

Cervical Spine Surgery Rates After Cervical Transforaminal vs. Interlaminar Steroid Injection for Radiculopathy

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WHY THIS MATTERS

Cervical transforaminal epidural steroid injections (CTFESIs) declined after the 2014 FDA safety warning, though recent evidence supports their safety. Prior meta-analyses found no difference in pain or function between transforaminal and interlaminar approaches.

THE GAP

No study has compared subsequent surgery rates — a potential proxy for inadequate response to conservative care.

QUESTION

Do 1-year cervical spine surgery rates differ between interlaminar (CILESI) and transforaminal (CTFESI) injections for radiculopathy?

HOW WE DID IT

- De-identified TriNetX network; IRB-exempt (MetroHealth System).
- Included: age >30 with cervical radiculopathy (M54.12, M54.13) or cervical disc disorder with radiculopathy (M50.1).
- Excluded: myelopathy (M47.12, M50.0), prior fusion (M43.22), post-laminectomy syndrome (M96.1).
- Two exclusive cohorts: CILESI (CPT 62321, excl. 64479/64480) vs CTFESI (CPT 64479/64480, excl. 62321).
- Propensity-matched on age, sex, tobacco, BMI, depression, anxiety, insomnia, and relevant medications (duloxetine, gabapentin, pregabalin, opioid medication)
- Primary outcome: c-spine surgery 1 day–1 yr post-injection (ACDF, arthroplasty, foraminotomy/laminotomy).
- Sensitivity window 90 days–1 yr to reduce confounding from CTFESI used as a diagnostic selective nerve root block.

MAIN TAKEAWAY

CILESI was associated with a lower 1-year cervical spine surgery rate than CTFESI.

PRIMARY ANALYSIS
1 day → 1 year

3.9% vs 8.9%

RR 0.440
95% CI 0.398–0.485 • p < 0.0001

Risk difference: −5.0%

539 of 13,705 CILESI patients underwent surgery vs 1,217 of 13,608 CTFESI patients.

SENSITIVITY ANALYSIS
90 days → 1 year

2.2% vs 4.6%

RR 0.473
95% CI 0.412–0.543 • p < 0.0001

Risk difference: −2.4%

293 of 13,459 CILESI patients underwent surgery vs 598 of 12,989 CTFESI patients.

SENSITIVITY ANALYSIS: KEY STATISTICAL TAKEAWAY

RELATIVE RISK: 0.440 → 0.473

The association persisted after excluding the first 90 days, when CTFESI may act as a diagnostic SNRB, although residual confounding cannot be excluded.

Scan for full methods and references

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WHAT WE FOUND

- Primary (1 day–1 yr): 539/13,705 (3.9%) CILESI vs 1,217/13,608 (8.9%) CTFESI. RR 0.440 (0.398–0.485), p<0.0001; risk difference −5.0% (−5.6% to −4.4%).
- Sensitivity (90 days–1 yr): 293/13,459 (2.2%) vs 598/12,989 (4.6%). RR 0.473 (0.412–0.543), p<0.0001.

WHAT IT MEANS

CILESI was associated with less surgery than CTFESI. The effect changed only modestly after excluding the first 90 days of possible diagnostic-SNRB use. These findings differ from prior analyses showing comparable outcomes, warranting further investigation.

LIMITATIONS

- Cannot grade severity of radiculopathy
- Cannot assess pain scores, imaging findings, injection techniques
- No data on interval from SNRB to surgery; 90-day window based on clinical reasoning
- Reliance on administrative coding may introduce misclassification
- Residual confounding possible (observational data)

KEY REFERENCES 1. Rathmell JP, et al. Anesthesiology 2015;122:974-84. 2. Beckworth WJ, et al. Interv Pain Med 2024;3:100420. 3. Seddio AE, et al. Spine 2024. 4. Lee JH, et al. Pain Physician 2022. 5. Kleimeyer JP, et al. Spine J 2020.