AXA Health

AXA 33 - Evidence for ultrasound-guided hip joint injections

(Version 33-1: 05/05/2023)

Summary:

Joint injections can be guided by surface anatomy or ultrasound. Blinded hip injections success rate (61% to 74%) is inferior to an ultrasound-guided hip injections success rate of 100%. The only evidence they weren't 100% was in the most severe patients with radiologically grade IV OA when the success rate of ultrasound guidance was 92% compared to 40% for blinded injections.

Fluoroscopy-guided injections were reported as equally accurate compared to ultrasound-guided injections with similar complication rates. But ultrasound-guided injections were considered more convenient and less painful than fluoroscopy-guided hospital-based injections and were preferred by patients who underwent both.

The above study was included in the 2021 review, is ultrasound-guided corticosteroid injection of the hip comparable to fluoroscopy-guided injection for the treatment of hip osteoarthritis? This retrospective study included 32 ultrasound-guided injections compared to convenient and six fluoroscopy-guided injections and reported that the two types of injections were equally accurate and had similar complication rates.

However, the evidence for hip joint injections remains weak, the quality of the evidence is relatively poor, and the injection of saline placebo is as efficacious as active treatments. Furthermore, Hyaluronan injections of the hip are not recommended based on NICE evidence of potential harm.

We also found no evidence to address whether the injected substance (e.g. platelet-rich plasma, viscosupplementation; other autologous blood products) impacts whether the injection should be guided.

Ultrasound-guided hip joint injection are, therefore, highly accurate and rated as AXA level green, meeting the standards of evidence set for safety and efficacy. Ultrasound-guided injections were considered more convenient and less painful than fluoroscopy-guided hospital-based injections and were preferred by patients who underwent both. The choice of imaging guidance procedure should therefore be based on the most cost-effective option.

Technology	Rating	Summary conclusion
AXA 33: Evidence for ultrasound-guided hip joint injections		Ultrasound Image-guided joint injections for hip osteoarthritis are recommended based on the latest guidance, improved accuracy and patient preference.

Background

Joint injections can be undertaken guided by surface anatomy or ultrasound. Ultrasound guidance has been advocated as a technically superior method for performing intra-articular injections, improving injection accuracy in the target intra-articular joint space of large joints. Indications for joint injections can be diagnostic or therapeutic. [1]

The evidence for hip joint injections, however, remains weak. [2] While a 2016 systematic review showed intra-articular steroids in hip osteoarthritis may be efficacious for short-term pain reduction, the quality of the evidence was relatively poor. At the time of the review, 2016, only five trials met the inclusion criteria. An IPD meta-analysis reported that patients with severe pain at baseline significantly benefit from IA glucocorticoid injection more than those with less severe pain at short-term follow-up. [3]

Questions:

1. Does guiding intra-articular hip injections for hip arthritis (corticosteroid or other) lead to clinically significantly better outcomes than anatomically guided or blind injections?
2. If so, how does the method of guiding – fluoroscopy or ultrasound scan – impact safety, efficacy, patient experience and cost?
3. Do the UK and comparable orthopaedic and rheumatology guidelines specify whether intra-articular hip joint injections should be given under image guidance?
4. Does the injected substance (e.g. platelet-rich plasma, viscosupplementation, other autologous blood products) impact whether the injection should be guided?

Population	Adults > 18 years with hip osteoarthritis (Kellgren-Lawrence score I-IV)
Intervention	Intra-articular guided hip injections with 1. hyaluronic acid of different molecular weights, 2. corticosteroids, 3. platelet-rich plasma a 4. saline solution
Comparison	Intra-articular hip injections anatomically guided or blind injections with 1. hyaluronic acid of different molecular weights, 2. corticosteroids, 3. Platelet-rich plasma and 4. saline solution

Outcome	Disability, pain, function, acute reactions, safety, costs and patient experience

Injection Compounds
The most common intra-articular knee injection compounds are corticosteroids, but other drugs have been used, including hyaluronic acid and platelet-rich plasma.

Sometimes injections are used in combination; e;g., corticosteroid type and a local anaesthetic such as lidocaine. The BNF states corticosteroid injections also include Triamcinolone hexacetonide injection, which has various trade names, [4] which is preferred because it is almost insoluble and has a long-acting (depot) effect. Although the BNF reports, its use is unlicensed.

Triamcinolone acetonide and methylprednisolone may also be considered for intra-articular injection into larger joints, whilst hydrocortisone acetate should be reserved for smaller joints or soft-tissue injections. Sometimes injections are used in combination; e;g., corticosteroid type and a local anaesthetic such as lidocaine. [5]

Methods
AXA Health's approach involves learning, adapting, and improving care using high-quality, evidence-based strategies. To achieve this, AXA developed a traffic light system to assess the evidence for developing treatments to identify which treatments are safe and effective.
A combination of evidence from NICE guidance, Systematic Reviews, and Randomised Controlled Trials generates traffic light ratings.

The following definitions are used in the traffic light system:
Green: Conventional Treatments* that have met the standards of evidence we've set for safety and efficacy.
Amber: Unproven Treatments that have met the standards of evidence we've set for safety but not efficacy.
Red: Unproven Treatments* that have not met the standards of evidence we've set for safety.

Search Strategy
The following databases were searched: the Trip Database (www.tripdatabase.com) - which searches the primary higher-level evidence sources, e.g., NICE, AHRQ, Cochrane etc.; PubMed (https://pubmed.ncbi.nlm.nih.gov/) - covers the leading journal articles and Google - used for general searching and to look for specific documents from the FDA, Aetna, NHS etc.

Analysis
Each piece of evidence retrieved is subjected to an assessment of its quality and the overall effect. Based on this evidence, an overall conclusion is reached, and a traffic light rating is awarded where appropriate. This evidence is then shared with key stakeholders for critical feedback.

Results of the Evidence Review

NICE guidance [NG226] Published: 19 October 2022. [6]

No evidence showed that hyaluronan injections improved the quality of life or physical function or reduced pain in people with knee or hip osteoarthritis.

Evidence showed potential harm for hip osteoarthritis. However, based on NICE expert opinion, the committee agreed that results were generalisable to other forms of osteoarthritis and that hyaluronan injections should not be offered.

Technology	Rating	Summary Conclusion
Evidence for Hyaluronan hip joint injections	Red	Hyaluronan injections of the hip are not recommended based on NICE evidence of potential harm.

Q1: Does guiding intra-articular hip injections for hip arthritis (corticosteroid or other) lead to clinically significantly better outcomes than anatomically guided or blind injections?

2016: the British Journal of Sports Medicine published a systematic review on Ultrasound-guided hip joint injections are more accurate than landmark-guided injections. [7]

This included nine studies (431 injections performed in 349 patients): four US-guided (136 hip injections) and five landmark-guided (295 hip injections) studies.

The results reported that US-guided hip injection accuracy was significantly higher than landmark-guided accuracy. The weighted means for US-guided injection accuracies was 100% (95%CI 98% to 100%), and for landmark-guided injection, 72% (56% to 85%). Risk difference 28%.

Since this review, there have been several recent studies published:

A 2020 study on the Accuracy of Blind and Ultrasound-Guided Arthrocentesis of Hip Joint. [8]

This study included 96 patients (187 injections) with uni or bilateral radiologically proven hip osteoarthritis (OA). One blind arthrocentesis by lateral approach was performed on each patient. The accurate position of the needle was verified by a following injection of 0.5-1.0 ml contrast and radiological assessment. After seven days, the same patients (187) underwent a second arthrocentesis under US guidance. The authors concluded that a blind lateral approach for arthrocentesis of the Hip joint is not recommended.

Results

Patient group	Blind arthrocentesis Success rate	US-guided arthrocentesis Success rate
Kellgren-Lawrence (K-L) radiological grade II, OA patients	(97/131) 74%	(131/131) 100%
Radiological grade III, OA patients	19/31 (61%)	31/31 (100%)
Radiological grade IV, OA	10/25 (40%)	23/25 (92%)

2022: Intra-articular Hip Injection Using Anatomical and Radiological Landmarks Without the Use of Ultrasound or Radiological Guidance [9]

This prospective study included 35 patients with hip osteoarthritis or femoroacetabular impingement and reported a combination of radiological and anatomical landmarks to perform intra-articular hip injections were successful in 33/35 (94%) patients without any complications and concluded:

2022: Radiologically Guided Versus Blinded Intra-articular Injection in Patients With Hip Osteoarthritis: A Retrospective Comparative Study [10]

In this retrospective study, 48 patients received corticosteroids, of which 19 were fluoroscopy-guided, and 29 were blinded. In the hyaluronic acid group, 28 were fluoroscopy-guided, and 19 were blinded. The blinded technique without radiological guidance in the outpatient clinic was as effective and safe as the radiologically guided technique administered in the operating room.

Q2: If so, how does the method of guiding – fluoroscopy or ultrasound scan – impact safety, efficacy, patient experience and cost?

2014 study Ultrasound-Guided Hip Injections: A Comparative Study With Fluoroscopy-Guided Injections [11] consisted of the first 50 consecutive patients to undergo ultrasound-guided intra-articular injection of the hip (by a nurse practitioner) and who had previously undergone fluoroscopy-guided intra-articular injections by fellowship-trained musculoskeletal radiologists.

The patients rated the ultrasound and fluoroscopic experiences on a scale from 1 to 10 for convenience and pain; they also indicated their preference between the two techniques. Ultrasound-guided injections were considered more convenient and less painful than

fluoroscopy-guided hospital-based injections and were preferred by patients who underwent both.

The above study was included in the 2021 review, is ultrasound-guided corticosteroid injection of the hip comparable to fluoroscopy-guided injection for the treatment of hip osteoarthritis? [12] This retrospective study included 32 ultrasound-guided injections compared to convenient and six fluoroscopy-guided injections and reported that the two types of injections were equally accurate and had similar complication rates.

Q3: Do the UK and comparable orthopaedic and rheumatology guidelines specify whether intra-articular hip joint injections should be given under image guidance?

NICE's guideline Osteoarthritis in over 16s: diagnosis and Management has a section on Intra-articular injections but does not discuss injection techniques.

The 2019 American College of Rheumatology/Arthritis Foundation Guideline for the Management of Osteoarthritis of the Hand, Hip, and Knee [13] reports:

"Ultrasound guidance for intra-articular glucocorticoid injection is strongly recommended for injection into hip joints.

When available, ultrasound guidance for steroid injection may help ensure accurate drug delivery into the joint but is not required for knee and hand joints. However, imaging guidance for injection into hip joints is strongly recommended."

The 2020 VA/DoD Clinical Practice Guideline for the Non-surgical Management of Hip & Knee Osteoarthritis suggested offering an intra-articular, image-guided corticosteroid injection for patients with persistent pain due to osteoarthritis of the hip inadequately relieved by other interventions." indicating the evidence for this recommendation was weak.

A **2021** Berkshire West Clinical Commissioning Group Thames Valley Priorities Committee Commissioning Policy Statement states:

Consider intra-articular steroid injection as an adjunct to core treatments (patient information, exercise and manual therapy and weight loss as appropriate) for the short-term pain relief of moderate to severe pain in people with hip osteoarthritis. And offer image guidance as clinically appropriate with the most cost-effective imaging option.

2023 Core Recommendations for Osteoarthritis Care: A Systematic Review of Clinical Practice Guidelines [14] looked at 11 osteoarthritis guidelines (not restricted to hip) and, from this, derived several consensus recommendations ("could do"), including ultrasound-guided injections.

Finally, Aetna has a document on ultrasound guidance (last reviewed in August 2022) that states that it is medically necessary to use ultrasound guidance for hip joint injections or aspiration. However, they also report that the use of US may not be required if the surgeon can ensure solid and constant results with blind injections.

Q4: Does the injected substance (e.g. platelet-rich plasma, viscosupplementation; other autologous blood products) impact whether the injection should be guided?

We found two systematic reviews:

A 2020 Intra-articular saline injection is as effective as corticosteroids, platelet-rich plasma and hyaluronic acid for hip osteoarthritis pain: [15]

The review included eleven RCTs comprising 1353 patients. The review showed that no intra-articular injections significantly improved pain and function compared with placebo at short-term follow-up.

At 2-4 and 6 months, no intervention significantly outperformed placebo IA injection for pain or functional outcomes. Regarding the change from baseline at 2-4 months and six months, pooled data demonstrated that all interventions, including placebo, except for HA+PRP, led to a clinically important improvement in both pain, exceeding the minimal clinically important difference.

A **2021** systematic review on intra-articular hip injections of different medications for osteoarthritis did not report on injection technique. [16]

References

1. Joint and soft tissue injection. Am Fam Physician. 2002 Jul 15;66(2):283-8. PMID: 12152964.

2. Clinical effectiveness of one ultrasound guided intra-articular corticosteroid and local anaesthetic injection in addition to advice and education for hip osteoarthritis (HIT trial): single blind, parallel group, three arm, randomised controlled trial BMJ 2022; 377 :e068446 doi:10.1136/bmj-2021-068446

3. The OA Trial Bank: meta-analysis of individual patient data from knee and hip osteoarthritis trials show that patients with severe pain exhibit greater benefit from intra-articular glucocorticoids. Osteoarthritis Cartilage. 2016 Jul;24(7):1143-52. doi: 10.1016/j.joca.2016.01.983.

4. https://www.mayoclinic.org/drugs-supplements/triamcinolone-injection-route/description/drg-20074674

5. Corticosteroid and Local Anesthetic Use Trends for Large Joint and Bursa Injections: Results of a Survey of Sports Medicine Physicians. PM R. 2021 Sep;13(9):962-968. doi: 10.1002/pmrj.12499. Epub 2020 Nov 23.

6. Osteoarthritis in over 16s: diagnosis and management NICE guideline [NG226]Published: 19 October 2022. https://www.nice.org.uk/guidance/ng226/chapter/rationale-and-impact#intra-articular-injections-2

7. Ultrasound-guided hip joint injections are more accurate than landmark-guided injections: a systematic review and meta-analysis. Br J Sports Med. 2016 Apr;50(7):392-6. doi: 10.1136/bjsports-2014-094570. Epub 2015 Jun 10.

8. Study on Accuracy of Blind and Ultrasound-Guided Arthrocentesis of Hip Joint. J Rheum Dis Treat 6:081. doi.org/10.23937/2469-5726/1510081

9. Intra-articular Hip Injection Using Anatomical and Radiological Landmarks Without the Use of Ultrasound or Radiological Guidance. Cureus. 2022 Mar 28;14(3):e23581. doi: 10.7759/cureus.23581.

10. Radiologically Guided Versus Blinded Intra-articular Injection in Patients With Hip Osteoarthritis: A Retrospective Comparative Study. Clin Med Insights Arthritis Musculoskelet Disord. 2022 Aug 23;15:11795441221118920. doi: 10.1177/11795441221118920.

11. Ultrasound-guided hip injections: a comparative study with fluoroscopy-guided injections. Arthroscopy. 2014 Jan;30(1):42-6. doi: 10.1016/j.arthro.2013.09.083.

12. Is ultrasound-guided corticosteroid injection of the hip comparable to fluoroscopy-guided injection for the treatment of hip osteoarthritis?. Evidence-Based Practice 24(2):p 39-40, February 2021. | DOI: 10.1097/EBP.0000000000000920

13. 2019 American College of Rheumatology/Arthritis Foundation Guideline for the Management of Osteoarthritis of the Hand, Hip, and Knee. Arthritis Care Res (Hoboken). 2020 Feb;72(2):149-162. doi: 10.1002/acr.24131. Epub 2020 Jan 6. Erratum in: Arthritis Care Res (Hoboken). 2021 May;73(5):764. PMID: 31908149.

14. Core Recommendations for Osteoarthritis Care: A Systematic Review of Clinical Practice Guidelines. Arthritis Care Res (Hoboken). 2023 Feb 10. doi: 10.1002/acr.25101.

15. Intra-articular saline injection is as effective as corticosteroids, platelet-rich plasma and hyaluronic acid for hip osteoarthritis pain: a systematic review and network meta-analysis of randomised controlled trials. Br J Sports Med. 2021 Mar;55(5):256-261. doi: 10.1136/bjsports-2020-102179. Epub 2020 Aug 22.

16. State of art in intra-articular hip injections of different medications for osteoarthritis: a systematic review. BMC Musculoskelet Disord 22 (Suppl 2), 997 (2021). https://doi.org/10.1186/s12891-021-04866-6