

# Evidence Tables and Data Extraction of Randomized Trials

Canadian Chiropractic Guideline Initiative (CCGI)  
Centre for Disability Prevention and Rehabilitation

Systematic Review Workshop 2019

# CCGI workshops

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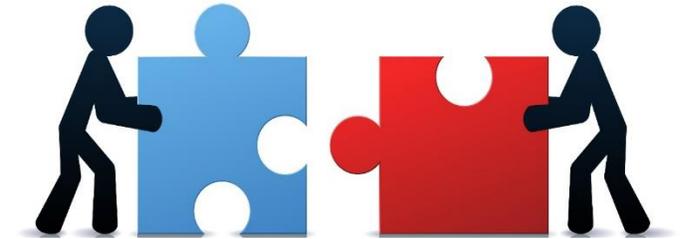
1. Introduction to research questions and the PICO framework
2. Systematic review screening of literature
3. Critical appraisal/risk of bias assessment of RCTs
4. **Evidence tables and data extraction of RCTs**

# Outline of workshop

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## 1. Introduction to evidence tables

- Exercise



## 2. Introduction to data extraction of RCTs to build evidence tables

- Exercise

# Learning objectives

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

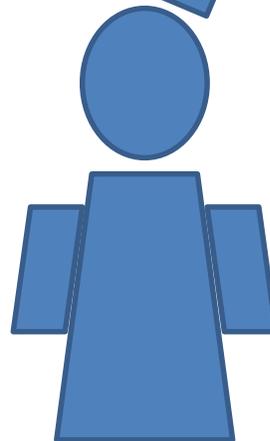
- Describe the purpose of an evidence table
- Identify key characteristics of studies when reading an evidence table
- Extract data from RCTs to build evidence tables

# Clinical/educational scenario

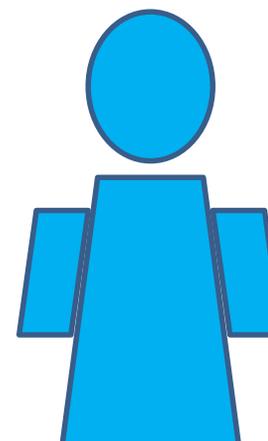
I had microdiscectomy for a lumbar disc herniation recently. An RCT suggests post-surgical rehabilitation (e.g. exercise). What should I do?



**Evidence-based practice**



**Patient**



**Healthcare provider**



Have you used evidence tables before? If yes, how?

If not, what do you think might be involved?

# Introduction to the Evidence Table

# What is an evidence table?

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- A summary of the most important information from included studies
- Concisely summarizes evidence in a standard format
- Includes outcomes (benefits and harms) and information on the setting and context of the study



What would you consider as key information from  
an RCT?

# PICO framework

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- Helps guide the development of clear research questions
- Helpful for questions related to treatment effectiveness

<b>P</b>	Population of interest
<b>I</b>	Intervention you want to know the effectiveness of
<b>C</b>	Comparison – what the intervention is being compared to
<b>O</b>	Outcome(s) you want to learn about

# PICO framework

<b>P</b>	Population	Population of interest	E.g., Headaches, flu
<b>I</b>	Intervention/ exposure	Treatment or exposure level of participants	E.g., Exercise, surgery
<b>C</b>	Comparison	Reference group used to compare with intervention/exposure	E.g., Injections, placebo, no treatment
<b>O</b>	Outcome	Measure used to examine effects of intervention/exposure	E.g., Pain, quality of life

# Additional details of PICO

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- **Population:**

- Disease or condition; stage, severity
- Demographic characteristics (e.g., age, gender)

- **Intervention:**

- Type of intervention
- Dose, duration, timing, route, etc.

- **Comparison:**

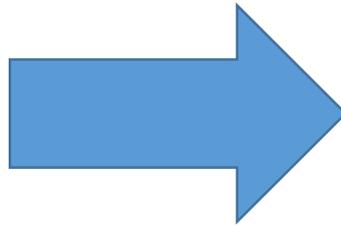
- Treatment interventions
- Placebo/sham, waiting list, no intervention

- **Outcome:**

- Benefit or harm; mean difference, frequency, time to event, etc.
- Type: mortality, pain, quality of life, disability, etc.

# What is an evidence table?

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P	I	C	O

**A snapshot of key information from studies.....written in a table format**

# Evidence table headings

**Population**   **Intervention**   **Comparison**   **Outcome/time**



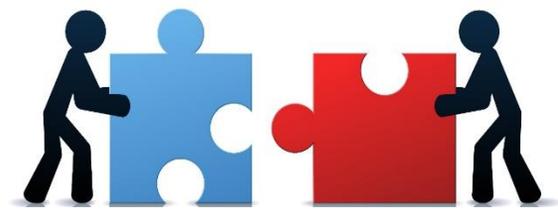
<b>Author(s), Year</b>	<b>Subjects and Setting; Number (n) Enrolled</b>	<b>Interventions; Number (n) of Subjects</b>	<b>Comparisons; Number (n) of Subjects</b>	<b>Follow- up</b>	<b>Outcomes</b>	<b>Key Findings</b>

# Example of evidence table

Population Intervention Comparison Outcome/time

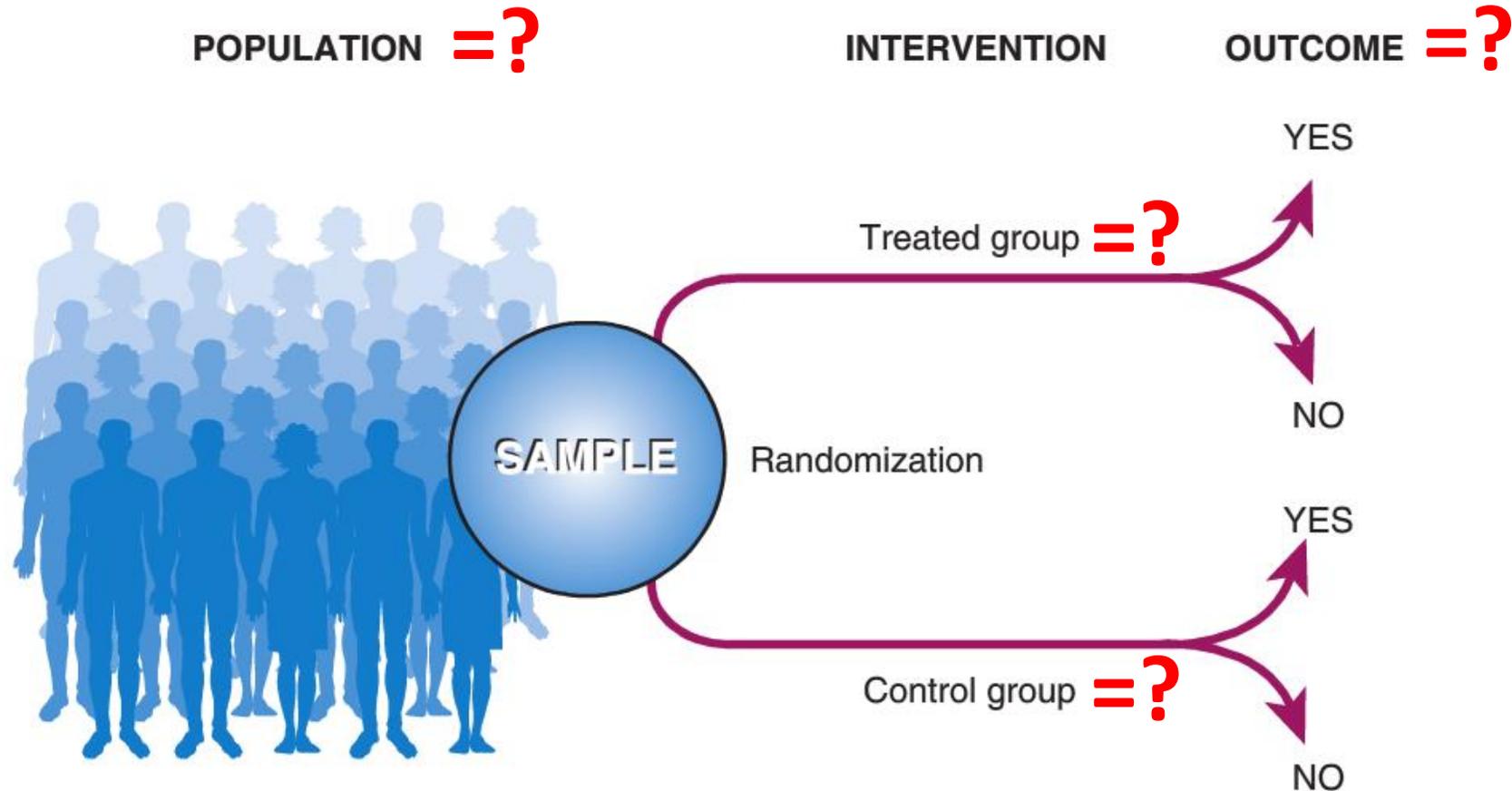


Authors, year	Subjects and setting, number (n) enrolled	Interventions, number (n) of subjects	Comparisons, number (n) of subjects	Follow-up	Outcomes	Key findings
Griffiths et al., 2009 [44]	<p>Patients (<math>\geq 18</math> y.o.) referred for outpatient physical therapy in the United Kingdom</p> <p>Case definition: chronic neck pain (<math>\geq 3</math> mo)</p> <p>n=74</p>	<p>Specific exercise: up to four sessions/6 wk by physical therapists. Active range of motion, posture correction techniques, and neck stabilization/isometric exercises</p> <p>Advice to perform exercises at home 5–10 times daily</p> <p>n=37</p>	<p>General exercise: up to four sessions for 6 wk by physical therapists. Active range-of-motion exercises and posture correction techniques</p> <p>Advice to perform exercises at home 5–10 times daily</p> <p>n=37</p>	6 wk, 6 mo	<p>Primary outcome: disability (NPDS)</p> <p>Secondary outcomes: disability (NPQ), pain affect (NRS), severity of patient-identified worst problem (NRS), medication use (48-h recall), global improvement, cointervention, and health-related quality of life (SF-36)</p>	<p>Difference in mean change (specific exercise–general exercise)</p> <p>NPDS 6 wk: <math>-0.15</math> (95% CI <math>-6.46</math> to <math>6.16</math>)*</p> <p>NPDS 6 mo: <math>6.46</math> (95% CI <math>-0.81</math> to <math>13.73</math>)*</p> <p>No significant difference in secondary outcomes except for medication use (general exercise–specific exercise)</p> <p>Percent reporting medication use: 6 wk: <math>0.29</math> (95% CI <math>0.10</math>–<math>0.84</math>), 6 mo: <math>1.16</math> (95% CI <math>0.37</math>–<math>3.59</math>)</p>



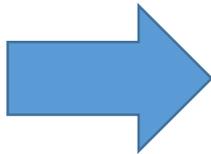
# Exercise: Study by Griffiths et al.

Using this evidence table, can you draw out the “design” of this RCT?



# Utility of an evidence table

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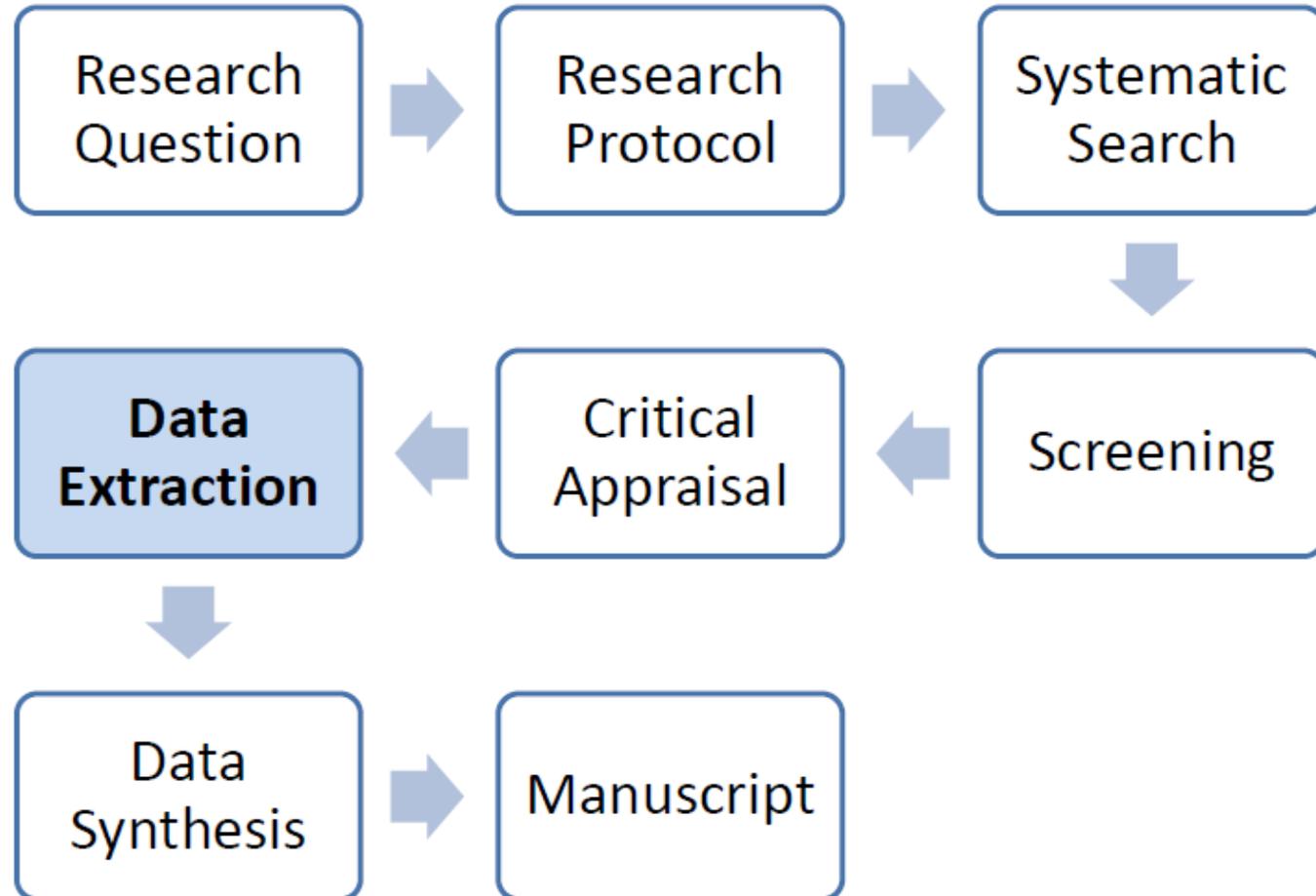


P	I	C	O

- Summarizes large volumes of information
- May not need to read original study
- A summary of multiple studies
- Often a summary of high quality studies

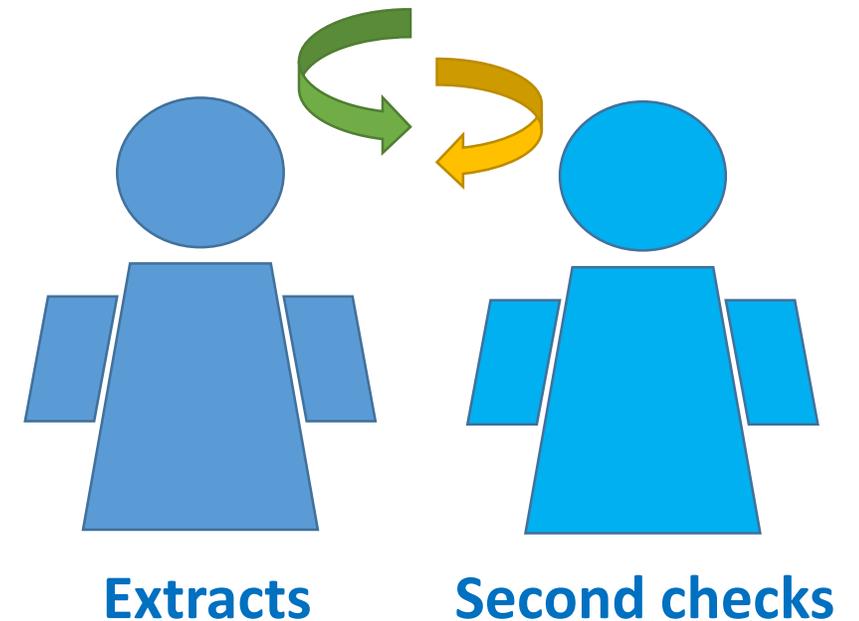
# Introduction to Data Extraction

# Systematic review process



# Data extraction process

- Data extraction items are listed in systematic review protocol
- One author extracts data from high quality studies to build evidence table
- Second reviewer independently checks data



# Prior to data extraction

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## Review the critical appraisal consensus document:

- Which data are relevant for this review?
- Any limitations that modify the data to be extracted?
- Are calculations indicated/possible?
  - *Calculations will not be covered in this workshop*

### Examples:

- Which interventions are relevant for this review?
- Which outcomes/follow-up periods were accepted?

# Key items to be extracted

Population Intervention Comparison Outcome/time



Author(s), Year	Subjects and Setting; Number (n) Enrolled	Interventions; Number (n) of Subjects	Comparisons; Number (n) of Subjects	Follow- up	Outcomes	Key Findings

# Example for evidence table

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Journal of Physiotherapy 63 (2017) 144–153



Journal of  
**PHYSIOTHERAPY**

journal homepage: [www.elsevier.com/locate/jphys](http://www.elsevier.com/locate/jphys)

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Research

Early rehabilitation after lumbar disc surgery is not effective or cost-effective compared to no referral: a randomised trial and economic evaluation

Teddy Oosterhuis<sup>a,b</sup>, Raymond W Ostelo<sup>a,b,c</sup>, Johanna M van Dongen<sup>a,b</sup>, Wilco C Peul<sup>d,e</sup>,  
Michiel R de Boer<sup>a,b</sup>, Judith E Bosmans<sup>a,b</sup>, Carmen L Vleggeert-Lankamp<sup>d</sup>, Mark P Arts<sup>e</sup>,  
Maurits W van Tulder<sup>a,b</sup>

# Example for evidence table

## Research question of study by Oosterhuis et al:

- Is referral for early rehabilitation after lumbar disc surgery effective (and cost-effective) compared to no referral?

<b>P</b>	Adults with herniated lumbar disc and signs of nerve root compression
<b>I</b>	Early rehabilitation after lumbar disc surgery
<b>C</b>	No referral for early rehabilitation after lumbar disc surgery
<b>O</b>	Functional status; leg and back pain; global perceived recovery; general physical and mental health (SF12); at 3, 6, 9, 12 and 26 weeks

# Column 1: Author(s), Year

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Author(s), Year
Oosterhuis et al., 2017 [1]

# Column 2: Subjects and Setting

Brief description of:	For study by Griffiths et al:
<ol style="list-style-type: none"><li>1. Participants (e.g., adults 18+ y.o.)</li><li>2. Health care setting of study</li><li>3. Region where study took place</li><li>4. Case definition</li><li>5. # of subjects enrolled in study</li></ol>	<p data-bbox="1345 562 2219 919">Patients (<math>\geq 18</math> y.o.) referred for outpatient physical therapy in the United Kingdom</p> <p data-bbox="1345 948 2270 1119">Case definition: chronic neck pain (<math>\geq 3</math> mo)</p> <p data-bbox="1345 1148 1531 1205">n=74</p>

# Column 2: Subjects and Setting

Brief description of:	For study by Oosterhuis et al:
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# Column 2: Subjects and Setting

## Subjects and Setting; Number (n) Enrolled

Patients (18-70 y.o.) from 10 peripheral hospitals in urban or regional areas of three regions in the Netherlands.

Case definition: herniated lumbar disc confirmed by MRI and signs of nerve root compression

n=184

# Column 3: Intervention

Brief description of:	For study by Griffiths et al:
<ol style="list-style-type: none"><li>1. Brief name of treatment arm</li><li>2. Treatment frequency/duration</li><li>3. Health care provider</li><li>4. Description of what types of treatment were provided</li><li>5. Number of subjects in group</li></ol>	<p>Specific exercise: up to four sessions/6 wk by physical therapists. Active range of motion, posture correction techniques, and neck stabilization/isometric exercises</p> <p>Advice to perform exercises at home 5–10 times daily</p> <p>n=37</p>

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<ol style="list-style-type: none"><li>1. Brief name of treatment arm</li><li>2. Treatment frequency/duration</li><li>3. Health care provider</li><li>4. Description of what types of treatment were provided</li><li>5. Number of subjects in group</li></ol>	

# Column 4: Comparison

Brief description of:	For study by Griffiths et al:
<ol style="list-style-type: none"><li>1. Brief name of treatment arm</li><li>2. Treatment frequency/duration</li><li>3. Health care provider</li><li>4. Description of what types of treatment were provided</li><li>5. Number of subjects in group</li></ol>	<p data-bbox="1434 522 2247 1278">General exercise: up to four sessions for 6 wk by physical therapists. Active range-of-motion exercises and posture correction techniques Advice to perform exercises at home 5–10 times daily n=37</p>

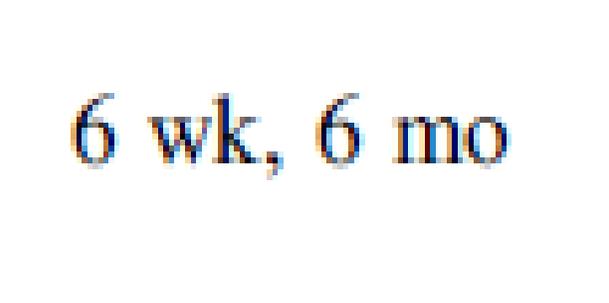
# Column 4: Comparison

Brief description of:	For study by Oosterhuis et al:
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# Column 3-4: Interventions and Comparisons

<b>Interventions; Number (n) of Subjects</b>	<b>Comparisons; Number (n) of Subjects</b>
<p><u>Referral for early rehabilitation following lumbar disc surgery:</u> Postoperative exercise therapy in primary care starting the first week after discharge. Over 6-8 weeks, participants received one or two individual, face-to-face, exercise therapy sessions of 30 minutes per week. n=92</p>	<p><u>No referral for early rehabilitation following lumbar disc surgery:</u> Not referred for rehab after discharge from the hospital. Participants could consult their neurosurgeon or GP. Were requested to refrain from exercise therapy or other allied health interventions in the 6- to 8- week study period. n=77</p>

# Column 5: Follow-up

Brief description of:	For study by Griffiths et al:
1. Follow-up periods after intervention/treatment was completed	

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# Column 5: Follow-up

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- List follow-up periods of the study that will be reported

Follow-up
3, 6, 9, 12, and 26 weeks following surgery

# Column 6: Outcomes

Brief description of:	For study by Griffiths et al:
<p>Outcomes in the following format:</p> <ol style="list-style-type: none"><li>1. Follow each outcome with outcome assessment method in brackets</li><li>2. Outcomes should be separated using semicolons</li><li>3. Adverse events (if assessed)</li></ol>	<p>Primary outcome: disability (NPDS)</p> <p>Secondary outcomes: disability (NPQ), pain affect (NRS), severity of patient-identified worst problem (NRS), medication use (48-h recall), global improvement, cointervention, and health-related quality of life (SF-36)</p>

# Column 6: Outcomes

<b>Brief description of:</b>	<b>For study by Oosterhuis et al:</b>
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# Column 6: Outcomes

## Outcomes

### Primary Outcomes:

- Functional Status (Oswestry Disability Index version 2.1a)
- Average Pain Intensity over the preceding week for leg pain and low back pain (11-point NRS)
- Global perceived effect (7-point Global Perceived Effect Scale)
- General physical and mental health (Medical Outcome Study Short Form 12)

# Column 7: Key findings

Brief description of:	For study by Griffiths et al:
<ol style="list-style-type: none"><li>1. Main results of study summarized by follow-up period</li><li>2. Effect sizes and 95% CI should be provided when possible</li><li>3. We are interested in between group differences</li><li>4. May require calculations</li></ol>	<p>Difference in mean change (specific exercise–general exercise)</p> <p>NPDS 6 wk: <math>-0.15</math> (95% CI <math>-6.46</math> to <math>6.16</math>)*</p> <p>NPDS 6 mo: <math>6.46</math> (95% CI <math>-0.81</math> to <math>13.73</math>)*</p> <p>No significant difference in secondary outcomes except for medication use (general exercise–specific exercise)</p> <p>Percent reporting medication use: 6 wk: <math>0.29</math> (95% CI <math>0.10</math>–<math>0.84</math>), 6 mo: <math>1.16</math> (95% CI <math>0.37</math>–<math>3.59</math>)</p>

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# Column 7: Key findings

## Key findings

### Mean difference (95% CI):

#### Functional Status (ODI, 0-100):

- Crude 1.0 (95% CI -3.7 to 5.7); adjusted 1.5 (95% CI -3.6 to 6.7)

#### Pain Intensity Leg (NRS, 0-10)\*

- Crude -0.1 (95% CI -0.8 to 0.6); adjusted 0.1 (95% CI -0.7 to 0.8)

#### Pain Intensity Back (NRS, 0-10)

- Crude 0.3 (95% CI -0.3 to 0.9); adjusted 0.3 (95% CI -0.3 to 0.9)

# Column 7: Key findings Cont'd

## Key findings

### Global Perceived Effect (n (%) recovered):

- OR 1.0 (0.6 to 1.7)

### General Physical Health (SF12, 0-100):

- Crude  $-1.1$  (95% CI  $-8.5$  to  $6.3$ ); adjusted  $-3.5$  (95% CI  $-11.3$  to  $4.3$ )

### General Mental Health (SF12, 0-100):

- Crude  $-0.9$  (95% CI  $-6.8$  to  $5.0$ ); adjusted  $-4.1$  (95% CI  $-9.4$  to  $1.3$ )

# Completed evidence table for Oosterhuis et al

Author(s), Year	Subjects and Setting; Number (n) Enrolled	Interventions; Number (n) of Subjects	Comparisons; Number (n) of Subjects	Follow-up	Outcomes	Key findings
Oosterhuis et al., 2017 [1]	<p>Patients (18-70 y.o.) from 10 peripheral hospitals in urban or regional areas of three regions in the Netherlands.</p> <p>Case definition: herniated lumbar disc confirmed by MRI and signs of nerve root compression</p> <p>n=184</p>	<p><u>Referral for early rehabilitation following lumbar disc surgery:</u> Postoperative exercise therapy in primary care starting the first week after discharge. 6-8 weeks, participants received one or two individual, face-to-face, exercise therapy sessions of 30 minutes per week. n=92</p>	<p><u>No referral for early rehabilitation following lumbar disc surgery:</u> Participants were instructed to refrain from exercise therapy or other allied health interventions in the 6- to 8- week study period. n=77</p>	3, 6, 9, 12, and 26 weeks	<p>Primary Outcomes:</p> <ul style="list-style-type: none"> <li>-Functional Status (Oswestry Disability Index version 2.1a)</li> </ul>	<p><b>Mean difference (95% CI):</b></p> <p>Functional Status (ODI, 0-100):</p> <ul style="list-style-type: none"> <li>• Crude 1.0 (-3.7 to 5.7); adjusted 1.5 (-3.6 to 6.7)</li> </ul> <p>Intensity Leg (NRS, 0-10)*</p> <ul style="list-style-type: none"> <li>• Crude -0.1 (-0.8 to 0.6); adjusted 0.1 (-0.7 to 0.8)</li> </ul> <p>Intensity Back (NRS, 0-10)</p> <ul style="list-style-type: none"> <li>• Crude 0.3 (-0.3 to 0.9); adjusted 0.3 (-0.3 to 0.9)</li> </ul> <p>Global Perceived Effect (n (%) recovered):</p> <ul style="list-style-type: none"> <li>• OR 1.0 (0.6 to 1.7)</li> </ul> <p>General Physical Health (SF12, 0-100):</p> <ul style="list-style-type: none"> <li>• Crude -1.1 (-8.5 to 6.3); adjusted -3.5 (-11.3 to 4.3)</li> </ul> <p>General Mental Health (SF12, 0-100):</p> <ul style="list-style-type: none"> <li>• Crude -0.9 (-6.8 to 5.0); adjusted -4.1 (-9.4 to 1.3)</li> </ul>

**Next steps:**

- Extract from all high quality studies
- To be checked by second reviewer

Author(s), Year	Subjects and Setting; Number (n) Enrolled	Interventions; Number (n) of Subjects	Comparisons; Number (n) of Subjects	Follow-up	Outcomes	Key findings
Bronfort et al., 2012 [2]	Residents from Minnesota (18-65 y.o.).  Case definition: acute/sub-acute neck pain grades I/III (2-12 weeks) and neck pain intensity $\geq$ 3/10.  (n=272)	Spinal manipulative therapy (SMT) by chiropractors (12 weeks):  manipulation and mobilization, soft-tissue massage, assisted stretching, hot and cold packs, and advice to stay active or modify activity as needed.  (n=91)	Home exercise with advice (HEA) by physical therapists with in-person instruction (2 1-hour sessions with daily home exercise): individualized program of neck and shoulder self-mobilization; education and advice regarding posture and daily activities. (n=90)  Medication by physician: NSAIDs, acetaminophen, (narcotics and, muscle relaxants if necessary); advice to stay active or modify activity. (n=91)	2, 4, 8, 12, 26, and 52 weeks	Primary outcome: neck pain (NRS)  Secondary outcomes: disability (NDI); global improvement; medication use (days/week); satisfaction with care; health-related quality of life (SF-36); cervical spine range of motion (CA 6000 Spine Motion Analyzer)	<p><b>Statistically sig. diff. in mean (SMT – HEA):</b> Satisfaction score: (0 to 12 weeks): 0.33 (95% CI 0.11; 0.56), (0 to 52 weeks): 0.32 (95% CI 0.11; 0.54)</p> <p>No statistically sig. diff. between groups for mean change in neck pain, disability, medication use, physical or mental health-related quality of life or ranges of motion. No statistically sig. diff. in mean global improvement</p> <p><b>Statistically sig. diff. in mean change (HEA – medication):</b> Neck pain: 26 weeks: 0.69 (95% CI 0.10; 1.28). Disability: 26 weeks: 2.95 (95% CI 0.37; 5.53). Medication use: 26 weeks: 1.49 (95% CI 0.78; 2.20), 52 weeks: 1.00 (95% CI 0.27; 1.73). Physical SF-36: 26 weeks: 2.28 (95% CI 0.63; 3.93), 52 weeks: 2.24 (95% CI 0.54; 3.93) Flexion-extension: 4 weeks: 4.25 (95% CI 1.39; 7.11), 12 weeks: 3.51 (95% CI 0.62; 6.40)</p> <p><b>Statistically sig. diff. in mean (HEA – medication):</b> Global improvement: (0 to 12 weeks): 0.30 (95% CI 0.01; 0.58), (0 to 52 weeks): 0.28 (95% CI 0.01; 0.56) Satisfaction score: (0 to 12 weeks): 0.36 (95% CI 0.13; 0.58), (0 to 52 weeks): 0.38 (95% CI 0.16; 0.59) No statistically sig. diff. between groups for mean change in mental health-related QOL.</p>

# Return to clinical/educational scenario



**Evidence table can provide:**

- Key information from high quality studies
- More detailed information of intervention

# Summary

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- A evidence table concisely summarizes key evidence from included studies
- Includes benefits, harms, setting, and context of the study
- A standardized process is used in systematic reviews to extract key information from studies (including a second check of the data)

# Resources

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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>

# Learning Objectives

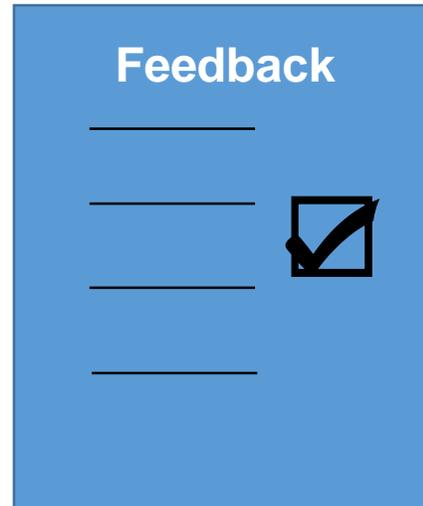
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**At the end of this session, you should be able to:**

- Describe the purpose of an evidence table
- Identify key characteristics of studies when reading an evidence table
- Extract data from RCTs to build evidence tables

# Thank You

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