



## Q / Does ultrasound guidance improve outcomes for steroid joint injections?

### EVIDENCE-BASED ANSWER

**A** / **YES**, at least in the short term. Ultrasound-guided (USG) injections of triamcinolone into the shoulder improve function more than palpation-guided (PG) steroid injections over 6 weeks (strength of recommendation [SOR]: **B**, 2 small randomized, controlled trials [RCTs]).

USG steroid injections are also less

painful than PG injections (SOR: **A**, multiple RCTs). They reduce pain more than PG injections in arthritic joints (shoulder, elbow, wrist, hand, hip, knee, or ankle) over 2 weeks (SOR: **B**, lower quality RCTs with some inconsistent results) but possibly not at 6 weeks (SOR: **B**, multiple RCTs with conflicting results).

### Evidence summary

A prospective RCT found that USG steroid joint injections improved shoulder function more than PG injections in patients with shoulder pain unresponsive to nonsteroidal anti-inflammatory drugs (NSAIDs).<sup>1</sup> Investigators randomized 60 patients (mean age 52.5 years) to either USG or PG injections of triamcinolone 40 mg given by a rheumatologist. They used a 10-point visual analog scale (VAS) to assess pain and evaluated joint function at 6 weeks using a validated 100-point scale for shoulder function,<sup>2</sup> with high scores indicating better function.

The USG group showed greater improvement from baseline in pain (TABLE)<sup>1,3-7</sup> and function scores than the PG group (32 vs 12 points;  $P < .05$ ).<sup>1</sup> Investigators didn't control for a possible placebo effect from ultrasound in this trial (or any trial described here).

Another RCT found that USG steroid joint injections improved shoulder function more than PG injections in patients with rheumatoid arthritis and at least one month of shoulder pain unresponsive to NSAIDs.<sup>3</sup> Investigators randomized 41 rheumatology clinic patients (mean age 52.4 years) to USG

or PG injections of 20 mg triamcinolone.

They assessed function at 6 weeks with a validated 70-point shoulder function assessment tool designed for patients with rheumatoid arthritis,<sup>8</sup> which evaluates pain with motion, range of motion, and activities of daily living (higher scores indicate better shoulder function), and used a 100-point VAS to assess pain.<sup>3</sup> Function scores showed greater improvement from baseline in the USG group than the PG group (15 vs 6 points;  $P = .012$ ), as did pain scores (TABLE).

### Ultrasound injections hurt less than palpation-guided injections

Three RCTs, all using triamcinolone, found that USG joint injections were less painful than PG joint injections (TABLE).<sup>4-6</sup> Three of 4 studies found that USG injections also were associated with lower pain scores 2 weeks after injection, as measured with a standardized VAS.<sup>1,3-7</sup> A common weakness of the 3 studies demonstrating a difference at 2 weeks was that they compared end scores rather than the magnitude of change from baseline between groups.

Two of 3 RCTs found that USG injec-

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TABLE

## How pain ratings for ultrasound-guided and palpation-guided steroid joint injections compare

Trial inclusion criteria (number of joints injected)	Subjective pain rating DURING procedure (10-point VAS)			...and AFTER procedure (at 2 weeks unless otherwise noted)		
	USG	PG	P value	USG	PG	P value
Knee effusions due to osteo- or rheumatoid arthritis <sup>4</sup> (64)	3.0	5.8	.001	1.5	2.8	.034
Osteoarthritis of the knee, refractory to oral analgesics <sup>5</sup> (92)	0.2	2.3	.0001	1.4	2.4	.025
Osteo- or rheumatoid arthritis of the knee, hip, shoulder, elbow, wrist, ankle, or hand <sup>6</sup> (148)	2.7	4.8	.0004	1.2	3.0	.0004
Rheumatoid arthritis in the shoulder, elbow, wrist, knee, or ankle <sup>7</sup> (184)				Change from baseline at 2 wk: -4.03	Change from baseline at 2 wk: -3.68	.324
				Change from baseline at 6 wk: -3.82	Change from baseline at 6 wk: -3.49	.436
Shoulder pain for at least 1 month unresponsive to NSAID therapy <sup>1</sup> (60)				Change from baseline at 6 wk: -4.0	Change from baseline at 6 wk: -2.2	<.05
Shoulder pain for at least 1 month unresponsive to NSAID therapy <sup>3</sup> (41)				Change from baseline at 6 wk: -3.49	Change from baseline at 6 wk: -0.71	<.001

NSAID, nonsteroidal anti-inflammatory drug; PG, palpation-guided; USG, ultrasound-guided; VAS, visual analog scale.

tions produced a greater reduction in the VAS pain score at 6 weeks, although the negative study was larger than the other 2 combined—184 patients, compared with a total of 285 patients for all 3 studies.<sup>1,3,7</sup>

### Recommendations

The American College of Radiology's practice guidelines for musculoskeletal ultrasound examination recommend using ultrasound to guide interventional procedures.<sup>9</sup> However,

no consensus statements comment on the use of ultrasound as opposed to palpation for guiding steroid joint injections. **JFP**

### References

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