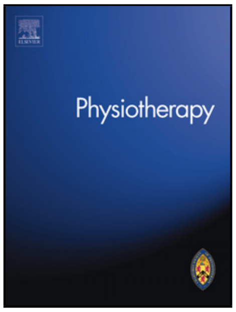

Shared decision making should be an integral part of physiotherapy practice

Tammy C. Hoffmann, Jeremy Lewis, Chris G Maher

PII: S0031-9406(18)30282-7

DOI: https://doi.org/10.1016/j.physio.2019.08.012

Reference: PHYST 1138

To appear in: *Physiotherapy*

Please cite this article as: Hoffmann TC, Lewis J, Maher CG, Shared decision making should be an integral part of physiotherapy practice, *Physiotherapy* (2019), doi: https://doi.org/10.1016/j.physio.2019.08.012

Debate article

Shared decision making should be an integral part of physiotherapy practice

Tammy C Hoffmann[1], Jeremy Lewis[2,3], Chris G Maher[4]

[1] Professor of Clinical Epidemiology, Centre for Research in Evidence-Based Practice, Bond University, Queensland, Australia. thoffmann@bond.edu.au

[2] Professor of Musculoskeletal Research, School of Health and Social Work, University of Hertfordshire, United Kingdom.

[3] Consultant Physiotherapist, MSK sonographer, Independent prescriber, Central London Community Healthcare NHS Trust, London, United Kingdom. jeremy.lewis@LondonShoulderClinic.com

[4] Professor, Sydney School of Public Health, Faculty of Medicine and Health, The University of Sydney, New South Wales, Australia. christopher.maher@sydney.edu.au

Corresponding Author: Professor Tammy Hoffmann

Address:Centre for Research in Evidence-Based Practice, Bond University, University Drive, Robina, Queensland, Australia 4229 Phone: +61 (0)7 5595 5522, Email: thoffmann@bond.edu.au

Abstract

Shared decision making is integral to high-quality, evidence-based, and patient-centred physiotherapy practice. It involves therapists and patients collaboratively making a health-related decision after having discussed the options, the likely benefits and harms of each option, and considered the patient's values, preferences and circumstances. Despite being a crucial part of the final step in evidence-based practice, the skills needed to facilitate shared decision making are rarely taught to physiotherapists. This Debate article explores the reasons for the importance of shared decision making to physiotherapy practice; its fundamental role in improving therapist-patient communication, informed decision-making, and evidence-based care; and illustrates some of the processes involved using clinical scenarios.

Introduction

Evidence-based care has been the recommended approach in clinical care for the last few decades. However, most of the focus of evidence-based practice research and training has been on providing clinicians with the knowledge, skills, and resources to help them find and appraise research evidence. Much less focus has been on what clinicians should do once they have the evidence. Texts and training on evidence-based practice typically provide little detail of what is actually involved in this final step of ‘applying the evidence’. And importantly, little about how to discuss evidence with patients in a way that it can be comprehended and involve them in the decision-making process so that evidence-informed and collaborative decisions are made.

As part of the final step in evidence-based practice, a process known as shared decision making should occur between clinician and patient. Shared decision making is when clinicians and patients collaboratively participate in making a health-related decision, having discussed the options, the likely benefits and harms of each option, and considered the patient's values, preferences and circumstances [1]. Shared decision making places the patient, and their family members when appropriate, at the centre of any clinical decision about that individual. Shared decision making can be used to inform different types of decisions, such as those relating to testing (such as laboratory tests, imaging) and treatment (such as deciding between two treatments, or deciding whether to undergo an active treatment).

Recently there have been calls for a move towards person-centred physiotherapy care that includes shared decision making [2]. This move is consistent with physiotherapy codes of conduct, eg those of the Physiotherapy Board of Australia [3], that encourage physiotherapists to discuss with their patients.”...the available healthcare options, including their nature, purpose, possible positive and adverse consequences, limitations and reasonable alternatives wherever they exist “ [Section 3.3e] However the evidence from the physiotherapy literature would suggest that there is substantial scope to increase the use of shared decision making in physiotherapy practice. Studies have shown low uptake of shared decision making by UK physiotherapists managing low back pain [4, 5] and Flemish physical therapists managing a range of health conditions [6].

We contend that shared decision making is integral to high-quality, evidence-based, and patient-centred clinical practice when health-related decisions need to be made. In this article, we will explore the reasons for this and use two musculoskeletal clinical scenarios (Boxes 1 and 2) to illustrate some of the processes that can be involved in shared decision making.

Why shared decision making is important

Poor communication is one of the leading causes of patient dissatisfaction and complaints with healthcare [7], and shared decision making is a way of improving the quality of patient-clinician communication and enabling patients to make evidence-informed decisions. As well as supporting patients to make informed decisions, shared decision making is a valuable final step in evidence translation as it provides a way of integrating evidence *and* patient preferences into a health-related decision in a consultation [1, 8].

Patient preferences are important in decision-making as for many decisions about tests or treatment, once the evidence is considered, often there is no one clearly superior option.

Hence, it is a patient's preference for one option over another that will, and should, influence the decision about how to proceed. Preference incorporation can also contribute to patients continuing with a treatment, and hence can maximise a treatment's effectiveness. Numerous factors can influence a person's preferences, such as: the potential benefits and harms (and the size/likelihood) of each option and the importance of these to that person; the person's values, his or her circumstances, and tolerance of risk; as well as practical considerations such as the nature of each option, what is involved in undertaking the test or treatment, costs, and inconveniences.

Shared decision making provides the opportunity to elicit, and where necessary, correct patient expectations about the reason, need for, or effect of interventions. For example, most people overestimate how much benefit interventions will have, and, are unaware of, or underestimate, the harms of interventions [9]. Patients often make different decisions once they are aware of the options and informed about the benefits and harms [10]. Other common types of misperceptions and cognitive biases that can be elicited and discussed as part of shared decision making include: low awareness that intervention is not always needed and that the option of 'wait and see' is sometimes an appropriate option; a mechanistic view of tests and treatment (e.g. "I need an X-ray for my back pain so that the health professional can see what's wrong and know how to treat it"[11]); and that more tests and treatment are always better than less.

Clinicians are also prone to various cognitive biases that can influence the clinical decisions they make [12]. Some of these include: optimism bias (with clinicians shown to often have inaccurate expectations about the benefits and harms of interventions, including the ones that they provide [13]; sunken cost bias (when clinicians have invested time, training, and resources in providing an intervention so there is a disincentive to discontinue providing it); commission bias (the tendency toward action rather than inaction); and mechanistic bias (that is, focussing on why/how an intervention *should* work, rather than the empirical evidence about whether it *does* work). Shared decision making can partially address these cognitive biases as it requires clinicians to know the best current evidence about the benefits and harms of the interventions being contemplated, so that they can discuss them with their patient. We acknowledge that awareness of the evidence is sometimes insufficient on its own to influence clinicians' beliefs about the value of interventions, but nonetheless it is an important requirement if clinicians are going to discuss the evidence with patients and assist them to reach an informed decision.

The process of shared decision making

While often not a simple linear process as presented here, the general process of shared decision making typically involves the following components [1]:

- outlining that there are a number of choices about the next steps and a decision to be made; inviting the patient to partner with you (the clinician) in the decision-making to the extent that they desire, and reassuring those who may feel overwhelmed or uncertain about their involvement or how to proceed;
- describing the nature of the problem and often its natural history (i.e. what is likely to happen without any active intervention);
- eliciting the patient's expectations about management of the condition (this can include previously tried interventions and experiences, along with fears and concerns; this allows for detecting and discussing misperceptions, where necessary, either now or later in the process);

- explaining the various test or treatment options (including that one option may be not to test or actively treat, but rather to ‘wait and watch’);
- elaborating on the benefits and harms of the options (including their likely probability or size) that the patient would like to hear more about (when patient decision aids exist, they can be used to assist with this);
- providing patients with the opportunity to weigh up the benefits and harms of the options, and consider them in the context of their preferences, values, and circumstances (decisions can also be used here if available); and
- exploring if the patient is ready to make a decision or needs further information, time, or the involvement of other people.

Clinician skills needed for shared decision making

Shared decision making needs clinicians to have skills and knowledge in both evidence-based practice and communication [8]. These are typically taught in clinician training and it is beyond the scope of this article to detail these skills. However, one of the necessary skills that is typically not taught is the ability to communicate evidence in a clear, understandable and non-misleading manner. Principles of effectively communicating statistical information to patients should be followed, such as using natural frequencies (i.e., x out of 100), being aware of framing effects, and using multiple formats [14]. There are various guides that describe in detail how to do this [14]. The benefits and harms of each option should be described, as well as the probability of each occurring where this is known. For dichotomous outcomes (e.g. developing an infection from surgery), this should be communicated using natural frequencies (e.g. the number out of 100 or 1000 people who experience the event) rather than relative risk. For continuous outcomes (e.g. amount of pain), this can be expressed by the estimated size of the effect (e.g. 15 points greater pain reduction on a 0-100 pain scale than if no treatment, or an alternative treatment, were provided). Patient decision aids, if available, can be useful at this stage [10]. Simple visual graphics (such as pictographs/icon arrays) can be particularly useful in helping to communicate the numbers. The discussion of harms should not only address adverse effects but other impacts on the patient such as reduced quality of life, inconvenience and interference with daily roles, overall treatment burden, and cost.

Box 1 - Scenario 1: Acute Low Back Pain

Setting and presenting condition: Mr Park, is 64 years old, and following the onset of severe acute low back pain that morning, has been transported by ambulance to the emergency department of the local hospital. He is severely incapacitated and highly anxious about what is wrong. Mr Park is initially seen by a junior emergency doctor, who then asks for the emergency department physiotherapist to assess Mr Park.

The identified problems that require a decision: Mr Park wants stronger pain relief as simple pain medicines have not helped and he wants imaging to know what is causing his pain. The doctor is considering admitting the patient, has noted the presence of red flags (age >50 years, insidious onset, and thoracic pain) and wants to refer Mr Park for imaging to exclude cancer.

Decision-making: In this situation, the patient, emergency doctor, and physiotherapist are involved in the decision-making. Some of the steps that might occur in a shared decision-making process are underlined below (although the sequence may not be linear as shown):

- Outlining that there are some choices about the next steps, decisions to be made, and inviting involvement: One of the decisions is about whether to have imaging, one is about whether to be admitted, and one is about the type of pain medicine.
- Explaining the options: In this scenario, decisions about imaging and admission have the options to 'do' or 'not do', whereas the decision about pain medicine has the options of using opioid medicines or simple pain medicines.
- Explaining the benefits and harms of the options, and eliciting expectations about management of the condition. For example:

  IMAGING

- Perceived benefits of imaging: Discussion with Mr Park should explore and challenge his assumption that imaging will explain the cause of his pain and hence inform treatment. Many patients, and some clinicians, erroneously believe that imaging is necessary to guide treatment [11]. The doctor is worried about the possibility of cancer because there are three red flags present. While the presence of some red flags has value in identifying patients with a higher likelihood of serious pathology [15], most red flags observed in patients with low back pain are false positives [16]. The three noted in this case are uninformative as they have positive likelihood ratio values close to 1.0 (which means that they are not very helpful for 'ruling in' a condition) and with a pre-test probability of cancer estimated at approximately 1.5% [15], cancer is very unlikely. Diagnostic work-up should be reserved for cases where there is stronger suspicion of cancer [17].

- Potential harm of imaging: For people with non-specific low back pain, imaging may detect incidental findings, especially in an older patient [18], that may worry the patient. Patients who are imaged are more likely to be admitted and undergo subsequent invasive procedures [19]. It is estimated that 1,200 future cancers in the United States could be related to the 2.2 million lumbar computed tomography scans done in 2007 [20]. Awareness of potential downstream harms from imaging is low [13].
- A potential harm of not imaging is missing a specific disease process, such as an epidural abscess [21], that requires early treatment which is different to the treatment that is provided for non-specific low back pain.

PAIN MEDICINE

- Benefits: Opioid medicines have effects about the same size as a simple pain medicine [22], but most patients and clinicians are not aware of this and believe that opioid medicines provide greater pain relief [23], which contributes to requests for them. There is no additional benefit from adding an opioid (or diazepam or cyclobenzaprine) to a nonsteroidal anti-inflammatory drug [24, 25].
- Potential harms of opioid medicines include side effects (such as constipation, sedation and dizziness [26]), some people do not respond to them, and addiction. In trials, about half the people stop taking the medicine as they cannot tolerate it or it does not help [22]. The risk of continued use of opioid medicine at 12 months

is 6% for those where the initial course of the drug was greater than 1 day, rising to 13.5% for people whose initial course was for greater than 8 days [27].

ADMISSION:

- The decision about whether Mr Park should be admitted to hospital or not is to some extent linked with the decision about whether to undergo imaging. An alternative to admission is that Mr Park could be referred to a community-based provider (e.g. physiotherapist or family medicine doctor) where all the recommended treatments for acute low back pain [28] could be accessed. A potential harm of hospital admission is that it strongly encourages bed rest, which is not recommended for acute low back pain [28].

- Providing the patient with the opportunity to weigh up the benefits and harms of the options, and consider them according to their preferences, values, and circumstances
- Exploring if the patient is ready to participate in the decision-making or needs more time, information, or to discuss with other people.

Box 2 - Scenario 2: Rotator-cuff related shoulder pain

Setting and presenting condition: Mrs Wilson is 58 years old and works as an actuary. She has 2 adult children and has become a widow in the last year. She presents with first episode, unilateral right dominant side shoulder pain of 8 weeks duration. She has no pain at rest, but severe pain (VAS pain 8/10) is experienced during shoulder movement that settles almost immediately when the movement ceases. Her Body Mass Index (BMI) is 28 and she has high blood pressure. She smoked 10-15 cigarettes per day for more than 30 years but ceased 6 months ago. Her pain onset coincides with a ‘new start’ involving cessation of smoking and new gym membership (aiming to reduce her BMI, and manage her blood pressure). Prior to this, Mrs Wilson has never participated in regular exercise, and she doesn’t see herself as a ‘gym going person’.

The identified problems that require a decision: After seeing an orthopaedic surgeon and based on orthopaedic tests and a radiograph, Mrs Wilson has been diagnosed with subacromial impingement and referred for an ultrasound scan. Corticosteroid injection was recommended by the surgeon as first line management and if not successful, surgery. Mrs Wilson self-referred for a physiotherapy appointment as she wanted a second opinion. Based on the interview and clinical examination conducted by the physiotherapist, rotator cuff related shoulder pain [29] was considered as a possible explanation for the presenting symptoms.

Key issues to explore in the decision-making process:

The initial decisions that need to be made are whether Mrs Wilson has an ultrasound scan, and which option she chooses to manage her shoulder pain.

- IMAGING: For most non-traumatic musculoskeletal conditions involving the shoulder, the changes seen on imaging do not appear to be the reason for the symptoms [30, 31]. For this scenario, imaging is unlikely to assist clinical decision making and may encourage unhelpful and incorrect beliefs relating to the reasons for pain and poor expectations of treatment outcome [32]. Discussion may involve explaining to Mrs Wilson that imaging is unlikely to help with understanding the basis for symptoms or with establishing a management plan [33].

- MANAGEMENT OPTIONS: Discussion may involve presenting the options for managing Mrs Wilson's shoulder pain (including the option of 'wait and watch'), each option's benefits and harms (and where possible, the size or likelihood of these), and practical details about what it involves – with the intent of helping her construct informed preferences about which option/s best aligns with her values and circumstances. The conversation should also explain the uncertainty around estimates of how much reduction in pain and/or improvement in function may be achieved, and over what timeframe, with any of the options. If a suitable decision aid that covers these options exists, it could be used as part of the conversation.
    - *No formal treatment ('wait and watch'):* As there are no definitive natural history studies, and no certainty that any intervention is superior, no formal treatment is an option. If Mrs Wilson chooses this option, further discussion about lifestyle issues and a graded return to activity [34, 35] may be valuable. Increasing daily function by gradually introducing activities such as walking, vacuuming and gardening would involve substantial amounts of varied shoulder exercise. The discussion should reassure Mrs Wilson that graded physical activity will not cause harm or damage the shoulder, or that the sensation of pain that occurs while exercising but settles, does not imply tissue damage is occurring, and that being inactive is more harmful.

- *Injection therapy:* Discussion may involve explaining that the potential benefit of an injection is likely to be a small and short-term reduction in pain. Either corticosteroid or local anaesthetic injections can be used, but the quality of the research evidence about their effect in people with rotator cuff related shoulder pain is low [36]. When corticosteroid injections are compared to a placebo, a small reduction in pain may occur between about 4 to 8 weeks after the injection, however, this benefit is usually not maintained by about 3 months [37]. Multiple corticosteroid injections do not appear to result in any further reduction in pain when compared with a single injection [37]. A potential harm of corticosteroid injections may be accelerated tendon and cartilage damage [37], although the likelihood of this and future implications are not well understood.
- *Exercise:* There is no definitive evidence about what constitutes best exercise practice and a variety of different exercise approaches may be considered [38]. Discussion may involve explaining that exercise appears to be more effective at reducing pain than not exercising [38] and that exercise may achieve comparable outcomes to surgery for pain, quality of life and disability at 1, 2, 4, 5, and 10-year follow-ups [39, 40]. However, the conversation should also explain that: the amount of reduction in pain that individuals will experience is variable (and for some people, there may be no benefit); it requires time commitment (on average 30 to 60 minutes per day, but not necessarily every day); and there is a need to have frequent reassessments with the clinician for progression of the exercises during the treatment (which typically lasts for up to 12 weeks).

- *Surgery:* Surgical procedures are commonly performed. However, it should be explained that the amount of benefit, in terms of pain and/or function, from surgery, compared to no treatment, may be very small (e.g. 3-4 points on a 48 point scale), and a smaller benefit than what many people with shoulder pain consider to be worthwhile (i.e. not a clinically relevant difference) [41, 42]. Discussion should also address the potential harms and inconveniences of surgery. Possible harms (although the risk of them is uncertain) include skin and joint infections, damage to blood vessels and nerves, non-resolution of pain and loss of function, and frozen shoulder. Surgery is more expensive than the other options and time off work is necessary. Following surgery, people who do not perform manual work may take up to 6 weeks to return to work, manual workers may need up to 12 weeks, and the mean time to return to driving is 29 days [43]. Following surgery, a comprehensive, graduated exercise program (similar to the exercise program used in non-surgical management) is needed.

It is acknowledged that multiple interwoven and complex biopsychosocial factors would also need to be considered in this process (that are not elaborated on above) and that after choosing an initial management option, Mrs Wilson may revisit the decision and try another option. It is currently not possible to confidently identify patients who will benefit more from exercise or from surgery, or a subgroup who will benefit from surgery [44].

Conclusion

Health decisions too frequently occur without sufficient genuine collaboration between patients and clinicians or regard for the evidence. This is a substantial threat to: patients receiving care that is aligned to their preferences, informed decision-making, patient satisfaction, the quality of clinician-patient communication, and health system sustainability [1]. Shared decision making can avert these undesirable outcomes, is acceptable to both patients and clinicians, and is a crucial, but under-recognised, component of evidence translation.

However, the implementation of shared decision making is being hampered by numerous factors, including misconceptions about it; evidence gaps; and a lack of training opportunities, suitable evidence syntheses and decision-support tools, and enabling policies. Clinicians' misconceptions include that it: lengthens a consultation too much, is not desired by patients, is too complicated for most patients to understand, and that "I already do this". Each of these misconceptions can be refuted [1, 45]. The uptake of shared decision making in physiotherapy should be progressed so that patients are supported by their physiotherapist to weigh up the evidence-informed benefits and harms of the options and choose the one that best aligns with their preferences and values.

Funding: No funding received for this article.

Conflicts of interest: Nil to declare

Contribution of the Paper

- Although shared decision making is important to the provision of evidence-based, patient-centred care, integration of it into physiotherapy practice is low.

- To increase awareness and use of shared decision making in physiotherapy, this paper explains the importance of it, and explains and illustrates some of its components.

References

1. Hoffmann TC, Legare F, Simmons MB, McNamara K, McCaffery K, Trevena LJ, et al. Shared decision making: what do clinicians need to know and why should they bother? Med J Aust. 2014;201(1):35-9.

2. Dukhu S, Purcell C, Bulley C. Person-centred care in the physiotherapeutic management of long-term conditions: a critical review of components, barriers and facilitators. IPDJ. 2018;8(2).

3. Physiotherapy Board of Australia. Code of Conduct 2019 [Available from: https://www.physiotherapyboard.gov.au/Codes-Guidelines/Code-of-conduct.aspx.

4. Jones LE, Roberts LC, Little PS, Mullee MA, Cleland JA, Cooper C. Shared decision-making in back pain consultations: an illusion or reality? Eur Spine J. 2014;23 Suppl 1:S13-9.

5. Stenner R, Swinkels A, Mitchell T, Palmer S. Exercise prescription for patients with non-specific chronic low back pain: a qualitative exploration of decision making in physiotherapy practice. Physiotherapy. 2016;102(4):332-8.

6. Dierckx K, Deveugele M, Roosen P, Devisch I. Implementation of shared decision making in physical therapy: observed level of involvement and patient preference. Phys Ther. 2013;93(10):1321-30.

7. Towle A. Changes in health care and continuing medical education for the 21st century. BMJ. 1998;316(7127):301-4.

8. Hoffmann TC, Montori VM, Del Mar C. The connection between evidence-based medicine and shared decision making. JAMA. 2014;312(13):1295-6.

9. Hoffmann TC, Del Mar C. Patients' expectations of the benefits and harms of treatments, screening, and tests: a systematic review. JAMA Intern Med. 2015;175(2):274-86.

10. Stacey D, Legare F, Lewis K, Barry MJ, Bennett CL, Eden KB, et al. Decision aids for people facing health treatment or screening decisions. Cochrane Database Syst Rev. 2017;4:CD001431.

11. Hoffmann TC, Del Mar CB, Strong J, Mai J. Patients' expectations of acute low back pain management: implications for evidence uptake. BMC Fam Pract. 2013;14:7.

12. Scott IA, Soon J, Elshaug AG, Lindner R. Countering cognitive biases in minimising low value care. Med J Aust. 2017;206(9):407-11.

13. Hoffmann TC, Del Mar C. Clinicians' expectations of the benefits and harms of treatments, screening, and tests: a systematic review. JAMA Intern Med. 2017;177(3):407-19.

14. Hoffmann T, Tooth L. Shared decision making. In: Hoffmann T, Bennett S, Del Mar C, editors. Evidence-based practice across the health professions. 3rd ed. Sydney: Elsevier; 2017. p. 337-63.

15. Downie A, Williams CM, Henschke N, Hancock MJ, Ostelo RW, de Vet HC, et al. Red flags to screen for malignancy and fracture in patients with low back pain: systematic review. BMJ. 2013;347:f7095.

16. Henschke N, Maher CG, Refshauge KM, Herbert RD, Cumming RG, Bleasel J, et al. Prevalence of and screening for serious spinal pathology in patients presenting to primary care settings with acute low back pain. Arthritis Rheum. 2009;60(10):3072-80.

17. Maher C, Underwood M, Buchbinder R. Non-specific low back pain. Lancet. 2017;389(10070):736-47.

18. Brinjikji W, Luetmer PH, Comstock B, Bresnahan BW, Chen LE, Deyo RA, et al. Systematic literature review of imaging features of spinal degeneration in asymptomatic populations. AJNR Am J Neuroradiol. 2015;36(4):811-6.

19. Webster BS, Choi Y, Bauer AZ, Cifuentes M, Pransky G. The cascade of medical services and associated longitudinal costs due to nonadherent magnetic resonance imaging for low back pain. Spine (Phila Pa 1976). 2014;39(17):1433-40.

20. Berrington de Gonzalez A, Mahesh M, Kim KP, Bhargavan M, Lewis R, Mettler F, et al. Projected cancer risks from computed tomographic scans performed in the United States in 2007. Arch Intern Med. 2009;169(22):2071-7.

21. Bhise V, Meyer AND, Singh H, Wei L, Russo E, Al-Mutairi A, et al. Errors in diagnosis of spinal epidural abscesses in the era of electronic health records. Am J Med. 2017;130(8):975-81.

22. Abdel Shaheed C, Maher CG, Williams KA, Day R, McLachlan AJ. Efficacy, tolerability, and dose-dependent effects of opioid analgesics for low back pain: a systematic review and meta-analysis. JAMA Intern Med. 2016;176(7):958-68.

23. Matthias MS, Donaldson MT, Jensen AC, Krebs EE. "I was a little surprised": qualitative insights from patients enrolled in a 12-month trial comparing opioids with nonopioid medications for chronic musculoskeletal pain. J Pain. 2018;19:1082-90.

24. Friedman BW, Cisewski D, Irizarry E, Davitt M, Solorzano C, Nassery A, et al. A randomized, double-blind, placebo-controlled trial of naproxen with or without orphenadrine or methocarbamol for acute low back pain. Ann Emerg Med. 2018;71(3):348-56 e5.

25. Friedman BW, Dym AA, Davitt M, Holden L, Solorzano C, Esses D, et al. Naproxen with cyclobenzaprine, oxycodone/acetaminophen, or placebo for treating acute low back pain: a randomized clinical trial. JAMA. 2015;314(15):1572-80.

26. Deyo RA, Von Korff M, Duhrkoop D. Opioids for low back pain. BMJ. 2015;350:g6380.

27. Shah A, Hayes CJ, Martin BC. Characteristics of initial prescription episodes and likelihood of long-term opioid use - United States, 2006-2015. MMWR Morb Mortal Wkly Rep. 2017;66(10):265-9.

28. Foster NE, Anema JR, Cherkin D, Chou R, Cohen SP, Gross DP, et al. Prevention and treatment of low back pain: evidence, challenges, and promising directions. Lancet. 2018;391(10137):2368-83.

29. Lewis J. Rotator cuff related shoulder pain: Assessment, management and uncertainties. Man Ther. 2016;23:57-68.

30. Frost P, Andersen JH, Lundorf E. Is supraspinatus pathology as defined by magnetic resonance imaging associated with clinical sign of shoulder impingement? J Shoulder Elbow Surg. 1999;8(6):565-8.

31. Girish G, Lobo LG, Jacobson JA, Morag Y, Miller B, Jamadar DA. Ultrasound of the shoulder: asymptomatic findings in men. AJR American journal of roentgenology. 2011;197(4):W713-9.

32. Dunn WR, Kuhn JE, Sanders R, An Q, Baumgarten KM, Bishop JY, et al. 2013 Neer Award: predictors of failure of nonoperative treatment of chronic, symptomatic, full-thickness rotator cuff tears. J Shoulder Elbow Surg. 2016;25(8):1303-11.

33. Lewis J, O'Sullivan P. Is it time to reframe how we care for people with non-traumatic musculoskeletal pain? Br J Sports Med. 2018.

34. Kyu HH, Bachman VF, Alexander LT, Mumford JE, Afshin A, Estep K, et al. Physical activity and risk of breast cancer, colon cancer, diabetes, ischemic heart disease, and ischemic stroke events: systematic review and dose-response meta-analysis for the Global Burden of Disease Study 2013. BMJ. 2016;354:i3857.

35. Dean E, Soderlund A. What is the role of lifestyle behaviour change associated with non-communicable disease risk in managing musculoskeletal health conditions with special reference to chronic pain? BMC Musculoskelet Disord. 2015;16:87.

36. Cook T, Minns Lowe C, Maybury M, Lewis JS. Are corticosteroid injections more beneficial than anaesthetic injections alone in the management of rotator cuff-related shoulder pain? A systematic review. Br J Sports Med. 2018;52(8):497-504.

37. Mohamadi A, Chan JJ, Claessen FM, Ring D, Chen NC. Corticosteroid injections give small and transient pain relief in rotator cuff tendinosis: a meta-analysis. Clin Orthop Relat Res. 2017;475(1):232-43.

38. Steuri R, Sattelmayer M, Elsig S, Kolly C, Tal A, Taeymans J, et al. Effectiveness of conservative interventions including exercise, manual therapy and medical management in adults with shoulder impingement: a systematic review and meta-analysis of RCTs. Br J Sports Med. 2017;51(18):1340-7.

39. Haahr JP, Andersen JH. Exercises may be as efficient as subacromial decompression in patients with subacromial stage II impingement: 4-8-years' follow-up in a prospective, randomized study. Scand J Rheumatol. 2006;35(3):224-8.

40. Ketola S, Lehtinen JT, Arnala I. Arthroscopic decompression not recommended in the treatment of rotator cuff tendinopathy: a final review of a randomised controlled trial at a minimum follow-up of ten years. Bone Joint J. 2017;99-B(6):799-805.

41. Beard DJ, Rees JL, Cook JA, Rombach I, Cooper C, Merritt N, et al. Arthroscopic subacromial decompression for subacromial shoulder pain (CSAW): a multicentre, pragmatic, parallel group, placebo-controlled, three-group, randomised surgical trial. Lancet. 2018;391(10118):329-38.

42. Paavola M, Malmivaara A, Taimela S, Kanto K, Inkinen J, Kalske J, et al. Subacromial decompression versus diagnostic arthroscopy for shoulder impingement: randomised, placebo surgery controlled clinical trial. BMJ. 2018;362:k2860.

43. McClelland D, Paxinos A, Dodenhoff RM. Rate of return to work and driving following arthroscopic subacromial decompression. ANZ J Surg. 2005;75(9):747-9.

44. Ketola S, Lehtinen J, Rousi T, Nissinen M, Huhtala H, Arnala I. Which patients do not recover from shoulder impingement syndrome, either with operative treatment or with nonoperative treatment? Acta Orthop. 2015;86(6):641-6.

45. Legare F, Thompson-Leduc P. Twelve myths about shared decision making. Patient Educ Couns. 2014;96(3):281-6.