

**AHRQ Technology Assessment Report Project ID: ESIB0813**

**Pain Management Injection Therapies for Low-back Pain**

**Report Addendum (Submitted July 10, 2015)**

Searches were updated through May 2015 for the *Annals of Internal Medicine* publication (Epidural Corticosteroid Injections for Radiculopathy and Spinal Stenosis: Systematic Review and Meta-analysis).

One new trial<sup>1</sup> of transforaminal epidural corticosteroid injections versus a placebo intervention for radiculopathy was identified, abstracted (**Table 1**), quality-rated (**Table 2**) and added to the meta-analyses. Updated results for the meta-analysis are shown in **Tables 3 and 4**.

**Table 1. Data Abstraction**

Author, Year	Study Design	Country Setting	Inclusion Criteria	Exclusion Criteria	Number of Treatment and Control Subjects (number approached, number eligible, number enrolled)	Type of Intervention (experimental & control groups, dose, duration of treatment)	Subject Characteristics	Other Patient Characteristics (expectations of treatment benefit, confidence in clinician, worker's compensation status, ongoing litigation, smoking status, other treatments received)
Manchikanti 2014 <sup>1</sup>	RCT	US Single center Pain clinic	≥18 years of age; disc herniation and radiculitis; function-limiting low back and lower extremity pain for ≥6 months and NRS pain score >5 on 0 to 10 scale; disc herniation at L4-L5 or L5-S1	Previous lumbar surgery; radiculitis secondary to spinal stenosis (foraminal or central); radiculitis without disc herniation; bilateral radiculitis; uncontrolled medical illnesses; unstable psychiatric disorders; extremely high dose opioid use; pregnant or lactating; patients with history of or potential for adverse reaction to study medications	Approached: 182 Eligible: 146 Randomized: 120 (60 vs. 60) Analyzed: 120 at 2 years, including 31 (15 vs. 16) with missing data	A: Transforaminal epidural injection with 3 mg betamethasone (0.5 ml) plus 0.5% lidocaine (1.5 ml), with fluoroscopic guidance (n=60)  B: Transforaminal epidural injection with 0.5% lidocaine (1.5 ml) and normal saline (0.5 ml), with fluoroscopic guidance (n=60)	A vs. B: Age (mean): 43 vs. 43 years Male: 45% vs. 17% Duration of symptoms (months): 104 vs. 98 Baseline pain (0 to 10 NRS): 8.2 vs. 8.3 Baseline ODI (0-50): 28 vs. 30	A vs. B: Treatments prior to intervention: Not specified Treatments following intervention: Structured exercise (timing and content not described) L4/5: 50% vs. 48% L5/S1: 65% vs. 72% Other patient characteristics: Not reported

**Table 1. Data Abstraction, continued**

Number and Frequency of Injections Number of Levels Provider Experience	Imaging Guidance	Type of Comparison	Results	Duration of Followup	Loss to Followup	Compliance to Treatment	Adverse Events and Withdrawal due to Adverse Events	Sponsor	Quality Rating
<p>Number and frequency of injections: Mean 4.8 vs. 5.2 over 2 years, frequency not specified Number of levels: Single level Provider experience: Not reported</p>	<p>Fluoroscopic guidance with contrast verification in epidural space</p>	<p>Transforaminal epidural injection with local anesthetic</p>	<p>A vs. B Pain Pain scores (0-10): at baseline 8.2 vs. 8.3; at 3 months 4.0 vs. 4.1; at 6 months 4.1 vs. 3.9; at 12 months 4.1 vs. 3.9; at 24 months 4.2 vs. 4.0 (p&gt;0.05 at all time points)</p> <p>Function ODI (0-50): at baseline 28 vs. 30, at 3 months 15 vs. 16; at 6 months 14 vs. 15; at 12 months 14 vs. 15; at 24 months 14 vs. 15 (p&gt;0.05 at all time points) ODI improved &gt;=50%: at 3 months 67% (40/60) vs. 75% (45/60), RR 0.89 (95% CI 0.71 to 1.12); at 6 months 67% (40/60) vs. 73% (44/60), RR 0.91 (95% CI 0.72 to 1.15); at 12 months 57% (34/60) vs. 75% (45/60), RR 0.76 (95% CI 0.58 to 0.98); at 24 months 57% (34/60) vs. 65% (39/60), RR 0.87 (95% CI 0.65 to 1.16)</p> <p>Other outcomes Opioid use (mg MED/day): at baseline 69 vs. 63; at 3 months 41 vs. 49; at 6 months 39 vs. 45; at 12 months 38 vs. 45; at 24 months 37 vs. 43 (p&gt;0.05 at all time points)</p>	<p>24 months</p>	<p>A vs. B 25% (15/60) vs. 27% (16/60) at 24 months</p>	<p>Appears complete</p>	<p>4.6% (28/601 injections) intravascular infiltrations and 1.5% (9/601) nerve root irritation, not reported by group; otherwise not reported</p>	<p>None</p>	<p>Poor</p>

**Table 2. Quality Rating**

<b>Author, Year</b>	<b>Randomization Adequate?</b>	<b>Allocation Concealment Adequate?</b>	<b>Groups Similar at Baseline?</b>	<b>Eligibility Criteria Specified?</b>	<b>Outcome Assessors Masked?</b>	<b>Care Provider Masked (injection/post-injection)</b>	<b>Patient Masked?</b>	<b>Attrition and Withdrawals Reported?</b>	<b>Attrition Acceptable and Comparable?</b>	<b>Analyze People in the Groups in Which They Were Randomized?</b>	<b>Primary Outcome Specified and Reported?</b>	<b>Quality Rating</b>
Manchikanti 2014 <sup>1</sup>	Yes	Unclear	No (large differences on multiple characteristics)	Yes	Unclear	Yes	Yes	Yes	No	Yes	Yes	Poor

**Table 3. Pooled Results of Epidural Corticosteroid Injections Versus Placebo Interventions for Radiculopathy**

Outcome	Estimate (95% CI)	Number of Trials	I <sup>2</sup>
Pain, mean improvement (WMD) <sup>*</sup>			
• Immediate follow-up	-7.55 (-11.4 to -3.74)	6 <sup>2-7</sup>	30%
• Short-term follow-up	-3.61 (-8.45 to 1.23)	15 <sup>1-3,5-16</sup>	83%
• Intermediate-term follow-up	0.71 (-5.50 to 6.92)	5 <sup>1,2,5,14,15</sup>	7%
• Long-term follow-up	0.13 (-2.39 to 2.65)	7 <sup>1,5,8,9,13-15</sup>	0%
Pain, successful composite outcomes (RR)			
• Short-term follow-up	1.21 (0.98 to 1.49)	8 <sup>4,8,11,14,15,17-19</sup>	67%
• Intermediate-term follow-up	1.12 (0.93 to 1.36)	3 <sup>11,14,15</sup>	41%
• Long-term follow-up	1.10 (0.94 to 1.28)	4 <sup>8,14,15,20</sup>	0%
Function, mean improvement (SMD)			
• Immediate follow-up	-0.75 (-1.62 to 0.11)	4 <sup>2,5,7,21</sup>	94%
• Short-term follow-up	-0.14 (-0.43 to 0.15)	13 <sup>1,2,5,7-11,13-16,21</sup>	87%
• Intermediate-term follow-up	-0.22 (-0.61 to 0.18)	6 <sup>1,2,5,14,15,21</sup>	85%
• Long-term follow-up	-0.17 (-0.47 to 0.12)	8 <sup>1,5,8,9,13-15,21</sup>	82%
Function, successful composite outcomes (RR)			
• Short-term follow-up	0.98 (0.77 to 1.26)	7 <sup>1,3,8,10,14,15,19</sup>	73%
• Intermediate-term follow-up	1.09 (0.86 to 1.38)	3 <sup>1,14,15</sup>	71%
• Long-term follow-up	1.07 (0.93 to 1.24)	4 <sup>1,8,14,15</sup>	0%
Surgery (RR)			
• Short-term follow-up	0.62 (0.41 to 0.92)	8 <sup>3,6,7,17,19,21,22†</sup>	0%
• Intermediate-term follow-up	0.56 (0.12 to 2.68)	1 <sup>2</sup>	--
• Long-term follow-up	0.97 (0.75 to 1.25)	14 <sup>4,5,8,9,11,13,16,18,20,23-27</sup>	23%
Successful composite outcomes (RR)			
• Immediate follow-up	1.05 (0.87 to 1.27)	2 <sup>14,28</sup>	0%
• Short-term follow-up	1.13 (0.98 to 1.32)	9 <sup>2,6,7,10-12,22,24†</sup>	3.5%
• Intermediate-term follow-up	0.71 (0.34 to 1.48)	1 <sup>11</sup>	--
• Long-term follow-up	1.04 (0.81 to 1.34)	2 <sup>14,27</sup>	0%

Abbreviations: RR=relative risk; SMD=standardized mean difference; WMD=weighted mean difference.

<sup>\*</sup>0 to 100 scale.

<sup>†</sup> One publication reported two trials.<sup>22</sup>

**Table 4. Epidural Corticosteroid Injections Versus Placebo Interventions, Stratified by Approach**

<b>Outcome</b>	<b>Transforaminal</b>
Pain, mean improvement (WMD)*	
• Immediate follow-up	-13.3 (-19.9 to -6.77), I <sup>2</sup> =5.8%, 2 trials <sup>4,5</sup>
• Short-term follow-up	-0.56 (-4.52 to 3.41), I <sup>2</sup> =0%, 4 trials <sup>1,5,11,16</sup>
• Intermediate-term follow-up	7.72 (-2.34 to 17.8); I <sup>2</sup> =79%, 2 trials <sup>1,5</sup>
• Long-term follow-up	3.29 (-0.82 to 7.39), I <sup>2</sup> =0%, 2 trials <sup>1,5</sup>
Pain, successful composite outcomes (RR)	
• Short-term follow-up	1.52 (0.68 to 3.41), I <sup>2</sup> =86%, 3 trials <sup>4,11,19</sup>
• Intermediate-term follow-up	0.71 (0.34 to 1.48), 1 trial <sup>11</sup>
• Long-term follow-up	No studies
Function, mean improvement (SMD)	
• Immediate follow-up	-0.33 (-0.64 to -0.02), 1 trial <sup>5</sup>
• Short-term follow-up	0.08 (-0.28 to 0.44), I <sup>2</sup> =72%, 4 trials <sup>1,5,11,16</sup>
• Intermediate-term follow-up	0.21 (-0.02 to 0.45), I <sup>2</sup> =0%, 2 trials <sup>1,5</sup>
• Long-term follow-up	0.08 (-0.15 to 0.32), I <sup>2</sup> =0%, 2 trials <sup>1,5</sup>
Function, successful composite outcomes (RR)	
• Short-term follow-up	0.79 (0.56 to 1.11), I <sup>2</sup> =45%, 2 trials <sup>1,19</sup>
• Intermediate-term follow-up	0.91 (0.72 to 1.15), 1 trial <sup>1</sup>
• Long-term follow-up	0.87 (0.65 to 1.16), 1 trial <sup>1</sup>
Surgery (RR)	
• Short-term follow-up	0.82 (0.29 to 2.32), I <sup>2</sup> =0%, 3 trials <sup>19,22†</sup>
• Long-term follow-up	0.89 (0.55 to 1.43), I <sup>2</sup> =56%, 5 trials <sup>4,5,11,16,23</sup>
Successful composite outcomes (RR)	
• Immediate follow-up	No studies
• Short-term follow-up	1.16 (0.79 to 1.71), I <sup>2</sup> =0%, 3 trials <sup>11,22†</sup>
• Intermediate-term follow-up	0.71 (0.34 to 1.48), 1 trial <sup>11</sup>
• Long-term follow-up	No studies

Abbreviations: RR=relative risk; SMD=standardized mean difference; WMD=weighted mean difference.

\* 0 to 100 scale

† One publication reported two trials.<sup>22</sup>

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