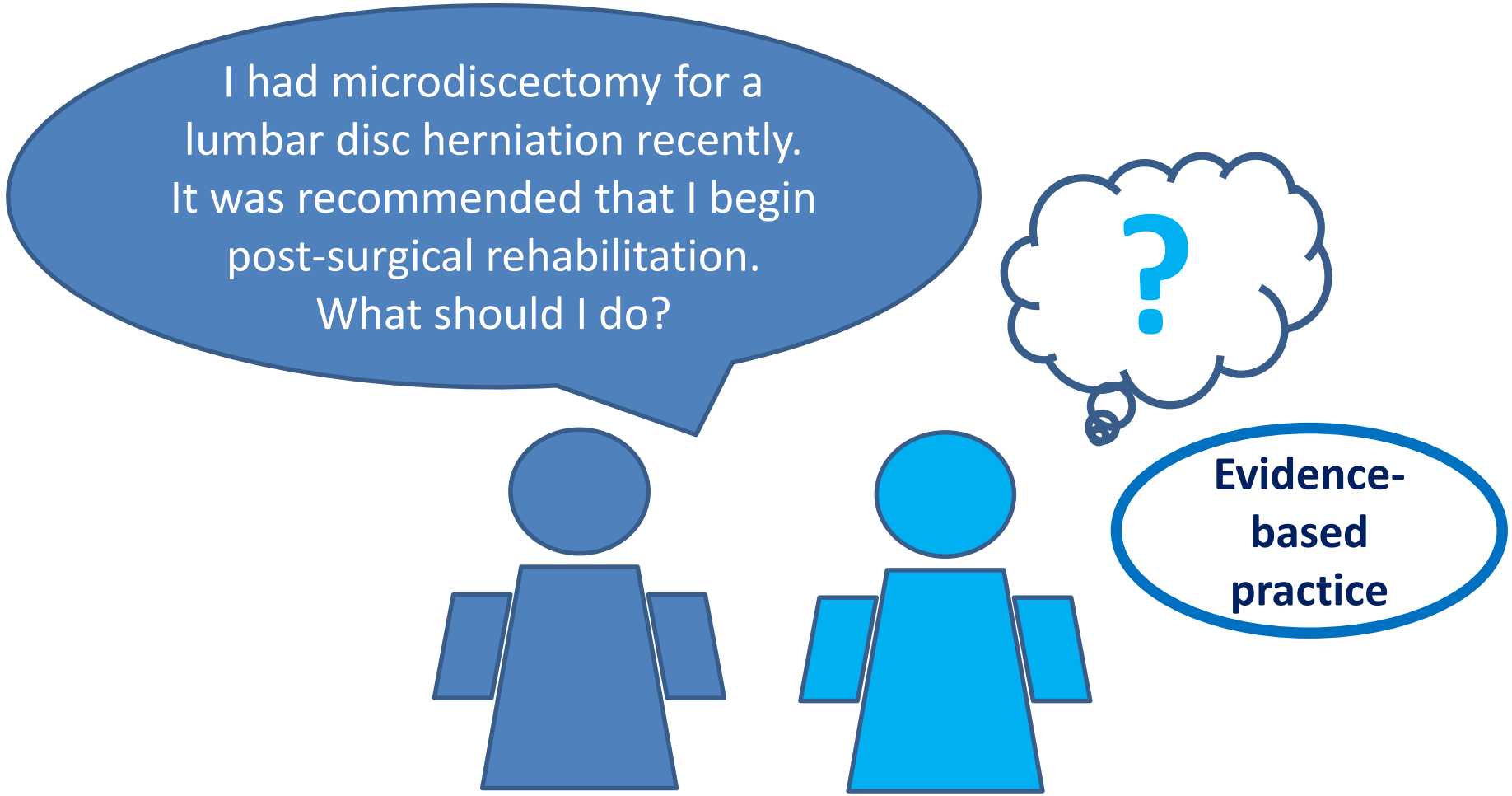
1. Overview of systematic reviews
2. Introduction to phase I (title/abstract) screening
    a) Small group learning
3. Introduction to phase II (full text) screening
    a) Small group learning

# Learning Outcomes

At the end of this session, you should be able to:

- Describe the methodology for the two-phase screening process
- Screen titles, abstracts, and full-text independently for relevance using screening criteria
- Reach consensus on relevance of screened titles, abstracts, and full text

# Clinical/Educational Scenario



# What is a Systematic Review?

- A review of a clearly formulated question that uses systematic and explicit methods to identify, select, and critically appraise relevant research, and to collect and analyze data from the studies that are included in the review.

- NHS Centre for Reviews and Dissemination, 2001

# Why conduct a Systematic Review?

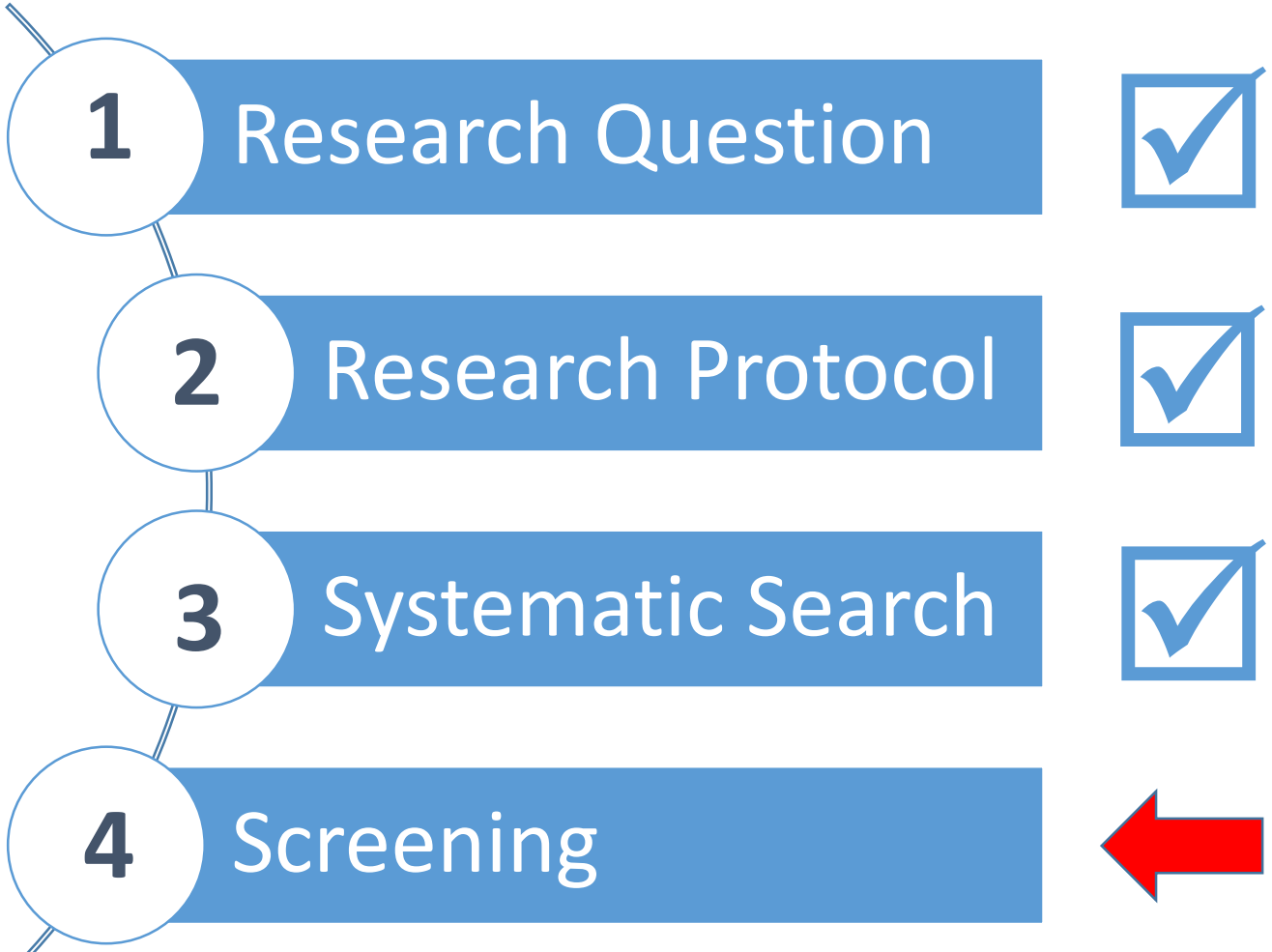
- “The purpose of a systematic review is to sum up the best available research on a specific question. This is done by synthesizing the results of several studies. A systematic review uses transparent procedures to find, evaluate and synthesize the results of relevant research. Procedures are explicitly defined in advance, in order to ensure that the exercise is transparent and can be replicated. This practice is also designed to minimize bias.”

-The Campbell Foundation

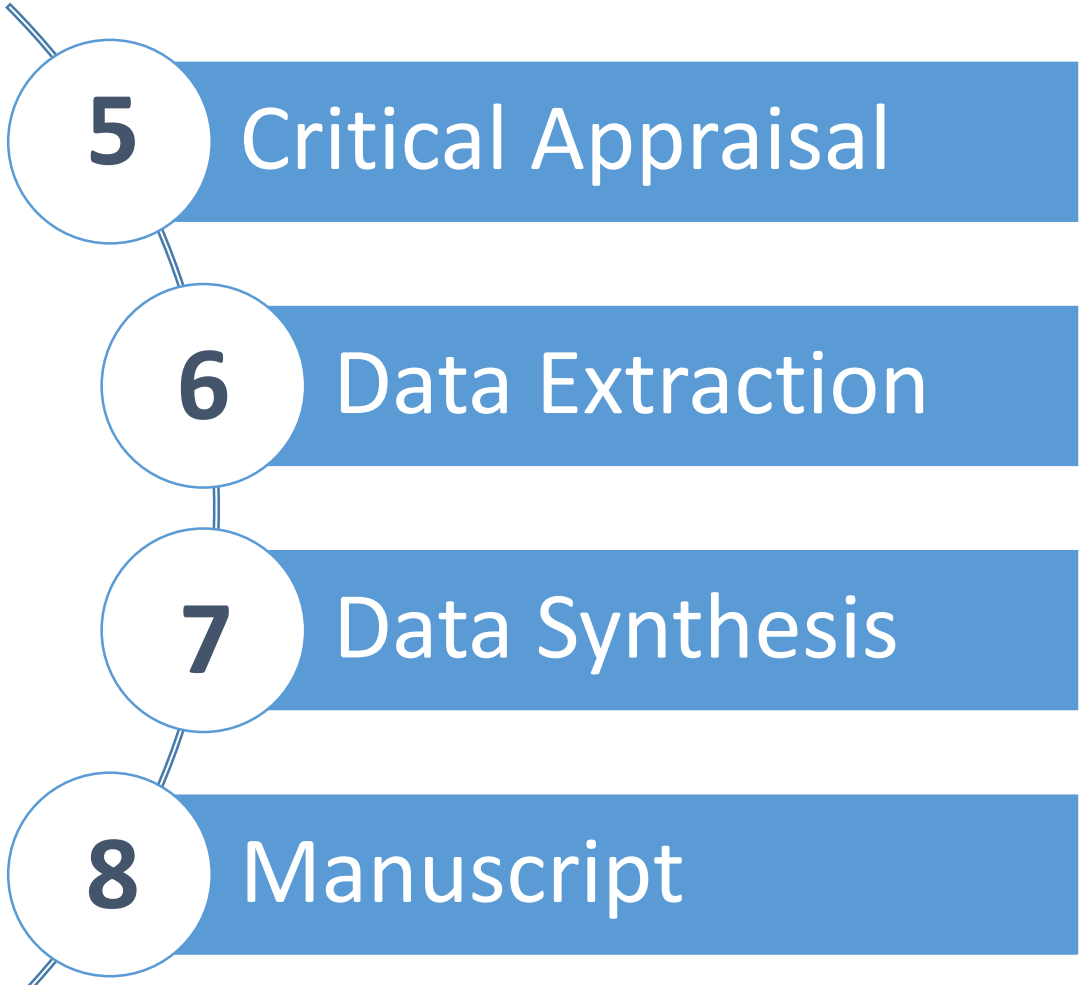
# Review of Main Components

**Systematic Search** → **Screening** → **Study Quality** → **Data Synthesis**

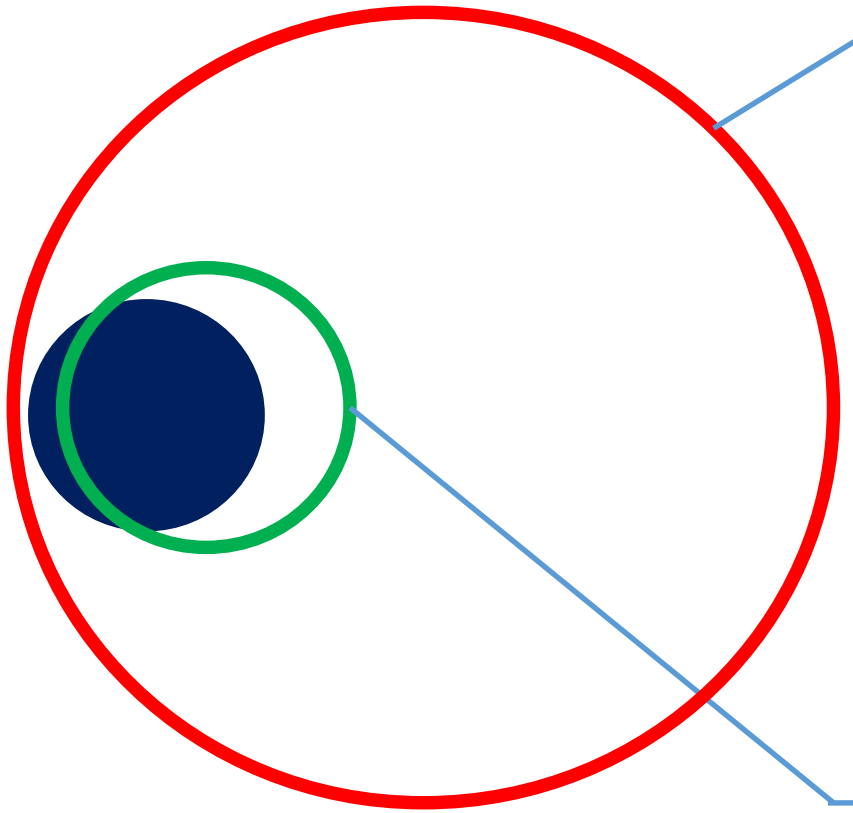
# Review of Steps



# Review of Steps



# The Problem



4761 articles retrieved from search

21 relevant articles

500 articles retrieved from search

# The Solution: Screening

Citations from literature search

Selection Criteria

Relevant Literature

Have you conducted literature screening before?

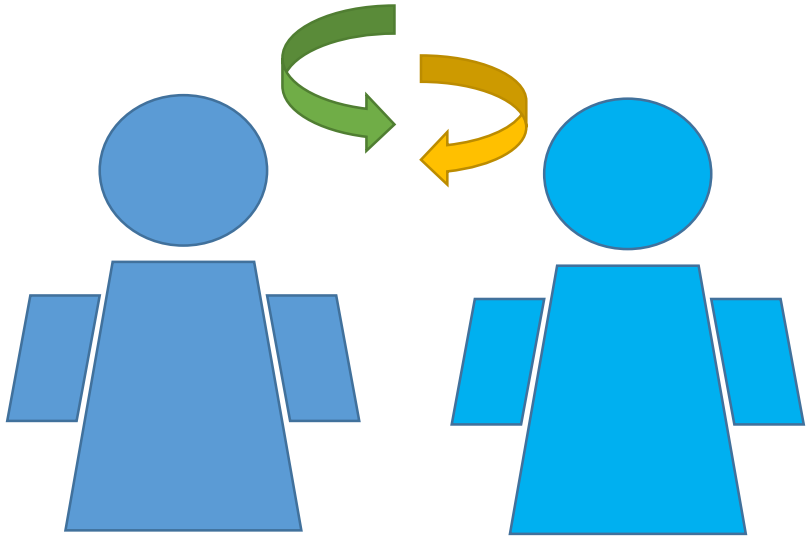
If yes, how?
If not, what do you think might be involved?

# Example: CCGI Systematic Review

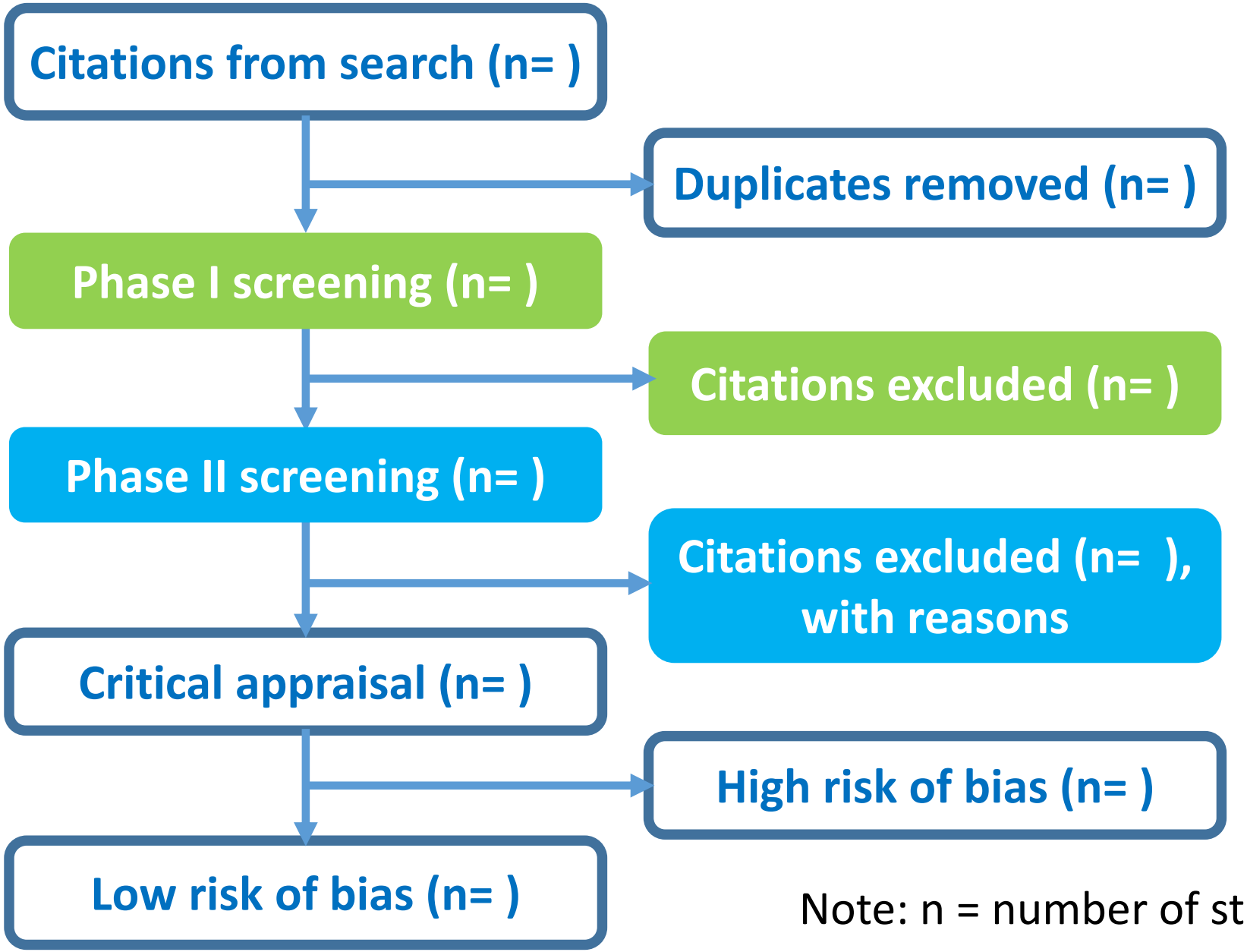
- CCGI is conducting a systematic review aimed to:
  - Systematically review the evidence on the effectiveness and safety of post-surgical rehabilitation interventions among adults with low back pain with or without radiculopathy

# Screening

- Two-phase screening
  - Phase I: titles and abstracts
  - Phase II: full text
- Random pairs of independent reviewers
- Consensus reached through discussion
- Involve third reviewer when necessary
- Contact authors if additional information needed

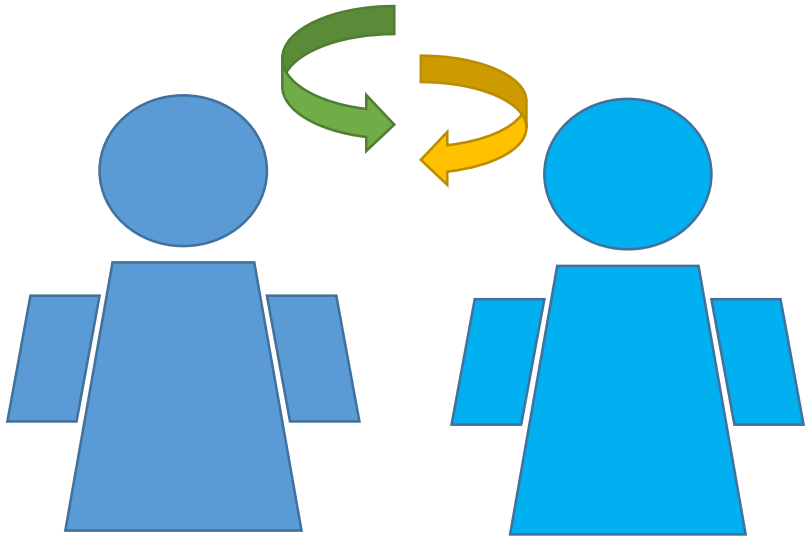


# Flow Diagram



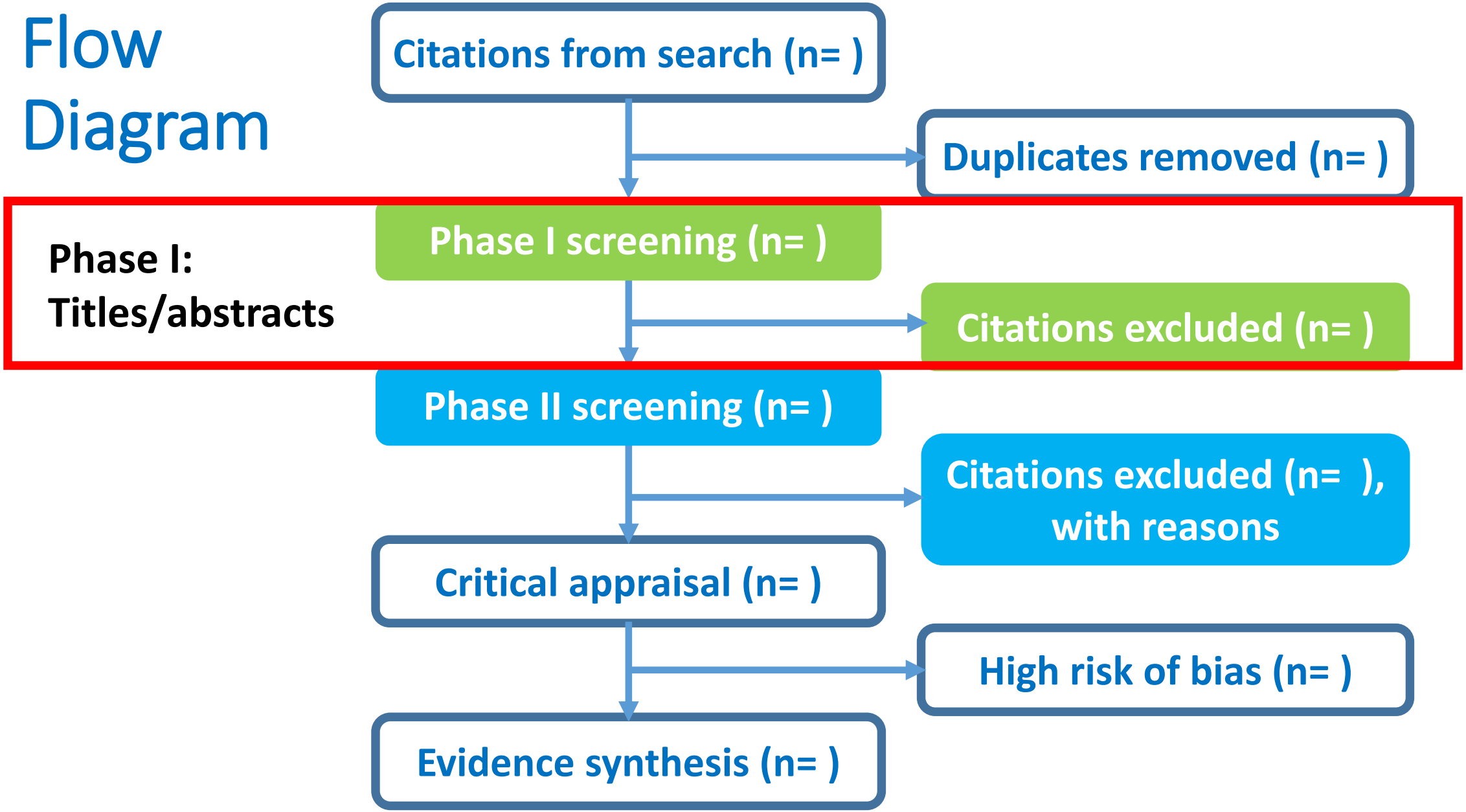

Note: n = number of studies

# Phase I Screening



**Using titles and abstracts**

# Flow Diagram



# Screening Criteria: Population

- Detailed description of the patients that you wish to apply the findings of your systematic review to

- Who: age, sex, occupation/sport, co-morbidities
- What: Condition being studied
- When: Chronicity

- *Example: How would you define low back pain?*

# Eligibility Criteria: Intervention

- Detailed description of the intervention that you wish to explore
  - Who: Providers
  - What: How is the intervention defined
  - When: Continuum of care, frequency,
  - Where: Health care setting (inpatient, outpatient, home, work)

# Eligibility Criteria: Comparison Groups

- Comparators may include any or all of:
  - Other intervention(s)
    - Groups of interventions
    - Specific intervention
  - Sham or placebo intervention
  - No intervention
  - Wait list

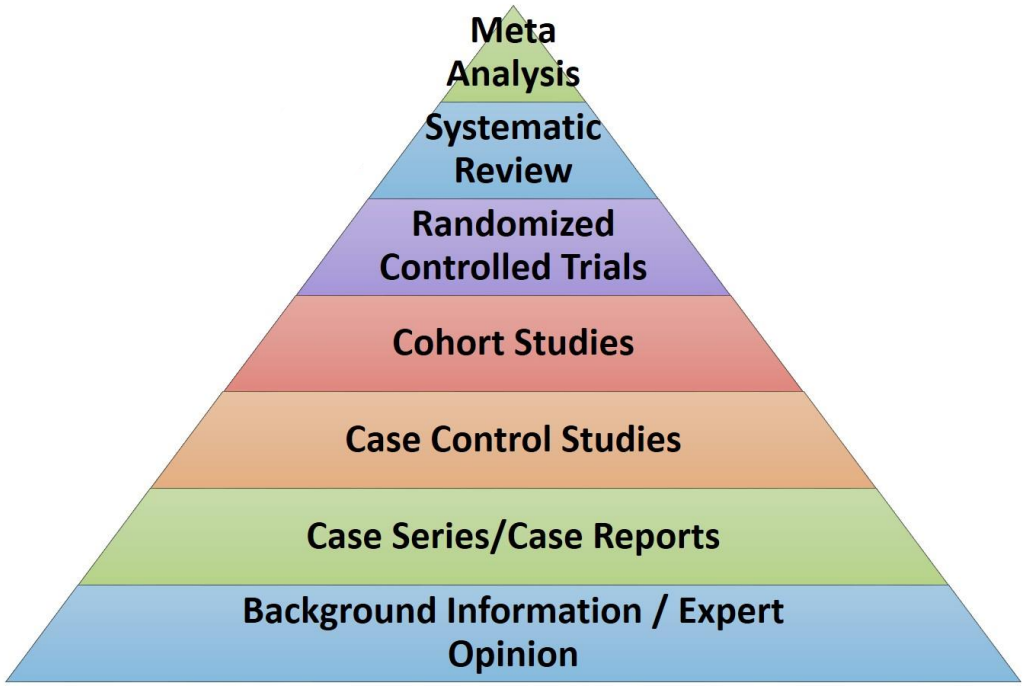
# Eligibility Criteria: Outcomes

- Clinically relevant to your research question
- Types of outcomes to consider:
  - Clinical (e.g. pain, range of motion)
  - Functional (e.g. disability, return to work)
  - Quality of life
  - Administrative (e.g. lost work days, claim closure)
  - Psychological (e.g. depressive symptoms, fear)
  - Cost
  - Adverse Events

# Eligibility Criteria

Other study characteristics may include:

- Language
- Publication dates
- Included study designs must be:
  - Consistent with the research question
- Sample size



# Example Screening Criteria: Population

- Include:
  - Adults (aged 18 years and older) who underwent surgery for LBP with or without radiculopathy

- Exclude:
  - LBP with or without radiculopathy attributed to major structural or systemic pathology (e.g., fracture, infection, tumour, osteoporosis, inflammatory arthritidies, vascular claudation, and cauda equina syndrome)

# Example Eligibility Criteria: Intervention

- Post-surgical rehabilitation
- Examples:
  - Education (e.g., information on self-management strategies)
  - Compensatory strategies, training, and exercises (e.g., stretching)
  - Manual Therapies (e.g., manipulation)
  - Passive physical modalities (e.g., ultrasound)
  - Acupuncture (e.g., needle acupuncture)
  - Pharmacological interventions (e.g., NSAIDS)
  - Support and counselling
  - Adaptation of workplace
  - Multimodal

# Example Eligibility Criteria: Comparison

- Other non-pharmacological or pharmacological interventions, placebo or sham interventions, wait list, and no intervention

# Example Eligibility Criteria: Outcomes

- Classify outcomes based on the International Classification of Functioning, Disability and Health (ICF) framework to describe functioning, disability, health, and adverse events
  - Body function and structure (to describe a person's impairment)
  - Activity and participation (to describe a person's functional status, health-related quality of life)
  - Additional surgeries
  - Adverse events

# Eligibility Criteria: Inclusions

- To be included in the systematic review, studies targeting the outlined population, intervention, comparisons, and outcomes must also meet the following inclusion criteria:
    1. English, French, Portuguese, or Swedish language;
    2. published in a peer-reviewed journal; and
    3. study designs including clinical practice guidelines, systematic reviews, randomized clinical trials, cohort studies, case-control studies, and qualitative studies

# Eligibility Criteria: Exclusions

- Studies meeting any of the following criteria will be excluded:
  1. publication types including: letters, editorials, commentaries, unpublished manuscripts, dissertations, government reports, books and book chapters, conference proceedings, meeting abstracts, lectures and addresses, consensus development statements, guideline statements;
  2. study designs including: pilot studies, cross-sectional studies, case reports, case series, non-systematic reviews, biomechanical studies, laboratory studies, and studies not reporting on methodology; and
  3. cadaveric or animal studies

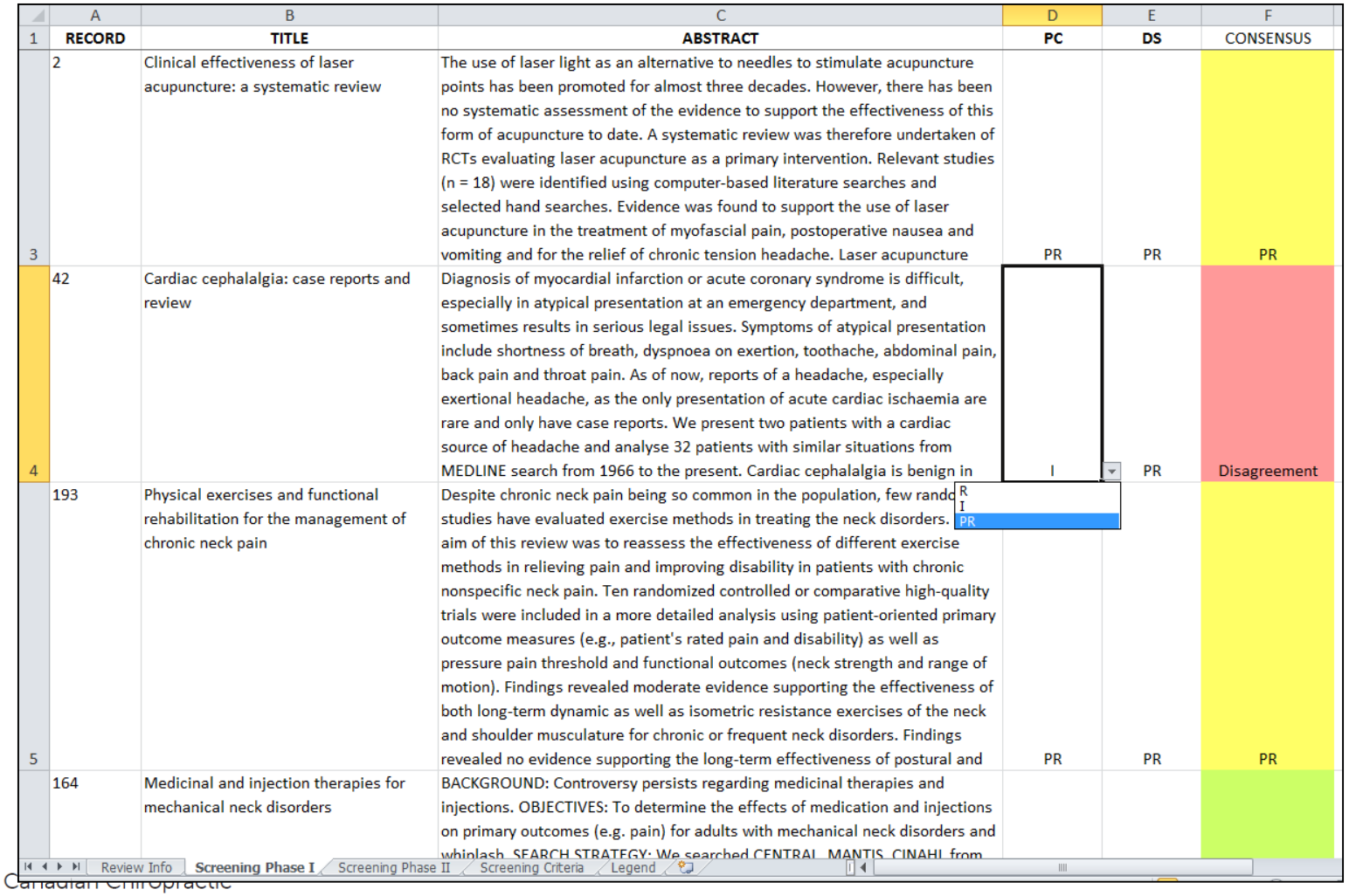
# Independent Screening Spreadsheets: Phase I

| | RECORD | TITLE | ABSTRACT | Southerst |
|---|---|---|---|---|
| 2 | 2 | Clinical effectiveness of laser acupuncture: a systematic review | The use of laser light as an alternative to needles to stimulate acupuncture points has been promoted for almost three decades. However, there has been no systematic assessment of the evidence to support the effectiveness of this form of acupuncture to date. A systematic review was therefore undertaken of RCTs evaluating laser acupuncture as a primary intervention. Relevant studies (n = 18) were identified using computer-based literature searches and selected hand searches. Evidence was found to support the use of laser acupuncture in the treatment of myofascial pain, postoperative nausea and vomiting and for the relief of chronic tension headache. Laser acupuncture would appear to represent an effective form of acupuncture for the management of these conditions and could be considered as a viable alternative to more traditional forms of acupuncture point stimulation. [References: 44] | PR |
| 3 | 183 | Conservative management of mechanical neck disorders: a systematic review | OBJECTIVE: To determine if conservative treatments (manual therapies, physical medicine methods, medication, and patient education) relieved pain or improved function/disability, patient satisfaction, and global perceived effect in adults with acute, subacute, and chronic mechanical neck disorders (MND) by updating 11 systematic reviews of randomized controlled trials (RCT). METHODS: Two independent authors selected studies, abstracted data, and assessed methodological quality from computerized databases. We calculated relative risks and standardized mean differences (SMD) when possible. In the absence of heterogeneity, we calculated pooled effect sizes. RESULTS: We studied 88 unique RCT. The mean methodological quality scores were acceptable in 59% of the trials. We noted strong evidence of benefit for maintained pain reduction [pooled SMD -0.85 (95% CI -1.20, -0.50)], improvement in function, and positive global perceived effect favoring exercise plus mobilization/manipulation versus control for subacute/chronic MND. We found moderate evidence of longterm benefit for improved function favoring direct neck strengthening and stretching for chronic MND, and for high global perceived effect favoring vertigo exercises. We noted moderate evidence of no benefit for botulinium-A injection [pooled SMD -0.39 (95% CI -01.25, 0.47)]. We found many treatments demonstrating short-term effects. CONCLUSION: Exercise combined with mobilization/manipulation, exercise alone, and intramuscular lidocaine for chronic MND; intravenous glucocorticoid for acute whiplash associated disorders; and low-level laser therapy demonstrated either intermediate or longterm benefits. Optimal dosage of effective techniques and prognostic indicators for responders to care should be explored in future research. [References: 137] | R |
| 4 | 7 | Hemorrhage from cavernous malformations of the brain: definition and reporting standards. Angioma Alliance Scientific Advisory Board | BACKGROUND AND PURPOSE: Cavernous malformations of the brain (CMs) cause intracranial hemorrhage, but its reported frequency varies, partly attributable to study design. To improve the validity of future research, we aimed to develop a robust definition of CM hemorrhage. METHODS: We systematically reviewed the published literature (Ovid Medline and Embase to June 1, 2007) for definitions of CM hemorrhage used in studies of the untreated clinical course of >or=20 participants with CM(s), to inform the development of a consensus statement on the clinical and imaging features of CM hemorrhage at a scientific workshop of the Angioma Alliance. RESULTS: A systematic review of 1426 publications about CMs in humans, revealed 15 studies meeting our inclusion criteria. Although 14 (93%) studies provided a definition of CM hemorrhage, data were less complete on the confirmatory type(s) of imaging (87%), whether CM hemorrhage should be clinically symptomatic (73%), and whether hemorrhage had to extend outside the CM or not (47%). We define a CM hemorrhage as requiring acute or subacute onset symptoms (any of: headache, epileptic seizure, impaired consciousness, or new/worsened focal neurological deficit referable to the anatomic location of the CM) accompanied by radiological, pathological, surgical, or rarely only cerebrospinal fluid evidence of recent extra- or intralesional hemorrhage. The definition includes neither an increase in CM diameter without other evidence of recent hemorrhage, nor the existence of a hemosiderin halo. CONCLUSIONS: A consistent approach to clinical and brain imaging classification of CM hemorrhage will improve the external validity of future CM research. [References: 41] | I |
| 5 | 1 | The relationship between antidepressant and analgesic | OBJECTIVE: Debate continues regarding whether onset of analgesia is faster than antidepressant effect in antidepressants with both properties. Duloxetine | |

R
I
PR

REVIEW INFO | Screening Phase I | Screening Phase II | Screening Criteria | Legend | Sheet6

# Consensus Screening Spreadsheets: Phase I



| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 1 | **RECORD** | **TITLE** | **ABSTRACT** | **PC** | **DS** | CONSENSUS |
| 3 | 2 | Clinical effectiveness of laser acupuncture: a systematic review | The use of laser light as an alternative to needles to stimulate acupuncture points has been promoted for almost three decades. However, there has been no systematic assessment of the evidence to support the effectiveness of this form of acupuncture to date. A systematic review was therefore undertaken of RCTs evaluating laser acupuncture as a primary intervention. Relevant studies (n = 18) were identified using computer-based literature searches and selected hand searches. Evidence was found to support the use of laser acupuncture in the treatment of myofascial pain, postoperative nausea and vomiting and for the relief of chronic tension headache. Laser acupuncture | PR | PR | PR |
| 4 | 42 | Cardiac cephalalgia: case reports and review | Diagnosis of myocardial infarction or acute coronary syndrome is difficult, especially in atypical presentation at an emergency department, and sometimes results in serious legal issues. Symptoms of atypical presentation include shortness of breath, dyspnoea on exertion, toothache, abdominal pain, back pain and throat pain. As of now, reports of a headache, especially exertional headache, as the only presentation of acute cardiac ischaemia are rare and only have case reports. We present two patients with a cardiac source of headache and analyse 32 patients with similar situations from MEDLINE search from 1966 to the present. Cardiac cephalalgia is benign in | I | PR | Disagreement |
| 5 | 193 | Physical exercises and functional rehabilitation for the management of chronic neck pain | Despite chronic neck pain being so common in the population, few rando studies have evaluated exercise methods in treating the neck disorders. aim of this review was to reassess the effectiveness of different exercise methods in relieving pain and improving disability in patients with chronic nonspecific neck pain. Ten randomized controlled or comparative high-quality trials were included in a more detailed analysis using patient-oriented primary outcome measures (e.g., patient's rated pain and disability) as well as pressure pain threshold and functional outcomes (neck strength and range of motion). Findings revealed moderate evidence supporting the effectiveness of both long-term dynamic as well as isometric resistance exercises of the neck and shoulder musculature for chronic or frequent neck disorders. Findings revealed no evidence supporting the long-term effectiveness of postural and | PR | PR | PR |
| | 164 | Medicinal and injection therapies for mechanical neck disorders | BACKGROUND: Controversy persists regarding medicinal therapies and injections. OBJECTIVES: To determine the effects of medication and injections on primary outcomes (e.g. pain) for adults with mechanical neck disorders and whiplash. SEARCH STRATEGY: We searched CENTRAL, MANTIS, CINAHL from | | | |

R
I
PR

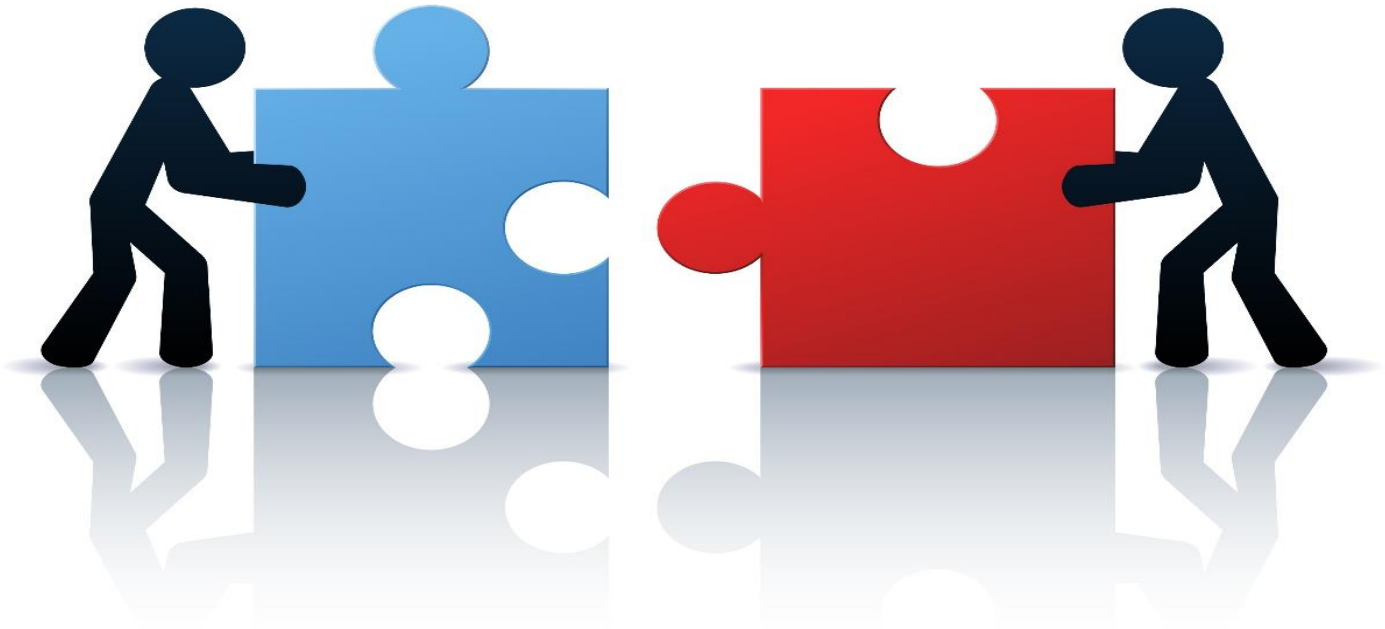
Review Info | Screening Phase I | Screening Phase II | Screening Criteria | Legend

UOIT-CMCC Centre for Disability Prevention and Rehabilitation

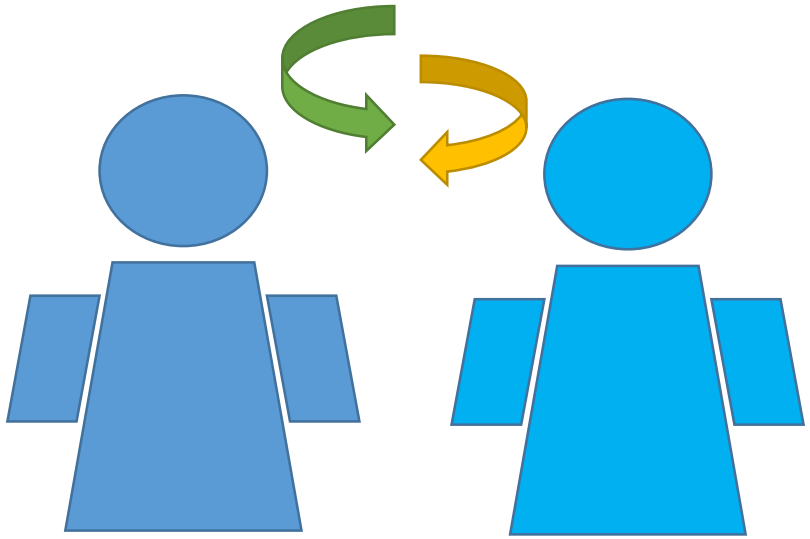
Canadian Chiropractic Guideline Initiative
ADVANCING EXCELLENCE IN CHIROPRACTIC CARE

OntarioTech UNIVERSITY | CMCC Canadian Memorial Chiropractic College

# Small Group Learning

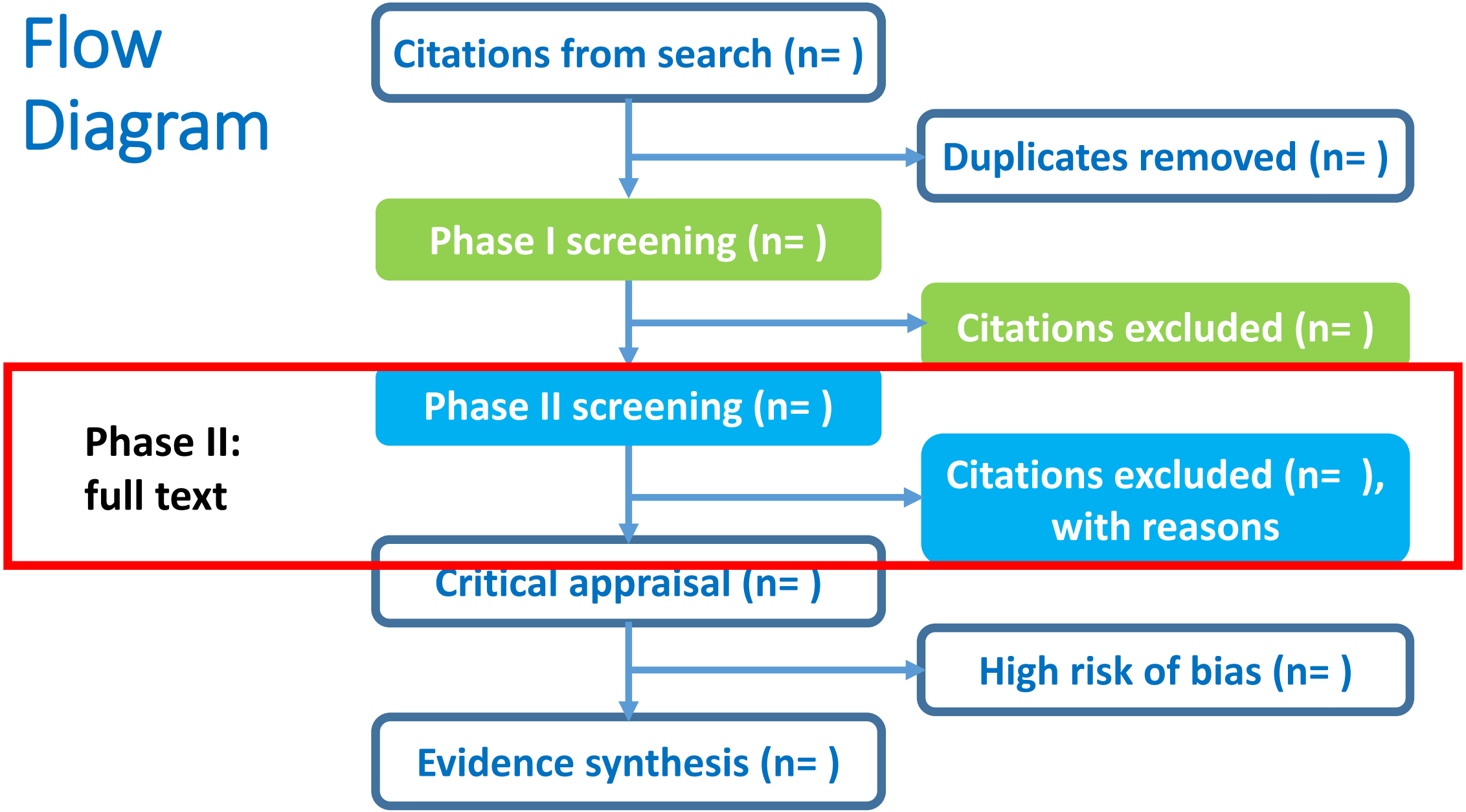


# Phase II Screening



**Using full text articles**

# Flow Diagram



# Independent Screening Spreadsheets: Phase II

| | A | B | C | D |
|---|---|---|---|---|
| 1 | **Record** | **Relevance** | **Notes** | |
| 2 | 3045 | I | Sample size too small | |
| 3 | 3068 | I | Ineligible condition | |
| 4 | 4098 | R | | |
| 5 | 4109 | I | Ineligible study design | |
| 6 | 4359 | I | Intervention not eligible | |
| 7 | 4507 | | | |
| 8 | | | | |
| 9 | | | | |
| 10 | | | | |
| 11 | | | | |
| 12 | | | | |
| 13 | | | | |
| 14 | | | | |
| 15 | | | | |
| 16 | | | | |

R
I
PR

Review Info | Screening Phase I | **Screening Phase II** | Screening Criteria | Legend

394

**EXTENDED REPORT**

## A pragmatic randomised controlled trial of local corticosteroid injection and physiotherapy for the treatment of new episodes of unilateral shoulder pain in primary care

**E M Hay, E Thomas, S M Paterson, K Dziedzic, P R Croft**

*Ann Rheum Dis* 2003;**62**:394–399

**Objectives:** To compare the long term effectiveness of local steroid injections administered by general practitioners with practice based physiotherapy for treating patients presenting in primary care with new episodes of unilateral shoulder pain.
**Methods:** Adults consulting with shoulder pain were recruited by their general practitioner. Patients were randomly allocated to receive either corticosteroid injections or community based physiotherapy. Primary outcome was self reported disability from shoulder problems at six months. Secondary outcomes included participant's global assessment of change; pain; function; "main complaint"; range of shoulder movement; co-interventions. A study nurse unaware of the treatment allocation performed baseline and follow up assessments. Analysis was by intention to treat.
**Results:** Over 22 months 207 participants were randomised, 103 to physiotherapy and 104 to injection. Prognostic variables were similar between the two groups at baseline. Mean (SD) improvements in disability scores at six weeks were 2.56 (5.4) for physiotherapy and 3.03 (6.3) for injection (mean difference=−0.5, 95% confidence interval (95% CI): −2.1 to 1.2) and at six months were 5.97 (5.4) for physiotherapy and 4.55 (5.9) for injection (mean difference=1.4, 95% CI −0.2 to 3.0). A "successful outcome" (a minimum 50% drop in the disability score from baseline) at six months was achieved by 59/99 (60%) in the physiotherapy group and 51/97 (53%) in the injection group (percentage difference=7%, 95% CI −6.8% to 20.4%). Co-interventions were more common in the injection group during follow up.
**Conclusion:** Community physiotherapy and local steroid injections were of similar effectiveness for treating new episodes of unilateral shoulder pain in primary care, but those receiving physiotherapy had fewer co-interventions.

See end of article for authors' affiliations

Correspondence to: Dr E M Hay, Staffordshire Rheumatology Centre, The Haywood, Burslem, Stoke-on-Trent, North Staffordshire ST6 7AG, UK; e.m.hay@keele.ac.uk

Accepted 19 September 2002

Systematic reviews of randomised controlled trials evaluating treatments for shoulder problems have been inconclusive about their clinical and cost effectiveness.[1–4] Overall, the best evidence relates to the use of local steroid injections. Four explanatory trials, rated by the above reviewers to have "good" methodologies, showed a small advantage of triamcinolone injection over placebo injection, non-steroidal anti-inflammatory drugs (NSAIDs), or physiotherapy for short term reduction in pain when used in hospital settings for participants with rotator cuff problems.[3 4] In addition, two recent pragmatic primary care based trials demonstrated short term benefit of local steroid injection in participants with capsulitis[5] and synovial disorders of the shoulder.[6]

Yet in the UK, the perceived confidence and competence amongst general practitioners (GPs) in diagnosing and treating shoulder problems remains low.[11] Only 22–50% of GPs offer steroid injections for shoulder problems, perhaps reflecting many patients dislike of injections.[12 13] This, together with a lack of long term evidence for the effectiveness of shoulder injections in the broad spectrum of shoulder problems presenting to primary care, raises the question about other treatment choices for shoulder problems. Physiotherapy is one option—it is popular with patients and GPs,[14] and there is a developing body of evidence supporting the effectiveness of exercise therapy, the cornerstone of physiotherapists' management, in the treatment of shoulder pain.[14 15]

We therefore compared the long term effectiveness of local steroid injections administered by GPs with practice based physiotherapy for treating patients presenting in primary care with new episodes of unilateral shoulder pain.

### METHODS

#### Study participants

This study was a multicentre, pragmatic randomised trial based in primary care. We recruited participants aged 18 years and above who consulted their general practitioner with a new episode of unilateral shoulder pain between June 1998 and March 2000. A "new episode" was defined as pain in the shoulder region, including the upper arm, elicited or exacerbated by active or passive shoulder movement, and no consultation for this pain in the affected shoulder in the previous 12 months. Exclusion criteria were a history of inflammatory arthritis, polymyalgia rheumatica, or gross structural or neurological abnormality of the shoulder; contraindications to local steroid injection; history or examination leading to a suspicion of potentially serious disease; referred pain from neck or internal organs; clinical findings of ruptured rotator cuff; previous fracture or surgery to shoulder, upper limb, neck, or thorax; previous physical therapy for shoulder pain within the past 12 months; pregnancy or breast feeding.

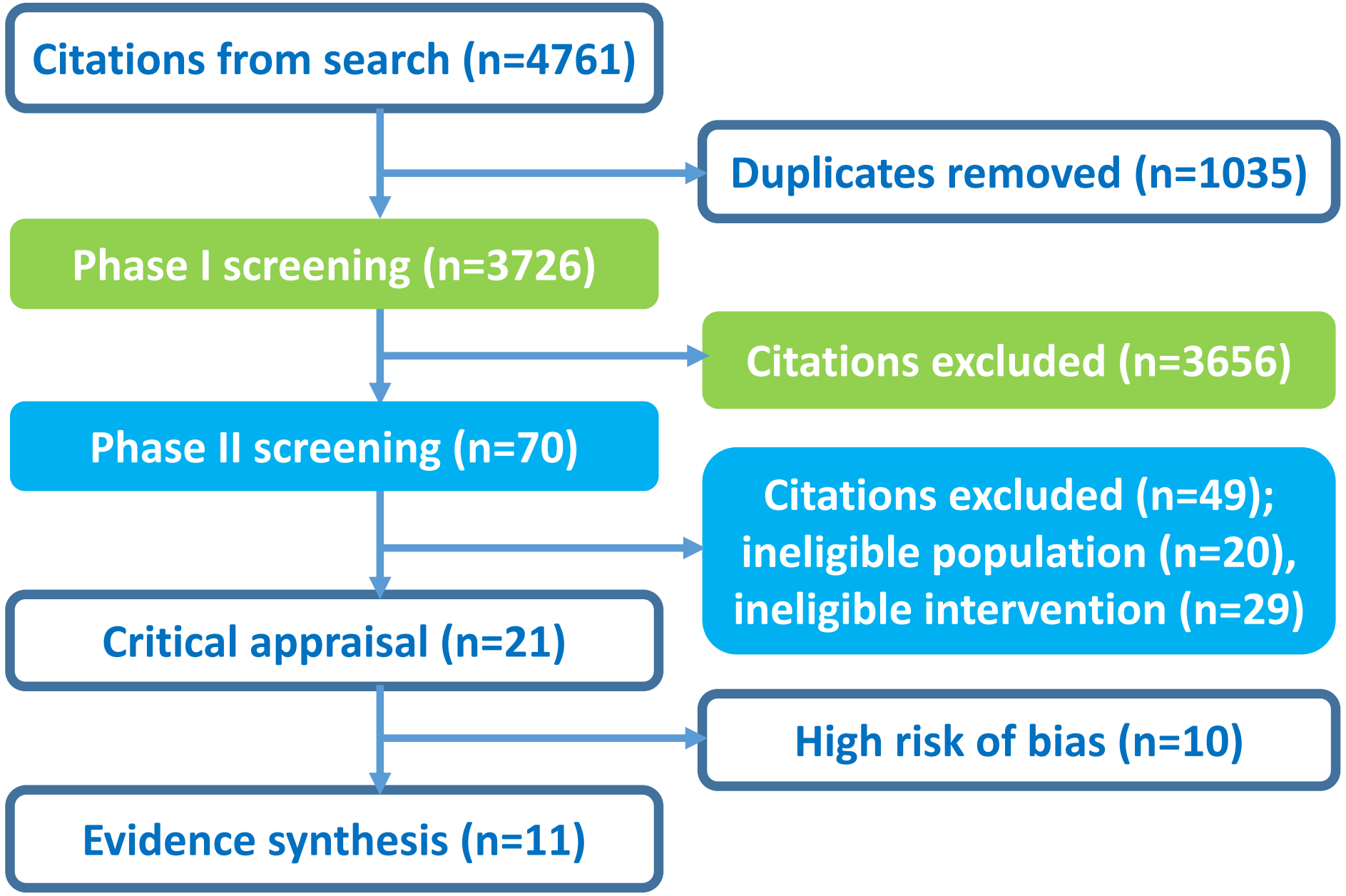
**Abbreviations:** CI, confidence interval; GPs, general practitioners; NSAIDs, non-steroidal anti-inflammatory drugs; VAS, visual analogue scale

# Consensus Screening Spreadsheets: Phase II

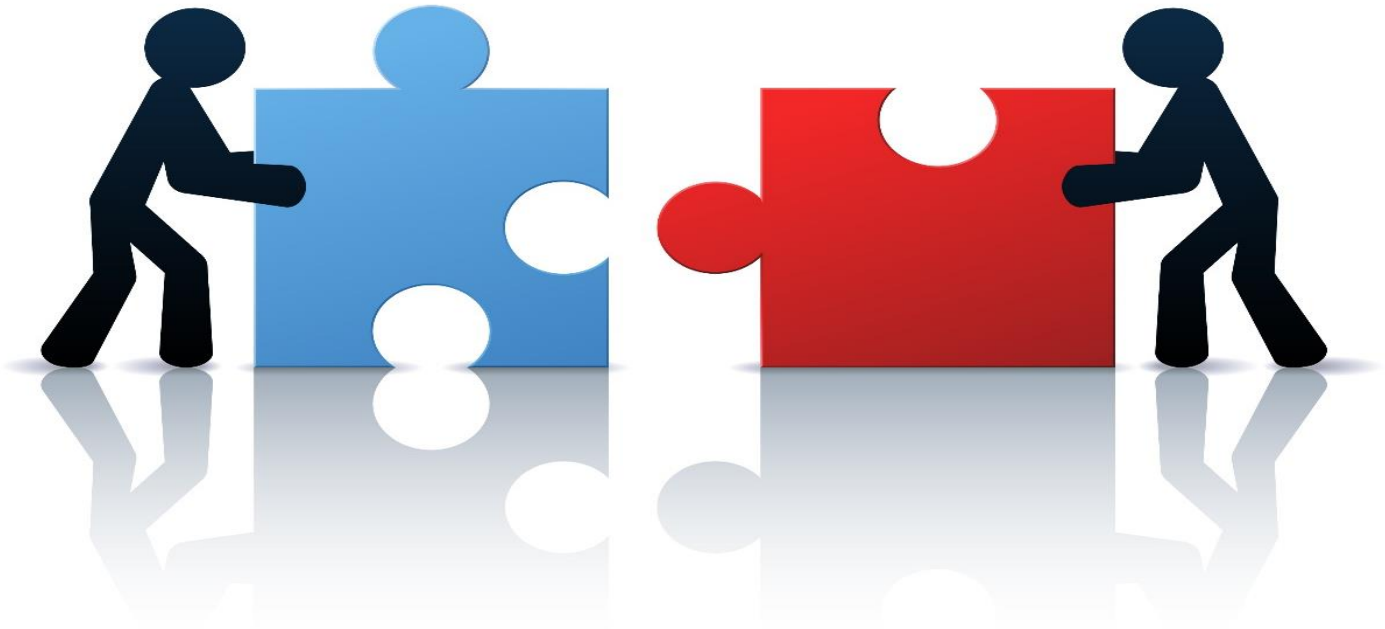
| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 1 | **RECORD** | **RG** | **JW** | **CONSENSUS** | **RG Notes** | **JW Notes** |
| 2 | 3045 | I | I | I | Sample size too small | n<30 |
| 3 | 3068 | I | R | Disagreement | Ineligible condition | WAD IV |
| 4 | 4098 | R | R | R | | |
| 5 | 4109 | I | I | I | Ineligible study design | pilot study |
| 6 | 4359 | I | I | I | Intervention not eligible | not exercise |
| 7 | 4507 | I | I | I | Ineligible condition | shoulder pain, not WAD/NAD |
| 8 | 4623 | R | R | R | | |
| 9 | | | | | | |
| 10 | | | | | | |
| 11 | | | | | | |
| 12 | | | | | | |
| 13 | | | | | | |
| 14 | | | | | | |
| 15 | | | | | | |
| 16 | | | | | | |
| 17 | | | | | | |
| 18 | | | | | | |

Review Info | Screening Phase I | **Screening Phase II** | Screening Criteria | Legend

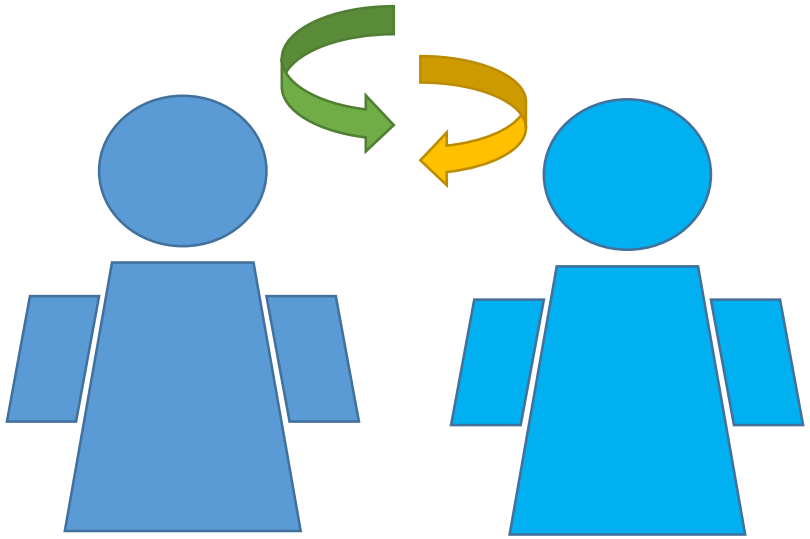
# Sample Flow Diagram



# Small Group Learning



# Tips for Screening



# Key Messages

- Systematic reviews use clear pre-defined eligibility criteria to determine the relevance of articles related to:
  - PICO
  - Study design and other characteristics (e.g., language, date)

- Screening is conducted in 2 phases (using titles/abstracts and full text)

- Paired reviewers independently assess the relevance of studies, and meet to discuss disagreements (with a third reviewer involved if needed)

# Learning Outcomes

At the end of this session, you should be able to:

- Describe the methodology for the two-phase screening process
- Screen titles, abstracts, and full-text independently for relevance using screening criteria
- Reach consensus on relevance of screened titles, abstracts, and full text

# Resources

PRISMA Statement (reporting for systematic reviews):

http://www.prisma-statement.org/PRISMAStatement/

PRISMA-P Checklist (reporting for systematic review protocols):

http://www.prisma-statement.org/Extensions/Protocols.aspx

# Thank you!

Email: carolina.cancelliere@uoit.ca

**Certificate of completion (for CE)**