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Evidence Summary: Lower Extremity Injury Medical Treatment Guidelines

This table contains summaries of the critiques that were completed for individual scholarly articles used in the Lower Extremity Medical Treatment Guidelines. Scholarly articles were given an assessment of *"adequate," "inadequate,"* or *"high quality."* When Division of Workers' Compensation staff completed additional statistical pooling, this is noted in the "Division Staff Assessment Column" using RevMan (Cochrane Collaboration of Systematic Reviews). These are denoted with a **. In multiple cases, literature from the Cochrane Collaboration was reviewed.

It should be noted that one scholarly article may be graded at different levels for different interventions. For those deemed inadequate, a brief rationale is provided. The criteria for the aforementioned assessment designations are located on the Division of Workers' Compensation Website: www.colorado.gov/pacific/cdle/guidelines-methodology-article-critiques. Or alternatively, www.colorado.gov/cdle/dwc (then go to "Treatment Guidelines").

The articles that are graded as either adequate or high quality are then translated into **"some evidence," "good evidence," and "strong evidence"** as defined in the General Guidelines Principles, located in each of the Division Medical Treatment Guidelines.

- "Some" means the recommendation considered at least one adequate scientific study, which reported that a treatment was effective. The Division recognizes that further research is likely to have an impact on the intervention's effect.
- "Good" means the recommendation considered the availability of multiple adequate scientific studies or at least one relevant high-quality scientific study, which reported that a treatment was effective. The Division recognizes that further research may have an impact on the intervention's effect.
- "Strong" means the recommendation considered the availability of multiple relevant and high-quality scientific studies, which arrived at similar conclusions about the effectiveness of a treatment. The Division recognizes that further research is unlikely to have an important impact on the intervention's effect.

Because we synthesize the medical evidence as much as possible, one assessment (or group of assessments) may potentially create more than one evidence statement. It is also possible that two assessments may be combined (eg. two "adequates" to create a higher level of evidence, (for example, elevating a statement from "some" to "good" evidence). It should also be noted that some scholarly literature that focuses on the cervical spine may also be clinically applicable to care of the injured worker with disorders of the lumbar spine.

This evidence table is a *summary* and based on critiques of scholarly articles. The full critiques are publicly available on the Division of Workers' Compensation Website. www.colorado.gov/cdle/dwc. These critiques outline the available evidence in the areas of Diagnostic Procedures; Non-operative Procedures; Operative procedures, and exposure/occupational relationship.

The Medical Treatment Guideline for Lower Extremity Injury has a bibliography comprised of 691 articles, of those 184 were used in evidence statements, many were used in various levels (Some, Good, Strong) of evidence. The departments summary of the articles used in evidence statements is provided in the following table.

First Author, Year	Intervention/ Research Question	Design	**Population/Sample**	Main Outcome Measures	Author (s)Conclusion	Division Assessment
Abane L, Antract P, et al., 2015	**A comparison of patient-specific and conventional instrumentation for total knee arthroplasty**	Randomized clinical trial	**N=** 140 patients (88 women, 52 men, mean age 69) undergoing TKA in an orthopedic surgery department in Paris	UCLA; SST; ASES	Not influenced by the nature of the instrumentation used during surgery. The study was short-term and the results do not necessarily imply long-term equivalence Operating time, blood loss, and clinical knee function at three months were also not influenced by the instrumentation used for TKA	High quality RCT providing good evidence
Related Evidence Statements: High quality RCT providing good evidence that in the setting of total knee arthroplasty, the mechanical alignment three months after surgery are not influenced by whether the instrumentation used for the operation was patient-specific or was conventional instrumentation						
Abou-Raia S, Abou-Raia A, Helmi M.,	**Duloxetine for the management of pain in older adults with**	Randomized clinical trial	**N=**288 patients (241 women, 47 men, mean age 68) treated for knee OA at	Primary outcome was pain response; Secondary measures	Older adults with knee OA treated for 16 weeks have	Adequate

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2012	**knee osteoarthritis**		the University of Alexandria, Egypt	WOMAC function and knee stiffness scales Patients were also asked about ADL's	greater pain reduction with duloxetine than with placebo The duloxetine group also appeared to decrease its use of NSAID and acetaminophen compared to the placebo group WOMAC functional scores also improved more with duloxetine than with placebo	
Related Evidence Statement: Adequate for evidence that duloxetine more effectively decreases knee OA pain in older adults than placebo, but there is a side effect profile of constipation and other symptoms that should be considered if the drug is given to older adults						
Adie S, Harris IA, et al., 2011	Pulsed electromagnetic field stimulation for acute tibial shaft fractures	Randomized clinical trial	218 patients (179 men, 39 women, mean age 39) treated for acute tibial fractures at six university-affiliated teaching hospital trauma centers in New South Wales	The primary outcome was the rate of secondary surgery (intramedullary nail dynamization, revision fixation, and/or bone grafting) within the first 12 months after the fracture	PEMF, used as an adjunct to standard care for acute tibial fractures, does not decrease the rate of secondary surgical procedures in the first twelve months after the fracture	High quality study
Related Evidence Statement: high quality study which supports good evidence that in the setting of acute tibial shaft fractures, pulsed electromagnetic field devices provide no benefits in terms of reducing the rate of secondary surgical procedures in the first twelve months following the acute fracture						
Aggarwal AK,	Platelet-rich plasma	Prospective	40 patients (mean age 57,	The primary	PRP administered	Adequate

First Author, Year	Intervention/ Research Question	Design	**Population/Sample**	Main Outcome Measures	Author (s)Conclusion	Division Assessment
Shashikanth VS, Marwaha N., 2014	prevents blood loss and pain and enhances early functional outcome after total knee arthroplasty	randomized controlled study	gender not reported) undergoing either unilateral or bilateral TKA at a postgraduate orthopedic surgery department in India	outcomes were related to blood loss: postoperative hemoglobin and need for transfusion. Blood loss was less in the PRP group for both unilateral and bilateral TKA	during TKA reduces blood loss, postoperative pain, and the need for narcotics compared to no PRP, and leads to earlier regaining of function Local application of PRP can be recommended during TKA to reduce blood loss and pain	
Related Evidence Statement: Adequate for evidence that in the setting of TKA, intraoperative use of PRP can reduce blood loss, improve levels of postoperative hemoglobin, and reduce the need for blood transfusions by the third postoperative day, and this may improve pain control and promote earlier return to function						
Ajuied A, Wong F, et al., 2013	Anterior Cruciate Ligament Injury and Radiologic Progression of Knee Osteoarthritis.	systematic review and meta-analysis of observational and controlled clinical trials	Patient population: any patients with ACL injury 9 studies with a total of 615 patients with mean ages from 22 to 41 fulfilled the inclusion criteria	For the comparison of an injured knee with an uninjured knee, data from 6 studies with 972 knees were combined to yield an estimate that radiographic OA of any K-L grade was 3.89 times as frequent in the ACL-injured knee than in the	10 years after an ACL injury, the risk of radiographic OA increases approximately fourfold compared to the opposite uninjured knee, both for minimal OA and for moderate-severe OA	Adequate

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				contralateral knee, with a 95% confidence interval (CI) for that relative risk (RR) from 2.72 to 5.57		
Related Evidence Statement: An adequate meta-analysis of observational studies which support strong evidence that an ACL injury increased the ten-year risk of developing Kellgren-Lawrence defined osteoarthritic changes compared to the uninjured knee, and that this risk is approximately fourfold both for minimal OA and for moderate to severe OA						
Al-Abbad H, Simon JV, 2013	The effectiveness of extracorporeal shock wave therapy on chronic Achilles tendinopathy	Systematic review of clinical trials	Systematic review of clinical trials	Of the two studies which were appropriately blinded, only one (Costa 2005), did not find statistically significant differences between ESWT (n=22) and sham ESWT (n=27) using several pain measures on a 100 point scale	The search strategy and assessment of methodological quality are satisfactory, but the authors found only two studies which had blinding of participants. In the setting of an intervention like ESWT, there is a high risk of bias in any study which does not blind participants by using a sham intervention, and the risk is that the effect of ESWT will be inflated when groups are compared	Adequate

First Author, Year	Intervention/ Research Question	Design	**Population/Sample**	Main Outcome Measures	Author (s)Conclusion	Division Assessment
Related Evidence Statement: an adequate systematic review which does not provide evidence to support the conclusion that ESWT is superior to sham ESWT, but a clinically important effect has not been ruled out, and future research may change the unbiased estimate of the effect of ESWT.						
Allen CL, Hooper GJ, et al., 2014	Does computer-assisted total knee arthroplasty improve the overall component position and patient function	nonrandomized controlled clinical trial	37 patients (mean age 67, sex not specified) undergoing bilateral TKA at an orthopedic hospital in Christchurch, New Zealand	The main patient-reported outcome was the High Activity Arthroplasty Score (HAAS), which was developed to assess how well an arthroplasty patient does high-demand activities (Talbot 2010) on four dimensions	Computer navigation did not improve alignment of the operated knee More patients had a better subjective outcome with the conventionally navigated knee than with the computer navigated knee	Adequate
Related Evidence Statement: Adequate for some evidence that in patients having bilateral total knee replacements, there are no radiographic alignment differences postoperatively and no functional differences at five years between the knee which was operated on with computer navigation and the knee which was operated on without computer navigation						
Apold H, Meyer HE, et al., 2014	To estimate the association between possible risk factors for osteoarthritis (OA) of the knee and the development of clinical OA leading to knee replacements (KR)	314,495 Norwegian citizens (153,795 men, 161,700 women) who were included in a National Health Screening between 1985 and 1994	During 12 years of followup, 1323 individuals had KR in the Arthroplasty Register; there were 225 unicondylar and 1098 total knee replacements	The risk of KR increased with higher age at screening; for each 5 years of age, the relative risk was 1.5 Women had a relative risk of 2.7 compared to men for having KR Men in the highest BMI quartile had 6.16 times the risk of the leanest quartile when all other factors were	Both BMI and physical activity at work have been previously linked to symptomatic knee OA, and these risk factors were confirmed in this population-based study	High quality

First Author, Year	Intervention/ Research Question	Design	**Population/Sample**	Main Outcome Measures	Author (s)Conclusion	Division Assessment
				accounted for		
Related Evidence Statement: High quality large cohort study supporting good evidence that obesity in men increases the risk of symptomatic knee OA at least six fold, and that it increases the risk in women at least eleven fold. There is good evidence that intensive physical work more than doubles the risk of symptomatic knee OA, and that there is a dose-response relationship between work load and the development of knee OA						
Aro HT, Govender S, et al., 2011	In patients being treated for open tibial fractures with reamed nail fixation, does the addition of rh-BMP2 lead to better outcomes?	Randomized clinical trial	277 patients (224 men, 53 women, mean age 38.5) treated for tibial fractures in Finland, South Africa, France, the UK, the US, Spain, and Romania	At week 13, 60% of the BMP group fractures were healed as compared to 48% of the SOC group, but this was not quite statistically significant (p=0.0541) At 20 weeks, there was no group difference on fracture healing The numbers of secondary procedures after 16 weeks was the same	BMP in an absorbable collagen sponge did not significantly accelerate the healing of open tibial fractures treated with reamed intramedullary nail fixation	Adequate
Related Evidence Statement: Adequate for some evidence that in the setting of open tibial fractures treated with reamed intramedullary nailing, the use of rh-BMP at the time of fracture fixation does not measurably improve fracture healing, and may increase risks of infection.						
Baldassin V, Gomes CR, Beraldo PS., 2009	To compare the effectiveness of prefabricated and customized foot orthoses in patients with plantar fasciitis	randomized controlled trial	142 patients (107 women, 35 men, mean age 47) treated for uncomplicated plantar fasciitis at a rehabilitation hospital in Brazil	Primary outcome was pain measured by a subscale of the Foot Function Index (FFI) at baseline, at 4 weeks, and again at 8 weeks	Prefabricated orthoses are as effective as custom orthoses for uncomplicated plantar fasciitis, and should be selected in	High Quality Study

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					that setting, especially when they are made of EVA	
Related Evidence Statement: High quality study with good evidence that foot orthoses made from ethylene vinyl acetate are equally effective for uncomplicated plantar fasciitis whether they are prefabricated or custom made						
Ball EM, McKeeman HM, et al., 2013	Does an injection of prednisolone acetate into the plantar fascia alleviate the pain of plantar fasciitis, and does ultrasound guidance of the injection affect the pain relief response?	Randomized clinical trial	65 patients (29 men, 36 women, mean age 49) treated for plantar fasciitis at a hospital rheumatology department in Belfast	The primary outcome was the VAS pain score 12 weeks after the injection	Both ultrasound guided and unguided steroid injections show a sustained benefit at 6 and 12 weeks compared to a placebo injection	High Quality
Related Evidence Statement: High quality study for evidence that an injection of 20 mg of methylprednisolone acetate, with or without ultrasound guidance, may be more effective than a placebo injection in reducing heel pain up to 12 weeks in patients with plantar fasciitis, but functional outcomes are uncertain						
Bannuru RR, Schmid CH, et al. , 2015	What are the efficacies of pharmacologic treatments of knee osteoarthritis (OA) compared to one another?	Network meta-analysis of randomized clinical trials	4122 literature citations were found; 497 full-text reports were retrieved, and 137 studies, with 33,243 participants, were judged to have met inclusion criteria for a network meta-analysis	Databases included MEDLINE, EMBASE, the Cochrane Central Register of Controlled Trials, Google Scholar, and Web of Science from inception through August 15, 2014	For pain outcomes, all NDAIDS and IA treatments, except for celecoxib, were superior to acetaminophen IA placebo was superior to oral placebo for pain outcomes, and IA treatments were more effective than oral	Inadequate

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					treatments	
Related Evidence Statement: Inadequate for the main comparisons, including for the effectiveness of IA hyaluronic acid (lack of adjustment for studies with high risk of bias); the effect sizes are probably inflated for many comparisons, but adequate for good evidence that acetaminophen is not more effective than placebo for the treatment of knee osteoarthritis.						
Barfod KW, Bencke J, et al., 2014	To compare the outcomes of nonoperatively treated Achilles tendon rupture when patients are allowed to bear weight from day one to outcomes when patients are not allowed to bear weight for six weeks after injury	Randomized clinical trial	57 patients (48 men, 9 women, mean age 40) treated for Achilles tendon rupture at a university hospital in Denmark	Primary outcome was the Achilles tendon Total Rupture Score (ATRS) at 6 months of followup and again at 12 months of followup	It is reasonable to recommend immediate return to weight-bearing during nonoperative dynamic treatment for acute Achilles tendon rupture, since this does not have a detrimental effect on outcome and may improve the patient's self-care ability	Adequate
Related Evidence Statement: Adequate for some evidence that in the setting of acute Achilles tendon rupture which is treated nonoperatively with an orthotic which provides for equinus positioning of the joint, a rehabilitation strategy which allows weight-bearing on the first day leads to outcomes equally favorable to those of delaying weight-bearing for six weeks after injury, provided that crutches are made available to the patient during the early phase of healing						
Blagojevic M, Jinks C, et al., 2010	To assess current evidence on risk factors for the incidence of knee pain and OA in the elderly	Systematic review and meta-analysis of observational studies	2233 studies were identified using the search strategy in all databases, and 85 studies were included in the review	Databases included MEDLINE, EMBASE, CINAHL, the Cochrane Library, the National Electronic Library for Health, and other databases through	Knee OA is more common in people with obesity and overweight than in people of normal weight with BMI less than 25 A history of knee	Adequate meta-analysis with strong evidence

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				January 2008	injury is associated with an increased risk of knee OA	
Related Evidence Statement: Adequate meta-analysis with strong evidence of increased BMI as a significant risk factor for the occurrence of onset of knee OA, and for previous knee injury as a significant risk factor for OA, and for hand OA as a significant marker of risk for knee OA						
Brantingham JW, Parkin-Smith G, et al., 2012	In patients with osteoarthritis (OA) of the hip who are receiving manual and manipulative therapy (MMT) plus exercise, does the addition of full kinetic chain manipulation improve clinical outcomes compared with MMT which is targeted at the affected hip joint?	Randomized clinical trial	108 patients (49 men, 59 women, mean age 63) treated for hip OA at 2 chiropractic teaching clinics in Australia	Main outcome was change on the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) Secondary outcomes were the Harris Hip Score (HHS) and an Overall Therapy Effectiveness (OTE) tool	This is the first randomized trial comparing targeted MMT with full kinetic chain MMT for hip OA with a 3 month followup Targeted and full kinetic chain MMT with similar exercise programs appear to provide equivalent benefits after 3 months for hip OA	Adequate for some evidence
Related Evidence Statement: Adequate for some evidence that in the setting of symptomatic hip OA of Kellgren-Lawrence grades 0 to 3, nine 30 minute sessions of MMT targeted at the hip are as beneficial as nine 30 minute sessions of MMT with additional manipulations of joints in the kinetic chain, such as the lumbar, knee, ankle, and foot joints, when both programs are accompanied by gradually increasing exercise instructions						
Burnett SJ, Barrack RL., 2013	When total knee arthroplasty is done, does computer-assisted navigation improve outcomes?	Systematic review of randomized trials	MEDLINE was the only online database, and was searched for English publications "within the past 10 years"	Meta-analysis was not done, because most recent meta-analyses have pooled data on coronal alignment, and results are presented descriptively	Computer navigation of TKA improves coronal alignment and reduces the frequency of radiographic outliers Despite this fact, improvements in	Adequate

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					functional outcomes, revision rates, or implant survival have not been shown	
Related Evidence Statement: Adequate for an evidence statement that navigated TKA improves coronal alignment compared to conventional TKA, increasing the likelihood that the implant will have alignment within 3° of neutral, but that there is no evidence that this alignment leads to improved knee function or implant durability compared to conventional TKA in patients who do not have considerations of extra-articular deformity, retained implants, or other factors precluding conventional alignment guides						
Busse JW, Kaur J, et al., 2009	Does low-intensity ultrasonography reduce the time to fracture healing?	Meta-analysis of randomized clinical trials	564 potentially eligible articles were screened, 18 were retrieved in full text, and 15 trials met inclusion criteria; two trials reported on a shared group of patients, leaving 13 unique trials for analysis	Most studies reported only surrogate end points and were downgraded for indirectness; five studies did report outcomes of importance to patients	There is moderate to very low quality evidence for LIPUS in accelerating functional recovery among patients with fractures However, the two studies with the highest quality evidence showed no difference in functional outcome	High quality systematic review
Related Evidence Statement: A high quality systematic review and meta-analysis which supports a statement that there is a lack of evidence that LIPUS has clinical efficacy in returning fracture patients to normal activities, and that the estimates of effectiveness in accelerating radiographic fracture healing are likely to be biased and inaccurate						
Cepeda MS, Camargo F, Zea C, Valencia L., 2006	To compare effectiveness of tramadol with both placebo and active control interventions	Meta-analysis of randomized clinical trials	11 RCTs were selected, with a total of 1019 patients receiving either tramadol or tramadol/acetaminophen	Outcomes: Pain intensity and relief self-report, global assessment of function, Physical	There is gold level evidence that tramadol is more effective than placebo in reducing pain	Adequate meta-analysis

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**	for the control of pain and improvement of function in patients with osteoarthritis (OA).		combination and 920 patients who received either placebo or another active comparison intervention	function, performance based measures of function, physical function scale Safety of tramadol (adverse effects), Joint imaging	intensity and improving function in the setting of hip OA, but these benefits are small	
Related Evidence Statement: Adequate meta-analysis which supports good evidence that in the setting of hip OA, the analgesic effects of tramadol compared to placebo are likely to be small enough to be clinically unimportant, and that the effects on hip function are similar. Adverse events can be expected to lead to stopping treatment unless careful dose titration is done, but there may be fewer life-threatening adverse events with tramadol than with commonly used NSAIDS						
Chan EY, Fransen M, et al., 2014 **	Do femoral nerve blocks at the time of total knee replacement reduce pain and opioid use compared to patient-controlled opioid analgesia and other pain control treatments during the time the patient is in the hospital?	Meta-analysis of randomized clinical trials	Patient population: adults undergoing total knee replacement (TKR) surgery The search led to a review of 87 full text articles, of which 45 RCTs with 2710 participants were selected for inclusion	Databases for literature search included MEDLINE, EMBASE, CINAHL, ISI Web of Science, and the Cochrane Central Register through January 2013	Following total knee replacement, FNB is superior to PCA opioid, whether FNB is or is not accompanied by PCA opioid in reducing pain at rest and with movement FNB and epidural analgesia did not differ significantly with respect to analgesic effectiveness Continuous FNB was superior to single shot FNB for postoperative analgesia	High quality meta-analysis

First Author, Year	Intervention/ Research Question	Design	**Population/Sample**	Main Outcome Measures	Author (s)Conclusion	Division Assessment
Related Evidence Statement: High quality meta-analysis supporting evidence that FNB reduces postoperative pain from total knee replacement more effectively than patient-controlled opioid intravenous analgesia, and that total opioid use in the immediate postoperative period is also lower with FNB than with PCA opioids						
Chappell AS, Ossanna MJ, et al., 2009	In the setting of knee osteoarthritis (OA), does duloxetine relieve pain more effectively than placebo?	Randomized clinical trial	231 patients (151 women, 80 men, mean age 62) treated for knee OA at four centers in the United States	Randomization was to 60 mg duloxetine qd (n=111) or placebo (n=120), Study was done in three phases	For knee OA, duloxetine is more effective than placebo for pain reduction Age appeared to influence the treatment effect	Adequate
Related Evidence Statement: Adequate for evidence that duloxetine is more effective than placebo in decreasing pain from knee OA						
Chen K, Li G, et al., 2013	In patients having total knee arthroplasty, does patellar resurfacing improve knee pain and function and does it reduce the risk of later reoperation?	Meta-analysis of randomized clinical trials	14 independent RCTs with 1725 knees were included in an overall meta-analysis	The Knee Society Score (KSS) data from nine combined studies was not conclusive, but when data from five studies with long-term followup (5 years or more) was combined, the KSS was better with patellar resurfacing by 2.14 points (95% CI from 0.76 to 3.52)	The rate of reoperation was lower following TKA with patellar resurfacing than without resurfacing, but there was no difference with respect to anterior knee pain	Adequate
Related Evidence Statement: Adequate meta-analysis supporting good evidence that patellar resurfacing reduces the risk of later reoperation; if 25 arthroplasties are done with resurfacing, one later reoperation may be avoided						
Cleland JA, Abbott JH, et	To compare the effectiveness of two	Randomized clinical trial	60 patients (42 women, 18 men, mean age 48) treated	The primary outcome was the patient's	At 4 weeks and 6 months, both MTEX	Adequate for some evidence

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al., 2009	programs to treat plantar heel pain: manual physical therapy plus exercise versus a combination of electrophysical agents plus exercise		for plantar heel pain in a multicenter international trial in the US and New Zealand	perceived level of disability due to heel pain, as measured by the Lower Extremity Functional Scale (LEFS) at 6 months followup	and EPAX patients has improved over their baseline scores on the LEFS, but the MTEX group had significantly greater benefit than the EPAX group	
Related Evidence Statement: Adequate for some evidence that in patients with plantar fasciitis, six sessions of individually tailored manual therapy plus exercise is more effective than six sessions of a standardized program of ultrasound and dexamethasone iontophoresis plus ice in improving foot function six months later						
Cleland JA, Mintken PE, et al., 2013	To compare the effectiveness of manual therapy and exercise (MTEX) to a home exercise program (HEP) in the management of individuals with acute inversion ankle sprains.	Randomized clinical trial	74 patients (36 women, 38 men, mean age 35) treated for acute inversion ankle sprains at 4 physical therapy clinics in the United States including Denver, Boulder, and Aurora	Primary outcome was the activities of daily living (ADL) subscale of the Foot and Ankle Ability Measure (FAAM)	The MTEX group had greater improvement in pain and function over the HEP group at 4 weeks and at 6 months	Adequate for some evidence
Related Evidence Statement: Adequate for some evidence that a 4 week program of twice weekly manual physical therapy plus home exercise provides benefits in addition to the benefits of home exercise alone at the end of treatment, but that these differences decrease over a 6 month period as the natural history of ankle sprains begins to resolve						
Collins N, Crossley K, et al. 2008	Foot orthoses and physiotherapy in the treatment of patellofemoral pain syndrome	Randomized clinical trial	179 patients (100 women, 79 men, mean age 29) treated for anterior knee pain in a university setting in Australia	Block randomization to one of four interventions: foot orthoses plus PT (n=44), PT alone (n=45), foot orthoses	Prefabricated foot orthoses are superior to flat inserts in short term management of patellofemoral pain syndrome, implying	Adequate

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				without PT (n=46), and flat shoe inserts (n=44)	that their contoured shape is beneficial	
Related Evidence Statement: For conclusion that prefabricated foot orthoses are superior to flat inserts : adequate						
Costa ML, MacMillan K, et al., 2006	To assess the effects of immediate versus delayed weight bearing in patients (1) choosing to have surgery for an Achilles tendon rupture, and to assess the effects of immediate verus delayed weight bearing in patients (2) choosing not to have surgery for an Achilles tendon rupture	Two separate randomized clinical trials in patients with Achilles tendon rupture	48 patients (40 men, 7 women, mean age 42) one gender not recorded) chose surgery 48 patients (32 men, 16 women, mean age 53) chose not to have surgery	The primary outcome measure was the time taken to return to normal activities, as reported by the patients. In the operated group, the early weight bearing group returned normal walking faster (median of 12.5 weeks) than the delayed weight bearing group (median 18 weeks)	In patients with surgically treated Achilles tendon ruptures, there are advantages to immediate weight-bearing mobilization	Adequate for some evidence
Related Evidence Statement: Adequate for some evidence that in patients undergoing surgical repair of a ruptured Achilles tendon, a rehabilitation program involving immediate weight bearing with a flexible orthosis is more efficient in returning patients to normal function than a program involving immobilization in a plaster cast. Adequate for some evidence than in nonoperatively treated Achilles tendon rupture, immediate weight bearing with a flexible orthosis presents no disadvantages for return to function in comparison to delayed weight-bearing in a plaster cast.						
Cotchett MP, Munteanu SE, Landorf KB., 2014	To compare the effectiveness of trigger point dry needling versus sham dry needling in patients with plantar	Randomized clinical trial	84 patients (44 men, 40 women, mean age 56) treated for plantar heel pain at a university gait studies program in Melbourne	The primary outcome was measured at six weeks, and included (1) first step pain on getting out of bed, using a 100 mm VAS,	At the end of 6 weeks, there were statistically significant differences in the primary end point	Adequate for some evidence

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	heel pain			and (2) the pain subscale of the Foot Health Status Questionnaire (FHSQ) on a 100 point scale	between dry needling and sham needling	
Related Evidence Statement: Adequate for some evidence that in the setting of plantar fasciitis, six weekly sessions of dry needling have a small benefit for pain in the first steps in the morning, no measurable effects on foot function, and frequent local pain during the treatment sessions in which dry needling is used						
da Costa BR, Nuesch E, et al., 2012 **	In the setting of hip or knee osteoarthritis (OA), is oral doxycycline an effective intervention to improve function, relieve pain, or slow the rate of joint space narrowing compared to placebo?	meta-analysis of randomized clinical trials	288 potentially relevant articles were identified, but only 12 reports describing only 2 randomized trials (633 patients) were included in the meta-analysis	Safety data showed that patients randomized to doxycycline were more than twice as likely to withdraw from a study because of adverse effects, even though no serious adverse events were deemed to be attributable to doxycycline	The benefits in terms of pain and function of doxycycline in patients with OA of the knee is minimal to non-existent. The small benefit in terms of joint space narrowing was of questionable clinical relevance	High quality meta-analysis providing good evidence
Related Evidence Statement: High quality meta-analysis providing good evidence that oral doxycycline has no therapeutic effect on knee OA						
de Vries JS, Krips R, et al., 2011 **	To compare outcomes of various operative and nonoperative treatments of chronic ankle instability	Meta-analysis of clinical trials	A total of 81 potentially eligible trials were retrieved in the literature search, and 10 studies with a total of 388 patients were used for the analysis of data	The authors were able to pool outcome data from two studies of postoperative rehabilitation comparing early mobilization in a	The review does not provide strong evidence on which to base practice, due to small sizes of study populations, high risk of bias of the studies,	A methodologically high quality systematic review

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				brace versus six weeks of plaster immobilization	and clinical heterogeneity	
Related Evidence Statement: A methodologically high quality systematic review and meta-analysis of suboptimal clinical trials of treatments of chronic ankle instability, supporting a statement that there is good evidence that 4 weeks of neuromuscular training aimed at improving balance and proprioception are more effective than no training at producing functional recovery, and there is good evidence that in patients who have undergone surgical repair of the ankle ligaments, early mobilization with a prefabricated walking boot leads to earlier return to work and activity than plaster immobilization for six weeks						
Eccleston C, Williams ACDC, Morley S., 2009 **	Psychological therapies for the management of chronic pain (excluding headache) in adults (Review)	Meta-analysis of randomized clinical trials	Adults over 18 reporting pain of at least 3 months duration, not associated with malignant disease, excluding headache or migraine	Pain, negative mood, and disability	The evidence of effectiveness of CBT and BT is weak; most effect sizes are either statistically non-significant or small Behavioral change is complex, and most chronic pain patients have established patterns over a long period of time	Adequate for good evidence
Related Evidence Statement: Adequate for good evidence that CBT may reduce pain and disability in patients with chronic pain, but that the magnitude of the benefit is uncertain						
Eggerding V, Reijman M, et al., 2014 **	In the setting of reconstruction of the anterior and posterior cruciate ligaments of the knee, are outcomes improved over conventional operating techniques	meta-analysis of controlled clinical trials	The authors included five studies with 366 participants (all from Europe), all of which compared computer assisted ACL reconstruction with conventional surgery (no	Anatomical and technical outcomes such at tunnel placement were reported by all five included studies; tibial tunnel placement was not	There is insufficient evidence from randomized trials to draw conclusions about the effectiveness of CAS, but the currently available evidence	Good meta-analysis

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	when computer technology is used for the surgery?		studies of PCL were included)	reported to have different accuracy in any study, and the one study reporting more accurate femoral tunnel	does not indicate that CAS in knee ligament reconstruction improves outcome	
Related Evidence Statement: Good meta-analysis of several imperfect studies supporting a statement that current evidence does not indicate that in the setting of knee ligament reconstruction, computer assisted surgery improves outcomes over conventional surgery, but may add to operating time						
Elizondo-Rodriguez J, Araujo-Lopez Y, et al., 2013	Is botulinum toxin injected into the calf an effective treatment of plantar fasciitis?	Randomized clinical trial	36 patients (16 men, 20 women, mean age 43) treated for plantar fasciitis at a university orthopedics department in Monterey, Mexico	Followup was done at 15 days after the injection and again at 1, 2, 4, and 6 months Several scales were used to evaluate outcomes	In plantar fasciitis patients who are doing stretch exercises, an injection of BTX-A leads to better symptomatic and functional scores than an injection of lidocaine plus dexamethasone	Adequate for some evidence
Related Evidence Statement: Adequate for some evidence that in the setting of plantar fasciitis which lasts more than 3 months, a single injection of botulinum toxin into the gastrocnemius and soleus, in combination with plantar stretching exercises is likely to lead to better pain and functional improvement lasting up to six months than an injection of dexamethasone into the plantar surface of the foot						
Englund M, Guermazi A, et al., 2009	To evaluate the association between meniscal damage in non-operated knees and the later development of radiographic tibiofemoral OA	Nested case-control study	3026 subjects recruited through media and community outreach campaigns for a prospective epidemiologic cohort study from Birmingham. Alabama and Iowa City, Iowa	OA was graded according to the Kellgren-Lawrence (KL) criteria using posteroanterior and lateral radiography with a fixed-flexion protocol, both at baseline and at 30	A meniscal tear is a potent structural risk factor for later development of tibiofemoral OA This association is present in knees which have never been operated on, and	High quality nested case-control study providing good evidence

First Author, Year	Intervention/ Research Question	Design	**Population/Sample**	Main Outcome Measures	Author (s)Conclusion	Division Assessment
				months	means that the association is not explained by damage from a meniscectomy	
Related Evidence Statement: High quality nested case-control study providing good evidence that meniscal damage, even in the absence of knee surgery, is associated with a significantly increased risk of development of radiographic tibiofemoral OA within 30 months of its detection on MRI						
Essving P, Axelsson K, et al., 2011	In patients undergoing TKA, are there differences in postoperative pain relief between intrathecal morphine and local infiltration analgesia?	Randomized clinical trial	50 patients (31 women, 19 men, mean age 71) undergoing TKA for knee osteoarthritis at a university orthopedic surgery department in Sweden	Primary outcome was morphine consumption in the first 48 hours after the operation	Local infiltration analgesia (LIA) is an effective intervention to control postoperative pain in patients undergoing TKA and has several advantages over intrathecal morphine	Adequate for some evidence
Related Evidence Statement: Adequate for some evidence that local infiltration analgesia with ropivacaine and ketorolac during and for the first two days after TKA has relevant advantages over intrathecal morphine on the day of the procedure, including lower postoperative consumption of morphine, less postoperative pain, and earlier return to activity						
Fransen M, Agaliotis M, et al., 2015 **	To estimate the effectiveness of glucosamine alone, chondroitin alone, and a combination of both for treating osteoarthritis (OA) of the knee	Randomized clinical trial	605 patients (about 50% women, mean age 60) treated for OA of the knee the University of Lidcombe in Australia	The 7 day symptom diary was sent every 2 months along with the study capsules for 2 years. Severity of OA was also assessed with the Kellgren-Lawrence system	Taking chondroitin plus glucosamine for two years provided a meaningful reduction in JSN among people with symptomatic OA of the knee with mostly mild radiographic disease	Inadequate for one conclusion, Adequate for secondary conclusion.
Related Evidence Statement: Inadequate for the conclusion that pharmaceutical grade chondroitin plus glucosamine reduces the progression of knee OA. Adequate for the conclusion that chondroitin plus glucosamine has no clinically important effect on knee pain and function when taken for two years. An						

First Author, Year	Intervention/ Research Question	Design	**Population/Sample**	Main Outcome Measures	Author (s)Conclusion	Division Assessment
effect of slowing of the progression of joint space narrowing cannot be ruled out.						
Fransen M, Anderson C, et al., 2006	Safety and efficacy of routine postoperative ibuprofen for pain and disability related to ectopic bone formation after hip replacement surgery (HIPAID)	Randomized clinical trial	898 patients (54% men, mean age 66) undergoing elective total hip replacement in 20 hospitals in Australia and New Zealand	Randomized to 14 days of ibuprofen 400 mg tid (n=449) or placebo (n=449) using minimization algorithm stratified by study center and type of surgery (primary vs. revision)	Ibuprofen shows no evidence of clinical benefit 6 to 12 months after hip arthroplasty	High quality
Related Evidence Statement: High quality						
Frobell RB, Roos HP, et al., 2013	In physically active people with an acute ACL tear who are participating in physical therapy, are there long-term differences between those who have early surgery and those who have optional delayed surgery?	Randomized clinical trial	121 young active adults (32 women, 89 men, mean age 26) treated for acute ACL injury in orthopedics and sports science departments in Denmark and Sweden	In 2010, Frobell et al published two-year followup data for the two groups Three outcomes were taken in the 2010: the Knee Injury and Osteoarthritis Outcome Score (KOOS), the SF-36, and the TAS Primary outcome was the change from baseline to two years in four of the five subscales of the KOOS	In this five year trial of young active people having rehabilitation for an ACL tear, a strategy of early reconstruction did not offer any important advantages over a strategy of optional surgery deferred to a later time; about half of the patients assigned to optional delayed surgery never needed an operation	Adequate for some evidence
Related Evidence Statement: Adequate for some evidence that in the setting of acute ACL tears, a treatment plan which refers the patient to physical therapy with an option for delayed surgery can be expected to be as successful at five years as a treatment plan which refers the patient for surgery within ten						

First Author, Year	Intervention/ Research Question	Design	**Population/Sample**	Main Outcome Measures	Author (s)Conclusion	Division Assessment
weeks of injury, and may reduce the frequency of surgery by one half						
Gaida JE, Cook J., 2011	Treatment options for patellar tendinopathy	Critical review of randomized trials and observational studies	35 patients (40 knees) were allocated by block randomization with opaque, sealed envelopes into two treatment groups	The evidence on sclerosing injections fails to compare them with exercise programs; the patients did not have a rehabilitation protocol, rendering the evidence inadequate regarding the usefulness of sclerosing injection	There is no evidence that ESWT is effective for patellar tendinopathy. There is no evidence that steroid injections are more effective than eccentric exercise. Sclerosing injections have not been compared with exercise and there is no evidence to support their use.	Inadequate
Related Evidence Statement: There is no evidence that ESWT is effective for patellar tendinopathy. There is no evidence that steroid injections are more effective than eccentric exercise. Sclerosing injections have not been compared with exercise and there is no evidence to support their use.						
Garrison KR, Shemilt I, et al., 2010 **	Does BMP improve fracture outcomes in adults?	Meta-analysis of randomized clinical trials and economic evaluations	Skeletally mature adults 16 and older with fractures, either acute or nonunion	Primary outcomes: Time to union, Union rate without a secondary procedure for acute fractures	Most studies were of poor quality; further well-designed RCTs are required to assess clinical effectiveness of BMP in treating tibial fractures	Adequate meta-analysis
Related Evidence Statement: Adequate meta-analysis of a largely low quality set of available studies, with current evidence not supporting measureable benefits of BMP over standard of care without BMP for tibial fractures. There is good evidence that for open tibial shaft fractures, BMP does not enhance fracture healing at 20 weeks compared to fracture fixation with intramedullary nailing.						
Gibson JN,	To compare	Randomized	63 patients (77 feet, 26	Both groups improved	Both arthrodesis and	Adequate

First Author, Year	Intervention/ Research Question	Design	**Population/Sample**	Main Outcome Measures	Author (s)Conclusion	Division Assessment
Thomson CE., 2005	effectiveness of arthrodesis versus arthroplasty for end stage first MTP joint arthritis	Clinical Trial	men, 37 women, mean age 55) with metatarsophalangeal	equally in the maximal distance they could walk comfortably from baseline to 24 months	arthroplasty were beneficial to most patients Arthroplasty was superior to arthrodesis in terms of pain and function	
Related Evidence Statement: Adequate for an evidence statement that first M-P joint arthritis is better treated with arthrodesis than arthroplasty for pain and functional improvement						
Gollwitzer H, Sacena A, et al., 2015	To estimate the effectiveness of extracorporeal shock wave therapy (ESWT) in the setting of plantar fasciitis	Randomized clinical trial	246 patients (77 men, 169 women, mean age 49) treated for plantar fasciitis at 5 study centers in the United States	Primary pain outcome was overall reduction of heel pain, measured by percentage change in VAS composite score 12 weeks after the last intervention, compared with the score at baseline	ESWT in weekly interventions without local analgesia is more effective than placebo ESWT in reducing pain and improving function in patients with chronic plantar fasciitis which has not responded to previous pharmacological and nonpharmacological treatments	High quality study for good evidence
Related Evidence Statement: High quality study for good evidence that high intensity ESWT at a dose of 0.25 mJ/mm^2 is more effective than sham ESWT for improving pain and function in chronic plantar fasciitis which has not responded to both nonpharmacological and pharmacological treatment after 6 months of symptoms						
Gormeli G, Gormeli CA, et al., 2015	In patients with osteoarthritis of the knee, to compare the clinical effectiveness of three injections of	Randomized clinical trial	162 patients (90 women, 72 men, mean age 53.5) who completed a RCT for knee osteoarthritis at a university setting in	Followup was done at 6 weeks, at 3 months, and finally at 6 months. The two outcomes were the	Multiple PRP injections are superior to a single PRP injection and are also superior to three HA	Adequate for some evidence

First Author, Year	Intervention/ Research Question	Design	**Population/Sample**	Main Outcome Measures	Author (s)Conclusion	Division Assessment
	PRP with different doses of PRP, hyaluronic acid injection, and saline injection		Turkey	EuroQol visual analogue scale (EQ-VAS) and the International Knee Documentation Committee (IKDC) scores	injections, and are also superior to three saline injections for patients with knee OA	
Related Evidence Statement: Adequate for some evidence that in patients with knee OA, a single PRP injection is more beneficial than a saline injection, and that more than one PRP injection is likely to be more beneficial than a single PRP injection when the Kellgren-Lawrence grade is less than Grade IV. Adequate for some evidence that three injections of high molecular weight hyaluronic acid is more beneficial than three saline injections for knee OA. Adequate for some evidence that a single PRP injection is as beneficial as three hyaluronic acid injections for knee OA.						
Gross DP, Battie MC, Cassidy JD., 2004	The Prognostic Value of Functional Capacity Evaluation [FCE] in Patients With Chronic Low Back Pain	Observational prognostic study	114 workers (74% male, mean age 41) undergoing FCE at the Alberta Workers' Compensation Board in 1999 and contributing complete data at a one-year follow-up to an exploratory analysis of the predictive value of FCE on return to work (RTW)	All claimants underwent the Isernhagen Work Systems FCE protocol, with claimant performance on each of 25 FCE tasks given a pass/fail rating for physical job demands	It is sometimes recommended that RTW be recommended only when a claimant passes all of the tasks on the FCE This recommendation would prevent many claimants from returning to work; only 4% of the claimants achieved the goal of passing all FCE tasks, but nearly all of them closed their claims and terminated TTD benefits during the	Adequate

First Author, Year	Intervention/ Research Question	Design	**Population/Sample**	Main Outcome Measures	Author (s)Conclusion	Division Assessment
					year following their FCE	
Related Evidence Statement: Adequate for evidence that (1) FCE task performance is weakly related to time on disability and on time for claim closure, and (2) even claimants who fail on numerous physical performance FCE tasks may be able to return to work						
Gudas R, Gudaite A, et al., 2012	To compare the outcomes of mosaicplasty versus microfracture in athletes with osteochondral defects of the knee	Randomized clinical trial	57 patients (35 men, 22 women, mean age 24) who were treated for osteochondral defects of the knee in an earlier (Gudas 2005) randomized clinical trial by the study authors in the orthopedics department of a university hospital in Lithuania	The main clinical outcome was based on the International Cartilage Repair Society (ICRS) "cartilage standard evaluation form" (Brittberg 2003)	Both OAT and MF procedures yielded significant improvements in clinical status of athletes with osteochondritis dissecans and with posttraumatic full-thickness articular cartilage defects	Adequate for some evidence
Related Evidence Statement: Adequate for some evidence that in highly athletic patients with osteochondritis dissecans or with posttraumatic full-thickness chondral lesions of the knee, who are fully compliant with an active postoperative rehabilitation program, an OAT procedure is more likely than a microfracture procedure to lead to return to sports, to higher functional knee scores, and fewer reoperations during the ten years following treatment of the injury						
Habib G, Jabbour A, et al., 2014	Does an intra-articular injection of a corticosteroid (IACI) suppress the hypothalamic-pituitary-adrenal (HPA) axis?	Randomized clinical trial	40 patients (27 men, 13 women, mean age 52) treated for knee osteoarthritis at a rheumatology department in Israel	All patients had an intra-articular knee injection either with steroid (methylprednisolone acetate, MCA) or SH	An injection of 80 mg of MCA at the osteoarthritic knee was associated with laboratory evidence of adrenal insufficiency in 25% of patients, but no patient who had an injection of SH had	Adequate

First Author, Year	Intervention/ Research Question	Design	**Population/Sample**	Main Outcome Measures	Author (s)Conclusion	Division Assessment
					lab evidence of loss of adrenal function	
Related Evidence Statement: Adequate for evidence that an intra-articular injection of 80 mg of methylprednisolone acetate into the knee has about a 25% probability of suppressing the adrenal gland response to exogenous ACTH for four or more weeks after injection, but recovery of the adrenal response is expected by week 8 after injection						
Herrlin SV, Wange PO, et al., 2013	For patients with degenerative tears of the medial meniscus, are the outcomes different with arthroscopic partial meniscectomy than with physical therapy?	Randomized clinical trial	90 patients (55 men, 35 women, mean age 45) treated for degenerative tears of the medial meniscus at the Karolinska Hospital in Sweden	Three questionnaires were administered to all patients at baseline and again after 8 weeks and 6 months in the 2007 study, and these were repeated at 24 and 60 months for the 2013 study: the Knee injury and Osteoarthritis Outcome Score (KOOS), the Lysholm score, and the Tegner Activity Scale	The most important finding was that both groups improved equally One third of the E group had enough complaints after the original published study to warrant crossing over to arthroscopic surgery, and the patients who did cross over to surgery had KOOS and Lysholm scores equal to those of the other patients	Adequate
Related Evidence Statement: Adequate for evidence that in the setting of nontraumatic meniscal tears, a treatment plan focusing on supervised exercise followed by home exercise has an equal probability of success as a treatment plan involving early arthroscopic partial meniscectomy, provided that a surgical option is offered to patients who have persistent knee limitations after several months of exercise therapy						
Hoeksma HL, Dekker J et al., 2004	To determine the effectiveness of a manual therapy program compared	Randomized clinical trial	109 patients (76 women, 33 men, mean age 72) with American College of Rheumatology (ACR)	Primary outcome was general improvement reported by patient on a 6 point Likert scale	Manual therapy seems to be a suitable treatment option for hip OA	Adequate for some evidence

First Author, Year	Intervention/ Research Question	Design	**Population/Sample**	Main Outcome Measures	Author (s)Conclusion	Division Assessment
	with an exercise therapy program in patients with osteoarthritis (OA) of the hip		defined osteoarthritis of the hip treated at a university hospital in Amsterdam	from "much worse" to "complete recovery" at 5 weeks from start of study; later measures were not done due to concerns about recall accuracy	Amount of exercise treatment (9 sessions) may not have been adequate to achieve the full benefit of exercise; the number of sessions was constrained to be the same in both groups by the study protocol	
Related Evidence Statement: Adequate for some evidence that in the setting of hip OA with Kellgren-Lawrence grades 0 through 3, a short 5 week course of 9 sessions of manual therapy yields better overall improvement and hip function in daily activities than a supervised exercise program of similar duration and number of supervised sessions						
Hoffman BM, Papas RK, et al., 2007	Psychological Interventions for Chronic Low Back Pain	Meta-analysis of controlled clinical trials	Adults with nonmalignant chronic low back pain lasting at least 3 months	Pain intensity, emotional functioning, physical functioning, health-related quality of life, pain interference, pain-specific disability, global improvement, treatment satisfaction	Psychological interventions appear to be superior to wait-list controls for pain intensity and health-related quality of life; and for work-related disability	Adequate for good evidence
Related Evidence Statement: Adequate for good evidence that psychological interventions, especially CBT, are superior to no psychological intervention for chronic low back pain, and that self-regulatory interventions such as biofeedback and relaxation training may be equally effective						
Jeffcoach ER, Sams VG, et al., 2014	Does the administration of NSAIDs in the setting of acute long	Retrospective cohort study	1901 patients (836 women, 1065 men, mean age 46.6) treated for long bone fractures at the	2 years of data were used in the data set. NSAID use was administered within	NSAIDs increase the risk of poor bone healing when administered early in	Adequate for some evidence

First Author, Year	Intervention/ Research Question	Design	**Population/Sample**	Main Outcome Measures	Author (s)Conclusion	Division Assessment
	bone fractures increase the rate of nonunion and other complications?		University of Tennessee Medical Center, a Level I Trauma Center, between October 2009 and September 2011	24 to 48 hours of admission; and 92.7% of NSAID was either ketorolac or ibuprofen	the treatment of long bone fractures Smoking also inhibits bone healing of long bone fractures	
Related Evidence Statement: Adequate for some evidence that in the setting of long bone fractures of the femur, tibia, and humerus, NSAID administration in the first 48 hours after injury is associated with poor healing of the fracture, and that tobacco use is also a risk factor for poor fracture healing						
Jiang N, Lin QR, et al., 2012	To compare the effectiveness of surgical versus nonsurgical treatment of displaced intra-articular calcaneal fractures	Systematic reviews of controlled clinical trials	Displaced intra-articular calcaneal fractures	142 articles were screened, 17 studies were assessed, and 10 trials with a total of 891 patients were included: 6 RCTs and 4 nonrandomized clinical trials	Anatomical restoration of the calcaneus is likely to be more successful with operative than with nonoperative treatment of displaced calcaneal fractures Surgically treated patients had a greater likelihood of returning to work than nonsurgically treated patients	An adequate meta-analysis
Related Evidence Statement: An adequate meta-analysis which supports some evidence that in the setting of displaced intra-articular calcaneal fractures, return to work is more likely with surgical than with nonsurgical treatment, but that a heavy workload makes return to work less likely than with a light or moderate workload						
Katz JN, Brophy RH, et al., 2013	In patients with knee osteoarthritis (OA) and a torn meniscus, do outcomes differ between arthroscopic surgery and nonoperative physical	Randomized clinical trial	330 patients (143 men, 187 women, mean age 58) who completed a 6 month followup of a study of arthroscopy for knee OA and a torn meniscus at seven academic centers in	Outcomes were assessed at 3 months, 6 months, and 12 months after randomization, with the primary outcome assessed at 6 months	There were no significant differences in pain and function between patients assigned to surgery and PT after 6 and after 12 months	High quality

First Author, Year	Intervention/ Research Question	Design	**Population/Sample**	Main Outcome Measures	Author (s)Conclusion	Division Assessment
	therapy?		the United States	Primary outcome was the physical function scale of the Western Ontario OA Index (WOMAC) between baseline and 6 months	from randomization These results were achieved with a 30% crossover from PT to APM at 6 months	
Related Evidence Statement: High quality study supporting good evidence that in the initial management of knee OA with a torn meniscus, it is reasonable to start with nonoperative physical therapy, and that about 30% of patients may not respond to PT alone. The appropriate treatment changes for the patients who do not do well with PT are not evident from the study, since little is known about what accounts for their lack of benefit from the PT program.						
Khan RJ, Carey Smith RL., 2010 **	In adults with acute Achilles tendon ruptures, what are the relative outcomes of surgical versus nonsurgical treatment, and what are the outcomes for different surgical interventions?	Meta-analysis of controlled clinical trials	Adults with acute ruptures of the Achilles tendon	32 potentially eligible trials were found, and 12 studies with 844 patients were included in the analysis	Open surgical repair of Achilles tendon rupture reduces the risk of re-rupture but increases the risk of other complications, including infection	Adequate meta-analysis for good evidence
Related Evidence Statement: Adequate meta-analysis for good evidence that operative repair lowers the re-rupture rate compared to nonoperative immobilization, but increases the rate of other complications including deep tissue infection						
Khoshbin A, Leroux T, et al. , 2013	In patients with knee osteoarthritis (OA), does injection of platelet-rich plasma (PRP) improve knee function in comparison with control injections of	Meta-analysis of randomized and nonrandomized clinical trials	Adults with osteoarthritis of the knee of any severity	157 abstracts were reviewed; after exclusion for insufficient followup, low level evidence, or inadequate data reporting, 6 studies, with 577 patients (625	Multiple sequential intra-articular PRP injections improve functional outcomes of WOMAC and IKDC at a minimum of 24 weeks in comparison with HA	Marginally adequate meta-analysis

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	hyaluronic acid (HA) or normal saline (NS)?			knees) were included in a meta-analysis, five written in English and one in Chinese	or NS However, pain VAS and patient satisfaction scores did not differ with PRP compared to control injection	
Related Evidence Statement: Marginally adequate meta-analysis which nevertheless supports a statement that there is some evidence that in the setting of knee OA, intra-articular injection with PRP is more effective than HA or placebo in improving knee function and pain						
Kimmell LA, Edwards ER, et al., 2012	In patients having surgical fixation of ankle fractures, are there differences in outcome between those who begin out-of-bed mobilization on the first postoperative day and those whose mobilization is delayed until the second postop day?	Randomized clinical trial	104 patients (60 men, 44 women, mean age 41.7)undergoing primary internal fixation of an ankle fracture at a hospital in Australia	The main outcome was length of stay postoperatively, with additional comparisons based on hospital length of stay, opioid use, and the condition of the injured ankle at the 10-14 day followup examination	Bed rest and elevation of an injured ankle following fixation may not be necessary for the first postoperative day; patients can be gotten out of bed and begun ambulating with an appropriate gait aid on the first postop day without increasing the need for analgesia and without adverse consequences on wound healing two weeks later	High quality
Related Evidence Statement: High quality study supporting good evidence that in patients who undergo internal fixation of acute nonpathological ankle fractures, it is not necessary to remain at bed rest for the first postoperative day; mobilization can safely be started with gait aids on the first morning after surgery, leading to shorter length of hospital stay, no increase in the need for opioid analgesia, and equally satisfactory wound healing two weeks after						

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surgery						
Kruse LM, Gray B, Wright RW., 2012	In patients who are recovering from ACL reconstruction, are there clinically significant differences between different rehabilitation protocols?	Systematic review of clinical trials	Patients in the postoperative period after ACL reconstruction, either hamstring autograft or bone-patella-bone 85 articles were screened following the database search, and 29 articles were selected for the systematic review	Variable depending on the study, but commonly measured outcomes included pain VAS, joint stability, patient-reported functional scores, and several kinetic and technical measures such femoral/tibial tunnel diameter on CT scan, isokinetic strength, and quadriceps lag	Although many studies are at risk of selection bias, some valuable conclusions appear to be warranted Knee bracing does not provide any benefit and is not necessary	Adequate systematic review
Related Evidence Statement: Adequate systematic review to support good evidence that in the setting of ACL rehabilitation, knee bracing is not helpful, continuous passive motion has no benefits, and home exercises are likely to be as effective as outpatient rehabilitation in motivated patients; there is some evidence that rehabilitation can begin safely as early as in the immediate postoperative period with weight-bearing, flexion up to 9 degrees, and quadriceps strengthening. Neuromuscular training such as proprioceptive and balance training, vibratory stimulation, and perturbation training have not yet shown clinically important benefit						
Krych AJ, Thompson M, et al., 2013	To compare outcomes of selective labral debridement with those of arthroscopic labral repair in women with femoroacetabular impingement (FAI)	Randomized clinical trial	36 women (mean age 38.5) being treated for femoroacetabular impingement at the department of orthopedic surgery at the Mayo Clinic in Minnesota	All patients completed Hip Outcome Score (HOS) preoperatively and 1 year postoperatively Global assessment was ascertained by having patients describe their hip	The debridement used in the current study was done in a manner which preserves more labral tissue than has been described in some earlier studies which have performed a complete resection; this was	Adequate

First Author, Year	Intervention/ Research Question	Design	**Population/Sample**	Main Outcome Measures	Author (s)Conclusion	Division Assessment
				function	done in order to reduce an apparent risk of subsequent osteoarthritis of the treated hip	
Related Evidence Statement: Adequate for some evidence that in women with pincer or combined cam-pincer femoroacetabular impingement, surgery which repairs the labrum is more likely to lead to normal hip function at one year than surgery which debrides part of the labrum						
Lamb SE, Marsh JL, et al., 2009	To compare the effectiveness of three types of mechanical support with that of tubular compression bandages after an acute ankle sprain	Randomized clinical trial	584 patients (247 women, 337 men, mean age 30) treated for acute severe (Grade II and III) ankle sprain at 8 emergency departments in the UK	Primary outcome was Foot and Ankle Outcome Score (FAOS) assessed by postal questionnaire at 3 months after randomization	Below-knee cast reduces symptoms of severe ankle sprain in the early stages of recovery, producing faster recovery of function at 3 months than interventions which do not immobilize the injured ankle	Adequate
Related Evidence Statement: Adequate for evidence that a below-knee cast leads to slightly faster recovery of ankle function than tubular compression bandage at up to three months in patients with acute Grade II and III ankle sprains						
Lambert RGW, Hutchings EJ, et al., 2007	To assess the efficacy of a fluoroscopically guided steroid injection for osteoarthritis (OA) of the hip	Randomized clinical trial	52 patients (31 women, 21 men, mean age 62) treated for osteoarthritis of the hip at the University of Alberta	Followup evaluations were done at 1, 2, 3, and 6 months postinjection Primary outcome was set at 2 months postinjection and was defined as either having or not having a	In patients receiving an intraarticular injection of local anesthetic plus steroid into the hip, a more favorable outcome was seen than in patients who received local anesthetic alone,	Adequate for some evidence

First Author, Year	Intervention/ Research Question	Design	**Population/Sample**	Main Outcome Measures	Author (s)Conclusion	Division Assessment
				20% decrease in the summed WOMAC pain scales (WOMAC20) a "responder" had at least a 20% decrease and a "nonresponder" did not have that decrease	with significant gains from baseline to 2 months in pain, stiffness, and function	
Related Evidence Statement: Adequate for some evidence that a fluoroscopically guided injection of triamcinolone into an osteoarthritic hip relieves pain and improves function for up to three months						
Landorf KB, Keenan A-M, Herbert RD., 2006	Effectiveness of Foot Orthoses to Treat Plantar Fasciitis.	Randomized clinical trial	135 patients (89 women, 46 men, mean age 48) treated for plantar fasciitis in a university podiatry clinic in Australia	Primary outcomes were pain and function at 3 and 12 months, using the 100 point Foot Health Status Questionnaire in which the best score is 100	Both prefabricated and custom orthoses produce small short-term benefits compared to sham orthoses, but it is not certain that these effects are clinically important	High quality
Related Evidence Statement: High quality study providing good evidence that a prefabricated and a custom orthosis are equally effective in improving pain and function of plantar fasciitis at 3 and at 12 months after they are first used.						
Massey T, Derry S, et al., 2010 **	To estimate the effectiveness of topical NSAIDS for acute pain from musculoskeletal injuries	Meta-analysis of randomized clinical trials	Adults 16 years or older with acute pain of at least moderate intensity from sprains, strains, or sports injuries, generally having occurred within 24 to 48 hours	"Clinical success" defined as a 50% reduction in pain or other equivalent measure, such as a "very good" or "excellent" global assessment of	Topical NSAIDS can provide good pain relief in acute settings such as sprains, strains, and overuse injuries, with little difference in efficacy between topical	Adequate meta-analysis

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				treatment, ascertained close to seven days (minimum of three days) from start of treatment	diclofenac, ibuprofen, ketoprofen, and piroxicam, but indomethacin is less effective and benzydamine is no better than placebo	
Related Evidence Statement: An adequate meta-analysis which supports strong evidence that topical NSAIDS are more effective than placebo vehicles such as gels or creams in the setting of acute musculoskeletal injuries, and for some evidence that topical NSAIDS are associated with fewer systemic adverse events than oral NSAIDS						
McMillan AM, Landorf KB, et al., 2012	Does a single injection of dexamethasone reduce heel pain from plantar fasciitis more effectively than saline, and does this benefit last longer than one month?	Randomized clinical trial	82 patients (39 women, 43 men, mean age 52) treated for plantar fasciitis at La Trobe University in Melbourne, Australia	Primary outcomes were the pain component of the foot health status questionnaire at 4, 8, and 12 weeks, and plantar fascial thickness at the same time points	A single ultrasound-guided injection of dexamethasone is a safe and effective short term treatment for plantar fasciitis, providing better pain relief than placebo for at least 4 weeks	Adequate for some evidence
Related Evidence Statement: Adequate for some evidence that a single ultrasound guided injection of dexamethasone into the plantar fascia reduces pain in the short term compared to saline injection						
Najm WI, Reinsch S, et al., 2004	S-Adenosyl methionine (SAMe) versus celecoxib for the treatment of osteoarthritis [OA] symptoms	Randomized crossover clinical trial	57 patients (40 women, 17 men, mean age 53) treated for OA of the knee at a general clinical research center at UC Irvine	Each participant received both interventions: 600 mg SAMe twice daily and 200 mg celecoxib twice daily; the order of the interventions differed between randomized groups in	SAMe and celecoxib are equally effective in reducing pain and increasing function in patients with OA of the knee. SAMe has a slower onset of action than celecoxib, requiring	Adequate

First Author, Year	Intervention/ Research Question	Design	**Population/Sample**	Main Outcome Measures	Author (s)Conclusion	Division Assessment
				a crossover design with sequence "A" (n=28) receiving 8 weeks of SAMe followed by 8 weeks of celecoxib, and sequence "B" (n=29) receiving celecoxib followed by SAMe	approximately one month to achieve therapeutic effects of celecoxib	
Related Evidence Statement: With respect to conclusion that SAMe has a slower onset of action than celecoxib but has approximately equal effectiveness for knee OA—Adequate						
Karen L. Newcomer, et al., 2008	Is a videotape to change beliefs and behavior superior to a standard videotype in acute low back pain?	A randomized controlled trial	138 subjects	Oswestry Disability Index, Pain and Impairment Relationship Scale, Fear-Avoidance Beliefs Questionnaire, medical costs related to LBP and total medical costs incurred over 1-year of follow-up	The participation rate was low with a 38 percent of subjects not completing the initial questionnaire and another 19 percent dropping out by the end of the 1-year study period. Assessors and analysts were not blinded. The study may not be sufficiently powered to detect clinically important differences in outcomes.	Inadequate for evidence, but adequate for a general information
Related Evidence Statement: Inadequate for evidence, but adequate for a general information statement that giving a video is no sufficient for patient education.						

First Author, Year	Intervention/ Research Question	Design	**Population/Sample**	Main Outcome Measures	Author (s)Conclusion	Division Assessment
Oesch P, Kool J, et al., 2010	Effectiveness of Exercise on Work Disability in Patients With Non-Acute Non-Specific Low Back Pain	Meta-analysis of randomized clinical trials	838 articles were retrieved in the literature search; 87 were evaluated in detail, and 23 studies were selected for review	Exercise dose was determined by the number of hours of supervised treatment sessions and their duration; interventions with at least 17 hours of supervised exercise were classed as high-dose, and interventions with less than 17 hours of supervised exercise as low dose	The OR of 0.66 for RTW in the long term means that the odds of improvement in work disability are 34% lower if only usual care, rather than exercise, is given	Adequate
Related Evidence Statement: Adequate for good evidence that exercise programs reduce long-term work disability and improve return to work						
Parker MJ, Gurusamy KS, Azegami S., 2010 **	To compare outcomes of various arthroplasties in the setting of proximal femoral fractures	meta-analysis of randomized and quasi-randomized clinical trials	Skeletally mature adults with proximal femoral fractures. 23 trials with 2861 older and primarily female patients were included in the review	Operative details (length of surgery, operative blood loss, etc) Implant related complications (dislocation, loosening, acetabular wear, breakage, etc) Postoperative complications	Many trial reports had a poor level of methodological rigor, lacking such features as allocation concealment, assessor blinding, and intention-to-treat analysis	A high quality meta-analysis
Related Evidence Statement: A high quality meta-analysis of numerous outcomes based on some suboptimal original studies; the results support good evidence that the risk of fracture is lower with a hemiarthroplasty than with a total hip replacement, good evidence that cemented hemiarthroplasty has a lower risk of intraoperative and postoperative fractures than an uncemented hemiarthroplasty. There is no evidence that different operations have different risks of mortality in a population with a high baseline risk of death within several years of a hip fracture. There is good evidence that unipolar and bipolar						

First Author, Year	Intervention/ Research Question	Design	**Population/Sample**	Main Outcome Measures	Author (s)Conclusion	Division Assessment
hemiarthroplasty yield similar results for mortality, acetabular erosion, reoperations, or mobility. The evidence regarding functional and pain outcomes of hemiarthroplasty versus total hip replacement remains unclear at this time.						
Petersen W, Rembitzki IV, et al., 2013	To answer research questions about the management of acute ankle ligament injuries, surgical/nonsurgical options, most effective type of external stabilization, effects of neuromuscular training , and whether there is a role for prophylactic bracing	Systematic review of randomized clinical trials and previous meta-analyses	Patient population: adults 16 years or older with acute ankle ligament injuries	158 articles were identified through the literature search, and 3 meta-analyses and 17 RCTs were included in the analysis	Most Grade 1, 2, and 3 ankle sprains can be managed without surgery, but surgery should not be totally abandoned, and the indication for surgical repair should be made on an individual basis in people such as athletes who are at risk for future sprains	Adequate
Related Evidence Statement: A weak but adequate systematic review which supports good evidence that in Grade 2 or Grade 3 ankle ligamentous injuries, external support with a semirigid brace or with a short-term use of a cast promotes injury healing more effectively than support with taping or with a tubular bandage, which may not furnish adequate protection against inversion of the ankle joint. Adequate for a general information statement that the majority of Grade 2 and 3 ankle sprains may be managed nonoperatively, but that the decision should be tailored to individual circumstances such as a large hematoma or a patient's level of physical activity using the lower extremity						
Pulavarti RS, Raut VV, McLauchlan GJ., 2014	When total knee arthroplasty (TKA) is being done, does patellar denervation at the time of the procedure reduce pain and improve patient satisfaction in the postoperative period?	Randomized clinical trial	126 patients (68 women, 58 men, mean age 70) undergoing primary TKA in the orthopedics department of a teaching hospital in the UK	Outcome measures included patient satisfaction, Oxford Knee Score (OKS), Knee Society Score (KSS), and Knee Society Function Score , patellar score, Activities of Daily Living, (ADL) ,	Patients undergoing primary TKA who did not require patellar resurfacing but who had circumferential denervation of the patella had better relief of anterior knee pain at 3 months than	High quality study

First Author, Year	Intervention/ Research Question	Design	**Population/Sample**	Main Outcome Measures	Author (s)Conclusion	Division Assessment
				Visual Analogue Scale, VAS for anterior knee pain, and the UCLA activity scale	the group with no denervation	
Related Evidence Statement: High quality study supporting good evidence that in patients undergoing primary TKA and who do not have patellar resurfacing, circumferential denervation of the patella during the operation can reduce pain postoperatively and improve patient satisfaction two years later						
Radwan YA, Mansour AM, Badawy WS., 2012	To compare the effectiveness of extracorporeal shock wave (ESWT) with endoscopic plantar fascia release (EPFR) for the treatment of recalcitrant heel pain	Randomized clinical trial	65 patients (40 men, 25 women, mean age 39) treated for plantar fasciopathy at an orthopedic surgery department at Cairo University in Giza, Egypt	Morning pain was measured at baseline, 3 weeks, 12 weeks, and 12 months after the intervention was done	In patients with a failure of conventional treatment for plantar fasciotomy, high dose shock wave treatment is comparable to plantar fascia release at 3 months and at one year; later comparisons appear to be more favorable for fascia release than for shock wave, but not in a statistically significant way	Adequate for some evidence
Related Evidence Statement: Adequate for some evidence that high dose shock wave produces successful outcomes similar to those for endoscopic plantar fascia release in patients with persistent plantar fasciopathy which has not responded to more conservative treatment						
Raviraj A, Anand a, et al., 2010	In patients with an acute ACL tear, do outcomes differ between those operated on early and those operated on	Randomized clinical trial	99 patients (51 men, 48 women, mean age 31) who diagnosed with a torn ACL on MRI in the emergency department of a hospital in Bangalore,	A blinded physiotherapist uninvolved in the surgery did the outcome assessments Patients were	Arthroscopic reconstruction of ACL injuries can be done at any time within six weeks of injury without	Adequate

First Author, Year	Intervention/ Research Question	Design	**Population/Sample**	Main Outcome Measures	Author (s)Conclusion	Division Assessment
	later?		India	followed up at intervals of 2, 6, and 12 weeks postoperatively, then at six month intervals	compromising outcomes, provided that a rehabilitation program is done while waiting for surgery, and a hinged knee brace is used for weight bearing during the preoperative delay	
Related Evidence Statement: Adequate for evidence that in the setting of an acute ACL injury not complicated by high grade chondral defects, surgical repair performed an any time in the first six weeks is as effective as immediate surgery, provided that the preoperative period is accompanied by an exercise rehabilitation and by a locking knee brace to support any weight-bearing						
Raymond J, Nicholson LL, et al., 2012	To estimate the effectiveness of ankle taping or bracing on proprioception in patients with functional ankle instability	Meta-analysis of crossover clinical trials	Patients who had sprained their ankle at least once or had functional ankle instability, defined as repeated episodes of ankle "giving way" following a history of a sprain	52 studies were retrieved for evaluation, and 8 studies were selected for having met all inclusion criteria	Wearing ankle tape or brace has no effect on proprioception, which may actually make detection of movement in the inversion/eversion plane slightly worse	Adequate
Related Evidence Statement: Adequate meta-analysis which supports good evidence that in the setting of ankle instability, ankle taping and bracing has no influence on proprioception, and that their effect in reducing recurrent ankle injury probably arises from other mechanisms						
Rompe JD, Furia J, Maffulli N., 2008	to compare the effectiveness of an eccentric loading exercise program with that of extracorporeal shock wave therapy (ESWT) for patients with insertional	Randomized clinical trial	50 patients (30 women, 20 men, mean age 40) treated for insertional Achilles tendinopathy at an orthopedic trauma clinic in Germany	Followup was done 16 weeks after baseline (4 weeks after the completion of eccentric loading exercise and 12 weeks after the completion of ESWT); an additional followup	In this patient population, the group which received ESWT had greater success of treatment than the group randomized to eccentric loading	Adequate

First Author, Year	Intervention/ Research Question	Design	**Population/Sample**	Main Outcome Measures	Author (s)Conclusion	Division Assessment
	Achilles tendinopathy			was done 15 months from baseline		
Related Evidence Statement: Adequate for some evidence that in patients with insertional Achilles tendinopathy who have no calcification of the tendon at the calcaneus and have not improved with six months of conservative treatment , three sessions of a moderate dose (flux density of 0.12 mJ/mm^2) is likely to be more successful than a 12 week program of eccentric loading exercise						
Rompe JD, Cacchio A, et al., 2005 **	In the setting of plantar fasciopathy of recent onset, are there differences in outcome between plantar fascia stretching exercises and the use of radial shock-wave therapy?	Randomized clinical trial	102 patients (66 women, 36 men, mean age 51) treated for plantar heel pain attributed to the plantar fascia at an orthopedic facility in Mainz, Germany	Main outcomes were the pain subscale of the Foot Function Index (PS-FFI) and a patient-relevant outcome measure (SROM) questionnaire which included generic items related to pain function, and satisfaction with treatment	A program of manual stretching exercises specific to the plantar fascia is more effective than radial shock wave therapy in reducing pain from plantar fasciitis of recent onset	High quality
Related Evidence Statement: High quality study for good evidence that in the setting of plantar fasciitis of recent onset, a program of home stretching exercises directed at the plantar fascia is more effective in reducing pain than radial shock wave therapy						
Rutjes AWS, Juni P, et al., 2012	Visco-supplementation for Osteoarthritis of the Knee	Meta-analysis of randomized clinical trials	Adults with symptomatic knee osteoarthritis	187 reports describing 89 trials in 12,667 patients met inclusion criteria	A small, clinically irrelevant effect of visco-supplementation on pain was seen in a meta-analysis of large trials with blinded outcome assessment	High quality meta-analysis

First Author, Year	Intervention/ Research Question	Design	**Population/Sample**	Main Outcome Measures	Author (s)Conclusion	Division Assessment
Related Evidence Statement: High quality meta-analysis with strong evidence that in the setting of knee osteoarthritis, the effectiveness of viscosupplementation is clinically unimportant, and may impose a risk of adverse events on the patient						
Ryan M, Hartwell J, et al., 2014	To compare the effectiveness of a single dexamethasone injection with that of an active physical therapy (PT) program in workers with plantar fasciopathy whose jobs entail prolonged standing	Randomized clinical trial	56 patients (32 women, 24 men, mean age 48) treated for plantar fasciopathy at a sports medicine center in British Columbia	The Foot and Ankle Disability Index (FADI) at baseline, week 6, and week 12 was the primary outcome	Positive clinical and structural improvements were seen with both PT and steroid injection, and PT was as effective as dexamethasone at 6 and 12 weeks	Adequate
Related Evidence Statement: Adequate for some evidence that in workers who spend the majority of working hours on their feet and who have developed plantar fasciopathy, a physical therapy program consisting of exercises which combine gastrocnemius stretching, plantar fascia stretching, balance exercises, and ankle inversion/eversion exercises produce functional and symptomatic benefits equal to those of a single injection of 4 mg of dexamethasone at 6 and at 12 weeks						
Sagi HC, Jordan CJ, et al., 2014	Does indomethacin decrease the rate of occurrence of heterotopic ossification (HO) after acetabular fracture surgery, and does it affect the rate of nonunion when used in this manner?	Randomized clinical trial	98 patients (71 men, 27 women, mean age 40.8) treated for acute acetabular fractures requiring operative treatment at a Level I trauma center in Tampa	Patients underwent pelvic CT at 6 months to assess both HO and fracture union The volume of heterotopic bone was determined through computerized volumetric analysis	This study supports the findings of other studies which did not show that indomethacin had a notable effect on HO after acetabular fracture surgery	Adequate
Related Evidence Statement: Adequate for some evidence that a postoperative course of 75 mg of daily indomethacin does not reduce the risk of heterotopic ossification compared to placebo, and that the risk of nonunion may be increased with 6 weeks of indomethacin.						
Saltzman CL,	In patients with ankle	Randomized	36 patients (12 men, 24	The primary outcome	Treatment with a	Adequate

First Author, Year	Intervention/ Research Question	Design	**Population/Sample**	Main Outcome Measures	Author (s)Conclusion	Division Assessment
Hillis SL, et al., 2012	osteoarthritis who are being treated with distraction, are there differences in outcome between fixed distractors which allow no ankle motion and hinged distractors which allow for some ankle motion?	clinical trial	women, mean age 42) treated for ankle osteoarthritis at the University of Iowa	was the change in the overall Ankle Osteoarthritis Scale (AOS) at 52 and at 104 weeks	hinged motion distractor led to better AOS scores than treatment with a fixed distractor at 52 and 104 weeks	
Related Evidence Statement: Adequate for some evidence that when an external distractor is used to treat ankle osteoarthritis in patients under 60, a hinged device which allows for ankle flexion and extension is to be preferred over a fixed distractor which allows for no ankle motion						
Sanders DW, Tieszer C, et al., 2012	To compare the effectiveness of surgical and nonoperative treatment of isolated unstable fractures of the lateral malleolus	Randomized clinical trial	81 patients (41 men, 40 women, mean age 41) treated for acute fractures of the lateral malleolus at the University of Ontario	The principal outcome was the physical component score (PCS) of the SF-36 and the joint-specific Olerud-Molander assessment (OMA) of ankle function	In this study, 81 patients with isolated fibular fractures and positive stress examinations had comparable functional outcomes whether treated operatively or nonoperatively	Adequate
Related Evidence Statement: Adequate for some evidence that in the setting of Weber B fractures of the ankle, in which there is a positive manual external rotation stress examination, in which there is a widening of the radiographic interval between the medial edge of the talar dome and the lateral edge of the medial malleolus upon external rotation of the foot, there are equally good functional outcomes and equally prompt recoveries with operative and with nonoperative treatment. This conclusion should be qualified to note that radiographic malalignment of uncertain functional importance is more often observed with nonoperative treatment, and that younger patients and more active patients warrant consideration of operative treatment						
Sassoon A,	To compare patient-	Sstematic	Patients undergoing total	Among the 3	The available	Marginally

First Author, Year	Intervention/ Research Question	Design	**Population/Sample**	Main Outcome Measures	Author (s)Conclusion	Division Assessment
Nam D, et al., 2015	specific cutting blocks with conventional methods of total knee arthroplasty with respect to (1) neutral mechanical alignment, (2) cost, and (3) clinical results	review of randomized trials and nonrandomized studies	knee arthroplasty (TKA)	randomized trials, the reporting of the data did not lend itself to pooling, and the authors decided not to attempt a meta-analysis of findings However, there was consistency among the 3 RCTs with respect to main conclusions regarding joint alignment	literature does not clearly support PSI over conventional cutting blocks for any outcomes of TKA	adequate
Related Evidence Statement: Marginally adequate systematic review which will support a statement that there is good evidence that in the setting of total knee replacement, the use of patient-specific cutting instrumentation does not offer benefits over conventional instrumentation in terms of postoperative radiographic joint alignment.						
Schofer MD, Block JE, et al., 2010	In the setting of delayed union in a tibial fracture, does low-intensity pulsed ultrasound (LIPUS) increase the rate of fracture healing	Randomized clinical trial	101 patients (24 women, 77 men, mean age 44) treated for delayed tibial union at 6 hospitals in Germany	Primary outcomes were bone mineral density (BMD) and gap area at the fracture site, all assessed by CT which was evaluated at a central radiology lab 16 weeks after the beginning of the initiation of LIPUS or sham LIPUS	LIPUS accelerates the healing process and probably improves the odds of achieving a solid union in patients with delayed union of tibial fractures	Adequate
Related Evidence Statement: Adequate for some evidence that in the setting of tibial fractures which have delayed union at 16 weeks, low-intensity pulsed ultrasound may accelerate gains in bone mineral density and fracture gap area when used daily for 16 weeks						

First Author, Year	Intervention/ Research Question	Design	**Population/Sample**	Main Outcome Measures	Author (s)Conclusion	Division Assessment
Skou ST, Roos EM, Laursen MB, et al., 2015	To compare the effectiveness of total knee replacement (TCR) with nonsurgical treatment in patients with moderate to severe knee osteoarthritis (OA)	Randomized clinical trial	100 patients (62 women, 38 men, mean age 66) treated for knee OA at two hospitals in Denmark	Primary outcome was the between-group difference in change from baseline to 12 months on four Knee Injury and Osteoarthritis Outcome Score ($KOOS_4$) subscales covering pain, symptoms, activities of daily life (ADL), and quality of life	In patients with knee OA who are eligible for unilateral knee replacement, TKR followed by nonsurgical rehabilitation treatment is more effective than nonsurgical treatment alone in improving pain, knee function, and quality of life 12 months after treatment is begun	High quality
Related Evidence Statement: High quality study supporting good evidence that in patients with knee OA and with moderate level pain, total knee replacement followed by nonsurgical rehabilitation leads to improvements in knee symptoms, function, and quality of life which are superior to nonsurgical rehabilitation alone. However, adverse events such as deep vein thrombosis and knee stiffness requiring manipulation under anesthesia occur in approximately 16% of knee replacements, and as many as 75% of patients can improve symptomatically over the course of 12 months with nonsurgical rehabilitation alone, and a shared decision-making process is appropriate for knee OA patients who are eligible for knee replacement.						
Snoeker BA, Bakker EW, et al., 2013	What are the factors that increase the risk for meniscal tears	Systematic review and meta-analysis of randomized trials, cohort studies ,and case-control studies	subjects over the age of 16 with knee disorders	The initial search yielded 1709 studies; 52 full-text articles were assessed for eligibility, and 11 full-text articles were included for analysis; 10 of these were included in quantitative synthesis (meta-analysis)	Age, male gender, work-related kneeling and squatting, and climbing more than 30 flights of stairs are risk factors for degenerative meniscal tears (at least doubling the risk), and BMI over 25 is also a likely risk	Adequate meta-analysis

First Author, Year	Intervention/ Research Question	Design	**Population/Sample**	Main Outcome Measures	Author (s)Conclusion	Division Assessment
					factor	
Related Evidence Statement: Adequate meta-analysis of observational studies providing good evidence for an increased risk of degenerative meniscal tears with age over 60, BMI over 25, male gender, work-related kneeling and squatting, and climbing greater than 30 flights of stairs, and for an increased risk of acute tears with soccer and rugby. Adequate for good evidence that medial meniscal tears are more commonly present when ACL reconstruction is done more than 12 months after injury than when it is done within 12 months of injury						
Sultan MJ, Zhing T, et al., 2014	To compare compression stocking with a tubular elastic support in the management of ankle fractures	Randomized clinical trial	90 patients (54 women, 36 men, mean age 47) treated for acute ankle fractures at the University of Manchester in the UK	The primary outcome was the Olerud–Molander ankle score (OMAS), a patient questionnaire assessing function based on pain, stiffness, swelling, stair climbing, running, jumping, squatting, and the use of a walker, with a best score of 100 and a worst score of 0	AIS applied as soon as possible after an ankle fracture reduces swelling, and in comparison to a tubular bandage, AIS leads to greater functional gains during the first six months after treatment of the ankle fracture	High quality study
Related Evidence Statement: High quality study with good evidence that in the setting of ankle fractures immobilized with a removable boot, a below-the-knee ankle injury stocking is more effective than a tubular bandage in controlling swelling and in yielding functional gains six months after the initial injury.						
Tang X, Liu G, et al., 2013	To estimate the association between obesity and risk of hip fracture from the available published prospective cohort studies	Systematic review and meta-analysis of prospective cohort studies	Adults at risk of hip fracture, presumably drawn from the general population of the countries in which the studies were conducted	23 full-text papers were initially included for the analysis, and after exclusion of 10 studies for not meeting all inclusion criteria, 15 studies were selected for the meta-analysis, with a	Obesity significantly reduces the risk of hip fracture in adults, and is probably a protective factor of hip fracture	High quality

First Author, Year	Intervention/ Research Question	Design	**Population/Sample**	Main Outcome Measures	Author (s)Conclusion	Division Assessment
				total of 3,126,313 subjects		
Related Evidence Statement: High quality meta-analysis with strong evidence that in adults at risk of hip fracture, obesity, defined as a BMI of 30 or greater, is associated with a substantial reduction in the risk of hip fracture compared to non-obese persons						
Thienpont E., 2014	To compare the effectiveness of advanced cryotherapy devices with that of cold pack in alleviating pain and decreasing narcotic use in patients undergoing knee arthroplasty	Randomized clinical trial	100 patients (25 men, 75 women, mean age 68) undergoing knee arthroplasty at a University orthopedics department in Brussels	The primary outcomes were (1) scores of postoperative pain (VAS at rest and during active deep knee flexion) and (2) analgesic use measured as morphine and tramadol consumption	Advanced cryotherapy devices do not offer any advantages over conventional cold packs in the setting of knee replacement for OA	High quality
Related Evidence Statement: High quality study which supports good evidence that a conventional cold pack is as effective as an advanced computer-controlled cryotherapy device in relieving pain after knee arthroplasty for osteoarthritis						
Thomas G, Whalley H, Modi C., 2009	To review the evidence in favor of early motion after joint fixation in ankle fractures	Systematic review of clinical trials	Patients with operatively treated ankle fractures using any type of internal fixation that allowed ankle joint motion	9 studies published between 1986 and 2007 met the inclusion criteria All studies were randomized but the quality of randomization varied	There is good evidence to show that treatment with early mobilization as compared with cast immobilization is associated with a faster return to work on average, with improved range of motion at 9 to 12 weeks, but is	Marginally adequate

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					associated with an increased risk of wound infection	
Related Evidence Statement: Marginally adequate systematic review which is not sufficient to support a "good evidence" statement for any outcome, but which gives some evidence that immediate mobilization with a brace on the day of fracture surgery leads to a higher risk of wound infection than with an immobilizing cast, and some evidence that if mobilization is done with a removable brace after primary wound healing has taken place, range of motion happens earlier and return to work happens more quickly						
Thomson CE, Beggs I, et al., 2013	All patients were given an individually fitted ethylene-vinyl acetate shoe orthotic with a medial arch and metatarsal dome support	Randomized clinical trial	131 patients (111 women, 20 men, mean age 53) treated for a diagnosis of Morton neuroma at a hospital in Edinburgh	The primary outcome was a global self-reported foot health thermometer, with a score of 0 for the worst imaginable health state and a score of 100 for the best imaginable health state, adapted from the EQ-5D scale for global quality of life	Corticosteroid injection plus local anesthetic improved global assessment of foot health more successfully than the injection of local anesthetic alone	Adequate for some evidence
Related Evidence Statement: Adequate for some evidence that an ultrasound-guided injection of methylprednisolone improves global perception of foot health more effectively than an injection of local anesthetic at one month and at three months, but there is no information regarding the effectiveness of an injection for preventing the need for surgery at a later date						
Trelle S, Reichenbach S, et al., 2011	Cardiovascular safety of non-steroidal anti-inflammatory drugs	Meta-analysis of randomized clinical trials	Patients treated with NSAIDs for any indication other than cancer	31 trials evaluating 7 NSAIDs were include in the analyses	Naproxen seemed the least harmful of the NSAIDS analyzed in the meta-analysis Several other drugs (ibuprofen and diclofenac) are	High quality

First Author, Year	Intervention/ Research Question	Design	**Population/Sample**	Main Outcome Measures	Author (s)Conclusion	Division Assessment
					associated with a 30% risk increase for several cardiovascular outcomes	
Related Evidence Statement: High quality for evidence that naproxen has a more favorable cardiovascular profile than other NSAIDS when used over a long period for chronic pain.						
van de Water ATM & Speksnijder CM., 2010	What is the efficacy of a taping construction as an intervention or as part of an intervention in patients with plantar fasciosis on pain and disability?	Systematic review	Any type of taping either alone or in combination with other non-surgical treatments No treatment, placebo, or any non-surgical treatment	Interrater agreement on methodological quality and clinical relevance calculated using Cohen K. 33 potentially relevant studies were identified, and 5 met inclusion criteria: 4 RCTs and one non-randomized controlled clinical trial.	There is limited evidence that low-Dye and calcaneal taping can reduce short-term pain in patients with plantar fasciosis	Adequate quality evidence
Related Evidence Statement: Adequate quality evidence for small to moderate short-term (1 week) pain reduction from calcaneal or low-Dye taping with or without stretching						
Wei LC, Lei GH, et al., 2012	To evaluate the effect of PRP when used in conjunction with bone allograft for displaced intra-articular calcaneal fractures in terms of allograft incorporation, bone	Randomized clinical trial	254 patients with 276 fractures (148 men, 106 women, mean age 46) treated for Sanders III calcaneal fractures at the department of orthopedics at XiangYa University in Hunan, China	Radiographic assessment was done with lateral x-ray and 3D CT reconstructions to assess the architecture of the calcaneus: the length, the width, and the height, Bohler's	Autograft involves some donor site morbidity which means that the violation of the iliac crest is not worth any advantages over allograft	Adequate for some evidence

First Author, Year	Intervention/ Research Question	Design	**Population/Sample**	Main Outcome Measures	Author (s)Conclusion	Division Assessment
	healing, and functional outcome			angle , and Gissane's angle		
Related Evidence Statement: Adequate for some evidence that in the open reduction of intra-articular calcaneal fractures, allograft yields anatomic and functional outcomes equal to those achieved with iliac crest autograft, and that donor site morbidity can be avoided if this is done. Inadequate for evidence that PRP enhances the outcomes of fracture reduction in a clinically relevant manner (study is overpowered to find small and unimportant differences in radiologic outcomes).						
Yang Z-G, Chen W-P, Wu L-D., 2012	To estimate the effectiveness of tranexamic acid (TXA) in the setting of total knee arthroplasty (TKA) for the prevention of blood loss	Meta-analysis of randomized clinical trials	Adults undergoing TKA in which a pneumatic tourniquet was used intraoperatively 15 randomized trials with 837 patients of TXA for TKA were retrieved, including 608 women and 229 men, with mean ages ranging from 62 to 78 years	Outcomes such as blood loss and number of transfusion units were analyzed in terms of means and standard deviations, while PE, DVT, and need for transfusion were analyzed in terms of odds ratios	TXA in the setting of TKA is safe and effective for reduction of blood loss, number of transfusion units, and the risk of needing a transfusion	Adequate meta-analysis
Related Evidence Statement: Adequate meta-analysis with strong evidence that tranexamic acid in the setting of total knee arthroplasty reduces blood loss, reduces the risk of transfusion, and reduces the number of units transfused, without increasing the risk of pulmonary embolus or deep vein thrombosis						
Yim JH, Seon J-K. et al., 2013	In patients with a horizontal degenerative tear of the medial meniscus, does arthroscopic meniscectomy yield better outcomes than nonoperative treatment?	Randomized clinical trial	102 patients (81 women, 21 men, mean age 57) who had analyzable data in a randomized trial for degenerative meniscal tears in a university setting in Korea	Clinical results were assessed with the VAS pain scores, the Lysholm knee score, and the Tegner activity scale	Both arthroscopic meniscectomy and nonoperative treatment result in substantial improvements in knee function in the setting of degenerative tears of the medial meniscus, but there	Adequate

First Author, Year	Intervention/ Research Question	Design	**Population/Sample**	Main Outcome Measures	Author (s)Conclusion	Division Assessment
					are no differences in outcome at 2 years from the beginning of treatment	
Related Evidence Statement: Adequate for some evidence that in patients with degenerative tears of the medial meniscus, a conservative treatment plan which includes both supervised physical therapy and a home exercise program may yield substantial functional and symptomatic benefits similar to the benefits of arthroscopic meniscectomy when measured 2 years after the beginning of treatment						
Zhao D, Cui D, et al., 2012	To assess the effectiveness of bone marrow derived and cultured mesenchymal stem cells in the setting of core decompression for osteonecrosis of the femoral head	Randomized clinical trial	100 patients (53 men, 47 women, mean age 33) treated for osteonecrosis of the femoral head at a university orthopedics department in China	Primary outcome was radiographic progression of the osteonecrotic lesion at 60 months, done by radiologists who were unaware of group assignment	Compared with CD alone, BMMSC can significantly delay or avoid the progress of early-stage osteonecrosis of the hip	Adequate
Related Evidence Statement: Adequate for some evidence that in the setting of core decompression, the use of bone marrow derived mesenchymal stem cells, taken from subtrochanteric marrow, cultured in vitro for two weeks, and implanted back into the necrotic lesion, greatly reduces the rate of progression of the disease process over the following five years, and similarly reduces the need for total hip replacement						
Bennell KL, Egerton T, Martin J, and et al., 2014	To determine if a 12-week multimodal physical therapy program, including manual therapy, exercise, and education, leads to greater improvements in pain and physical function than sham physical therapy	Randomized clinical trial	100 community volunteers aged 50 years of age or older with radiographically confirmed hip osteoarthritis (OA) participated in the study and were randomly assigned to 1 of 2 groups, an active intervention group (n = 49, mean age =	Two primary outcome variables were included (self-reported) to measure hip pain and function at week 13.	The results of this clinical trial demonstrated that a 12-week multimodal physical therapy treatment typical of current practice for people with symptomatic hip osteoarthritis did not confer additional	Adequate

First Author, Year	Intervention/ Research Question	Design	**Population/Sample**	Main Outcome Measures	Author (s)Conclusion	Division Assessment
	among people with symptomatic hip osteoarthritis.		64.5) or a sham intervention group (n = 53, mean age = 62.7).		benefits over a realistic sham treatment that controlled for the therapeutic environment, therapist contact time, and home tasks. Both groups showed significant improvements in pain and function following treatment.	
Related Evidence Statement: This adequate study provides some evidence that a 12-week multimodal physical therapy program, consisting of a combination of manual therapy, exercise, and education, provides no additional reductions in pain or improvements in physical function than sham physical therapy among people with hip osteoarthritis.						
Bloomer BA, and Durall CJ., 2014	To evaluate the effects of adding hip muscle strengthening to a knee-focused strengthening and stretching exercise program to help reduce pain and improve function for individuals with patellofemoral pain syndrome (PFPS).	Systematic Review and meta-analysis of randomized clinical trials	Adults with patellofemoral pain syndrome (PFPS)	Overall 4 RCTs with a total of 170 participants with PFPS were included in this review. Ages ranged from 17 to 40 years with mean age ranges of 21-25 years. Thirteen (8%) males and 157 (92%) females participated. All 4 studies were RCTs directly comparing knee-focused exercises	Current high-quality evidence (level 1b evidence) supports the addition of hip muscle strengthening to knee-focused strengthening and stretching for individuals with PFPF to help reduce pain and improve function.	Adequate quality meta-analysis

First Author, Year	Intervention/ Research Question	Design	**Population/Sample**	Main Outcome Measures	Author (s)Conclusion	Division Assessment
				combined with hip muscle strengthening exercises to knee-focused exercises alone to address PFPS, and one study also included a non-treatment control group.		
Related Evidence Statement: Adequate quality meta-analysis which supports good evidence that the addition of hip muscle strengthening exercises to knee-focused strengthening and stretching exercises results in greater improvements in pain and function and is more effective than knee-strengthening exercises alone in individuals with patellofemoral pain syndrome (PFPS).						
Boese CK, Weis M, Phillips T, and et al., 2014	To evaluate the effects of early aggressive continuous passive motion (CPM) and fixed flexion CPM preceding progressive CPM on the short-term outcomes of range of motion (ROM), pain, and hospital length of stay compared to standardized physical therapy alone in patients after total knee arthroplasty (TKA).	Randomized clinical trial	A total of 160 patients who were scheduled to undergo a primary TKA (107 females, 53 males, mean age 68 years) were recruited by one of four surgeons at Alegent Creighton Health Mercy Hospital in Council Bluffs, Iowa. Patients were randomized into one of 3 treatment groups; Group A-CPM device on and moving from the immediate post- operative period (N = 55), Group B-CPM device on and stationary at 90 degree flexion for the first night	Primary outcome measures included; self-reported pain scores 30 minutes prior to morning and afternoon physical therapy sessions on postoperative days 1 and 2 using the visual analog scale (VAS); Active flexion and extension ROM measurements collected preoperatively, at each morning PT session on postoperative days 1 and 2, and 3-4 weeks	CPM provided no apparent benefit to patients recovering from TKA in all outcome variables. We found no clinically significant differences in ROM, swelling, blood loss, pain scores, or active ROM between any of the groups at any time.	Adequate

First Author, Year	Intervention/ Research Question	Design	**Population/Sample**	Main Outcome Measures	Author (s)Conclusion	Division Assessment
			and then moving throughout the rest of their stay (N = 51), and Group C- no CPM (N = 54).	after surgery; Hospital length of stay.		
Related Evidence Statement: This adequate study provides some evidence that there are no beneficial effects of early aggressive continuous passive motion (CPM) and fixed flexion CPM preceding progressive CPM on the short-term outcomes of range of motion (ROM), pain, and hospital length of stay compared to standardized physical therapy alone in patients following total knee arthroplasty.						
Cameron M, Chrubasik S., 2013 **	To evaluate the evidence on effectiveness for topical and oral herbal therapies for treating patients with knee or hip OA.	Cochrane Systematic Review and Meta-Analyses	single study of 174 people with hand osteoarthritis single trial of 99 people with knee osteoarthritis a single trial of 220 people with knee osteoarthritis	Pooling of results was not possible with topical therapies due to single and non-comparable studies.		Moderate quality evidence
Related Evidence Statement: Moderate quality evidence from a single study of 174 people with hand osteoarthritis indicated that treatment with **Arnica extract gel** probably results in similar benefits as treatment with ibuprofen (non-steroidal anti-inflammatory drug) with a similar number of adverse events. Moderate quality evidence from a single trial of 99 people with knee osteoarthritis indicated that compared with placebo, **Capsicum extract gel** probably does not improve pain or knee function, and is commonly associated with treatment-related adverse events including skin irritation and a burning sensation. Moderate quality evidence from a single trial of 220 people with knee osteoarthritis suggested that **comfrey extract gel** probably improves pain without increasing adverse events. Treatment with comfrey reduced pain by a mean of 41.5 points (MD -41.5, 95% CI -48 to -34), an absolute reduction of 42%. Function was not reported.						
Cameron M, Chrubasik S., 2014 **	To evaluate the evidence on effectiveness for topical and oral herbal therapies for treating patients with knee or hip OA.	Cochrane Systematic Review and Meta-Analyses	Due to differing interventions, meta-analyses were restricted to *Boswellia serrata* (mono-herbal) and avocado-soybean unsaponifiables (ASU) (two herb	Five studies of three different extracts from **Boswellia serrata** were included	There is high-quality evidence from 2 studies (85 participants) by the same author that in people with osteoarthritis, 90 days	Adequate quality meta-analysis

First Author, Year	Intervention/ Research Question	Design	**Population/Sample**	Main Outcome Measures	Author (s)Conclusion	Division Assessment
			combination) products.		of treatment with 100 mg of enriched **Boswellia serrata** extract slightly improved pain and function compared to placebo and showed trends of benefits that warrant further investigation. Further research is unlikely to change these estimates.	
Related Evidence Statement: This adequate quality meta-analysis supports good evidence that ***Boswellia serrata*** is marginally effective for decreasing pain and improving function in treating patients with knee or hip OA.						
Escalante Y, García-Hermoso A, et al., 2011	To summarize evidence for the effectiveness and structure of different physical exercise programs on functional aerobic capacity (ability to perform activities of daily living that require sustained aerobic metabolism) in patients with hip and knee osteoarthritis.	Systematic Review and meta-analysis of randomized clinical trials	Adults with hip or knee osteoarthritis (OA) according to the criteria of the American College of Rheumatology.	Overall 20 studies with a total of 2142 participants with symptomatic hip or knee OA were included. Nineteen were RCTs and one was a controlled clinical trial. Only six RCTs had more than 50 participants in each allocation. Only 4 of 13 RCTs used in the pooled analyses had more than 50 participants in each allocation.	The results of this systematic review provide moderate quality evidence that exercise programs based on tai chi, aerobic, and mixed exercise, and not hydrotherapy programs, are effective in improving functional aerobic capacity in patients with hip and knee osteoarthritis.	Adequate

First Author, Year	Intervention/ Research Question	Design	**Population/Sample**	Main Outcome Measures	Author (s)Conclusion	Division Assessment
Related Evidence Statement: An adequate quality systematic review and meta-analysis which supports good evidence that exercise programs based on tai chi, aerobic, and mixed exercise, and not hydrotherapy programs, are effective in improving functional aerobic capacity in patients with hip and knee osteoarthritis.						
Fransen M, McConnell S, et al., 2014 **	To determine whether land-based therapeutic exercise is beneficial for people with hip OA in terms of reduced joint pain and improved physical function and quality of life.	Meta-analysis of randomized clinical trials	Participants 18 years of age or over with clinical radiologic confirmation of hip osteoarthritis (OA) as defined using accepted criteria or self-reported hip OA based on chronic anterior joint pain. Overall 10 studies with 549 participants with mostly mild-to-moderate symptomatic hip OA, alone or with knee OA were included. Only two RCTs had more than 50 participants in each allocation.	Nine RCTs were included in the meta-analysis for the immediate post-treatment function outcome with 521 participants.	The overall results of the meta-analysis (high-level evidence) suggest that land-based exercise is beneficial in terms of reduced pain and improved physical function at the completion of a supervised exercise program and these benefits are sustained for at least a further three to six months among people with symptomatic hip OA.	High quality
Related Evidence Statement: High quality Cochrane meta-analysis which supports strong evidence that land-based exercise shows a small clinically important benefit for the relief of pain and improvement in function at the completion of a supervised exercise program and these benefits are sustained for at least another three to six months among people with symptomatic osteoarthritis of the hip.						
Fukuda TY, Melo WP, Zaffalon BM, and et al., 2012	To determine if adding hip strengthening exercises to a conventional knee exercise program	Randomized clinical trial	54 female volunteers aged 20 to 40 years of age with unilateral PFPS participated in the study and were randomly assigned to 1 of 2 groups,	Four primary outcome variables were included (3 were self-reported) to measure knee pain and function.	**T**he results of this clinical trial demonstrated the long-term effectiveness of hip-strengthening	Adequate

First Author, Year	Intervention/ Research Question	Design	**Population/Sample**	Main Outcome Measures	Author (s)Conclusion	Division Assessment
	produces better long-term outcomes than conventional knee exercises alone in women with patellofemoral pain syndrome (PFPS).		a knee exercise group (KE; n = 26, mean age = 23) or a knee and hip exercise group (KHE; n = 28, mean age = 22). Two patients in the KE and 3 patients in the KHE group did not complete the study.		exercises to supplement a conventional knee exercise program for improving function and reducing pain in sedentary women with PFPS. The group that performed a combination of hip and knee exercises showed significant improvements for all outcome measures at 3, 6, and 12 months post-treatment, in contrast to the group that performed knee exercises alone, which only showed significant improvement in pain at 3 and 6 months post-treatment.	
Related Evidence Statement: This adequate quality study supports some evidence that a treatment approach consisting of a combination of hip- and knee-strengthening exercises was more effective in improving function and reducing pain over a 1-year period than knee-strengthening exercises alone in sedentary women with PFPS.						
Harding AK, Dahl AW, Geijer M, and et al., 2011	To determine whether a post-surgery single infusion of zoledronic acid reduces the time	Randomized clinical trial	A total of 46 participants (10 females, 36 males, mean age 49 years) who underwent a tibial	The primary outcome was clinical fracture healing, evaluated blind, to determine	Our results demonstrated no difference in the effect of zoledronic	Adequate

First Author, Year	Intervention/ Research Question	Design	**Population/Sample**	Main Outcome Measures	Author (s)Conclusion	Division Assessment
	to clinical osteotomy healing compared to a control infusion.		osteotomy and were operated on for knee OA by the hemicallotasis technique (HCO) were included in the study.	whether one single infusion of zoledronic acid could reduce the time to fracture healing.	acid on fracture healing. With the time from surgery to extraction the same in both groups, it appears that the intervention of a single infusion of zoledronic acid did not shorten the healing time and did not exhibit any differences between the groups.	
Related Evidence Statement: This adequate study provides some evidence that a post-surgery single infusion of zoledronic acid is not effective in reducing the time to clinical osteotomy healing compared to a control infusion.						
Harvey LA, Brosseau L, and Herbert RD., 2014 **	To assess the benefits and harms of continuous passive motion (CPM) and standard postoperative care versus similar postoperative care, with or without additional knee exercises, in people with knee arthroplasty.	Meta-analysis of randomized clinical trials	Any age persons diagnosed with knee arthritis prior to total knee arthroplasty in a hospital 24 studies were included with 1335 people randomized	There was moderate-quality evidence from 10 studies (470 participants) showing that CPM does not have statistically significant or clinically important short-term effects on active knee flexion ROM.	The effects of continuous passive motion (CPM) on range of motion (ROM), pain, function, and quality of life are too small and clinically unimportant to justify its use and costs.	High quality

First Author, Year	Intervention/ Research Question	Design	**Population/Sample**	Main Outcome Measures	Author (s)Conclusion	Division Assessment
Related Evidence Statement: High quality Cochrane meta-analysis which supports good evidence that in people with osteoarthritis of the knee, continuous passive motion following total knee arthroplasty does not have clinically important short-term effects on active knee flexion ROM or medium-term effects on function or quality of life.						
Hatef MR, Mirfeizi Z, Sahebari M, et al., 2014	To compare the effectiveness of laterally elevated and neutrally wedged insoles in patients with medial compartment knee osteoarthritis.	Double-blind parallel treatment trial	150 patients with mild to moderate medial compartment knee osteoarthritis (OA) according to the Kellgren and Lawrence scale enrolled in this clinical trial; 118 completed the study in northeast Iran (Group A: 49 female and 8 male, mean age 48.2) and (Group B: 52 female and 9 male, mean age 48.6).	The primary outcome measures were the EKFS for function, the VAS for knee pain and the numbers of NSAIDs taken to relieve knee pain. Outcome measures were compared before and after intervention between the two groups.	This study demonstrated that laterally elevated wedged insoles are significantly more effective than neutrally wedged insoles for pain reduction in medial knee OA, but both significantly reduced knee pain.	Adequate
Related Evidence Statement: This study is adequate for some evidence that laterally elevated wedged insoles are more effective in reducing pain, improving function, and reducing NSAID usage than neutrally wedged insoles in adults with medial compartment knee osteoarthritis. Participants wore the neutral insoles more consistently than the elevated insoles, and this may reflect on their comfort and greater acceptance of use.						
Hinman RS, McCrory P, Pirotta M, and et al., 2014	To determine the efficacy of laser and needle acupuncture for chronic knee pain.	Randomized clinical trial	282 community volunteers (143 males, 139 females) aged ≥50 years with chronic knee pain were recruited from metropolitan Melbourne and regional Victoria, Australia from February 2010 to December 2012 via advertisements in the media and at clinics.	Primary outcome variables included self-reported average knee pain and function over the previous week at 12 weeks follow-up.	Needle and active laser acupuncture were no more effective than sham laser acupuncture. Even though needle and active laser acupuncture improved pain after treatment compared with control after 12	Good evidence

First Author, Year	Intervention/ Research Question	Design	**Population/Sample**	Main Outcome Measures	Author (s)Conclusion	Division Assessment
					weeks, improvements were not sustained at 1 year and were of a clinically unimportant magnitude.	
Related Evidence Statement: There is good evidence that the small therapeutic effects of needle acupuncture, active laser acupuncture, and sham laser acupuncture for reducing pain or improving function among patients older than 50 years with moderate to severe chronic knee pain from symptoms of osteoarthritis are due to non-specific effects similar to placebo, and that acupuncture should only be offered as an option to patients who express interest in receiving it, and who expect to benefit from it.						
Husby VS, Helgerud J, Bjørgen S, and et al., 2009 **Husby VS, Helgerud J, Bjørgen S, and et al., 2010**	To determine if adding a maximal strength training intervention to a conventional hip rehabilitation program in the early postoperative phase after undergoing total hip arthroplasty (THA) produces better short-term and long-term outcomes.	Randomized clinical trial	Twenty-four volunteers (9 men, 15 women) aged < 70 years of age with hip osteoarthritis (OA) scheduled for THA were recruited to participate in the study from the orthopedic department at a University hospital in Norway.	Three primary outcome variables were included: 1) leg press muscle strength, 2) abduction strength, and 3) work efficiency measured at 3 time points between the 2 studies: 1) 5 weeks postoperatively after the rehabilitation training, 2) 6 months after THA, and 3) 12 months after THA.	The results of this clinical trial demonstrated that it is both appropriate and safe to carry out maximal strength training 1 week after undergoing THA. The main finding in this study is that the STG showed significantly higher performance in leg press, and hip abduction after the 4-week training intervention compared with the CRG, but these differences were not present at the 6 or 12 months tests.	Adequate

First Author, Year	Intervention/ Research Question	Design	**Population/Sample**	Main Outcome Measures	Author (s)Conclusion	Division Assessment
Related Evidence Statement: This adequate study provides some evidence that adding a 4-week maximal strength training intervention to a conventional hip rehabilitation program in the early postoperative phase after undergoing total hip arthroplasty (THA) is effective in improving lower extremity muscle and hip abductor strength in the short-term (5 weeks post-op), and in improving work efficiency 6 and 12 months after THA better than a conventional hip rehabilitation program alone.						
Jansen MJ, Viechtbauer W, Lenssen AF, and et al., 2011	Strength training alone, exercise therapy alone, and exercise therapy with passive manual mobilization each reduce pain and disability in people with knee osteoarthritis	Systematic review and meta-analysis of randomized clinical trials	Participants were adults with knee osteoarthritis as defined by the original authors. 153 citations were retrieved and screened for inclusion.	The effect size of exercise with additional manual mobilization on pain (0.69) was of moderate size, while the effect sizes of strength training (0.38) and exercise therapy alone (0.34) could be considered small. The effects on physical function tended to be smaller than those on pain, and would be considered moderate or small.	The main findings of this meta-analysis of 12 RCTs with 1262 participants were that all three intervention types were effective at relieving pain and improving physical function for knee OA.	Adequate
Related Evidence Statement: An adequate quality meta-analysis which supports good evidence that supervised exercise therapy with added manual mobilization shows moderate, clinically important reductions in pain compared to non-exercise controls in people with osteoarthritis of the knee.						
Jones RK, Nester CJ, Richards JD, and et al., 2013	To compare the biomechanical and clinical effects of valgus knee braces and lateral wedged insoles in patients with knee	Randomized Cross-Over Study	28 volunteers (16 males, 12 females, mean age 66.3 years) with unilateral medial tibiofemoral osteoarthritis were recruited in the United Kingdom.	The primary clinical outcomes measured were self-reported Western and McMaster Universities Osteoarthritis Index	Both the valgus knee brace and the lateral wedged insole reduced the EKAM during walking. Greatest reductions were achieved by the	Some Evidence

First Author, Year	Intervention/ Research Question	Design	**Population/Sample**	Main Outcome Measures	Author (s)Conclusion	Division Assessment
	osteoarthritis.			(WOMAC) pain score, WOMAC function score, and Visual Analog Scale (VAS) for pain.	lateral wedged insole (12% reduction compared to 7% for the valgus knee brace).	
Related Evidence Statement: This study provides some evidence that conservative management using either the valgus knee brace or the lateral wedged insole reduces pain and improves function in adults with medial tibiofemoral osteoarthritis of the knee. There were no significant differences between the two orthoses in any of the clinical outcomes. Participants wore the insoles more consistently than the braces, and this may reflect convenience and greater acceptance of use.						
Juhl C, Christensen R, Roos EM, and et al., 2014	Impact of Exercise Type and Dose on Pain and Disability in Knee Osteoarthritis	Systematic review and meta-analysis of randomized clinical trials	Participants were adults with clinical or radiological confirmation of knee osteoarthritis in one or both knees as defined by the American College of Rheumatology (ACR) criteria for classification of osteoarthritis 2, 418 citations were retrieved and screened for inclusion.	63% of trials were at low risk of bias (adequate) for sequence generation, 65% were at low risk of bias for concealment of allocation, and 27% were at low risk of bias for incomplete outcome data addressed. Since most trials were not registered, only 2 trials were assessed as adequate in selective outcome reporting.	The main findings of this meta-analysis of 48 RCTs with more than 4,000 patients were that exercise programs focusing on a single type of exercise are more effective in reducing pain and disability than those mixing several types of exercise within the same session	Adequate
Related Evidence Statement: An adequate meta-analysis which supports good evidence that exercise shows moderate, clinically important reductions in pain and disability in people with osteoarthritis of the knee. Furthermore, an optimal exercise program for knee OA should focus on improving aerobic capacity, quadriceps muscle strength, or lower extremity performance. In addition, the exercise program should be supervised, carried out 3 times weekly, and consist of at least 12 sessions. It is suggested that aerobic exercise and strength training should be performed in different sessions in order to achieve the greatest effect.						

First Author, Year	Intervention/ Research Question	Design	**Population/Sample**	Main Outcome Measures	Author (s)Conclusion	Division Assessment
Köybaşi M, Borman P, Kocaoğlu S, and et al., 2010	To evaluate the short and long-term efficacy of ultrasound (US) treatment in combination with conventional physical therapy in patients with primary hip OA	Randomized clinical trial	A total of 45 participants (33 females, 12 males, mean age 65 years) with primary hip OA who self-referred to the Physical Medicine and Rehabilitation outpatient clinic were enrolled in the study and randomized to one of 3 groups	The primary outcome measurements were: Hip pain at rest measured by the VAS, Hip pain during activity by the VAS, 0-100 scale	The results of this study indicated a significant long-term improvement in pain and function, in favor of the additional US therapy.	Adequate
Related Evidence Statement: This adequate study provides some evidence that the addition of ultrasound (US) treatment with conventional physical therapy is more effective in reducing pain and improving function one and 3 months after treatment compared with conventional physical therapy alone in patients with primary hip osteoarthritis.						
Kristensen J, Franklyn-Miller A., 2011	To review the efficacy of resistance training (RT) as a therapeutic modality in various musculoskeletal conditions including tendinopathy, knee osteoarthritis, anterior cruciate ligament reconstruction, and hip replacement surgery.	Systematic review of randomized controlled trials and observational studies	Adult patients having clinically diagnosed tendinopathy (299), knee osteoarthritis (433), anterior cruciate ligament reconstruction (189) and hip replacement surgery (75).	Fifteen studies with a total of 291 patients (mean ages 25-49 years) focused on chronic tendinopathy.	RT is a valid therapeutic tool in the rehabilitation of a variety of musculoskeletal conditions, especially those where loss of muscular strength and functional ability is evident, such as knee osteoarthritis, chronic tendinopathy, and after hip replacement surgery.	Adequate study, good evidence
Related Evidence Statement: This adequate review provides good evidence that 4 weeks of resistance training is effective for improving maximal strength, functional ability, and reducing pain when used as a therapeutic rehabilitation program for various musculoskeletal conditions including chronic tendinopathy, knee osteoarthritis, and after hip replacement surgery.						

First Author, Year	Intervention/ Research Question	Design	**Population/Sample**	Main Outcome Measures	Author (s)Conclusion	Division Assessment
Labraca NS, Castro-Sanchez AM, Mataran-Penarrocha GA, and et al., 2011	To compare the benefits of initiating rehabilitation treatment within 24 hours versus 48–72 hours after total knee arthroplasty for osteoarthritis.	Randomized clinical trial	A total of 273 participants (211 females, 62 males, mean age 66 years) recruited from a single hospital in Spain scheduled for TKA due to OA were randomized to an experimental group (*n* = 138) or to a control group (*n* = 135).	The primary outcome measurement was pain assessment measured by using a visual analogue scale ranging from 0 (no pain) to 10 (worst imaginable pain). Secondary outcome was length of hospital stay in days	This study found that the initiation of rehabilitation within 24 hours of total knee arthroplasty reduced the hospital stay and thus the number of sessions in comparison to a later start of rehabilitation (48–72 hours post-surgery). The earlier onset of rehabilitation also reduced pain.	Adequate
Related Evidence Statement: This adequate study provides some evidence that initiating rehabilitation treatment within 24 hours versus 48–72 hours after total knee arthroplasty for osteoarthritis is more effective in reducing the hospital stay and reducing pain leading to an earlier onset of postoperative recovery.						
Li S, Yu B, Zhou D, and et al., 2013 **	To assess the benefits and harms of electromagnetic fields for the treatment of osteoarthritis as compared to placebo or sham	Meta-analysis of randomized clinical trials	Participants over 18 years of age with clinical or radiological confirmation of knee osteoarthritis as defined using the American College of Rheumatology (ACR) criteria for classification of osteoarthritis	Overall 9 studies were included, 636 participants were randomized, 327 participants in active electromagnetic field treatment groups and 309 participants in placebo groups	The current, limited evidence shows a moderate clinically important benefit of electromagnetic field treatment for the relief of pain in the treatment of knee osteoarthritis.	Adequate
Related Evidence Statement: Adequate quality Cochrane meta-analysis which supports good evidence that electromagnetic field treatment shows a small clinically important benefit for the relief of pain in people with osteoarthritis of the knee. The effect on function is very uncertain.						

First Author, Year	Intervention/ Research Question	Design	**Population/Sample**	Main Outcome Measures	Author (s)Conclusion	Division Assessment
Linton, Steven J. , Boersma, Katja, et al., 2005	The Effects of Cognitive-Behavioral and Physical Therapy Preventive Interventions on Pain-Related Sick Leave	Randomized clinical trial	185 participants at risk for developing long-term disability were recruited from local primary care facilities in Sweden.	Primary outcome variables were sick leave from work and health-care utilization.	The addition of cognitive-behavioral treatment with or without physical therapy to the standard minimal treatment for patients with nonspecific back or neck pain decreases the risk for future disability by more than 5 fold.	Adequate
Related Evidence Statement: This study is adequate for some evidence that a 6-week program of cognitive-behavioral group intervention with or without physical therapy can reduce sick leave, health care utilization, and the risk for developing long-term sick leave disability (≥ 15 days) in workers with nonspecific low back or neck pain compared with simple verbal instruction by a physician.						
Manheimer E, Cheng K, Linde K, et al., 2010 **	For treating people with osteoarthritis of the knee or hip, what are the differences in the effects of traditional needle acupuncture compared with a sham, another active treatment, or with a waiting list control?	Meta-analysis of randomized clinical trials	Adults diagnosed with osteoarthritis of the knee or hip 16 studies with 3498 people were included in the analysis of results	In comparing acupuncture vs a sham control, meta-analysis pooled data from nine studies at 8 weeks (short-term), 8 involving knee OA and one involving hip OA	The effects of true acupuncture relative to sham did not meet the pre-specified thresholds for clinical relevance.	High Quality
Related Evidence Statement: High quality Cochrane meta-analysis which supports good evidence that in people with osteoarthritis of the knee or hip, the effects of true needle acupuncture treatment relative to sham acupuncture may be too small to be perceived by participants as beneficial, and thus may not actually result in significant, clinically relevant functional improvement or significant pain reduction.						
Matassi F,	Range of motion after	Randomized	A total of 122 participants	The primary outcome	The most important	Adequate

First Author, Year	Intervention/ Research Question	Design	**Population/Sample**	Main Outcome Measures	Author (s)Conclusion	Division Assessment
Duerinckx J, Vandenneucker H, and et al., 2014	total knee arthroplasty: the effect of a preoperative home exercise program.	clinical trial	(59 females, 63 males, mean age 66.5 years) scheduled for primary TKA for the treatment of OA in the Orthopedic Surgery Department of the Pellenberg University Hospital, Belgium were recruited into the study and randomized to a treatment group (*n* = 61) or to a control group (*n* = 61).	measurement of the study was to evaluate whether the preoperative home exercise program provided the patient with a better passive flexion 1 year after TKA.	finding of the present study was that the preoperative home exercise program provided better short-term postoperative recovery in terms of reaching 90^0 of knee flexion sooner after TKA and resulting in a shorter hospital stay after TKA.	
Related Evidence Statement: This adequate study provides some evidence that 6-weeks of a home preoperative exercise program prior to knee arthroplasty is more effective in improving range of motion, and knee function before TKA, and in reducing the time to reach functional postoperative recovery (90^0 of knee flexion) after TKA compared with usual care in patients with knee osteoarthritis, but these effects are not sustained one year after TKA.						
Matheson L, Isernhagen S, et al., 2002	To determine the validity of Functional Capacity Evaluation (FCE) testing results, specifically lifting ability and grip force, in terms of subsequent return to work and the level of work to which they returned	Retrospective Study	650 adults of working age (mean age = 41.5 years, 391 males, 259 females) who were not working due to reported functional limitation. Clients were selected from 25 clinics in 16 states and one province in Canada affiliated with the Isernhagen Work System (IWS-FCE).	The study sample consisted of 349 (53.6%) participants who had returned to work and 301 (46.4%) who had not returned to work. Return to work participants were younger (40.1 years vs. 43.2 years) and had been off work for a shorter period of time (6.9 months vs. 17.0 months) (P<.05) than those who did not return to work.	The amount of time a worker was off from work and gender were the 2 factors that had the strongest relationships to whether or not a person returns to work, and time off work had the stronger relationship of the two.	Adequate

First Author, Year	Intervention/ Research Question	Design	**Population/Sample**	Main Outcome Measures	Author (s)Conclusion	Division Assessment
Related Evidence Statement: This study is adequate for some evidence that gender and time off work are important predictors for return to work. Floor-to-waist lifting is also related to return to work, but the strength of the relationship and its relative importance cannot be determined from the data provided in this study.						
Moyer RF, Birmingham TB, Bryant DM, and et al., 2015	To evaluate the effects of valgus knee bracing on pain and function, and to describe compliance and complications, in patients with medial knee osteoarthritis (OA).	Systematic Review and meta-analysis of randomized clinical trials	Adults with medial compartment knee osteoarthritis (OA)	Overall 6 RCTs with a total of 445 participants with knee OA were included. A total of 274 patients used a valgus knee brace.	The pooled results of the meta-analysis of the 6 randomized trials indicates valgus knee bracing improved pain and function in patients with medial knee osteoarthritis. The size of effects on pain and function varied, depending on the type of control intervention that was used.	Adequate
Related Evidence Statement: Adequate quality meta-analysis which supports good evidence that valgus knee bracing provides moderate improvement in pain and function compared to those that do not use another type of orthosis, and provides a small improvement in pain compared to those that do use another type of orthosis among patients with medial knee osteoarthritis.						
Pisters MF, Veenhof C, Schellevis FG, and et al., 2010	To determine if 12 weeks of behavioral graded activity (BGA) results in better long-term effectiveness (5 years after inclusion) than usual exercise therapy (UC; usual	Randomized clinical trial	A total of 200 patients with OA of the hip or knee (154 females, 46 males, mean age 65 years, 97 patients in the BGA intervention group and 103 patients in the UC control group) were recruited by 87	Primary outcome measures were pain in the last 48 hours and physical function, both assessed using the WOMAC, and patient global assessment (PGA).	Both treatment groups showed beneficial effects in the long-term. No significant differences between treatment groups were found on the primary outcome	Adequate

First Author, Year	Intervention/ Research Question	Design	**Population/Sample**	Main Outcome Measures	Author (s)Conclusion	Division Assessment
	care) in patients with osteoarthritis (OA) of the hip or knee.		participating physiotherapists from the region of Utrecht in the Netherlands and by articles about the study in local newspapers.		measures of pain, physical function, and PGA at 5 years follow-up, as well as in patients with only hip OA or in patients with only knee OA.	
Related Evidence Statement: This adequate study provides some evidence that 12 weeks of behavioral graded activity does not result in better long-term effectiveness in reducing pain or improving function at 5 years than usual exercise therapy in patients with osteoarthritis (OA) of the hip or knee.						

First Author, Year	Intervention/ Research Question	Design	**Population/Sample**	Main Outcome Measures	Author (s)Conclusion	Division Assessment
Scolaro JA, Schenker ML, et al., 2014	To assess the association between smoking and the development of fracture nonunion, fracture-healing time, and soft-tissue recovery in patients following operative treatment of long-bone fractures.	Systematic Review and meta-analysis of prospective and retrospective cohort studies	Adults with long bone fractures managed both operatively and nonoperatively	Overall 19 studies were included, seven prospective and twelve retrospective cohort studies. These included 6374 fractures in 6356 patients, 1446 smokers and 4910 nonsmokers. Nine studies evaluated fractures of the tibia, three of the femur or hip, three of the ankle, one of the humerus, and 3 of multiple long bones. Six studies evaluated open fractures only.	The results of this review show that cigarette smoking is associated with an increased nonunion rate of long bone fractures overall, tibial fractures, and open fractures, with nonsignificant trends toward prolonged healing time and increased risk of wound infection.	Adequate
Related Evidence Statement: An adequate systematic review and meta-analysis which supports good evidence that smoking significantly increases the risk of nonunion of long bone fractures overall, tibial fractures, and open fractures compared to nonsmokers in patients following operative treatment of long-bone fractures.						
Spangehl MJ, Clarke HD, Hentz JG and et al., 2015	To compare two modalities of postoperative pain management which included a combined	Randomized clinical trial	A total of 160 patients who presented for unilateral TKA were recruited sequentially at the Mayo Clinic in	The primary outcome measure was the patient's postoperative pain score on the afternoon	Patients receiving periarticular injections had similar pain scores, shorter lengths of hospital	Adequate

First Author, Year	Intervention/ Research Question	Design	**Population/Sample**	Main Outcome Measures	Author (s)Conclusion	Division Assessment
	femoral and sciatic nerve block with periarticular injection as part of a multimodal pain protocol after total knee arthroplasty (TKA) with respect to pain, narcotic use, quadriceps function and length of stay, and peripheral nerve complications.		Phoenix, Arizona for this study (89 females, 71 males, mean age 68 years, mean BMI 31), and randomized into 2 groups in a one-to-one ratio resulting in 79 patients in the peripheral nerve block group (PNB) and 81 patients in the periarticular injection group (PAI).	of postoperative day 1. This pain score was measured at rest on a linear analog scale from 0 to 10 points before the patient's afternoon physical therapy session on the day after surgery (postoperative day 1).	stay, less likelihood of peripheral nerve dysesthesia, but greater narcotic use on the day of surgery compared with patients receiving peripheral nerve blocks.	
Related Evidence Statement: This adequate study provides some evidence that periarticular injections provide comparable pain relief to femoral sciatic nerve blocks as part of postoperative pain management in patients after total knee arthroplasty, but peripheral nerve blocks have a higher rate of peripheral nerve dysesthesia 6 weeks after surgery.						
Svege I, Nordsletten L, Fernandes L, and et al., 2015	To determine if exercise therapy in addition to patient education results in better long-term cumulative survival of the native hip from total hip replacement (THR) compared with patient education alone in patients with osteoarthritis (OA) of the hip.	Randomized clinical trial	A total of 109 patients with OA of the hip (59 females, 50 males, mean age 57.5 years) were recruited by one university hospital, one local hospital, one rehabilitation center, general medical practitioners, and by advertisement in a local newspaper in Oslo, Norway.	The main outcome measure for this long-term follow-up was survival of the native hip from THR.	Participating in both exercise therapy and patient education resulted in significantly higher 6-year cumulative survival of the native hip from THR compared with patient education only. The cumulative survival of the native hip was higher in the exercise therapy group from 1 year	Adequate

First Author, Year	Intervention/ Research Question	Design	**Population/Sample**	Main Outcome Measures	Author (s)Conclusion	Division Assessment
					and throughout the follow-up period.	
Related Evidence Statement: This adequate study provides some evidence that 12 weeks of supervised exercise therapy in addition to patient education results in better long-term cumulative survival of the native hip from total hip replacement (THR) compared with patient education alone in patients with osteoarthritis (OA) of the hip.						
Tungtrongjit Y, Weingkum P, and Saunkool P., 2012	To evaluate the effects of 3-weeks of preoperative quadriceps exercise on postoperative pain and functional outcomes after total knee arthroplasty (TKA) compared with usual care.	Randomized clinical trial	A total of 60 participants (50 females, 10 males, mean age 64.5 years) scheduled for primary TKA for the treatment of OA at Phrae Hospital in Thailand were randomized to a quadriceps strengthening exercise group (n = 30) or to a usual care control group (n = 30).	The primary outcome measure was the modified WOMAC score at 6 months.	Three weeks of preoperative quadriceps exercise before TKA resulted in short-term benefits in the exercise group showing significantly improved quadriceps strength, pain scores, and modified WOMAC scores that were better than the usual care group at 3 months post-TKA.	Adequate
Related Evidence Statement: This adequate study provides some evidence that 3-weeks of a home preoperative quadriceps exercise program prior to knee arthroplasty is more effective in reducing pain, and improving function and quadriceps strength in the short-term up to 3 months postoperatively compared with usual care in patients with knee osteoarthritis, but these effects are not sustained at 6 months after TKA.						
Villadsen A, Overgaard S, Holsgaard-Larsen A, and et al., 2014	To evaluate the efficacy of a supervised, 8-week preoperative program of neuromuscular exercise on the 3 month postoperative effects compared	Randomized clinical trial	A total of 165 participants (92 females, 73 males, mean age 67 years) recruited from a single hospital in Denmark scheduled for THA (84) or TKA (81) due to severe symptomatic OA were	The primary outcome measurements were: a physical muscle function measurement using ADL, HOOS or the KOOS for patients with hip and knee OA. The HOOS and	At 3 months postoperatively (primary endpoint), no additional benefits were seen from the preoperative exercise. Seen over the entire time period from	Adequate

First Author, Year	Intervention/ Research Question	Design	**Population/Sample**	Main Outcome Measures	Author (s)Conclusion	Division Assessment
	with surgery alone prior to hip or knee arthroplasty (TJA).		randomized to a neuromuscular exercise group (EX+TJA, *n* = 84) or to a control group (TJA, *n* = 81).	KOOS are scored on a 0–100 worst to best scale. MCID = 10 points	baseline to 3 months after surgery, this previously validated and feasible exercise program resulted in an earlier onset of postoperative recovery in self-reported function and pain compared with the standard TJA procedure.	
Related Evidence Statement: This adequate study provides some evidence that a supervised, 8-week preoperative program of neuromuscular exercise prior to hip or knee arthroplasty (TJA) is not more effective in reducing pain or improving function 3 months postoperatively compared with surgery alone in patients with severe hip or knee osteoarthritis, but is more effective in improving function and reducing pain 6 weeks after surgery.						
Vuorenmaa M, Ylinen, J, Piitulainen K, and et al., 2014	To evaluate the efficacy of a delayed, long-term12-month home exercise program compared with normal care after primary total knee arthroplasty (TKA).	Randomized clinical trial	A total of 108 participants (66 females, mean age 69 years) recruited from a single hospital in Finland during TKA pre-op visits were randomized to a home-based exercise group (EG, *n* = 53) or to a control group (CG, *n* = 55).	The primary outcome measurements were: pain and functional disability, measured using the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC)	The long-term home exercise program in this study improved physical performance by increasing maximal walking speed and knee flexion strength significantly more in the EG compared with the CG.	Adequate
Related Evidence Statement: This adequate study provides some evidence that a long-term, 12-month home exercise program intervention is not more effective in reducing pain or improving function in patients after primary total knee arthroplasty than a control group receiving normal care, but is more effective in improving walking speed and knee flexion strength.						
Wallis JA,	To determine if pre-	Systematic	Adults with hip or knee	Overall 23 RCTs with	There is moderate	Adequate

First Author, Year	Intervention/ Research Question	Design	**Population/Sample**	Main Outcome Measures	Author (s)Conclusion	Division Assessment
and Taylor NF., 2012	operative exercise provide benefit before and after joint replacement for patients with hip and knee osteoarthritis awaiting lower limb joint replacement surgery.	Review and meta-analysis of randomized clinical trials	osteoarthritis (OA) awaiting hip or knee replacement surgery.	a total of 1461 participants with symptomatic hip or knee OA were included. 922 were awaiting knee replacement, 305 awaiting hip replacement and 234 awaiting either hip or knee replacement. Only four RCTs had more than 50 participants in each allocation.	quality evidence from two small RCTs that preoperative exercise and education programs improve function 3 months after hip replacement.	
Related Evidence Statement: Adequate quality meta-analysis which supports good evidence that preoperative exercise with education programs improve function 3 months after total hip replacement among people with symptomatic osteoarthritis of the hip.						
Wu D, Huang Y, Gu Y, and et al., 2013	Efficacies of different preparations of glucosamine for the treatment of osteoarthritis	Systematic review and meta-analysis of randomized clinical trials	Participants were adults with knee or hip osteoarthritis as defined by the original authors	215 citations were retrieved and screened for inclusion. Overall, 19 trials with 3159 participants reported between 1980 and 2010 met criteria and were included. 15 trials (1941 participants) evaluated GS, and 4 trials (1218 participants) evaluated GH, all compared to placebo	The main findings of this meta-analysis support the fact that GS treatment for more than 6 months improves joint function, but not joint pain, in patients with knee OA. GH is ineffective for relieving pain in OA patients. Additional trials of GS for the treatment of knee or hip OA are needed to	Adequate

First Author, Year	Intervention/ Research Question	Design	**Population/Sample**	Main Outcome Measures	Author (s)Conclusion	Division Assessment
				controls.	confirm this apparent lack of benefit of GS.	
Related Evidence Statement: An adequate meta-analysis which supports good evidence that glucosamine sulfate and glucosamine hydrochloride are ineffective for relieving pain in patients with knee or hip OA, but glucosamine sulfate treatment for more than 6 months shows a small improvement in joint function compared to placebo controls in people with osteoarthritis of the knee or hip.						