

## 7 Most Common Chronic Non-Cancer Pain Conditions

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### Introduction

As we all know, pain is one of the most common reasons for all the visits to physicians in different settings all around the world. Acute pain is a sign of injury and insult to the body and pain is one of the defending mechanisms to protect us against harmful stimuli. Like any other system in our body we have a control system to stop nerve stimulation when the insult is over, but this can fail in many ways like many other systems in our body. This is the etiology of non-cancer chronic pain. Even after resolving the culprit, stimulation of the pain receptors continues and can cause many different symptoms from hyperalgesia and Allodynia to depression, anxiety and mental health problems. This can be very debilitating and between 20-50% of the people all across the world are affected by non-cancer chronic pain. Due to the importance of this issue, I reviewed many articles and will discuss the most common conditions and their managements. Without exaggeration, more than 60% of the patients that I see in any day given day, in any setting, have complaints about some sort of pain. I definitely felt lack of enough knowledge and experience in pain management and this was my motivation to learn more and help patients in the best way possible. Since education is one of the most important parts for pain management, I hope this handout help patients to better understand their condition and their options. I did not include surgery and hospital interventional procedures in this handout since they are different for each condition and they are usually customized for each patient. I just concentrated on chronic pain conditions and their managements. I used UpToDate which is a well-known website for using the most valid evidence-based medicine. I have attached all the references and if you are interested, you can easily read more about your condition. They are chronically listed according to the conditions in the handout. I also did not include medical marijuana in this handout since this is something fairly new and there is no robust evidence for their use in chronic non-cancer pain patients.

### Headache

**Introduction:** Chronic headache is one of the most debilitating conditions which affect millions of people all over the world. Many people lose their jobs and are not able to do their activities of daily life due this medical issue. About 4% of the adults are suffering from this condition and women are affected 2-3 times more than men. Definition of chronic headache is 15 days or more of headache per month for over 3 months. There are many conditions that can cause this problem like migraine, tension headache, hemicranias continua, rebound headache and many more.

**Evaluation and diagnosis:** Like any other chronic pain we should first do a thorough evaluation and investigation to make sure pain is not related to an organic problem that like a brain mass, infection, abscess or similar conditions which, missing them, can have a devastating outcome for patients. Upon diagnosing any red flags like signs and symptoms of increasing intracranial pressure, focal weakness, paralysis or any alarming signs and symptoms, patients should be evaluated again. I have seen many cases in emergency which were treated as chronic headache for a very long period of time.

**Treatment:** Like any other condition we have pharmacological and non-pharmacological options for treatment of this condition. Biofeedback, relaxation, massage, stretches, acupuncture and hypnosis have been used for many years and have different effects on different patients. Emotional and musculoskeletal part of the headache can probably be managed with these treatments.

**Topical and systemic analgesics:** Tylenol and different NSAIDs have been used for headache. These agents are working on the Arachidonic pathway and can have a role in many different types of headaches.

**B-Blockers, calcium channel blockers and TCA:** These agents have been used for prevention of some chronic headaches like migraine.

**Anticonvulsant medications and glucocorticoids:** These agents have been used for treating neuralgic pains and also prevention of attacks in some types of headaches like migraine and cluster headaches.

**Botox injections:** This has been started to be used for migraine headaches. This is something quite new and has shown some efficacy in some patients.

**Nerve blocks:** This can be done for neuralgic pain. Supraorbital, infraorbital, lesser occipital, greater occipital, trigeminal, auriculotemporal and maxillary nerves are the most common blocks used for managing chronic stabbing pains.

## **Back pain**

**Introduction:** This is one of the most common reasons of regular visits to primary care, emergency rooms and many other disciplines. More than 84% of adult have experience back pain. Many people lose their job and quality of life due to back pain. When pain is present for 12 or more weeks, we call it chronic back pain.

**Evaluation and diagnosis:** This is very important to find red flags and diagnose treatable conditions before labeling the patient for chronic back pain. I have seen many patients with metastatic disease, intraabdominal tumor, multiple myeloma and many other conditions which were labeled as chronic back pain for a very long time. This is also very vital to diagnose deterioration and red flags since we have many cases of cauda equina syndrome which are missed, and patients can end up in a wheel chair for the rest of their life.

**Treatment:** Again many non-pharmacological and pharmacological treatments have been tried for back pain. There are many things that can be done to help back pain. Stretches, core muscle exercises, proper mattress, biofeedback, massage, physiotherapy, exercise, meditation, yoga, cognitive behavioral therapy, Tai chi, acupuncture, medium frequency alternating current, chiropractor, shortwave diathermy, laser therapy, ultrasound, transcutaneous electric nerve stimulation and many more have been tried for acute and chronic back pain.

**Topical and systemic analgesics:** Tylenol and NSAIDs are usually the first line for treatment and help the pain and inflammation.

**Muscle relaxant and Benzodiazepines:** Muscle spasm is usually one of the reasons for pain and these agents have shown some benefits.

**Antidepressant:** They can definitely help patients who are emotionally affected by chronic pain.

**Antiepileptic medications:** These agents have been used frequently for back pain but there is limited evidence to support their efficacy. Many patients express improvement which could be placebo effect or due to sedative effects of these medications.

**Opioids:** These agents have been used for many years for back pain. Non opioid agents are supposed to have the same efficacy compared to opioid agents but how many times a day we hear patients saying that nothing touches the pain but Oxycocet, Tylenol#3 etc. I personally do not think all of these patients are drug seekers and different medications have different effects in different people. A few years ago opioids were prescribed without any limitation which caused so many problems in our society. Now medical regulatory authorities have much tougher protocol for prescribers which have caused so much fear in physicians. Many doctors do not even use these agents properly. I am totally against abusing opioids but it is essential to understand patients, know the guidelines and use everything properly. As long as physicians follow the guidelines and know their patients, there should be no fear of disciplinary actions. I have seen even many palliative patients who are suffering because their doctors do not want to prescribe narcotics for them.

**Nerve blocks and trigger point injection:** Spinal, sciatic, femoral, facet and paravertebral injections can help acute and chronic pains.

## **Neck pain**

**Introduction:** Neck pain is another very common reason for so many visits per year. Prevalence of neck pain is pretty close to back pain. Many people just have axial pain and some have extremities and neurologic symptoms while many patients have both.

**Diagnosis and evaluation:** Chronic pain can be generated from cervical spines or musculature of the neck. It is very crucial to rule out other pathologies that can mimic chronic neck pain like cancers, vascular problems, infection and other treatable conditions.

**Treatment:** Many pharmacological and non-pharmacological treatments have been tried for neck pain Posture improvement, stretches, exercise, adjustment of mattress and pillow, biofeedback, physiotherapy, acupuncture, relaxation techniques, tai chi, Yoga, massage therapy, laser therapy, transcutaneous nerve stimulation, chiropractor, electromagnetic therapy, percutaneous radiofrequency neurotomy and exercise have all been effective for neck pain.

**Topical and systemic analgesic:** Tylenol and NSAIDs have been used for years and are effective for many patients.

**Anti-depressant:** Like many other medical conditions anxiety, depression and mental health disease has always played a big role.

**Anti-epileptic medications:** These medications have been used for years but there is no well-designed clinical trial to confirm their efficacy for neck pain yet. We all have seen many patients who report benefit from these medications though. They work for diabetic neuropathic pain and with the same token might help when there is a neuropathic component for the pain. They are also a sedative which will probably help the patient sleep and ultimately feel better.

**Tri Cyclic antidepressant:** These agents are effective on the mental health part of the pain and also improve patient's sleep.

**Nerve block and triggers point injections:** These procedures have been very effective for many patients and provide so much relief.

## **Fibromyalgia**

**Introduction:** This is a very common condition and very hard to treat. These patients usually have chronic pain, fatigue and insomnia. Many people are affected by this condition and often remained undiagnosed for a long period of time.

**Diagnosis and evaluation:** Fibromyalgia has many non-specific symptoms which makes it very hard to diagnosis. Cancers and chronic infections can have similar symptoms and easily be missed. It usually takes many visits and so much time and investigations in a multidisciplinary approach to make the proper diagnosis.

**Treatment:** Many non-pharmacological treatments have been used for fibromyalgia. Relaxation, cognitive behavioral treatments, stretches, exercise programs, massage, physiotherapy, chiropractor, sleep hygiene, patient education and stress managements are all effective.

**Topical and systemic analgesics and opioids:** These agents have been prescribed for many years but there is no evidence for their efficacy. Opioids can also worsen their outcome.

**Tri cyclic antidepressant:** These agents are effective and should be started at low dose and hopefully continue at low dose. They also improve sleep and mood disorder which can accompany the disorder.

**Muscle relaxant:** They help muscle spasm and cyclobenzaprine has some antidepressant benefit as well.

**Anti-depressant:** They are effective in managing emotional aspect of the disease and also controlling chronic pain and fatigue related to these conditions.

**Anti-epileptic medications:** These agents have been used but there is a lot of controversy about them. The best approach is give them a try and continue them if effective.

**Nerves block and triggers point injections:** These procedure have been effective in many patients.

## Hip Pain

**Introduction:** Chronic hip pain affects mobility and productivity of millions of people and has a huge impact on many people's lives.

**Diagnosis and evaluation:** Joint, bursa and bones are usually the etiology of the pain. We can also get referral pain from knee, lumbosacral and sacroiliac joints. Even aortoiliac vascular pain can be felt in the hip. It is crucial to think broad, and get a proper diagnosis before labeling any hip pain as a pain with musculoskeletal origin.

**Treatment:** Many non-pharmacological treatments have been used and effective for hips pain. Physiotherapy, stretches, chiropractor, Transcutaneous nerve stimulation, massage, exercise, posture improvement are all some of the many options.

**Topical and systemic analgesics:** Systemic analgesics are more effective since pain is most often from deeper structures.

**Muscle relaxant:** These agents are helping with muscle spasm which can be the main etiology for many cases due to large muscle bulk in the hip region.

**Anti-epileptic medications:** These medications are mostly effective when there is a neuropathic component for the pain. Sciatic nerve is one of the most nerves affected and these medications usually help.

**Opioids:** These agents can be used at recommended dose for patients who are not responding to regular analgesics or treatment. They are better to be used in patients without red flags for dependency or older individuals who are not a surgical candidate and NSAIDs can get more side effect and complications from them.

**Nerves block and triggers point injections:** Intraarticular injection, nerve blocks and trigger point/bursa injections are very helpful for hip, trochanteric and gluteal pains.

## Knee Pain

**Introduction:** About 25% of adults are affected by chronic knees pain. This condition can be very debilitating and affect activities of daily life, work productivity, quality of life and life satisfaction as a whole.

**Diagnosis and etiologies:** Bursitis, muscle spasm, joint and ligament wear and tear, bone bruise, Baker cyst, Osgood-Schlatter disease, patella subluxation, patellofemoral syndrome, plica syndrome, nerve entrapments and referring pain are the most common reasons for chronic knee pain. We can get chronic pain from aneurysm, vascular entrapment, inflammatory disease and many more causes.

**Treatment:** Non-pharmacological treatments are the cornerstone and initial management of any condition. Massage, physiotherapy, exercise, stretches and muscle strengthening are the most common available and effective options.

**Topical and systemic analgesic:** Both modalities have been very effective for pain and inflammation management of chronic knee pain.

**Opioids:** Their use is very similar for patients with hip pain. Patients should be well screened and their use should be limited for certain patients who cannot use NSAIDS due to their side effects.

### **Shoulder pain:**

**Introduction:** Sport, Motor Vehicle Accident and work related injuries are very common and many patients are suffering from chronic shoulders pain.

**Etiology and diagnosis:** Pain can arise from muscles, joints, bursa, ligaments and referral pains from neck, heart, intraabdominal organs or hepatobiliary system. I will concentrate on musculoskeletal etiologies in this hand out.

**Treatments:** Non-pharmacological treatments like physiotherapy, massage, transcutaneous nerve stimulation, stretches, strengthening and exercise programs have been effective for pain managements.

**Topical and systemic analgesics:** Both modalities have been used and quite effective in many patients. Unlike other chronic pains there is no evidence for efficacy of any other type of medications for shoulder pain. Some practitioners are prescribing opioids but there is no evidence for its benefits for chronic shoulder pain.

**Nerve block, trigger points and Steroid injections:** These treatments have been effective and many people get significant benefits from them.

### **Conclusion:**

If you are reading this hand out and suffering from one of these common pains, there is some good news for you! You know now that you are not alone. Almost everyone has experienced excruciating pain in his/her life. The best way to approach any problem is first understand the issue and the options available and be realistic about the outcome. 30-50% of pain relief is usually a success. Change your mind to change your life. If you want to stay negative and always complain, you obviously have a wrong vision to the world. Positive people get positive things. There is always hope for every one and you are the one who will ultimately change your life. We have all dedicated our life in North York pain poly clinic

to help you and shine a light into your darkest time with pain. You are all welcome in our clinic and remember we want you to be part of our team. Together we can make impossible possible. Please do not hesitate to contact any of our team members if you need further information or help and I will be delighted to see you in my office. I hope you find this hand out useful and please do not hesitate to give us your productive suggestions.

1. Deyo RA, Tsui-Wu YJ. Descriptive epidemiology of low-back pain and its related medical care in the United States. *Spine (Phila Pa 1976)* 1987; 12:264.
2. Cassidy JD, Carroll LJ, Côté P. The Saskatchewan health and back pain survey. The prevalence of low back pain and related disability in Saskatchewan adults. *Spine (Phila Pa 1976)* 1998; 23:1860.
3. Croft PR, Macfarlane GJ, Papageorgiou AC, et al. Outcome of low back pain in general practice: a prospective study. *BMJ* 1998; 316:1356.
4. Bigos SJ, Boyer OR, Braen GR, et al. Acute low back problems in adults. Clinical Practice Guideline Number 4. US Department of Health and Human Services; Rockville, MD 1994.
5. Deyo RA, Rainville J, Kent DL. What can the history and physical examination tell us about low back pain? *JAMA* 1992; 268:760.
6. Chou R, Deyo R, Friedly J, et al. Nonpharmacologic Therapies for Low Back Pain: A Systematic Review for an American College of Physicians Clinical Practice Guideline. *Ann Intern Med* 2017; 166:493.
7. van Tulder MW, Assendelft WJ, Koes BW, Bouter LM. Spinal radiographic findings and nonspecific low back pain. A systematic review of observational studies. *Spine (Phila Pa 1976)* 1997; 22:427.
8. Pengel LH, Herbert RD, Maher CG, Refshauge KM. Acute low back pain: systematic review of its prognosis. *BMJ* 2003; 327:323.
9. Gatchel RJ, Polatin PB, Mayer TG. The dominant role of psychosocial risk factors in the development of chronic low back pain disability. *Spine (Phila Pa 1976)* 1995; 20:2702.
10. Hay EM, Mullis R, Lewis M, et al. Comparison of physical treatments versus a brief pain-management programme for back pain in primary care: a randomised clinical trial in physiotherapy practice. *Lancet* 2005; 365:2024.
11. Jellema P, van der Windt DA, van der Horst HE, et al. Should treatment of (sub)acute low back pain be aimed at psychosocial prognostic factors? Cluster randomised clinical trial in general practice. *BMJ* 2005; 331:84.
12. Carey TS, Freburger JK, Holmes GM, et al. A long way to go: practice patterns and evidence in chronic low back pain care. *Spine (Phila Pa 1976)* 2009; 34:718.
13. Pengel HM, Maher CG, Refshauge KM. Systematic review of conservative interventions for subacute low back pain. *Clin Rehabil* 2002; 16:811.
14. Vroomen PC, de Krom MC, Slofstra PD, Knottnerus JA. Conservative treatment of sciatica: a systematic review. *J Spinal Disord* 2000; 13:463.
15. Luijsterburg PA, Verhagen AP, Ostelo RW, et al. Effectiveness of conservative treatments for the lumbosacral radicular syndrome: a systematic review. *Eur Spine J* 2007; 16:881.
16. Hill JC, Whitehurst DG, Lewis M, et al. Comparison of stratified primary care management for low back pain with current best practice (STarT Back): a randomised controlled trial. *Lancet* 2011; 378:1560.

17. Qaseem A, Wilt TJ, McLean RM, et al. Noninvasive Treatments for Acute, Subacute, and Chronic Low Back Pain: A Clinical Practice Guideline From the American College of Physicians. *Ann Intern Med* 2017; 166:514.
18. Hagen KB, Jamtvedt G, Hilde G, Winnem MF. The updated cochrane review of bed rest for low back pain and sciatica. *Spine (Phila Pa 1976)* 2005; 30:542.
19. Frost H, Lamb SE, Doll HA, et al. Randomised controlled trial of physiotherapy compared with advice for low back pain. *BMJ* 2004; 329:708.
20. *The Back Book*, 2nd Rev ed., The Stationery Office, London 2002.
21. Burton AK, Waddell G, Tillotson KM, Summerton N. Information and advice to patients with back pain can have a positive effect. A randomized controlled trial of a novel educational booklet in primary care. *Spine (Phila Pa 1976)* 1999; 24:2484.
22. Cherkin DC, Deyo RA, Battié M, et al. A comparison of physical therapy, chiropractic manipulation, and provision of an educational booklet for the treatment of patients with low back pain. *N Engl J Med* 1998; 339:1021.
23. Cherkin DC, Eisenberg D, Sherman KJ, et al. Randomized trial comparing traditional Chinese medical acupuncture, therapeutic massage, and self-care education for chronic low back pain. *Arch Intern Med* 2001; 161:1081.
24. Sherman KJ, Cherkin DC, Erro J, et al. Comparing yoga, exercise, and a self-care book for chronic low back pain: a randomized, controlled trial. *Ann Intern Med* 2005; 143:849.
25. Kovacs FM, Abaira V, Peña A, et al. Effect of firmness of mattress on chronic non-specific low-back pain: randomised, double-blind, controlled, multicentre trial. *Lancet* 2003; 362:1599.
26. Bergholdt K, Fabricius RN, Bendix T. Better backs by better beds? *Spine (Phila Pa 1976)* 2008; 33:703.
27. van Duijvenbode IC, Jellema P, van Poppel MN, van Tulder MW. Lumbar supports for prevention and treatment of low back pain. *Cochrane Database Syst Rev* 2008; :CD001823.
28. Calmels P, Queneau P, Hamonet C, et al. Effectiveness of a lumbar belt in subacute low back pain: an open, multicentric, and randomized clinical study. *Spine (Phila Pa 1976)* 2009; 34:215.
29. Byström MG, Rasmussen-Barr E, Grooten WJ. Motor control exercises reduces pain and disability in chronic and recurrent low back pain: a meta-analysis. *Spine (Phila Pa 1976)* 2013; 38:E350.
30. Rubinstein SM, van Middelkoop M, Assendelft WJ, et al. Spinal manipulative therapy for chronic low-back pain. *Cochrane Database Syst Rev* 2011; :CD008112.
31. Walker BF, Hebert JJ, Stomski NJ, et al. Short-term usual chiropractic care for spinal pain: a randomized controlled trial. *Spine (Phila Pa 1976)* 2013; 38:2071.
32. Bronfort G, Hondras MA, Schulz CA, et al. Spinal manipulation and home exercise with advice for subacute and chronic back-related leg pain: a trial with adaptive allocation. *Ann Intern Med* 2014; 161:381.
33. Schneider M, Haas M, Glick R, et al. Comparison of spinal manipulation methods and usual medical care for acute and subacute low back pain: a randomized clinical trial. *Spine (Phila Pa 1976)* 2015; 40:209.
34. Furlan AD, van Tulder MW, Cherkin DC, et al. Acupuncture and dry-needling for low back pain. *Cochrane Database Syst Rev* 2005; :CD001351.
35. Manheimer E, White A, Berman B, et al. Meta-analysis: acupuncture for low back pain. *Ann Intern Med* 2005; 142:651.
36. Brinkhaus B, Witt CM, Jena S, et al. Acupuncture in patients with chronic low back pain: a randomized controlled trial. *Arch Intern Med* 2006; 166:450.



37. Haake M, Müller HH, Schade-Brittinger C, et al. German Acupuncture Trials (GERAC) for chronic low back pain: randomized, multicenter, blinded, parallel-group trial with 3 groups. *Arch Intern Med* 2007; 167:1892.
38. Lam M, Galvin R, Curry P. Effectiveness of acupuncture for nonspecific chronic low back pain: a systematic review and meta-analysis. *Spine (Phila Pa 1976)* 2013; 38:2124.
39. Kalauokalani D, Cherkin DC, Sherman KJ, et al. Lessons from a trial of acupuncture and massage for low back pain: patient expectations and treatment effects. *Spine (Phila Pa 1976)* 2001; 26:1418.
40. Furlan AD, Giraldo M, Baskwill A, et al. Massage for low-back pain. *Cochrane Database Syst Rev* 2015; :CD001929.
41. Little P, Lewith G, Webley F, et al. Randomised controlled trial of Alexander technique lessons, exercise, and massage (ATEAM) for chronic and recurrent back pain. *BMJ* 2008; 337:a884.
42. Cherkin DC, Sherman KJ, Kahn J, et al. A comparison of the effects of 2 types of massage and usual care on chronic low back pain: a randomized, controlled trial. *Ann Intern Med* 2011; 155:1.
43. Ostelo RW, van Tulder MW, Vlaeyen JW, et al. Behavioural treatment for chronic low-back pain. *Cochrane Database Syst Rev* 2005; :CD002014.
44. Hoffman BM, Papas RK, Chatkoff DK, Kerns RD. Meta-analysis of psychological interventions for chronic low back pain. *Health Psychol* 2007; 26:1.
45. Lamb SE, Hansen Z, Lall R, et al. Group cognitive behavioural treatment for low-back pain in primary care: a randomised controlled trial and cost-effectiveness analysis. *Lancet* 2010; 375:916.
46. Anheyer D, Haller H, Barth J, et al. Mindfulness-Based Stress Reduction for Treating Low Back Pain: A Systematic Review and Meta-analysis. *Ann Intern Med* 2017; 166:799.
47. Cherkin DC, Sherman KJ, Balderson BH, et al. Effect of Mindfulness-Based Stress Reduction vs Cognitive Behavioral Therapy or Usual Care on Back Pain and Functional Limitations in Adults With Chronic Low Back Pain: A Randomized Clinical Trial. *JAMA* 2016; 315:1240.
48. Engers A, Jellema P, Wensing M, et al. Individual patient education for low back pain. *Cochrane Database Syst Rev* 2008; :CD004057.
49. Moseley GL. Evidence for a direct relationship between cognitive and physical change during an education intervention in people with chronic low back pain. *Eur J Pain* 2004; 8:39.
50. Parreira P, Heymans MW, van Tulder MW, et al. Back Schools for chronic non-specific low back pain. *Cochrane Database Syst Rev* 2017; 8:CD011674.
51. Kamper SJ, Apeldoorn AT, Chiarotto A, et al. Multidisciplinary biopsychosocial rehabilitation for chronic low back pain: Cochrane systematic review and meta-analysis. *BMJ* 2015; 350:h444.
52. Glass LS, Harris JS, Blais BR, et al. *Occupational Medicine Practice Guidelines: Evaluation and Management of Common Health Problems and Functional Recovery of Workers*, 2nd ed, OEM Press, Beverly Farms, MA 2003.
53. Schaafsma FG, Whelan K, van der Beek AJ, et al. Physical conditioning as part of a return to work strategy to reduce sickness absence for workers with back pain. *Cochrane Database Syst Rev* 2013; 8:CD001822.
54. Maher CG. Effective physical treatment for chronic low back pain. *Orthop Clin North Am* 2004; 35:57.

55. Hurley DA, McDonough SM, Dempster M, et al. A randomized clinical trial of manipulative therapy and interferential therapy for acute low back pain. *Spine (Phila Pa 1976)* 2004; 29:2207.
56. Hurley DA, Minder PM, McDonough SM, et al. Interferential therapy electrode placement technique in acute low back pain: a preliminary investigation. *Arch Phys Med Rehabil* 2001; 82:485.
57. Werners R, Pynsent PB, Bulstrode CJ. Randomized trial comparing interferential therapy with motorized lumbar traction and massage in the management of low back pain in a primary care setting. *Spine (Phila Pa 1976)* 1999; 24:1579.
58. Basford JR, Sheffield CG, Harmsen WS. Laser therapy: a randomized, controlled trial of the effects of low-intensity Nd:YAG laser irradiation on musculoskeletal back pain. *Arch Phys Med Rehabil* 1999; 80:647.
59. Blythin P. Triage in the UK. *Nursing (Lond)* 1988; 3:16.
60. Soriano F, Rios R. Gallium arsenide laser treatment of chronic low back pain: a prospective, randomized and double blind study. *Laser Ther* 1998; 10:175.
61. Toya S, Motegi M, Inomata K, et al. Report on a computer-randomized double blind clinical trial to determine the effectiveness of the GaAlAs (830nm) diode laser for attenuation in selected pain groups. *Laser Ther* 1994; 6:143.
62. Klein RG, Eek BC. Low-energy laser treatment and exercise for chronic low back pain: double-blind controlled trial. *Arch Phys Med Rehabil* 1990; 71:34.
63. Gur A, Karakoc M, Cevik R, et al. Efficacy of low power laser therapy and exercise on pain and functions in chronic low back pain. *Lasers Surg Med* 2003; 32:233.
64. Yousefi-Nooraie R, Schonstein E, Heidari K, et al. Low level laser therapy for nonspecific low-back pain. *Cochrane Database Syst Rev* 2007; :CD005107.
65. Ansari NN, Ebadi S, Talebian S, et al. A randomized, single blind placebo controlled clinical trial on the effect of continuous ultrasound on low back pain. *Electromyogr Clin Neurophysiol* 2006; 46:329.
66. ROMAN MP. A clinical evaluation of ultrasound by use of a placebo technic. *Phys Ther Rev* 1960; 40:649.
67. Philadelphia Panel. Philadelphia Panel evidence-based clinical practice guidelines on selected rehabilitation interventions for low back pain. *Phys Ther* 2001; 81:1641.
68. Gibson T, Grahame R, Harkness J, et al. Controlled comparison of short-wave diathermy treatment with osteopathic treatment in non-specific low back pain. *Lancet* 1985; 1:1258.
69. Sweetman BJ, Heinrich I, Anderson JA. A randomized controlled trial of exercises, short wave diathermy, and traction for low back pain, with evidence of diagnosis-related response to treatment. *J Orthop Rheumatol* 1993; 6:159.
70. Clarke J, van Tulder M, Blomberg S, et al. Traction for low back pain with or without sciatica: an updated systematic review within the framework of the Cochrane collaboration. *Spine (Phila Pa 1976)* 2006; 31:1591.
71. Wu LC, Weng PW, Chen CH, et al. Literature Review and Meta-Analysis of Transcutaneous Electrical Nerve Stimulation in Treating Chronic Back Pain. *Reg Anesth Pain Med* 2018; 43:425.
72. Yokoyama M, Sun X, Oku S, et al. Comparison of percutaneous electrical nerve stimulation with transcutaneous electrical nerve stimulation for long-term pain relief in patients with chronic low back pain. *Anesth Analg* 2004; 98:1552.
73. Ghoname EA, Craig WF, White PF, et al. Percutaneous electrical nerve stimulation for low back pain: a randomized crossover study. *JAMA* 1999; 281:818.
74. Ghoname EA, White PF, Ahmed HE, et al. Percutaneous electrical nerve stimulation: an alternative to TENS in the management of sciatica. *Pain* 1999; 83:193.

75. Weiner DK, Rudy TE, Glick RM, et al. Efficacy of percutaneous electrical nerve stimulation for the treatment of chronic low back pain in older adults. *J Am Geriatr Soc* 2003; 51:599.
76. Mafi JN, McCarthy EP, Davis RB, Landon BE. Worsening trends in the management and treatment of back pain. *JAMA Intern Med* 2013; 173:1573.
77. Enthoven WT, Roelofs PD, Deyo RA, et al. Non-steroidal anti-inflammatory drugs for chronic low back pain. *Cochrane Database Syst Rev* 2016; 2:CD012087.
78. A COMPARISON of prednisolone with aspirin on other analgesics in the treatment of rheumatoid arthritis. *Ann Rheum Dis* 1959; 18:173.
79. Towheed TE, Maxwell L, Judd MG, et al. Acetaminophen for osteoarthritis. *Cochrane Database Syst Rev* 2006; :CD004257.
80. Wegman A, van der Windt D, van Tulder M, et al. Nonsteroidal antiinflammatory drugs or acetaminophen for osteoarthritis of the hip or knee? A systematic review of evidence and guidelines. *J Rheumatol* 2004; 31:344.
81. Zhang W, Jones A, Doherty M. Does paracetamol (acetaminophen) reduce the pain of osteoarthritis? A meta-analysis of randomised controlled trials. *Ann Rheum Dis* 2004; 63:901.
82. Saragiotto BT, Machado GC, Ferreira ML, et al. Paracetamol for low back pain. *Cochrane Database Syst Rev* 2016; :CD012230.
83. Kearney PM, Baigent C, Godwin J, et al. Do selective cyclo-oxygenase-2 inhibitors and traditional non-steroidal anti-inflammatory drugs increase the risk of atherothrombosis? Meta-analysis of randomised trials. *BMJ* 2006; 332:1302.
84. Larson AM, Polson J, Fontana RJ, et al. Acetaminophen-induced acute liver failure: results of a United States multicenter, prospective study. *Hepatology* 2005; 42:1364.
85. van Tulder MW, Touray T, Furlan AD, et al. Muscle relaxants for nonspecific low back pain: a systematic review within the framework of the cochrane collaboration. *Spine (Phila Pa 1976)* 2003; 28:1978.
86. Basmajian JV. Cyclobenzaprine hydrochloride effect on skeletal muscle spasm in the lumbar region and neck: two double-blind controlled clinical and laboratory studies. *Arch Phys Med Rehabil* 1978; 59:58.
87. Grond S, Sablotzki A. Clinical pharmacology of tramadol. *Clin Pharmacokinet* 2004; 43:879.
88. Beakley BD, Kaye AM, Kaye AD. Tramadol, Pharmacology, Side Effects, and Serotonin Syndrome: A Review. *Pain Physician* 2015; 18:395.
89. Skljarevski V, Desai D, Liu-Seifert H, et al. Efficacy and safety of duloxetine in patients with chronic low back pain. *Spine (Phila Pa 1976)* 2010; 35:E578.
90. Skljarevski V, Ossanna M, Liu-Seifert H, et al. A double-blind, randomized trial of duloxetine versus placebo in the management of chronic low back pain. *Eur J Neurol* 2009; 16:1041.
91. Skljarevski V, Zhang S, Desai D, et al. Duloxetine versus placebo in patients with chronic low back pain: a 12-week, fixed-dose, randomized, double-blind trial. *J Pain* 2010; 11:1282.
92. Deyo RA, Von Korff M, Dohrkoop D. Opioids for low back pain. *BMJ* 2015; 350:g6380.
93. Martell BA, O'Connor PG, Kerns RD, et al. Systematic review: opioid treatment for chronic back pain: prevalence, efficacy, and association with addiction. *Ann Intern Med* 2007; 146:116.
94. Chaparro LE, Furlan AD, Deshpande A, et al. Opioids compared to placebo or other treatments for chronic low-back pain. *Cochrane Database Syst Rev* 2013; :CD004959.
95. Abdel Shaheed C, Maher CG, Williams KA, et al. Efficacy, Tolerability, and Dose-Dependent Effects of Opioid Analgesics for Low Back Pain: A Systematic Review and Meta-analysis. *JAMA Intern Med* 2016; 176:958.

96. Krebs EE, Gravely A, Nugent S, et al. Effect of Opioid vs Nonopioid Medications on Pain-Related Function in Patients With Chronic Back Pain or Hip or Knee Osteoarthritis Pain: The SPACE Randomized Clinical Trial. *JAMA* 2018; 319:872.
97. Salerno SM, Browning R, Jackson JL. The effect of antidepressant treatment on chronic back pain: a meta-analysis. *Arch Intern Med* 2002; 162:19.
98. Staiger TO, Gaster B, Sullivan MD, Deyo RA. Systematic review of antidepressants in the treatment of chronic low back pain. *Spine (Phila Pa 1976)* 2003; 28:2540.
99. Urquhart DM, Hoving JL, Assendelft WW, et al. Antidepressants for non-specific low back pain. *Cochrane Database Syst Rev* 2008; :CD001703.
100. Bair MJ, Robinson RL, Katon W, Kroenke K. Depression and pain comorbidity: a literature review. *Arch Intern Med* 2003; 163:2433.
101. Park TW, Saitz R, Ganoczy D, et al. Benzodiazepine prescribing patterns and deaths from drug overdose among US veterans receiving opioid analgesics: case-cohort study. *BMJ* 2015; 350:h2698.
102. Sun EC, Dixit A, Humphreys K, et al. Association between concurrent use of prescription opioids and benzodiazepines and overdose: retrospective analysis. *BMJ* 2017; 356:j760.
103. Shanthanna H, Gilron I, Rajarathinam M, et al. Benefits and safety of gabapentinoids in chronic low back pain: A systematic review and meta-analysis of randomized controlled trials. *PLoS Med* 2017; 14:e1002369.
104. McCleane GJ. Does gabapentin have an analgesic effect on background, movement and referred pain? A randomised, double-blind, placebo controlled study. *The Pain Clinic* 2001; 13:103.
105. Yildirim K, Sisecioglu M, Karatay S, et al. The effectiveness of gabapentin in patients with chronic radiculopathy. *The Pain Clinic* 2003; 15:213.
106. Baron R, Freynhagen R, Tölle TR, et al. The efficacy and safety of pregabalin in the treatment of neuropathic pain associated with chronic lumbosacral radiculopathy. *Pain* 2010; 150:420.
107. Yaksi A, Ozgönel L, Ozgönel B. The efficiency of gabapentin therapy in patients with lumbar spinal stenosis. *Spine (Phila Pa 1976)* 2007; 32:939.
108. Markman JD, Frazer ME, Rast SA, et al. Double-blind, randomized, controlled, crossover trial of pregabalin for neurogenic claudication. *Neurology* 2015; 84:265.
109. Muehlbacher M, Nickel MK, Kettler C, et al. Topiramate in treatment of patients with chronic low back pain: a randomized, double-blind, placebo-controlled study. *Clin J Pain* 2006; 22:526.
110. Khoromi S, Patsalides A, Parada S, et al. Topiramate in chronic lumbar radicular pain. *J Pain* 2005; 6:829.
111. Wilkens P, Scheel IB, Grundnes O, et al. Effect of glucosamine on pain-related disability in patients with chronic low back pain and degenerative lumbar osteoarthritis: a randomized controlled trial. *JAMA* 2010; 304:45.
112. Oltean H, Robbins C, van Tulder MW, et al. Herbal medicine for low-back pain. *Cochrane Database Syst Rev* 2014; :CD004504.
113. Korhonen T, Karppinen J, Paimela L, et al. The treatment of disc herniation-induced sciatica with infliximab: results of a randomized, controlled, 3-month follow-up study. *Spine (Phila Pa 1976)* 2005; 30:2724.
114. Korhonen T, Karppinen J, Paimela L, et al. The treatment of disc-herniation-induced sciatica with infliximab: one-year follow-up results of FIRST II, a randomized controlled trial. *Spine (Phila Pa 1976)* 2006; 31:2759.

115. Childs JD, Fritz JM, Flynn TW, et al. A clinical prediction rule to identify patients with low back pain most likely to benefit from spinal manipulation: a validation study. *Ann Intern Med* 2004; 141:920.
116. Choi BK, Verbeek JH, Tam WW, Jiang JY. Exercises for prevention of recurrences of low-back pain. *Cochrane Database Syst Rev* 2010; :CD006555.
117. Cohen SP. Epidemiology, diagnosis, and treatment of neck pain. *Mayo Clin Proc* 2015; 90:284.
118. Guzman J, Haldeman S, Carroll LJ, et al. Clinical practice implications of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders: from concepts and findings to recommendations. *Spine (Phila Pa 1976)* 2008; 33:S199.
119. Grubb SA, Kelly CK. Cervical discography: clinical implications from 12 years of experience. *Spine (Phila Pa 1976)* 2000; 25:1382.
120. Slipman CW, Plastaras C, Patel R, et al. Provocative cervical discography symptom mapping. *Spine J* 2005; 5:381.
121. Boden SD, McCowin PR, Davis DO, et al. Abnormal magnetic-resonance scans of the cervical spine in asymptomatic subjects. A prospective investigation. *J Bone Joint Surg Am* 1990; 72:1178.
122. Teresi LM, Lufkin RB, Reicher MA, et al. Asymptomatic degenerative disk disease and spondylosis of the cervical spine: MR imaging. *Radiology* 1987; 164:83.
123. Schellhas KP, Smith MD, Gundry CR, Pollei SR. Cervical discogenic pain. Prospective correlation of magnetic resonance imaging and discography in asymptomatic subjects and pain sufferers. *Spine (Phila Pa 1976)* 1996; 21:300.
124. Bogduk N, Marsland A. On the concept of third occipital headache. *J Neurol Neurosurg Psychiatry* 1986; 49:775.
125. Lord SM, Barnsley L, Wallis BJ, Bogduk N. Chronic cervical zygapophysial joint pain after whiplash. A placebo-controlled prevalence study. *Spine (Phila Pa 1976)* 1996; 21:1737.
126. Manchikanti L, Singh V, Rivera J, Pampati V. Prevalence of cervical facet joint pain in chronic neck pain. *Pain Physician* 2002; 5:243.
127. Gennis P, Miller L, Gallagher EJ, et al. The effect of soft cervical collars on persistent neck pain in patients with whiplash injury. *Acad Emerg Med* 1996; 3:568.
128. Richter M, Ferrari R, Otte D, et al. Correlation of clinical findings, collision parameters, and psychological factors in the outcome of whiplash associated disorders. *J Neurol Neurosurg Psychiatry* 2004; 75:758.
129. Côté P, Hogg-Johnson S, Cassidy JD, et al. Initial patterns of clinical care and recovery from whiplash injuries: a population-based cohort study. *Arch Intern Med* 2005; 165:2257.
130. Walton DM, Macdermid JC, Giorgianni AA, et al. Risk factors for persistent problems following acute whiplash injury: update of a systematic review and meta-analysis. *J Orthop Sports Phys Ther* 2013; 43:31.
131. Pain in the neck and arm: a multicentre trial of the effects of physiotherapy, arranged by the British Association of Physical Medicine. *Br Med J* 1966; 1:253.
132. Aker PD, Gross AR, Goldsmith CH, Peloso P. Conservative management of mechanical neck pain: systematic overview and meta-analysis. *BMJ* 1996; 313:1291.
133. Deyo RA. Drug therapy for back pain. Which drugs help which patients? *Spine (Phila Pa 1976)* 1996; 21:2840.
134. Peloso P, Gross A, Haines T, et al. Medicinal and injection therapies for mechanical neck disorders. *Cochrane Database Syst Rev* 2007; :CD000319.

135. Borenstein DG, Korn S. Efficacy of a low-dose regimen of cyclobenzaprine hydrochloride in acute skeletal muscle spasm: results of two placebo-controlled trials. *Clin Ther* 2003; 25:1056.
136. Turturro MA, Frater CR, D'Amico FJ. Cyclobenzaprine with ibuprofen versus ibuprofen alone in acute myofascial strain: a randomized, double-blind clinical trial. *Ann Emerg Med* 2003; 41:818.
137. Bronfort G, Evans R, Anderson AV, et al. Spinal manipulation, medication, or home exercise with advice for acute and subacute neck pain: a randomized trial. *Ann Intern Med* 2012; 156:1.
138. Mealy K, Brennan H, Fenelon GC. Early mobilization of acute whiplash injuries. *Br Med J (Clin Res Ed)* 1986; 292:656.
139. Rosenfeld M, Gunnarsson R, Borenstein P. Early intervention in whiplash-associated disorders: a comparison of two treatment protocols. *Spine (Phila Pa 1976)* 2000; 25:1782.
140. Verhagen AP, Peeters GG, de Bie RA, Oostendorp RA. Conservative treatment for whiplash. *Cochrane Database Syst Rev* 2001; :CD003338.
141. Chow RT, Johnson MI, Lopes-Martins RA, Bjordal JM. Efficacy of low-level laser therapy in the management of neck pain: a systematic review and meta-analysis of randomised placebo or active-treatment controlled trials. *Lancet* 2009; 374:1897.
142. Schellingerhout JM, Heymans MW, Verhagen AP, et al. Prognosis of patients with nonspecific neck pain: development and external validation of a prediction rule for persistence of complaints. *Spine (Phila Pa 1976)* 2010; 35:E827.
143. Shahidi B, Curran-Everett D, Maluf KS. Psychosocial, Physical, and Neurophysiological Risk Factors for Chronic Neck Pain: A Prospective Inception Cohort Study. *J Pain* 2015; 16:1288.
144. Valenza MC, Valenza G, González-Jiménez E, et al. Alteration in sleep quality in patients with mechanical insidious neck pain and whiplash-associated neck pain. *Am J Phys Med Rehabil* 2012; 91:584.
145. Gross A, Kay TM, Paquin JP, et al. Exercises for mechanical neck disorders. *Cochrane Database Syst Rev* 2015; 1:CD004250.
146. Hurwitz EL, Carragee EJ, van der Velde G, et al. Treatment of neck pain: noninvasive interventions: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. *Spine (Phila Pa 1976)* 2008; 33:S123.
147. Gross A, Miller J, D'Sylva J, et al. Manipulation or mobilisation for neck pain. *Cochrane Database Syst Rev* 2010; :CD004249.
148. Harris GR, Susman JL. Managing musculoskeletal complaints with rehabilitation therapy: summary of the Philadelphia Panel evidence-based clinical practice guidelines on musculoskeletal rehabilitation interventions. *J Fam Pract* 2002; 51:1042.
149. Philadelphia Panel. Philadelphia Panel evidence-based clinical practice guidelines on selected rehabilitation interventions for neck pain. *Phys Ther* 2001; 81:1701.
150. Ylinen J, Takala EP, Nykänen M, et al. Active neck muscle training in the treatment of chronic neck pain in women: a randomized controlled trial. *JAMA* 2003; 289:2509.
151. Viljanen M, Malmivaara A, Uitti J, et al. Effectiveness of dynamic muscle training, relaxation training, or ordinary activity for chronic neck pain: randomised controlled trial. *BMJ* 2003; 327:475.
152. Klaber Moffett JA, Jackson DA, Richmond S, et al. Randomised trial of a brief physiotherapy intervention compared with usual physiotherapy for neck pain patients: outcomes and patients' preference. *BMJ* 2005; 330:75.

153. Michaleff ZA, Maher CG, Lin CW, et al. Comprehensive physiotherapy exercise programme or advice for chronic whiplash (PROMISE): a pragmatic randomised controlled trial. *Lancet* 2014; 384:133.
154. van der Heijden GJ, Beurskens AJ, Koes BW, et al. The efficacy of traction for back and neck pain: a systematic, blinded review of randomized clinical trial methods. *Phys Ther* 1995; 75:93.
155. Graham N, Gross A, Goldsmith CH, et al. Mechanical traction for neck pain with or without radiculopathy. *Cochrane Database Syst Rev* 2008; :CD006408.
156. Klaber Moffett JA, Hughes GI, Griffiths P. An investigation of the effects of cervical traction. Part 1: Clinical effectiveness. *Clin Rehabil* 1990; 4:205.
157. Patel KC, Gross A, Graham N, et al. Massage for mechanical neck disorders. *Cochrane Database Syst Rev* 2012; :CD004871.
158. Hoving JL, Koes BW, de Vet HC, et al. Manual therapy, physical therapy, or continued care by a general practitioner for patients with neck pain. A randomized, controlled trial. *Ann Intern Med* 2002; 136:713.
159. Korthals-de Bos IB, Hoving JL, van Tulder MW, et al. Cost effectiveness of physiotherapy, manual therapy, and general practitioner care for neck pain: economic evaluation alongside a randomised controlled trial. *BMJ* 2003; 326:911.
160. Hurwitz EL, Morgenstern H, Harber P, et al. A randomized trial of chiropractic manipulation and mobilization for patients with neck pain: clinical outcomes from the UCLA neck-pain study. *Am J Public Health* 2002; 92:1634.
161. Gross AR, Hoving JL, Haines TA, et al. A Cochrane review of manipulation and mobilization for mechanical neck disorders. *Spine (Phila Pa 1976)* 2004; 29:1541.
162. Walker MJ, Boyles RE, Young BA, et al. The effectiveness of manual physical therapy and exercise for mechanical neck pain: a randomized clinical trial. *Spine (Phila Pa 1976)* 2008; 33:2371.
163. Hurwitz EL, Aker PD, Adams AH, et al. Manipulation and mobilization of the cervical spine. A systematic review of the literature. *Spine (Phila Pa 1976)* 1996; 21:1746.
164. Thiel HW, Bolton JE, Docherty S, Portlock JC. Safety of chiropractic manipulation of the cervical spine: a prospective national survey. *Spine (Phila Pa 1976)* 2007; 32:2375.
165. Barkin RL, Barkin S. The role of venlafaxine and duloxetine in the treatment of depression with decremental changes in somatic symptoms of pain, chronic pain, and the pharmacokinetics and clinical considerations of duloxetine pharmacotherapy. *Am J Ther* 2005; 12:431.
166. Esenyel M, Caglar N, Aldemir T. Treatment of myofascial pain. *Am J Phys Med Rehabil* 2000; 79:48.
167. Alvarez DJ, Rockwell PG. Trigger points: diagnosis and management. *Am Fam Physician* 2002; 65:653.
168. Langevin P, Lowcock J, Weber J, et al. Botulinum toxin intramuscular injections for neck pain: a systematic review and metaanalysis. *J Rheumatol* 2011; 38:203.
169. Langevin P, Peloso PM, Lowcock J, et al. Botulinum toxin for subacute/chronic neck pain. *Cochrane Database Syst Rev* 2011; :CD008626.
170. Nordemar R, Thörner C. Treatment of acute cervical pain--a comparative group study. *Pain* 1981; 10:93.
171. Kroeling P, Gross A, Graham N, et al. Electrotherapy for neck pain. *Cochrane Database Syst Rev* 2013; :CD004251.
172. Chiu TT, Hui-Chan CW, Chein G. A randomized clinical trial of TENS and exercise for patients with chronic neck pain. *Clin Rehabil* 2005; 19:850.

173. Gross AR, Aker PD, Goldsmith CH, Peloso P. Physical medicine modalities for mechanical neck disorders. *Cochrane Database Syst Rev* 2000; :CD000961.
174. Foley-Nolan D, Barry C, Coughlan RJ, et al. Pulsed high frequency (27MHz) electromagnetic therapy for persistent neck pain. A double blind, placebo-controlled study of 20 patients. *Orthopedics* 1990; 13:445.
175. Manchikanti L, Singh V, Falco FJ, et al. Cervical medial branch blocks for chronic cervical facet joint pain: a randomized, double-blind, controlled trial with one-year follow-up. *Spine (Phila Pa 1976)* 2008; 33:1813.
176. Niemisto L, Kalso E, Malmivaara A, et al. Radiofrequency denervation for neck and back pain. A systematic review of randomized controlled trials. *Cochrane Database Syst Rev* 2003; :CD004058.
177. Lord SM, Barnsley L, Wallis BJ, et al. Percutaneous radio-frequency neurotomy for chronic cervical zygapophyseal-joint pain. *N Engl J Med* 1996; 335:1721.
178. Teasell RW, McClure JA, Walton D, et al. A research synthesis of therapeutic interventions for whiplash-associated disorder: part 1 - overview and summary. *Pain Res Manag* 2010; 15:287.
179. David J, Modi S, Aluko AA, et al. Chronic neck pain: a comparison of acupuncture treatment and physiotherapy. *Br J Rheumatol* 1998; 37:1118.
180. Irnich D, Behrens N, Molzen H, et al. Randomised trial of acupuncture compared with conventional massage and "sham" laser acupuncture for treatment of chronic neck pain. *BMJ* 2001; 322:1574.
181. White AR, Ernst E. A systematic review of randomized controlled trials of acupuncture for neck pain. *Rheumatology (Oxford)* 1999; 38:143.
182. Trinh K, Graham N, Irnich D, et al. Acupuncture for neck disorders. *Cochrane Database Syst Rev* 2016; :CD004870.
183. Lansinger B, Larsson E, Persson LC, Carlsson JY. Qigong and exercise therapy in patients with long-term neck pain: a prospective randomized trial. *Spine (Phila Pa 1976)* 2007; 32:2415.
184. Rendant D, Pach D, Lütke R, et al. Qigong versus exercise versus no therapy for patients with chronic neck pain: a randomized controlled trial. *Spine (Phila Pa 1976)* 2011; 36:419.
185. Guzman J. Neck pain and low-level laser: does it work and how? *Lancet* 2009; 374:1875.
186. Monticone M, Cedraschi C, Ambrosini E, et al. Cognitive-behavioural treatment for subacute and chronic neck pain. *Cochrane Database Syst Rev* Clauw DJ. Fibromyalgia: A clinical review. *JAMA* 2014; 311:1547.
187. Goldenberg DL, Burckhardt C, Crofford L. Management of fibromyalgia syndrome. *JAMA* 2004; 292:2388.
188. Fitzcharles MA, Ste-Marie PA, Goldenberg DL, et al. Canadian Pain Society and Canadian Rheumatology Association recommendations for rational care of persons with fibromyalgia: a summary report. *J Rheumatol* 2013; 40:1388.
189. Carville SF, Arendt-Nielsen L, Bliddal H, et al. EULAR evidence-based recommendations for the management of fibromyalgia syndrome. *Ann Rheum Dis* 2008; 67:536.
190. Häuser W, Thieme K, Turk DC. Guidelines on the management of fibromyalgia syndrome - a systematic review. *Eur J Pain* 2010; 14:5.
191. Macfarlane GJ, Kronisch C, Dean LE, et al. EULAR revised recommendations for the management of fibromyalgia. *Ann Rheum Dis* 2017; 76:318.



192. Busch AJ, Webber SC, Richards RS, et al. Resistance exercise training for fibromyalgia. *Cochrane Database Syst Rev* 2013; :CD010884.
193. Bidonde J, Busch AJ, Webber SC, et al. Aquatic exercise training for fibromyalgia. *Cochrane Database Syst Rev* 2014; :CD011336.
194. Häuser W, Klose P, Langhorst J, et al. Efficacy of different types of aerobic exercise in fibromyalgia syndrome: a systematic review and meta-analysis of randomised controlled trials. *Arthritis Res Ther* 2010; 12:R79.
195. Perrot S, Russell IJ. More ubiquitous effects from non-pharmacologic than from pharmacologic treatments for fibromyalgia syndrome: a meta-analysis examining six core symptoms. *Eur J Pain* 2014; 18:1067.
196. Friesen LN, Hadjistavropoulos HD, Schneider LH, et al. Examination of an Internet-Delivered Cognitive Behavioural Pain Management Course for Adults with Fibromyalgia: A Randomized Controlled Trial. *Pain* 2016.
197. Goldenberg DL, Simms RW, Geiger A, Komaroff AL. High frequency of fibromyalgia in patients with chronic fatigue seen in a primary care practice. *Arthritis Rheum* 1990; 33:381.
198. Aaron LA, Burke MM, Buchwald D. Overlapping conditions among patients with chronic fatigue syndrome, fibromyalgia, and temporomandibular disorder. *Arch Intern Med* 2000; 160:221.
199. Hughes G, Martinez C, Myon E, et al. The impact of a diagnosis of fibromyalgia on health care resource use by primary care patients in the UK: an observational study based on clinical practice. *Arthritis Rheum* 2006; 54:177.
200. Annemans L, Wessely S, Spaepen E, et al. Health economic consequences related to the diagnosis of fibromyalgia syndrome. *Arthritis Rheum* 2008; 58:895.
201. Pfeiffer A, Thompson JM, Nelson A, et al. Effects of a 1.5-day multidisciplinary outpatient treatment program for fibromyalgia: a pilot study. *Am J Phys Med Rehabil* 2003; 82:186.
202. Luciano JV, Martínez N, Peñarrubia-María MT, et al. Effectiveness of a psychoeducational treatment program implemented in general practice for fibromyalgia patients: a randomized controlled trial. *Clin J Pain* 2011; 27:383.
203. Lera S, Gelman SM, López MJ, et al. Multidisciplinary treatment of fibromyalgia: does cognitive behavior therapy increase the response to treatment? *J Psychosom Res* 2009; 67:433.
204. Rooks DS, Gautam S, Romeling M, et al. Group exercise, education, and combination self-management in women with fibromyalgia: a randomized trial. *Arch Intern Med* 2007; 167:2192.
205. Kaleth AS, Slaven JE, Ang DC. Does increasing steps per day predict improvement in physical function and pain interference in adults with fibromyalgia? *Arthritis Care Res (Hoboken)* 2014; 66:1887.
206. Busch AJ, Schachter CL, Overend TJ, et al. Exercise for fibromyalgia: a systematic review. *J Rheumatol* 2008; 35:1130.
207. Bidonde J, Busch AJ, Schachter CL, et al. Aerobic exercise training for adults with fibromyalgia. *Cochrane Database Syst Rev* 2017; 6:CD012700.
208. Bircan C, Karasel SA, Akgün B, et al. Effects of muscle strengthening versus aerobic exercise program in fibromyalgia. *Rheumatol Int* 2008; 28:527.
209. Hooten WM, Qu W, Townsend CO, Judd JW. Effects of strength vs aerobic exercise on pain severity in adults with fibromyalgia: a randomized equivalence trial. *Pain* 2012; 153:915.
210. Ericsson A, Palstam A, Larsson A, et al. Resistance exercise improves physical fatigue in women with fibromyalgia: a randomized controlled trial. *Arthritis Res Ther* 2016; 18:176.

211. Fernandes G, Jennings F, Nery Cabral MV, et al. Swimming Improves Pain and Functional Capacity of Patients With Fibromyalgia: A Randomized Controlled Trial. *Arch Phys Med Rehabil* 2016; 97:1269.
212. Brosseau L, Wells GA, Tugwell P, et al. Ottawa Panel evidence-based clinical practice guidelines for strengthening exercises in the management of fibromyalgia: part 2. *Phys Ther* 2008; 88:873.
213. Sañudo B, Galiano D, Carrasco L, et al. Effects of a prolonged exercise program on key health outcomes in women with fibromyalgia: a randomized controlled trial. *J Rehabil Med* 2011; 43:521.
214. Sañudo B, Galiano D, Carrasco L, et al. Aerobic exercise versus combined exercise therapy in women with fibromyalgia syndrome: a randomized controlled trial. *Arch Phys Med Rehabil* 2010; 91:1838.
215. Sañudo B, Carrasco L, de Hoyo M, McVeigh JG. Effects of exercise training and detraining in patients with fibromyalgia syndrome: a 3-yr longitudinal study. *Am J Phys Med Rehabil* 2012; 91:561.
216. McDowell CP, Cook DB, Herring MP. The Effects of Exercise Training on Anxiety in Fibromyalgia Patients: A Meta-analysis. *Med Sci Sports Exerc* 2017; 49:1868.
217. Andrade A, Steffens RAK, Vilarino GT, et al. Does volume of physical exercise have an effect on depression in patients with fibromyalgia? *J Affect Disord* 2017; 208:214.
218. Sanz-Baños Y, Pastor-Mira MÁ, Lledó A, et al. Do women with fibromyalgia adhere to walking for exercise programs to improve their health? Systematic review and meta-analysis. *Disabil Rehabil* 2017; :1.
219. Puiu T, Kairys AE, Pauer L, et al. Association of Alterations in Gray Matter Volume With Reduced Evoked-Pain Connectivity Following Short-Term Administration of Pregabalin in Patients With Fibromyalgia. *Arthritis Rheumatol* 2016; 68:1511.
220. Häuser W, Petzke F, Sommer C. Comparative efficacy and harms of duloxetine, milnacipran, and pregabalin in fibromyalgia syndrome. *J Pain* 2010; 11:505.
221. Häuser W, Petzke F, Üçeyler N, Sommer C. Comparative efficacy and acceptability of amitriptyline, duloxetine and milnacipran in fibromyalgia syndrome: a systematic review with meta-analysis. *Rheumatology (Oxford)* 2011; 50:532.
222. Häuser W, Bernardy K, Üçeyler N, Sommer C. Treatment of fibromyalgia syndrome with antidepressants: a meta-analysis. *JAMA* 2009; 301:198.
223. Häuser W, Wolfe F, Tölle T, et al. The role of antidepressants in the management of fibromyalgia syndrome: a systematic review and meta-analysis. *CNS Drugs* 2012; 26:297.
224. Goldenberg DL. Is there evidence for any truly effective therapy in fibromyalgia? *Pain Manag* 2016; 6:325.
225. Goldenberg DL, Felson DT, Dinerman H. A randomized, controlled trial of amitriptyline and naproxen in the treatment of patients with fibromyalgia. *Arthritis Rheum* 1986; 29:1371.
226. Carette S, McCain GA, Bell DA, Fam AG. Evaluation of amitriptyline in primary fibrositis. A double-blind, placebo-controlled study. *Arthritis Rheum* 1986; 29:655.
227. Bennett RM, Gatter RA, Campbell SM, et al. A comparison of cyclobenzaprine and placebo in the management of fibrositis. A double-blind controlled study. *Arthritis Rheum* 1988; 31:1535.
228. Carette S, Bell MJ, Reynolds WJ, et al. Comparison of amitriptyline, cyclobenzaprine, and placebo in the treatment of fibromyalgia. A randomized, double-blind clinical trial. *Arthritis Rheum* 1994; 37:32.
229. Tofferi JK, Jackson JL, O'Malley PG. Treatment of fibromyalgia with cyclobenzaprine: A meta-analysis. *Arthritis Rheum* 2004; 51:9.

230. Arnold LM, Keck PE Jr, Welge JA. Antidepressant treatment of fibromyalgia. A meta-analysis and review. *Psychosomatics* 2000; 41:104.
231. O'Malley PG, Balden E, Tomkins G, et al. Treatment of fibromyalgia with antidepressants: a meta-analysis. *J Gen Intern Med* 2000; 15:659.
232. Carette S, Oakson G, Guimont C, Steriade M. Sleep electroencephalography and the clinical response to amitriptyline in patients with fibromyalgia. *Arthritis Rheum* 1995; 38:1211.
233. Uçeyler N, Häuser W, Sommer C. A systematic review on the effectiveness of treatment with antidepressants in fibromyalgia syndrome. *Arthritis Rheum* 2008; 59:1279.
234. Clauw DJ, Mease P, Palmer RH, et al. Milnacipran for the treatment of fibromyalgia in adults: a 15-week, multicenter, randomized, double-blind, placebo-controlled, multiple-dose clinical trial. *Clin Ther* 2008; 30:1988.
235. Mease PJ, Clauw DJ, Gendreau RM, et al. The efficacy and safety of milnacipran for treatment of fibromyalgia. a randomized, double-blind, placebo-controlled trial. *J Rheumatol* 2009; 36:398.
236. Rico-Villademoros F, Slim M, Calandre EP. Amitriptyline for the treatment of fibromyalgia: a comprehensive review. *Expert Rev Neurother* 2015; 15:1123.
237. Schmidt-Wilcke T, Clauw DJ. Fibromyalgia: from pathophysiology to therapy. *Nat Rev Rheumatol* 2011; 7:518.
238. Reynolds WJ, Moldofsky H, Saskin P, Lue FA. The effects of cyclobenzaprine on sleep physiology and symptoms in patients with fibromyalgia. *J Rheumatol* 1991; 18:452.
239. Quimby LG, Gratwick GM, Whitney CD, Block SR. A randomized trial of cyclobenzaprine for the treatment of fibromyalgia. *J Rheumatol Suppl* 1989; 19:140.
240. Moldofsky H, Harris HW, Archambault WT, et al. Effects of bedtime very low dose cyclobenzaprine on symptoms and sleep physiology in patients with fibromyalgia syndrome: a double-blind randomized placebo-controlled study. *J Rheumatol* 2011; 38:2653.
241. Arnold LM, Lu Y, Crofford LJ, et al. A double-blind, multicenter trial comparing duloxetine with placebo in the treatment of fibromyalgia patients with or without major depressive disorder. *Arthritis Rheum* 2004; 50:2974.
242. Arnold LM, Rosen A, Pritchett YL, et al. A randomized, double-blind, placebo-controlled trial of duloxetine in the treatment of women with fibromyalgia with or without major depressive disorder. *Pain* 2005; 119:5.
243. Russell IJ, Mease PJ, Smith TR, et al. Efficacy and safety of duloxetine for treatment of fibromyalgia in patients with or without major depressive disorder: Results from a 6-month, randomized, double-blind, placebo-controlled, fixed-dose trial. *Pain* 2008; 136:432.
244. Vitton O, Gendreau M, Gendreau J, et al. A double-blind placebo-controlled trial of milnacipran in the treatment of fibromyalgia. *Hum Psychopharmacol* 2004; 19 Suppl 1:S27.
245. Gendreau RM, Thorn MD, Gendreau JF, et al. Efficacy of milnacipran in patients with fibromyalgia. *J Rheumatol* 2005; 32:1975.
246. Branco JC, Zachrisson O, Perrot S, et al. A European multicenter randomized double-blind placebo-controlled monotherapy clinical trial of milnacipran in treatment of fibromyalgia. *J Rheumatol* 2010; 37:851.
247. Arnold LM, Gendreau RM, Palmer RH, et al. Efficacy and safety of milnacipran 100 mg/day in patients with fibromyalgia: results of a randomized, double-blind, placebo-controlled trial. *Arthritis Rheum* 2010; 62:2745.
248. Arnold LM, Zhang S, Pangallo BA. Efficacy and safety of duloxetine 30 mg/d in patients with fibromyalgia: a randomized, double-blind, placebo-controlled study. *Clin J Pain* 2012; 28:775.

249. Lunn MP, Hughes RA, Wiffen PJ. Duloxetine for treating painful neuropathy, chronic pain or fibromyalgia. *Cochrane Database Syst Rev* 2014; :CD007115.
250. Murakami M, Osada K, Ichibayashi H, et al. An open-label, long-term, phase III extension trial of duloxetine in Japanese patients with fibromyalgia. *Mod Rheumatol* 2017; 27:688.
251. Branco JC, Cherin P, Montagne A, et al. Longterm therapeutic response to milnacipran treatment for fibromyalgia. A European 1-year extension study following a 3-month study. *J Rheumatol* 2011; 38:1403.
252. Goldenberg DL, Clauw DJ, Palmer RH, et al. Durability of therapeutic response to milnacipran treatment for fibromyalgia. Results of a randomized, double-blind, monotherapy 6-month extension study. *Pain Med* 2010; 11:180.
253. Häuser W, Urrútia G, Tort S, et al. Serotonin and noradrenaline reuptake inhibitors (SNRIs) for fibromyalgia syndrome. *Cochrane Database Syst Rev* 2013; :CD010292.
254. Arnold LM, Palmer RH, Ma Y. A 3-year, open-label, flexible-dosing study of milnacipran for the treatment of fibromyalgia. *Clin J Pain* 2013; 29:1021.
255. Sayar K, Aksu G, Ak I, Tosun M. Venlafaxine treatment of fibromyalgia. *Ann Pharmacother* 2003; 37:1561.
256. Wiffen PJ, Derry S, Moore RA, et al. Antiepileptic drugs for neuropathic pain and fibromyalgia - an overview of Cochrane reviews. *Cochrane Database Syst Rev* 2013; :CD010567.
257. Moore A, Wiffen P, Kalso E. Antiepileptic drugs for neuropathic pain and fibromyalgia. *JAMA* 2014; 312:182.
258. Häuser W, Bernardy K, Üçeyler N, Sommer C. Treatment of fibromyalgia syndrome with gabapentin and pregabalin--a meta-analysis of randomized controlled trials. *Pain* 2009; 145:69.
259. Crofford LJ, Rowbotham MC, Mease PJ, et al. Pregabalin for the treatment of fibromyalgia syndrome: results of a randomized, double-blind, placebo-controlled trial. *Arthritis Rheum* 2005; 52:1264.
260. Mease PJ, Russell IJ, Arnold LM, et al. A randomized, double-blind, placebo-controlled, phase III trial of pregabalin in the treatment of patients with fibromyalgia. *J Rheumatol* 2008; 35:502.
261. Crofford LJ, Mease PJ, Simpson SL, et al. Fibromyalgia relapse evaluation and efficacy for durability of meaningful relief (FREEDOM): a 6-month, double-blind, placebo-controlled trial with pregabalin. *Pain* 2008; 136:419.
262. Tzellos TG, Toulis KA, Goulis DG, et al. Gabapentin and pregabalin in the treatment of fibromyalgia: a systematic review and a meta-analysis. *J Clin Pharm Ther* 2010; 35:639.
263. Arnold LM, Russell IJ, Diri EW, et al. A 14-week, randomized, double-blinded, placebo-controlled monotherapy trial of pregabalin in patients with fibromyalgia. *J Pain* 2008; 9:792.
264. Üçeyler N, Sommer C, Walitt B, Häuser W. Anticonvulsants for fibromyalgia. *Cochrane Database Syst Rev* 2013; :CD010782.
265. Arnold LM, Emir B, Murphy TK, et al. Safety profile and tolerability of up to 1 year of pregabalin treatment in 3 open-label extension studies in patients with fibromyalgia. *Clin Ther* 2012; 34:1092.
266. Derry S, Cording M, Wiffen PJ, et al. Pregabalin for pain in fibromyalgia in adults. *Cochrane Database Syst Rev* 2016; 9:CD011790.
267. Arnold LM, Goldenberg DL, Stanford SB, et al. Gabapentin in the treatment of fibromyalgia: a randomized, double-blind, placebo-controlled, multicenter trial. *Arthritis Rheum* 2007; 56:1336.

268. Cooper TE, Derry S, Wiffen PJ, Moore RA. Gabapentin for fibromyalgia pain in adults. *Cochrane Database Syst Rev* 2017; 1:CD012188.
269. Derry S, Wiffen PJ, Häuser W, et al. Oral nonsteroidal anti-inflammatory drugs for fibromyalgia in adults. *Cochrane Database Syst Rev* 2017; 3:CD012332.
270. Goldenberg DL, Clauw DJ, Palmer RE, Clair AG. Opioid Use in Fibromyalgia: A Cautionary Tale. *Mayo Clin Proc* 2016; 91:640.
271. Kim SC, Landon JE, Solomon DH. Clinical characteristics and medication uses among fibromyalgia patients newly prescribed amitriptyline, duloxetine, gabapentin, or pregabalin. *Arthritis Care Res (Hoboken)* 2013; 65:1813.
272. Liu Y, Qian C, Yang M. Treatment Patterns Associated with ACR-Recommended Medications in the Management of Fibromyalgia in the United States. *J Manag Care Spec Pharm* 2016; 22:263.
273. Ben-Ami Shor D, Weitzman D, Dahan S, et al. Adherence and Persistence with Drug Therapy among Fibromyalgia Patients: Data from a Large Health Maintenance Organization. *J Rheumatol* 2017; 44:1499.
274. Wolfe F, Anderson J, Harkness D, et al. Health status and disease severity in fibromyalgia: results of a six-center longitudinal study. *Arthritis Rheum* 1997; 40:1571.
275. Walitt B, Fitzcharles MA, Hassett AL, et al. The longitudinal outcome of fibromyalgia: a study of 1555 patients. *J Rheumatol* 2011; 38:2238.
276. Fitzcharles MA, Da Costa D, Pöyhiä R. A study of standard care in fibromyalgia syndrome: a favorable outcome. *J Rheumatol* 2003; 30:154.
277. White KP, Speechley M, Harth M, Ostbye T. Comparing self-reported function and work disability in 100 community cases of fibromyalgia syndrome versus controls in London, Ontario: the London Fibromyalgia Epidemiology Study. *Arthritis Rheum* 1999; 42:76.
278. Walitt B, Nahin RL, Katz RS, et al. The Prevalence and Characteristics of Fibromyalgia in the 2012 National Health Interview Survey. *PLoS One* 2015; 10:e0138024.
279. Guymer EK, Littlejohn GO, Brand CK, Kwiatek RA. Fibromyalgia onset has a high impact on work ability in Australians. *Intern Med J* 2016; 46:1069.
280. Fitzcharles MA, Ste-Marie PA, Rampakakis E, et al. Disability in Fibromyalgia Associates with Symptom Severity and Occupation Characteristics. *J Rheumatol* 2016; 43:931.
281. Castro-Sánchez AM, Matarán-Peñarrocha GA, López-Rodríguez MM, et al. Gender differences in pain severity, disability, depression, and widespread pressure pain sensitivity in patients with fibromyalgia syndrome without comorbid conditions. *Pain Med* 2012; 13:1639.
282. Reisine S, Fifield J, Walsh S, Forrest DD. Employment and health status changes among women with fibromyalgia: a five-year study. *Arthritis Rheum* 2008; 59:1735.
283. Kim CH, Luedtke CA, Vincent A, et al. Association of body mass index with symptom severity and quality of life in patients with fibromyalgia. *Arthritis Care Res (Hoboken)* 2012; 64:222.
284. Mundal I, Gråwe RW, Bjørngaard JH, et al. Psychosocial factors and risk of chronic widespread pain: an 11-year follow-up study--the HUNT study. *Pain* 2014; 155:1555.
285. Toussaint LL, Vincent A, McAllister SJ, et al. A Comparison of Fibromyalgia Symptoms in Patients with Healthy versus Depressive, Low and Reactive Affect Balance Styles. *Scand J Pain* 2014; 5:161.
286. Edwards RR, Bingham CO 3rd, Bathon J, Haythornthwaite JA. Catastrophizing and pain in arthritis, fibromyalgia, and other rheumatic diseases. *Arthritis Rheum* 2006; 55:325.

287. Romeyke T, Noehammer E, Scheuer HC, Stummer H. Severe forms of fibromyalgia with acute exacerbation of pain: costs, comorbidities, and length of stay in inpatient care. *Clinicoecon Outcomes Res* 2017; 9:317.
288. Dreyer L, Kendall S, Danneskiold-Samsøe B, et al. Mortality in a cohort of Danish patients with fibromyalgia: increased frequency of suicide. *Arthritis Rheum* 2010; 62:3101.
289. Ratcliffe GE, Enns MW, Belik SL, Sareen J. Chronic pain conditions and suicidal ideation and suicide attempts: an epidemiologic perspective. *Clin J Pain* 2008; 24:204.
290. Gilbert JW, Wheeler GR, Storey BB, et al. Suicidality in chronic noncancer pain patients. *Int J Neurosci* 2009; 119:1968.
291. Lan CC, Tseng CH, Chen JH, et al. Increased risk of a suicide event in patients with primary fibromyalgia and in fibromyalgia patients with concomitant comorbidities: A nationwide population-based cohort study. *Medicine (Baltimore)* 2016; 95:e5187.
292. Acosta-Manzano P, Segura-Jiménez V, Estévez-López F, et al. Do women with fibromyalgia present higher cardiovascular disease risk profile than healthy women? The al-Ándalus project. *Clin Exp Rheumatol* 2017; 35 Suppl 105:61.
293. Arnold LM, Clauw DJ. Challenges of implementing fibromyalgia treatment guidelines in current clinical practice. *Postgrad Med* 2017; 129:709.
294. Anderson BC. *Office Orthopedics for Primary Care: Diagnosis and Treatment*, 2nd ed, WB Saunders, Philadelphia 1999.
295. Christmas C, Crespo CJ, Franckowiak SC, et al. How common is hip pain among older adults? Results from the Third National Health and Nutrition Examination Survey. *J Fam Pract* 2002; 51:345.
296. Steinberg GG, Seybold EA. Hip and pelvis. In: *Orthopaedics in Primary Care*, 3rd, Steinberg GG, Akins CM, Baran DT (Eds), Lippincott Williams and Wilkins, Baltimore 1999.
297. Swezey RL, Spiegel TM. Evaluation and treatment of local musculoskeletal disorders in elderly patients. *Geriatrics* 1979; 34:56.
298. Altman R, Alarcón G, Appelrouth D, et al. The American College of Rheumatology criteria for the classification and reporting of osteoarthritis of the hip. *Arthritis Rheum* 1991; 34:505.
299. Mont MA, Hungerford DS. Non-traumatic avascular necrosis of the femoral head. *J Bone Joint Surg Am* 1995; 77:459.
300. Zizic TM, Marcoux C, Hungerford DS, Stevens MB. The early diagnosis of ischemic necrosis of bone. *Arthritis Rheum* 1986; 29:1177.
301. LaPorte DM, Mont MA, Mohan V, et al. Multifocal osteonecrosis. *J Rheumatol* 1998; 25:1968.
302. Moder KG, Hunder GG. Examination. In: *Textbook of Rheumatology*, 5th, Kelly WN, Harris ED, Ruddy S, et al (Eds), WB Saunders, Philadelphia 1997. p.364.
303. Deyo RA, Rainville J, Kent DL. What can the history and physical examination tell us about low back pain? *JAMA* 1992; 268:760.
304. Cardinal E, Chhem RK, Beauregard CG. Ultrasound-guided interventional procedures in the musculoskeletal system. *Radiol Clin North Am* 1998; 36:597.
305. 1.Jinks C, Jordan K, Croft P. Measuring the population impact of knee pain and disability with the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC). *Pain* 2002; 100:55.
306. 2.Nguyen US, Zhang Y, Zhu Y, et al. Increasing prevalence of knee pain and symptomatic knee osteoarthritis: survey and cohort data. *Ann Intern Med* 2011; 155:725.
307. 3.Razek AA, Fouda NS, Elmetwaley N, Elbogdady E. Sonography of the knee joint(). *J Ultrasound* 2009; 12:53.

308. 4.National Clinical Guideline Center. Osteoarthritis: care and management in adults. National Institute for Health and Clinical Excellence: Guidance, London 2014. <http://www.ncbi.nlm.nih.gov/pubmed/25340227> (Accessed on September 24, 2016).
309. 5.Zhang W, Doherty M, Peat G, et al. EULAR evidence-based recommendations for the diagnosis of knee osteoarthritis. *Ann Rheum Dis* 2010; 69:483.
310. 6.Subhawong TK, Eng J, Carrino JA, Chhabra A. Superolateral Hoffa's fat pad edema: association with patellofemoral maltracking and impingement. *AJR Am J Roentgenol* 2010; 195:1367.
311. 7.Dragoo JL, Johnson C, McConnell J. Evaluation and treatment of disorders of the infrapatellar fat pad. *Sports Med* 2012; 42:51.
312. 8.Schindler OS. 'The Sneaky Plica' revisited: morphology, pathophysiology and treatment of synovial plicae of the knee. *Knee Surg Sports Traumatol Arthrosc* 2014; 22:247.
313. 9.Pihlajamäki HK, Kuikka PI, Leppänen VV, et al. Reliability of clinical findings and magnetic resonance imaging for the diagnosis of chondromalacia patellae. *J Bone Joint Surg Am* 2010; 92:927.
314. 10.Behrens SB, Deren ME, Matson A, et al. Stress fractures of the pelvis and legs in athletes: a review. *Sports Health* 2013; 5:165.
315. 11.Morganti CM, McFarland EG, Cosgarea AJ. Saphenous neuritis: a poorly understood cause of medial knee pain. *J Am Acad Orthop Surg* 2002; 10:130.
316. 12.Rajasekaran S, Finnoff JT. Exertional Leg Pain. *Phys Med Rehabil Clin N Am* 2016; 27:91.
317. 13.Georgoulis AD, Papageorgiou CD, Moebius UG, et al. The diagnostic dilemma created by osteoid osteoma that presents as knee pain. *Arthroscopy* 2002; 18:32.
318. 14.Chan KL, Mok CC. Glucocorticoid-induced avascular bone necrosis: diagnosis and management. *Open Orthop J* 2012; 6:449.
319. 15.Pujalte GG, Acosta L. Bilateral knee and intermittent elbow pain in a competitive archer/hunter: phosphodiesterase-5-inhibitor-statin interaction? *Clin J Sport Med* 2014; 24:e52.
320. 16.Gough AW, Kasali OB, Sigler RE, Baragi V. Quinolone arthropathy--acute toxicity to immature articular cartilage. *Toxicol Pathol* 1992; 20:436.
321. 17.Luthi F, Eggel Y, Theumann N. Premature epiphyseal closure in an adolescent treated by retinoids for acne: an unusual cause of anterior knee pain. *Joint Bone Spine* 2012; 79:314.
322. 18.Vasudev M, Zacharisen MC. New-onset rheumatoid arthritis after anthrax vaccination. *Ann Allergy Asthma Immunol* 2006; 97:110.
323. 19.Sahin N, Salli A, Enginar AU, Ugurlu H. Reactive arthritis following tetanus vaccination: a case report. *Mod Rheumatol* 2009; 19:209.
324. 1.Anderson BC. *Office Orthopedics for Primary Care: Diagnosis*, 3rd, WB Saunders, Philadelphia 2005.
325. 2.Clark JM, Harryman DT 2nd. Tendons, ligaments, and capsule of the rotator cuff. *Gross and microscopic anatomy. J Bone Joint Surg Am* 1992; 74:713.
326. 3.Reinold MM, Escamilla RF, Wilk KE. Current concepts in the scientific and clinical rationale behind exercises for glenohumeral and scapulothoracic musculature. *J Orthop Sports Phys Ther* 2009; 39:105.
327. 4.Harryman DT 2nd, Sidles JA, Clark JM, et al. Translation of the humeral head on the glenoid with passive glenohumeral motion. *J Bone Joint Surg Am* 1990; 72:1334.

328. 5.Lippitt SB, Vanderhooft JE, Harris SL, et al. Glenohumeral stability from concavity-compression: A quantitative analysis. *J Shoulder Elbow Surg* 1993; 2:27.
329. 6.Gosk J, Urban M, Rutowski R. Entrapment of the suprascapular nerve: anatomy, etiology, diagnosis, treatment. *Ortop Traumatol Rehabil* 2007; 9:68.
330. 7.Martin SD, Warren RF, Martin TL, et al. Suprascapular neuropathy. Results of non-operative treatment. *J Bone Joint Surg Am* 1997; 79:1159.
331. 8.Gleason PD, Beall DP, Sanders TG, et al. The transverse humeral ligament: a separate anatomical structure or a continuation of the osseous attachment of the rotator cuff? *Am J Sports Med* 2006; 34:72.
332. 9.Miranda H, Viikari-Juntura E, Heistaro S, et al. A population study on differences in the determinants of a specific shoulder disorder versus nonspecific shoulder pain without clinical findings. *Am J Epidemiol* 2005; 161:847.
333. 10.Johnson TR. The shoulder. In: *Essentials of Musculoskeletal Care*, Snider RK (Ed), American Academy of Orthopaedic Surgeons, Rosemont 1997.
334. 11.Worland RL, Lee D, Orozco CG, et al. Correlation of age, acromial morphology, and rotator cuff tear pathology diagnosed by ultrasound in asymptomatic patients. *J South Orthop Assoc* 2003; 12:23.
335. 12.Tempelhof S, Rupp S, Seil R. Age-related prevalence of rotator cuff tears in asymptomatic shoulders. *J Shoulder Elbow Surg* 1999; 8:296.
336. 13.Chakravarty K, Webley M. Shoulder joint movement and its relationship to disability in the elderly. *J Rheumatol* 1993; 20:1359.
337. 14.Neer CS 2nd. Impingement lesions. *Clin Orthop Relat Res* 1983; :70.
338. 15.Lequesne M, Dang N, Bensasson M, Mery C. Increased association of diabetes mellitus with capsulitis of the shoulder and shoulder-hand syndrome. *Scand J Rheumatol* 1977; 6:53.
339. 16.Morén-Hybbinette I, Moritz U, Scherstén B. The clinical picture of the painful diabetic shoulder--natural history, social consequences and analysis of concomitant hand syndrome. *Acta Med Scand* 1987; 221:73.
340. 17.Arkkila PE, Kantola IM, Viikari JS, Rönnemaa T. Shoulder capsulitis in type I and II diabetic patients: association with diabetic complications and related diseases. *Ann Rheum Dis* 1996; 55:907.
341. 18.Fraenkel L, Lavalley M, Felson D. The use of radiographs to evaluate shoulder pain in the ED. *Am J Emerg Med* 1998; 16:560.
342. 19.Fraenkel L, Shearer P, Mitchell P, et al. Improving the selective use of plain radiographs in the initial evaluation of shoulder pain. *J Rheumatol* 2000; 27:200.
343. 20.Torstensen ET, Hollinshead RM. Comparison of magnetic resonance imaging and arthroscopy in the evaluation of shoulder pathology. *J Shoulder Elbow Surg* 1999; 8:42.
344. 21.Burk DL Jr, Karasick D, Kurtz AB, et al. Rotator cuff tears: prospective comparison of MR imaging with arthrography, sonography, and surgery. *AJR Am J Roentgenol* 1989; 153:87.
345. 22.Yeu K, Jiang CC, Shih TT. Correlation between MRI and operative findings of the rotator cuff tear. *J Formos Med Assoc* 1994; 93:134.
346. 23.Sher JS, Uribe JW, Posada A, et al. Abnormal findings on magnetic resonance images of asymptomatic shoulders. *J Bone Joint Surg Am* 1995; 77:10.
347. 24.Iannotti JP, Zlatkin MB, Esterhai JL, et al. Magnetic resonance imaging of the shoulder. Sensitivity, specificity, and predictive value. *J Bone Joint Surg Am* 1991; 73:17.
348. 25.Stevenson JH, Trojian T. Evaluation of shoulder pain. *J Fam Pract* 2002; 51:605.
349. 26.Teefey SA, Rubin DA, Middleton WD, et al. Detection and quantification of rotator cuff tears. Comparison of ultrasonographic, magnetic resonance imaging, and arthroscopic findings in seventy-one consecutive cases. *J Bone Joint Surg Am* 2004; 86-A:708.



350. 27. Iannotti JP, Ciccone J, Buss DD, et al. Accuracy of office-based ultrasonography of the shoulder for the diagnosis of rotator cuff tears. *J Bone Joint Surg Am* 2005; 87:1305.
351. 28. Moosmayer S, Smith HJ. Diagnostic ultrasound of the shoulder--a method for experts only? Results from an orthopedic surgeon with relative inexpensive compared to operative findings. *Acta Orthop* 2005; 76:503.
352. 29. Teefey SA, Middleton WD, Payne WT, Yamaguchi K. Detection and measurement of rotator cuff tears with sonography: analysis of diagnostic errors. *AJR Am J Roentgenol* 2005; 184:1768.
353. 30. Schibany N, Zehetgruber H, Kainberger F, et al. Rotator cuff tears in asymptomatic individuals: a clinical and ultrasonographic screening study. *Eur J Radiol* 2004; 51:263.
354. 31. Sugimoto K. Ultrasonographic evaluation of the Bankart lesion. *J Shoulder Elbow Surg* 2004; 13:286.
355. 32. Martinoli C, Bianchi S, Prato N, et al. US of the shoulder: non-rotator cuff disorders. *Radiographics* 2003; 23:381.
356. 33. Middleton WD, Payne WT, Teefey SA, et al. Sonography and MRI of the shoulder: comparison of patient satisfaction. *AJR Am J Roentgenol* 2004; 183:1449.
357. 34. Blanchard TK, Bearcroft PW, Constant CR, et al. Diagnostic and therapeutic impact of MRI and arthrography in the investigation of full-thickness rotator cuff tears. *Eur Radiol* 1999; 9:638.