PICO Search Assignment Worksheet
PICO #2- Back Pain- Tara Capo

Brief description of patient problem/setting (summarize the case very briefly)
Pt is a 54 YOM with PMHx of type II DM and HLD who presents to the clinic for lower back pain, which he attributes to shoveling about 1-2 weeks ago. He states it hurts when he bends forward and gets up from a seated position. He has been taking Tylenol with minimal relief of symptoms. Pt was prescribed muscle relaxant (Baclofen), lidoderm patch, and Diclofenac for the pain.

Search Question: Clearly state the question (including outcomes or criteria to be tracked)
In patients with back pain secondary to strenuous activity, does treatment with muscle relaxants lead to better relief of symptoms compared to non-opioid analgesics (like Tylenol) or NSAIDs?

Question Type: What kind of question is this? (boxes now checkable in Word)

☐Prevalence	☐Screening	☐Diagnosis
☐Prognosis	☐**Treatment**	☐Harms

Assuming that the highest level of evidence to answer your question will be meta-analysis or systematic review, what other types of study might you include if these are not available (or if there is a much more current study of another type)? Please explain your choices.
- If meta-analysis or systematic review are not available, randomized controlled trials (RCTs) are a great alternative because they directly compare treatment groups and randomization reduces confounding variables. While less strong because there is no randomization, prospective cohort studies are another alternative, as they follow patients receiving different treatments over time, thereby allowing comparisons of, in this case, pain improvement.

PICO search terms:

P	I	C	O
Adults	Muscle relaxants	Non-opioid analgesics	Symptom resolution
Adult patients	Muscle relaxant	NSAIDs	Symptom relief
Back pain	Cyclobenzaprine	Tylenol	
Strenuous activity	Baclofen		

Search tools and strategy used:
Please indicate what data bases/tools you used, provide a list of the terms you searched together in each tool, and how many articles were returned using those terms and filters. Explain how you narrow your choices to the few selected articles.

Results found:

PubMed:
Patients AND Back pain AND Muscle relaxant AND Tylenol: 68 results
- Filters: Meta analysis, RCT, systematic review: 11 results

Adults AND Back pain AND Muscle relaxant AND NSAID AND Symptom relief: 11 results
- Filters: in the last 10 years: 7 results

Back pain AND Baclofen AND Non-opioid analgesic: 13 results

- Filters: Meta analysis, RCT, systematic review: 5 results

Back pain AND Cyclobenzaprine AND Non-opioid analgesic: 37 results
- Filters: Meta analysis, RCT, systematic review: 12 results

Google Scholar:
Symptomatic relief with NSAIDs vs cyclobenzaprine for back pain due to strenuous activity: 2,670 results
- Filters: since 2022, review articles, sort by relevance: 151 results

Muscle relaxants vs non opioid analgesics in back pain: 23,400 results
- Filters: since 2022, review articles, sort by relevance: 743 results

Baclofen vs Tylenol in back pain: 4,590 results
- Filters: since 2022, review articles, sort by relevance: 282 results

Cochrane:
NSAIDs vs muscle relaxant for low back pain: 7 results

There was extensive research on my PICO topic, even after filters were applied. I focused primarily on RCTs, meta-analyses, and systematic reviews by applying the database filters. Although two of the articles I ended up using were narrative reviews, they still provided relevant and reasonable insight. I chose my final 3 articles based largely on their titles, selecting those that most directly aligned with and addressed the core components of my PICO question.

Identify at least 3 articles (or other appropriate reputable sources) that answer your specific question with the highest available level of evidence (you will probably need to look at more than 3 articles to get the 3 most focused and highest level articles to address your question). Please make sure that they are Medline indexed.

Please post the citation and abstract for each article (to include the journal and authors' names and date) and say why you chose it. Please also note what kind of article it is (e.g. meta-analysis, cohort study, or independent blind comparison with gold standard of diagnosis, etc.). At the bottom of each abstract, please comment on what your key points are from this article (including any points or concepts included in the article, but not present in the abstract – i.e. make the concepts understandable to the reader). Please note that if the evidence is not in the abstract, you must clearly summarize the evidence in your posting.

(1) **Citation:** Friedman, B. W., Dym, A. A., Davitt, M., Holden, L., Solorzano, C., Esses, D., Bijur, P. E., & Gallagher, E. J. (2015). Naproxen with cyclobenzaprine, oxycodone/acetaminophen, or placebo for treating acute low back pain: A randomized clinical trial. JAMA, 314(15), 1572–1580. https://doi.org/10.1001/jama.2015.13043 Link: https://pubmed.ncbi.nlm.nih.gov/26501533/

Type of article: Randomized Controlled Trial

Abstract
Importance: Low back pain (LBP) is responsible for more than 2.5 million visits to US emergency departments (EDs) annually. These patients are usually treated with nonsteroidal anti-inflammatory drugs, acetaminophen, opioids, or skeletal muscle relaxants, often in combination.

Objective: To compare functional outcomes and pain at 1 week and 3 months after an ED visit for acute LBP among patients randomized to a 10-day course of (1) naproxen + placebo; (2) naproxen + cyclobenzaprine; or (3) naproxen + oxycodone/acetaminophen.

Design, setting, and participants: This randomized, double-blind, 3-group study was conducted at one urban ED in the Bronx, New York City. Patients who presented with nontraumatic, nonradicular LBP of 2 weeks' duration or less were eligible for enrollment upon ED discharge if they had a score greater than 5 on the Roland-Morris Disability Questionnaire (RMDQ). The RMDQ is a 24-item questionnaire commonly used to measure LBP and related functional impairment on which 0 indicates no functional impairment and 24 indicates maximum impairment. Beginning in April 2012, a total of 2588 patients were approached for enrollment. Of the 323 deemed eligible for participation, 107 were randomized to receive placebo and 108 each to cyclobenzaprine and to oxycodone/acetaminophen. Follow-up was completed in December 2014.

Interventions: All participants were given 20 tablets of naproxen, 500 mg, to be taken twice a day. They were randomized to receive either 60 tablets of placebo; cyclobenzaprine, 5 mg; or oxycodone, 5 mg/acetaminophen, 325 mg. Participants were instructed to take 1 or 2 of these tablets every 8 hours, as needed for LBP. They also received a standardized 10-minute LBP educational session prior to discharge.

Main outcomes and measures: The primary outcome was improvement in RMDQ between ED discharge and 1 week later.

Results: Demographic characteristics were comparable among the 3 groups. At baseline, median RMDQ score in the placebo group was 20 (interquartile range [IQR],17-21), in the cyclobenzaprine group 19 (IQR,17-21), and in the oxycodone/acetaminophen group 20 (IQR,17-22). At 1-week follow-up, the mean RMDQ improvement was 9.8 in the placebo group, 10.1 in the cyclobenzaprine group, and 11.1 in the oxycodone/acetaminophen group. Between-group difference in mean RMDQ improvement for cyclobenzaprine vs placebo was 0.3 (98.3% CI, -2.6 to 3.2; P = .77), for oxycodone/acetaminophen vs placebo, 1.3 (98.3% CI, -1.5 to 4.1; P = .28), and for oxycodone/acetaminophen vs cyclobenzaprine, 0.9 (98.3% CI, -2.1 to 3.9; P = .45).

Conclusions and relevance: Among patients with acute, nontraumatic, nonradicular LBP presenting to the ED, adding cyclobenzaprine or oxycodone/acetaminophen to naproxen alone did not improve functional outcomes or pain at 1-week follow-up. These findings do not support use of these additional medications in this setting.

Key points:
- Regardless of treatment group, all patients improved over time.
- Adding Cyclobenzaprine (muscle relaxant) to naproxen (NSAID) did not improve pain or functional outcomes compared with naproxen alone
- Adding oxycodone/acetaminophen also did not provide superior pain relief or function improvement compared with naproxen alone
- There were no significant differences in pain scores between the 3 groups at 1 week.

I chose this article because it directly compared my intervention (muscle relaxants with Cyclobenzaprine) with the comparison (NSAID with naproxen) and their effects on back pain. The study measured pain reduction and functional improvement, which aligned with my “better relief of symptoms” outcome. The article was a randomized, double-blind clinical trial which provides strong evidence for treatment questions. The article showed that adding a muscle relaxant to NSAIDs did not improve outcomes compared with NSAIDs alone, suggesting that muscle relaxants are not superior.

(2) **Citation:** Deyo, R. A. (1996). Drug therapy for acute low back pain. Journal of General Internal Medicine, 11(5), 268–285. https://pubmed.ncbi.nlm.nih.gov/9112708/

Type of article: Narrative Review

Abstract
Study design: A brief review of current literature and issues on drug therapy for low back pain.

Objectives: To identify current knowledge and future research needs related to drug therapy.

Summary of background data: Drug therapy is one of many possible treatment choices for symptom relief in patients with low back pain. The variety of drugs used suggests that there is no uniquely successful form of drug therapy. One reason for uncertainty and slow progress in this area is the limited quality of many clinical trials for back pain, with inadequate description of patients and outcomes being common deficits.

Methods: A selective review of randomized trials and systematic literature syntheses on drug therapy is given.

Results: Despite limitations, there is good evidence to support the efficacy of nonsteroidal anti-inflammatory drugs for acute low back pain and fair evidence for the use of muscle relaxants. There is greater controversy about the use of corticosteroids, which have been administered orally, intramuscularly, and epidurally. There is conflicting evidence regarding epidural injection of corticosteroids, but one meta-analysis suggests they may provide a small symptomatic improvement for patients with radiculopathy. Trials of systemic steroids and antidepressant drugs for managing chronic pain are inconclusive. The only randomized trial of local anesthetic injection into trigger points suggested that this treatment was equivalent to that of saline injection, needling without injection, or vapo-coolant spray alone.

Conclusion: It seems reasonable to recommend acetaminophen or nonsteroidal anti-inflammatory drugs for patients with acute back pain, with efforts to minimize costs and complications. Muscle relaxants and narcotic analgesics may be appropriate for some patients, but selection criteria are unclear, and these drugs should be prescribed for fixed periods. Drug treatment for chronic low back pain is less clear, and a current controversy centers on the use of chronic narcotic analgesics for such patients. Future research should include evaluating combinations of medications, combinations of medication and physical therapy, systemic corticosteroid therapy, trigger point injections, and narcotic use for patients with chronic pain. Spinal stenosis is common in the older population, and more drug trials are needed for this condition.

Key points:
- NSAIDs are effective for short term relief of acute lower back pain and have better supporting evidence than many other medication classes.
- Acetaminophen may provide pain relief, but evidence was less robust compared with NSAIDs
- Muscle relaxants may reduce short term pain, but evidence is limited and side effects (especially sedation) are common
- Opioids should be used with caution, as evidence for superiority over NSAIDs is lacking and risks such as dependence and adverse effects are significant

I chose this article because it provides a comprehensive review RCTs and systemic literature of pharmacological treatment options for acute lower back pain, including NSAIDs, Tylenol, and muscle relaxants, which directly addresses the classes in my PICO question. The article evaluates their effectiveness, helping to determine whether muscle relaxants provide superior symptom relief compared with non opioid analgesics. The article highlights that NSAIDs have the strongest supporting evidence, while muscle relaxants may provide short term relief but carry more side effects.

(3) Citation: Manca, A., Cugusi, L., van Tulder, M., Furlan, A., Solla, F., & Monticone, M. (2025). Oral non-benzodiazepine muscle-relaxants for people with acute and chronic primary low back pain: A systematic review with meta-analysis. European Spine Journal. https://doi.org/10.1007/s00586-025-08786-0 Link: https://pubmed.ncbi.nlm.nih.gov/40186696/

Type of article: Systematic Review and Meta-analysis

Abstract

Purpose: To determine benefits and adverse effects (AE) of oral muscle-relaxants (MR) (non-benzodiazepines) for acute (< 6 weeks) and chronic (> 12 weeks) primary LBP, administered alone or combined with analgesics/NSAIDs.

Methods: CENTRAL, MEDLINE, EMBASE, CINAHL were searched for pertinent randomized controlled trials. Primary outcomes comprised lack of pain relief, global efficacy and AE at 5-7 days follow-up assessed dichotomously (risk ratio, RR).

Results: Fifty studies (7531 participants) were included, with data from 4775 pooled in meta-analyses. For acute LBP, non-benzodiazepine MR were associated with increased likelihood of pain relief (moderate certainty; RR: 0.53, $p < 0.0001$), global efficacy (RR: 0.49, $p = 0.0001$), muscle spasm (RR: 0.62, $p < 0.00001$), and physical outcomes (RR: 0.60, $p < 0.00001$) compared to placebo. AE were more frequent with non-benzodiazepine MR compared to placebo (low-to-moderate certainty; RR: 1.56; $p = 0.003$), and at central nervous system (CNS; RR: 2.40; $p < 0.00001$), but not at gastrointestinal (GI) level (RR: 0.77; $p = 0.62$). Combined non-benzodiazepines + analgesics/non-steroidal anti-inflammatory drugs (NSAIDs) provide a larger and clinically meaningful benefit compared to placebo + analgesics/NSAIDs for global efficacy at 5-7 days (low-certainty; RR: 0.62; $p = 0.01$). Combined therapy did not result in significant between-group differences for total AE (moderate-certainty; RR: 1.15; $p = 0.50$) and GI AE (RR: 0.63; $p = 0.08$), despite responsible for more CNS AE (low-certainty; RR: 1.91; $p = 0.002$). When comparing non-benzodiazepine MR versus placebo for chronic LBP, only data on total AE could be pooled, without between-group difference (RR: 0.93; $p = 0.69$).

Conclusions: Non-benzodiazepine MR for acute LBP were associated with increased likelihood of pain relief and global efficacy compared to placebo. Combined therapy with analgesics/NSAIDs proved superior for global efficacy. Studies are needed to evaluate if non-benzodiazepine MR are of larger benefit than analgesics/NSAIDs, and if stand-alone administration provides more benefit than combined treatment. The observed AE warrant caution.

Key points:

- Non benzodiazepine muscle relaxants were associated with increased likelihood of pain relief and efficacy for acute lower back pain compared with placebo at 5-7 days
- Combining non benzodiazepine muscle relaxants with analgesics/NSAIDs provided larger benefit in efficacy compared with placebo with analgesics/NSAIDs, though evidence was low certainty
- For chronic low back pain, there was no significant difference in total adverse events between muscle relaxants and placebo, but data on long term benefit were limited.

I chose this article because it is a systematic review and meta analysis that evaluates the effectiveness and safety of oral muscle relaxants in acute and chronic low back pain. Although it doesn't directly examine muscle relaxants vs NSAIDs or Tylenol, it provides high level evidence relevant to my PICO question by examining whether muscle relaxants provide better short term pain relief compared to placebo or when combined with NSAIDs. This helps determine whether muscle relaxants provide meaningful pain relief compared to standard non-opioid analgesics. Further, the article provides pooled data from multiple RTCs, which strengthens the level of evidence compared to a single trial.

(4) Citation: Anderson, D. B., & Abdel Shaheed, C. (2022). Medications for treating low back pain in adults: Evidence for the use of paracetamol, opioids, non-steroidal anti-inflammatories, muscle relaxants, antibiotics, and antidepressants — an overview for musculoskeletal clinicians. Journal of Orthopaedic & Sports Physical Therapy, 52(7), 425–431. https://doi.org/10.2519/jospt.2022.10788
Link: https://www.jospt.org/doi/full/10.2519/jospt.2022.10788

Type of article: Narrative Review

Abstract
Background: Because pharmacological therapies may play an important role in managing musculoskeletal pain, the appropriate use of medicines for common conditions like low back pain (LBP) is critical. New evidence on the effects and safety of paracetamol, nonsteroidal anti-inflammatory drugs (NSAIDs), opioid analgesics, muscle relaxants, antibiotics, and antidepressants for LBP warrants an updated overview for musculoskeletal clinicians on this topic.

Clinical Question: How effective and safe are paracetamol, NSAIDs, opioid analgesics, muscle relaxants, antibiotics, and antidepressants compared with placebo for treating LBP?

Key Results: For acute LBP (<12 weeks), muscle relaxants and NSAIDs may be superior to placebo for reducing pain, but the effects of opioids, antibiotics, and antidepressants are unknown. Paracetamol provides no additional benefit for acute LBP. For chronic LBP (>12 weeks), NSAIDs, antidepressants, and opioids may be superior to placebo for reducing pain, but opioids have an established profile of harms. Antibiotics may also reduce pain for people with chronic LBP with Modic type 1 changes, although the risks may outweigh their benefits. The effects of paracetamol and muscle relaxants for chronic LBP were unclear.

Conclusion: NSAIDs may have a role in the management of LBP, with consideration given to the appropriateness of their use in people who may be at greater risk of experiencing adverse events from these medicines. Opioids, paracetamol, muscle relaxants, antibiotics, and antidepressants should only be prescribed following a discussion between the treating practitioner and the patient, considering the risks and possible benefits, and after or in conjunction with recommended nonpharmacological strategies for improving LBP.

Key points/findings: Findings: For acute LBP (<12 weeks), muscle relaxants and NSAIDs may be superior to placebo for reducing pain, but the effects of opioids, antibiotics, and antidepressants are unknown. For chronic LBP (>12 weeks), NSAIDs, certain antidepressants, and opioids may be superior to placebo for reducing pain, but opioids have an established profile of harms.

I chose this article because it specifically reviews all the medication classes mentioned in my PICO question, including muscle relaxants, NSAIDs and Tylenol, in the context of low back pain. Although it is a narrative review, the article summarizes findings from both RCTs and systematic reviews. The findings show that NSAIDs have strongest supporting evidence, Tylenol has little to no benefit, and muscle relaxants may provide short term relief but are not clearly superior. The article even went further to discuss other medication classes, including opioids and antidepressants.

What is the clinical "bottom line" derived from these articles in answer to your question?
From the articles provided, and in regards to my PICO question, "In patients with back pain secondary to strenuous activity, does treatment with muscle relaxants lead to better relief of symptoms compared to non-opioid analgesics (like Tylenol) or NSAIDs?" NSAIDs should be considered first line therapy, as they have the strongest and most consistent evidence for short-term pain relief for patients with acute low back pain. While muscle relaxants such as Cyclobenzaprine and Baclofen may provide short term symptom improvement compared with placebo, high-quality randomized evidence shows that adding them to an NSAID does not significantly improve pain or functional outcomes compared with NSAIDs

alone. Tylenol alone is unlikely to provide meaningful relief for acute lower back pain. In summary, current evidence does not support muscle relaxants to be superior to NSAIDs for symptom relief in acute back pain due to strenuous activity. Muscle relaxants may be considered in certain patients, but potential benefits must be weighed against adverse effects such as sedation.