Evidence from the research reviewed in this article supports the use of corticosteroid injections as an effective treatment for shoulder pain.

What has been learned
Locally administered steroid injections are effective for patients with painful shoulder. They are better than placebo injection for improving range of motion. Compared to physiotherapy they are better in the short term follow-up (1 week) but similar in the long term (6 months and 1 year) with respect to pain, disability and range of motion.

The Research
Six million new articles reporting results of biomedical research are published each year. For health professionals, consumers and policy-makers, it is an overwhelming task to sift through this information efficiently and to be able to make decisions on patient care, treatment choice and health policy in a timely manner. Traditionally, research results have been summarized in non-systematic narrative reviews. However, these are open to bias as they may involve the author's subjective opinion of an article's quality. Systematic reviews offer a better alternative to these narrative reviews as they apply scientific strategies in ways that limit bias, to the assembly, critical appraisal, and synthesis of all relevant studies that address a specific clinical question. Although systematic reviews should use methods which minimize bias and error, flaws in their methodology may contribute to invalid results. Therefore, critically reviewing systematic reviews is as important as reviewing the individual trials in these reviews. This issue reviews a systematic review article on the common interventions for shoulder pain and a randomized controlled trial (RCT) on painful stiff shoulder published after the latest update of this systematic review. The systematic review and the randomized trial were critically reviewed by two internal Institute reviewers using standard criteria. Two external reviewers provided commentaries on the articles' relevance and applicability.

Steroid Injections and Shoulder Pain
Summary of Research Results

Shoulder pain is a common condition for which people consult primary care providers. In a survey conducted in Finland with 6,526 patients (7,634 visits) who visited a primary care centre, 1,380 presented with musculoskeletal symptoms (21%). Low back pain was the most common reason for men aged 25-54 years, while for women aged 35-74 years, the most common reason was neck and shoulder pain. In the UK 6,000 adults from three family medicine practices were surveyed. The most common site of pain was back (23%), followed by knee (19%) and shoulder (16%).

A multitude of problems are included under the term “shoulder pain”, including fractures, inflammatory diseases, tumor, infections, mechanical disorders and work-related musculoskeletal diseases. For this discussion we chose a recent systematic review that focused on shoulder pain in an adult population irrespective of diagnostic label. Studies examining acute pain (less than 3 months), rheumatoid arthritis and fractures were excluded.

From the range of treatment modalities for shoulder pain examined in this review, we selected injection therapy versus placebo and physiotherapy for a deeper insight.

Systematic Review


Objective: To review the efficacy of common interventions for shoulder pain.

Data Sources: MEDLINE, EMBASE, CINAHL and Science Citation Index from 1966 to 1997, plus handsearch of the major textbooks, bibliographies of relevant literature and subject indices of relevant journals from 1966 to 1997.

Study selection: A study was included if: 1) it was a RCT; 2) the trial included the intervention of interest; 3) the outcome assessment was blinded.
Methodological Quality: All trials were scored according to the criteria developed by Glazier et al which consisted of scoring the patient selection, outcome measurements and treatment effect from trials that were blinded to author, journal and country of origin.

Outcomes: Range of motion (ROM) (degrees), pain and overall effects (0-100 point scales).

Analysis: Effect sizes were calculated and combined in a pooled analysis if study population, endpoint and intervention were comparable.

Results: Thirty one trials met the inclusion criteria. In general, the effect sizes were small, suggesting a lack of clear benefit for any of the treatments investigated. Two studies comparing subacromial steroid injection (triamcinolone) with placebo were pooled in a meta-analysis. Subacromial steroid injection was found to be better than placebo in improving ROM by 35o (95% confidence interval 14o to 55o) but not in reducing pain.

Conclusions: There is little evidence to support or refute the efficacy of common interventions for shoulder pain. The only positive finding was that shoulder steroid injection was found to be better than placebo in improving ROM.

Randomized Control Trial
Van der Windt DAWM, Koes BW, Devillé W, Bocke AJP, De Jong BA, Bouter LM.

“Comparison of results across studies of interventions for shoulder pain would be facilitated if researchers in this field reached a consensus on a minimum common set of standard measures…”

Mr. Dwayne Van Eerd & Dr. Andrea Furlan, MD

Outcomes: Improvement rated on a six point Likert scale; pain rated on 100 mm visual analog scale; 16-item shoulder disability questionnaire; standardized physical examination; and passive ROM with a digital inclinometer. The measures were taken at 3, 7, 13, 26 and 52 weeks after the randomization.

Results: One hundred and nine patients were included, 53 in the injection group and 56 in the physiotherapy group. At 7 weeks 77% of the patients treated with injections were considered to be treatment successes compared to 46% treated with physiotherapy for all outcome measures. Group differences for all outcome measures except restriction of abduction and severity of main complaint were statistically significant (p value <0.05). Success was defined as having made a complete recovery or having had much improvement. At follow-up assessments conducted at 26 and 52 weeks, there were comparatively small differences noted between the groups, although both groups had continued to improve.

Conclusions: Patients treated with corticosteroid injections are significantly more likely to improve on outcome measures of pain and disability than patients treated with physiotherapy. The differences between those who received injections and those treated with physiotherapy result mainly from comparatively fast relief of symptoms that occurs after injections. This advantage is not maintained at the six and twelve months point.

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Objective: To compare the effectiveness of corticosteroid injection with physiotherapy for the treatment of painful stiff shoulder.

Subjects: Consecutive patients who consulted one of 60 general practitioners, had a painful restriction of glenohumeral mobility and were over 18 years old. Patients were excluded if they had bilateral symptoms, had received steroid injection or physiotherapy in the previous 6 months or had contraindications for the intervention.

Interventions: Patients were randomly allocated to 6 weeks of treatment either with (a) triamcinolone 40 mg injection, using the posterior route or (b) 12 sessions of 30 minutes of passive joint mobilization and exercise treatment. Ice, hot packs, or electrotherapy could be used to reduce pain.

Feedback on Infocus
will provide insight into contemporary issues of workplace safety and health as they relate to our audience. Along with healthcare providers, we will focus on researchers and policy makers, as well as employers, employees and other workplace parties.

If you would like to comment on this publication, please contact the editor by e-mail at atwork@iwh.on.ca.
The systematic review by Green et al. received the maximum score for methodological quality. The synthesis of the results was well done and insightful given the nature of the studies reviewed. The authors noted wide variations in outcome measures used in the trials; the follow-up periods in the studies were consistently quite short (2-6 weeks) and they rarely included a measure of disability. Recommendations included: more clinical trials research, the establishment of a uniform method of defining shoulder disorders, and the development of valid, reliable and responsive outcome measures.

Comparison of results across studies of interventions for shoulder pain would be facilitated if researchers in this field reached a consensus on a minimum common set of standard measures as has recently been done for low back pain,¹ where suggested outcomes are pain symptoms, function, well-being, disability, social role and satisfaction with care.

The randomized controlled trial by van der Windt et al. also achieved a high methodological quality score. This study would have been strengthened by adding a sham intervention group, to distinguish between the true effect of the intervention versus a placebo and the effect due to the attention given. There were some differences at baseline between the intervention and control group (gender, concomitant neck pain and dominant side affected) that may have favoured the injection group. It is not clear whether the decision to use intent to treat analysis was problematic (after 7 weeks) given that subjects were free to receive other treatments after this period. A longer follow-up period with no co-interventions may have addressed this concern.

Mr. Dwayne Van Eerd MSc. Kinesiologist
Dr. Andrea Furlan, MD, IWH Evidence-Based Practice Coordinator

The Systematic Review of Randomized Control Trials of Interventions for Painful Shoulder by Green et al. is a provocative study. The authors demonstrate that there is no uniformity in outcome assessment and wide variation in the quality of the 31 trials that met the authors criteria. Incredibly there is little evidence to support or refute the efficacy of common interventions for shoulder pain. This study presents a wake-up call to clinicians treating patients with painful shoulders. Clearly there is much scientific ground to be broken and the public health and economic implications of obtaining scientific information in this regard are potentially far reaching.

The study by van der Windt et al. regarding the effectiveness of corticosteroid injections versus physiotherapy for treatment of painful stiff shoulders is of interest. Notably no diagnosis apart from “painful stiff shoulder” was made and up to three intra-articular injections were given over a six week period of time. Although the study showed a difference between the two groups I believe further investigation in this area is required. There was not a separate group receiving placebo injections. Nor was there a group that received no treatment. The patients were not stratified according to a specific diagnosis. Furthermore at 26 and 52 weeks there were comparatively small differences between the groups. I think the true value of the study lies in the demonstration that such prospective randomized studies can be performed and clearly many more will be required before definitive statements can be made regarding the best method of treatment for this common condition.

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The review by Green et al. crystallized the difficulty in attempting to draw substantial conclusions about interventions for the “painful shoulder”. A “painful shoulder” is a symptom which can be caused by a myriad of pathologies. Even when broadly characterized into rotator cuff disease and adhesive capsulitis there is conflicting criteria and poor agreement of definitions. Due to other inherent research issues of poor methodology, questionable and mixed outcome tools and various follow-up times little useful information is imparted to the clinician.

In the second study, van der Windt et al. defined their use of the “painful stiff shoulder” by only including patients with a specific clinical presentation. The study is well controlled and demonstrates that intra-articular injections can be extremely effective in patients with a characteristic presentation of painful passive restricted glenohumeral joint motion (capsular syndrome, adhesive capsulitis, idiopathic primary frozen shoulder), excluding symptomatic rotator cuff pathology. It is almost impossible to determine that rotator cuff pathology did not initiate the subsequent sequella of symptoms. The practitioner (general, specialist i.e. orthopod and therapist) should consider a glenohumeral joint intra-articular injection in individuals who present with signs and symptoms consistent with “capsular syndrome”. Previous arthroscopic studies have revealed the underlying pathology of synovitis in the described patient presentation. An accurately administered steroid injection should influence the synovitis, however it may not affect the established capsuloligamentous (CL) fibrosis. If the patient or clinicians is adverse to the practice of cortisone injection, the outcome will likely be the same after 6 months of conservative treatment. The practitioner’s ability to place the cortisone in the glenohumeral joint and their personal philosophy toward the use of cortisone must be considered.

The study unfortunately does not attempt to clarify the stage of the pathology (synovitis vs fibrosis) which may influence short term outcome. For instance, someone presenting with little pain and significant restriction will probably respond less to the steroid therapy. I am also concerned that an “either-or” conclusion will be drawn from this study. Physiotherapy has a critical role in patient management through exercise instruction to regain movement lost by established CL fibrosis and identify/treat patients with manual techniques who will/have not respond(ed) to injection therapy. The combination of cortisone injection and physiotherapy may optimize short term pain reduction, ROM and functional outcomes.

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