PEER simplified decision aid: chronic back pain treatment options in primary care

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This decision aid was developed to provide clinicians with a review of the effectiveness of chronic back pain treatment options while highlighting study quality. It is derived from our accompanying systematic review of randomized controlled trials (RCTs) on chronic low back pain (**page e20**).[1]

How was this tool developed?

While systematic reviews provide an estimate of the mean effect of an intervention, when RCTs are pooled together in a meta-analysis, low-quality RCTs can skew the mean result, making an intervention appear more effective than it is. Researchers often apply different quality markers (eg, larger studies) to their systematic reviews to see if the results are consistent and reliable. These subgroup analyses are usually performed when there are a certain number of RCTs in order to ensure the analysis is adequately powered. In the systematic review, only 3 out of 8 interventions had an adequate number of RCTs for these subgroup analyses.[1] Readers might overestimate the potential benefit of the intervention because the research quality was unexplored. We expanded the quality subgroup assessment to all interventions, regardless of the number of RCTs, to highlight the effects of each intervention depending on the quality markers applied, allowing the reader to determine which interventions have the most reliable data.

The primary outcome of our systematic review was the proportion of patients with chronic back pain who had a *clinically meaningful response* to treatment, generally defined as a 30% reduction in pain score, although the definition varied across RCTs.

We performed subgroup analyses for each intervention using the following quality markers: longer study duration (>12 weeks), comparable placebo or sham treatment (as opposed to passive controls such as a waitlist), larger studies (>150 participants), lower risk-of-bias scores (ie, median risk-of-bias score as per the systematic review), and publicly funded studies. The control rate was standardized to the mean control rate seen across all interventions (40%) for indirect comparison of efficacy across treatments. The risk ratio for each intervention was then applied to the standardized control rate to give the new intervention rate. The control event rate (40%) was subtracted from the new intervention rate to provide the absolute benefit over placebo (**Figure 1**). Differences between treatments are not from direct comparisons and represent approximations.

The decision aid

Figure 2 provides an icon array of the different treatments based on the analysis of the quality markers. **Figure 3**[1-3] classifies the treatments for chronic low back pain by benefits and harms, and provides information on withdrawals due to adverse effects, basic prescribing tips, and cost estimates. An interactive version can be found at **www.pain-calculator.com**, and a printable version of the entire decision aid is available from **CFPlus**.*

This decision aid is not a practice guideline and has not been assessed by an independent guideline committee for clinical use. However, the information presented here will be used in conjunction with other systematic reviews and tools to inform future guideline development.

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Competing interests

None declared

References

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*Easy-to-print versions of **Figures 1, 2,** and **3** are available at **www.cfp.ca**. Go to the full text of the article online and click on the **CFPlus** tab.

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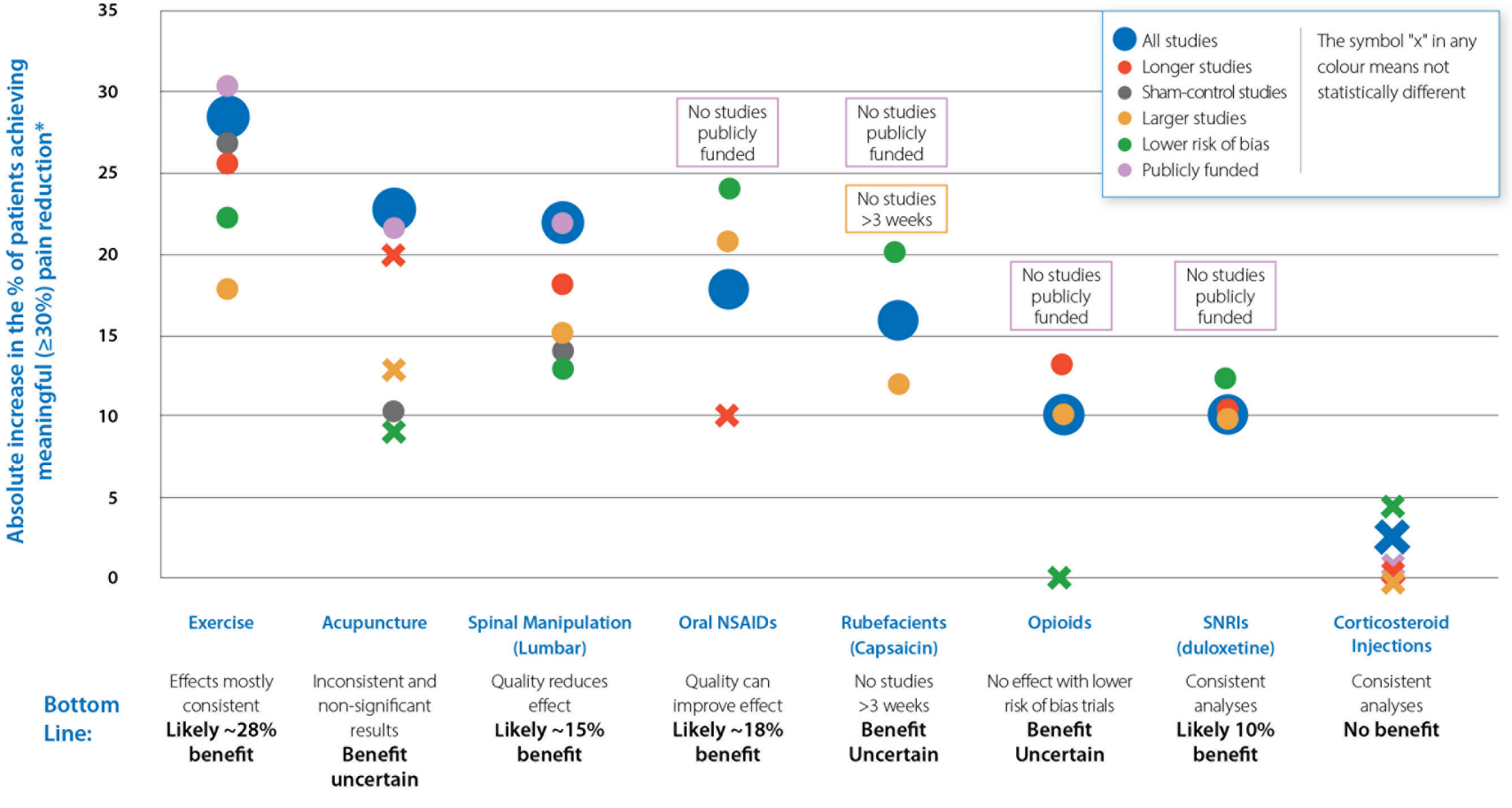
Figure 1 Impact of Study Quality on Treatment Effectiveness in Chronic Low Back Pain



*Over control (assuming 40% of control have meaningful pain reduction)

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Figure 2

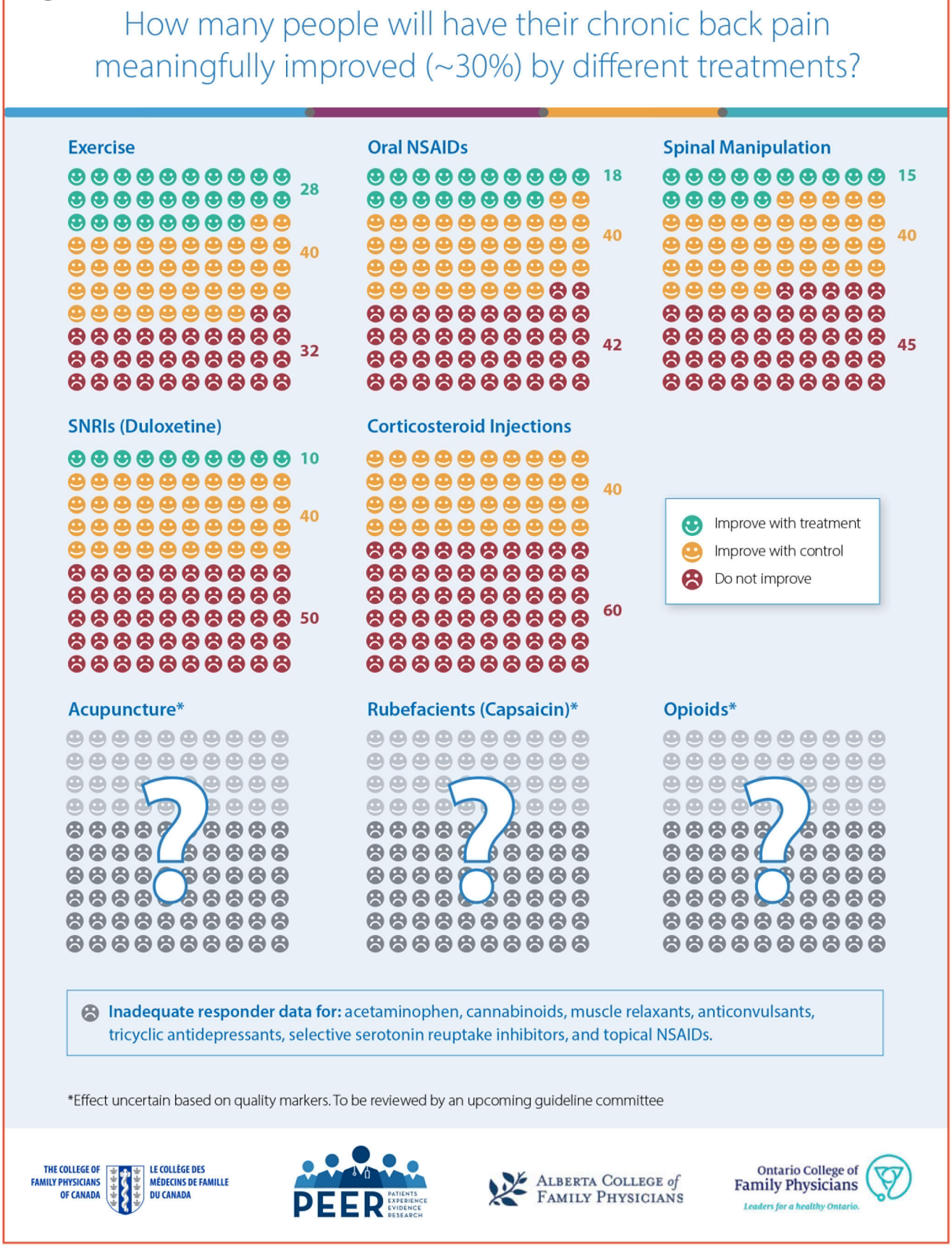
How many people will have their chronic back pain meaningfully improved (~30%) by different treatments?
Exercise
28
40
32
Oral NSAIDs
18
40
42
Spinal Manipulation
15
40
45
SNRIs (Duloxetine)
10
40
50
Corticosteroid Injections
40
60
Improve with treatment
Improve with control
Do not improve
Acupuncture*
Rubefacients (Capsaicin)*
Opioids*
Inadequate responder data for: acetaminophen, cannabinoids, muscle relaxants, anticonvulsants, tricyclic antidepressants, selective serotonin reuptake inhibitors, and topical NSAIDs.
*Effect uncertain based on quality markers. To be reviewed by an upcoming guideline committee

Figure 3

Treatment Options for Chronic Low Back Pain

Benefits and Harms	Treatment	Withdrawals Due to Adverse Events*	Adverse Events (Examples)	Cost	Prescribing Comments
☺ Benefits likely exceed harms	Exercise	Not reported	Mild muscle soreness, joint pain, injuries	$ to $$$$	Benefits consistent across trials. May provide continued pain relief beyond study period. Type of exercise likely doesn't matter.
	Spinal Manipulation (Lumbar)	Not reported	Unknown	$$$ to $$$$	Degree of benefit is uncertain. Case reports have associated neck manipulation with stroke.[2]
☺ Benefits may not exceed harms in some patients	Oral NSAIDs	Similar to placebo	Gastrointestinal, renal, and cardiovascular adverse effects	$ to $$	Consider naproxen or ibuprofen. Diclofenac and COX-2 Inhibitors may increase cardiovascular disease risk.[3]
	SNRIs (Duloxetine)	18% for SNRI versus 9% for placebo	Nausea, dizziness, somnolence	$$	Most trials studied duloxetine 60 – 120mg once daily. The number of people who benefit over placebo (about 10%) is similar to the number who stop for adverse events (about 9%).
☹ No benefit	Corticosteroid Injections	Not reported	Infection, post-dural puncture headache	$$	Effects are not statistically different from placebo.
☹ Harms likely exceed benefits	Opioids	27% for opioids versus 5% for placebo	Dependency, constipation, overdose, nausea, dizziness	$$ to $$$	Lower risk of bias trials show no effect in chronic back pain but the risk of harm remains.
😐 Unclear benefits	Acupuncture	Similar to placebo	None consistently reported	$$$ to $$$$	Efficacy of acupuncture disappears in trials >4 weeks and in higher quality studies.
	Rubefacients (Capsaicin)	Not reported	Heat or burning sensation, mild or moderate local erythema	$ to $$	The absence of trials that last longer than 3 weeks makes it difficult to extrapolate for a chronic condition.

Cost approximates dollars per month: $ = <25, $$ = 25-50, $$$ = 50-100, $$$$ = >100
NSAIDs: Non-Steroidal Anti-Inflammatory Drugs, **SNRI:** Serotonin Norepinephrine Reuptake Inhibitors
Note: Insufficient responder data for acetaminophen, muscle relaxants, selective serotonin reuptake inhibitors, cannabinoids, tricyclic antidepressants, anticonvulsants, and topical NSAIDs to judge whether or not they are effective.
*Percents reported are statistically different from placebo