



Q/Which injections are effective for lateral epicondylitis?

EVIDENCE-BASED ANSWER

A | **PLACEBO INJECTIONS** actually improve lateral epicondylitis at high rates. No other injections convincingly improve it better than placebo.

Corticosteroid injection is not superior to saline or anesthetic injection (strength of recommendation [SOR] **A**, systematic review of randomized controlled trials [RCTs]). Platelet-rich plasma (PRP) injection is not superior to saline injection (SOR **A**, meta-analysis of RCTs).

Botulinum toxin injection, compared to saline injection, modestly improved pain in lateral epicondylitis, but with

short-term grip-strength weakness (SOR **A**, meta-analysis of RCTs). Prolotherapy injection, compared to saline injection, improved pain at 16-week, but not at 8-week, follow-up (SOR **B**, one small pilot RCT).

Hyaluronic acid injection, compared to saline injection, resulted in a statistically significant pain reduction (6%) but did not achieve the minimum clinically important difference (SOR **B**, single RCT). Autologous blood injection, compared to saline injection, did not improve disability ratings (SOR **B**, one small RCT).

Evidence summary

Neither corticosteroids nor platelet-rich plasma are superior to placebo

A 2014 systematic review of RCTs of non-surgical treatments for lateral epicondylitis identified 4 studies comparing corticosteroid injections to saline or anesthetic injections.¹ In the first study, investigators followed 64 patients for 6 months. Both groups significantly improved from baseline, but there were no differences in pain or function at 1 or 6 months. Skin discoloration occurred in 2 patients who received lidocaine injection and 1 who received dexamethasone.²

In a second RCT of patients with symptoms for > 4 weeks, 39 participants were randomized to either betamethasone/bupivacaine or bupivacaine-only injections. In-person follow-up occurred at 4 and 8 weeks and telephone follow-up at 6 months. Both groups statistically improved from baseline to 6 months. No differences were seen between groups in pain or functional improvement at 4, 8, or 26 weeks, but the betamethasone

group showed statistically greater improvement on the Visual Analog Scale (VAS) from 8 weeks to the final 6-month telephone follow-up. No functional assessments were reported at 6 months.³

The third RCT of 165 patients with lateral epicondylitis for > 6 weeks evaluated 4 intervention groups: corticosteroid injection with/without physiotherapy and placebo (small-volume saline) injection with/without physiotherapy. At the end of 1 year, the corticosteroid injection groups had less complete recovery (83% vs 96%; relative risk [RR] = 0.86; 99% CI, 0.75-0.99) and more recurrences (54% vs 12%; RR = 0.23; 99% CI, 0.10-0.51) than the placebo groups.⁴

The fourth RCT randomized 120 patients to either 2 mL lidocaine or 1 mL lidocaine plus 1 mL of triamcinolone. At 1-year follow-up, 57 of 60 lidocaine-injected patients had an excellent recovery and 56 of 60 triamcinolone plus lidocaine patients had an excellent recovery.⁵

■ **Platelet-rich plasma.** A meta-analysis⁶ of RCTs of PRP vs saline injections included

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doi: 10.12788/fjp.0308

> All injections that contained “placebo” significantly improved lateral epicondylitis.

5 trials and 276 patients with a mean age of 48 years; duration of follow-up was 2 to 12 months. No significant differences were found between the groups for pain score—measured by VAS or the Patient-Rated Tennis Elbow Evaluation (PRTEE)—(standardized mean difference [SMD] = -0.51 ; 95% CI, -1.32 to -0.30) nor for functional score (SMD = 0.07 ; 95% CI, -0.46 to 0.33). Two of the trials reported adverse reactions of pain around the injection site: 16% to 20% in the PRP group vs 8% to 15% in the saline group.

Corticosteroids and PRP. A 2013 3-armed RCT⁷ (n = 60) compared 1-time injections of PRP, corticosteroid, and saline for treatment of lateral epicondylitis. Pain was evaluated at 1 and 3 months using the PRTEE. Compared to saline, corticosteroid showed a statistically significant, but not a minimum clinically important, reduction (8% greater improvement) at 1 month but not at 3 months. PRP pain reduction at both 1 and 3 months was not significantly different from placebo. Importantly, a small sample size combined with a high dropout rate (> 70%) limit validity of this study.

Botulinum toxin shows modest pain improvement, but ...

A 2017 meta-analysis⁸ of 4 RCTs (n = 278) compared the effectiveness of botulinum toxin vs saline injection and other nonsurgical treatments for lateral epicondylitis. The studies compared the mean differences in pain relief and hand grip strength in adult patients with lateral epicondylitis symptoms for at least 3 months. Compared with saline injection, botulinum toxin injection significantly reduced pain to a small or medium SMD, at 2 to 4 weeks post injection (SMD = -0.73 ; 95% CI, -1.29 to -0.17); 8 to 12 weeks post injection (SMD = -0.45 ; 95% CI, -0.74 to -0.15); and 16+ weeks post injection (SMD = -0.54 ; 95% CI, -0.98 to -0.11). Harm from botulinum toxin was greater than from saline or corticosteroid, with a significant reduction in grip strength at 2 to 4 weeks (SMD = -0.33 ; 95% CI, -0.59 to -0.08).

Prolotherapy needs further study

A 2008 RCT⁹ of 20 adults with at least 6 months of lateral epicondylitis received

either prolotherapy (1 part 5% sodium morphuate, 1.5 parts 50% dextrose, 0.5 parts 4% lidocaine, 0.5 parts 0.5% bupivacaine HCl, and 3.5 parts normal saline) injections or 0.9% saline injections at baseline, 4 weeks, and 8 weeks. On a 10-point Likert scale, the prolotherapy group had a lower mean pain score at 16 weeks than the saline injection group (0.5 vs 3.5), but not at 8 weeks (3.3 vs 3.6). This pilot study’s results are limited by its small sample size.

Hyaluronic acid improves pain, but not enough

A 2010 double-blind RCT¹⁰ (n = 331) compared hyaluronic acid injection vs saline injection in treatment of lateral epicondylitis in adults with > 3 months of symptoms. Two injections were performed 1 week apart, with follow-up at 30 days and at 1 year after the first injection. VAS score in the hyaluronic acid group, at rest and after grip testing, was significantly different (statistically) than in the placebo group but did not meet criteria for minimum clinically important improvement. Review of the literature showed limited follow-up studies on hyaluronic acid for lateral epicondylitis to confirm this RCT.

Autologous blood has no advantage over placebo

The only RCT of autologous blood compared to saline injections¹¹ included patients with lateral epicondylitis for < 6 months: 10 saline injections vs 9 autologous blood injections. Patient scores on the Disabilities of the Arm, Shoulder, and Hand scale (which measures symptoms from 0 to 100; lower is better) showed no difference but favored the saline injections at 2-month (28 vs 20) and 6-month (20 vs 10) follow-up.

Editor’s takeaway

Limiting the evidence review to studies with a placebo comparator clarifies the lack of effectiveness of lateral epicondylitis injections. Neither corticosteroid, platelet-rich plasma, botulinum toxin, prolotherapy, hyaluronic acid, or autologous blood injections have proven superior to saline or anesthetic injections. However, all injections that contained

“placebo” significantly improved lateral epicondylitis. **JFP**

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1. Publication Title: The Journal of Family Practice

2. Publication Number: 0 0 9 4 3 5 0 9

3. Filing Date: 10/1/21

4. Issue Frequency: Monthly (except combined January/February and July/August issues)

5. Number of Issues Published Annually: 10

6. Annual Subscription Price (if any): \$169

7. Complete Mailing Address of Known Office of Publication (Not printer) (Street, city, county, state, and ZIP+4®): Frontline Medical Communications Inc., 7 Century Drive, Suite 302, Parsippany, Morris County, NJ 07054-4609

Contact Person: Jared Somers
Telephone (include area code): 973-206-6001

8. Complete Mailing Address of Headquarters or General Business Office of Publisher (Not printer): 7 Century Drive, Suite 302, Parsippany, NJ 07054-4609

9. Full Names and Complete Mailing Addresses of Publisher, Editor, and Managing Editor (Do not leave blank):
 Publisher (Name and complete mailing address): Geoff Watkins, 7 Century Drive, Suite 302, Parsippany, NJ 07054-4609
 Editor (Name and complete mailing address): Marya Ostrowski, 7 Century Drive, Suite 302, Parsippany, NJ 07054-4609
 Managing Editor (Name and complete mailing address): N/A

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 Has Not Changed During Preceding 12 Months
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