Juan Guzman

Anesthésiologiste

CHUM

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Objectifs:
1- Connaitre les tendances
2- Déterminer l'importance de guidelines
3- Connaitre le guidelines du Lumbar Facet Intervention Committee 2020
4- Déterminer la pertinence d'un procédure spécifique en concordance avec la pathologie du patient.

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Pain Physician 2013; 16:S1-S48 • ISSN 1533-3159

Guidelines

An Update of Comprehensive Evidence-Based Guidelines for Interventional Techniques in Chronic Spinal Pain. Part I: Introduction and General Considerations

Laxmaiah Manchikanti, MD[1], Frank J.E. Falco, MD[2], Vijay Singh, MD[3], Ramsin M. Benyamin, MD[4], Gabor B. Racz, MD[5], Standiford Helm II, MD[6], David L. Caraway, MD[7], Aaron K. Calodney, MD[8], Lee T. Snook, MD[9], Howard S. Smith, MD[10], Sanjeeva Gupta, MD[11], Stephen P. Ward, MD, FRCA, FFPMRCA[12], Jay S. Grider, DO, PhD[13], and Joshua A. Hirsch, MD[14]

Pain Physician 2013; 16:S49-S283 • ISSN 1533-3159

IPM Guidelines

An Update of Comprehensive Evidence-Based Guidelines for Interventional Techniques in Chronic Spinal Pain. Part II: Guidance and Recommendations

Laxmaiah Manchikanti, MD, Salahadin Abdi, MD, PhD, Sairam Atluri, MD, Ramsin M. Benyamin, MD, Mark V. Boswell, MD, PhD, Ricardo M. Buenaventura, MD, David A. Bryce, MD, Trish A. Burks, LPT, David L. Caraway, MD, Aaron K. Calodney, MD, Kimberly A Cash, RT, Paul J. Christo, MD, Steven P. Cohen, MD, James Colson MS, MD, Ann Conn, MD, Harold J. Cordner, MD, Sareta Coubarous, DO, Sukdeb Datta, MD, Timothy R. Deer, MD, Sudhir A. Diwan, MD, Frank J.E. Falco, MD, Bert Fellows, MA, Stephanie C. Geffert, MLIS, Jay S. Grider, DO, PhD, Sanjeeva Gupta, MD, Haroon Hameed, MD, Mariam Hameed, MD, Hans Hansen, MD, Standiford Helm II, MD, Jeffrey W. Janata, PhD, Rafael Justiz, MD, Alan D. Kaye, MD, PhD, Marion Lee, MD, Kavita N. Manchikanti, MD, Carla D. McManus, RN, BSN, Obi Onyewu, MD, Allan T. Parr, MD, Vikram Patel, MD, Gabor B. Racz, MD, Nalini Sehgal, MD, Manohar Sharma, MD, FRCA, FFPMRCA, Thomas T. Simopoulos, MD, Vijay Singh, MD, Howard S. Smith, MD, Lee T. Snook, MD, John Swicegood, MD, Ricardo Vallejo, MD, PhD, Stephen P. Ward, MD, FRCA, FFPMRCA, Bradley W. Wargo, DO, Jie Zhu, MD, and Joshua A. Hirsch, MD

North American Spine Society

Evidence-Based Clinical Guidelines for Multidisciplinary Spine Care

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Special article

Consensus practice guidelines on interventions for lumbar facet joint pain from a multispecialty, international working group

Steven P Cohen ,[1] Arun Bhaskar,[2] Anuj Bhatia,[3] Asokumar Buvanendran,[4] Tim Deer,[5] Shuchita Garg,[6] W Michael Hooten ,[7] Robert W Hurley,[8] David J Kennedy,[9] Brian C McLean,[10] Jee Youn Moon,[11] Samer Narouze,[12] Sanjog Pangarkar,[13] David Anthony Provenzano,[14] Richard Rauck,[15] B Todd Sitzman,[16] Matthew Smuck,[17] Jan van Zundert ,[18,19] Kevin Vorenkamp,[20] Mark S Wallace,[21] Zirong Zhao[22]

Cohen SP, *et al*. *Reg Anesth Pain Med* 2020;**0**:1–44.

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Pain Physician 2020; 23:E133-E149 • ISSN 2150-1149

Health Policy Review

Update of Utilization Patterns of Facet Joint Interventions in Managing Spinal Pain from 2000 to 2018 in the US Fee-for-Service Medicare Population

Laxmaiah Manchikanti, MD[1], Mahendra R. Sanapati, MD[2], Vidyasagar Pampati, MSc[1], Amol Soin, MD[3], Sairam Atluri, MD[4], Alan D. Kaye, MD, PhD[5], Joysree Subramanian, MD[6], and Joshua A. Hirsch, MD[7]

Results: Facet joint interventions increased 1.9% annually and 18.8% total from 2009 to 2018 per 100,000 FFS Medicare population compared with an annual increase of 17% and overall increase of 309.9% from 2000 to 2009.

Conclusions: Utilization patterns of facet joint interventions increased 1.9% per 100,000 Medicare population from 2009 to 2018. This results from an annual decline of - 0.2% lumbar facet joint injection sessions but with an increase of facet joint radiofrequency sessions of 7.4%.

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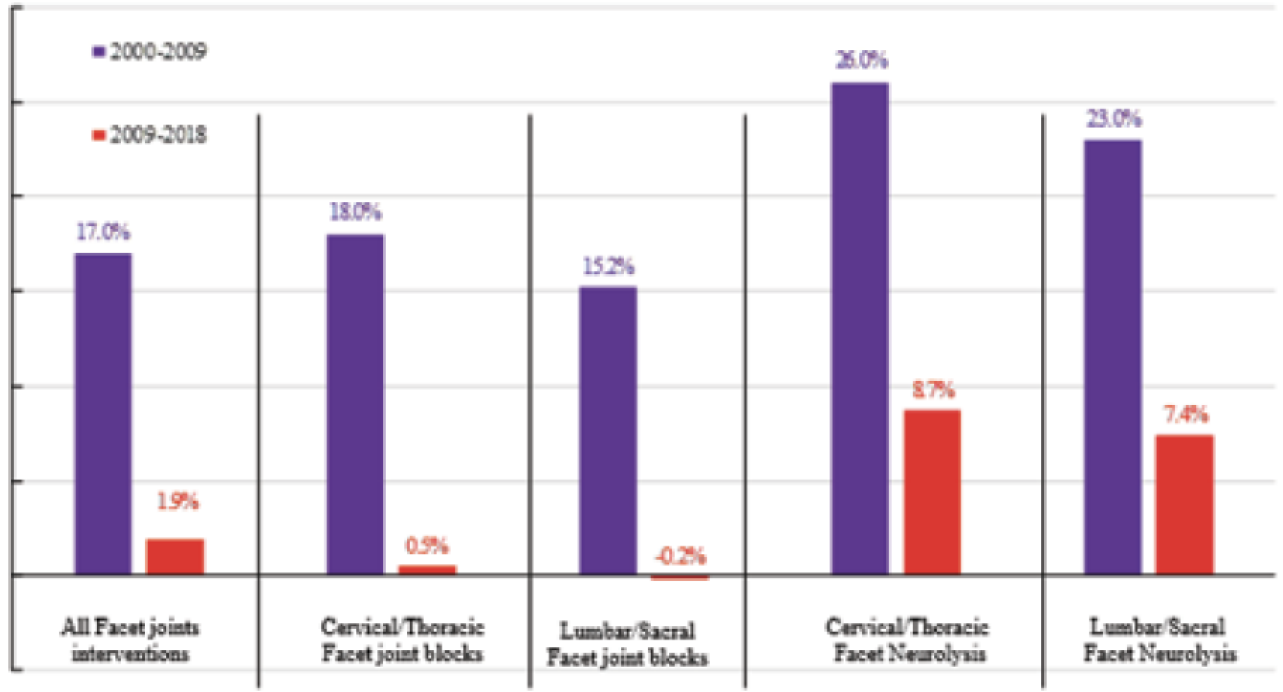

Fig. 1. *Comparative utilization patterns based on an annual rate from 2000-2009 and 2009-2018.*

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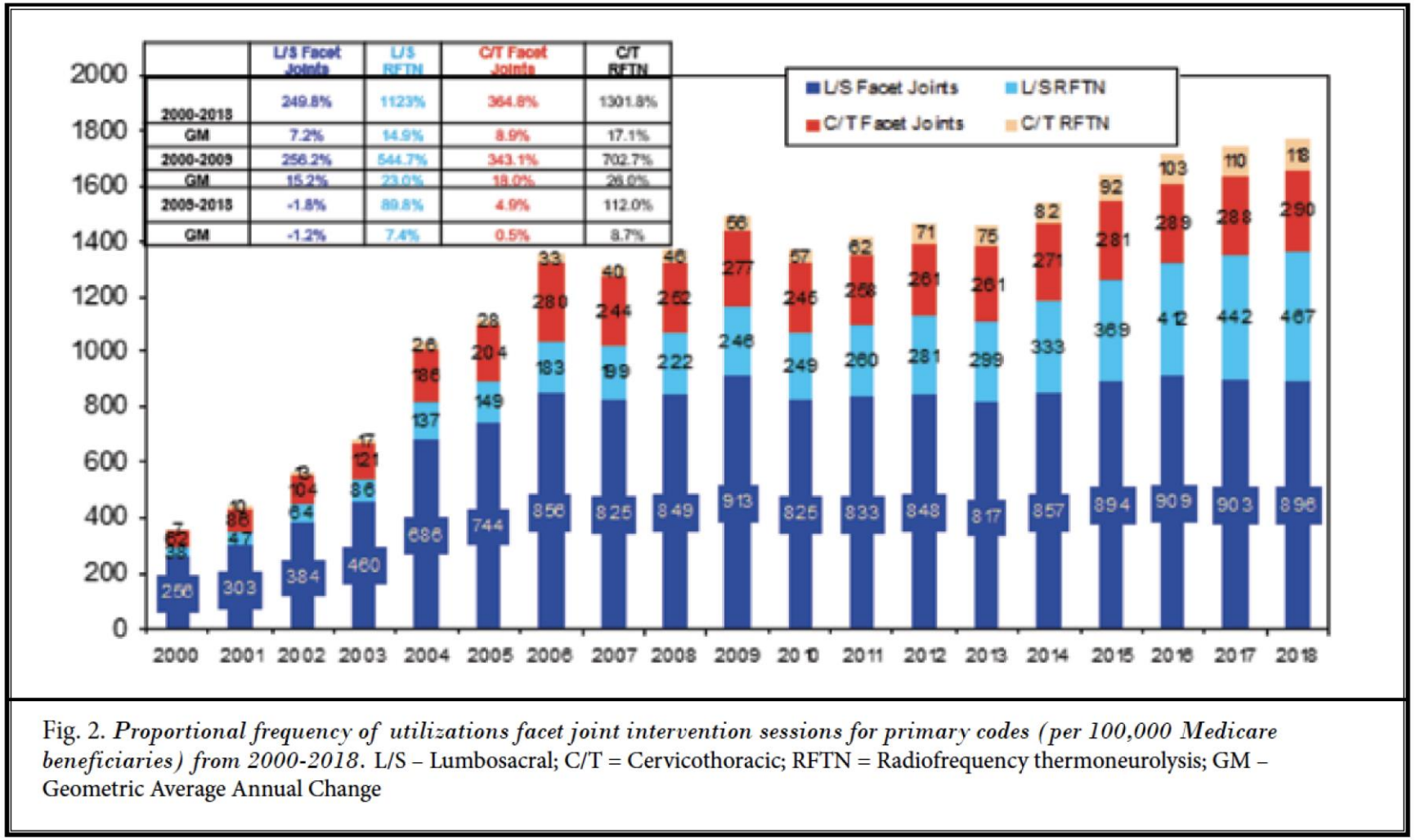

	L/S Facet Joints	L/S RFTN	C/T Facet Joints	C/T RFTN
2000-2018	249.8%	1123%	364.8%	1301.8%
GM	7.2%	14.9%	8.9%	17.1%
2000-2009	256.2%	544.7%	343.1%	702.7%
GM	15.2%	23.0%	18.0%	26.0%
2009-2018	-1.8%	89.8%	4.9%	112.0%
GM	-1.2%	7.4%	0.5%	8.7%

Fig. 2. *Proportional frequency of utilizations facet joint intervention sessions for primary codes (per 100,000 Medicare beneficiaries) from 2000-2018.* L/S – Lumbosacral; C/T = Cervicothoracic; RFTN = Radiofrequency thermoneurolysis; GM – Geometric Average Annual Change

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Grade	Definition	Suggestions for practice
A	Our committee recommends this treatment, test or strategy to improve outcomes. There is high certainty that the net benefit is substantial.	Offer or provide this service.
B	Our committee recommends this treatment, test or strategy to improve outcomes. There is high certainty that the net benefit is moderate or there is moderate certainty that the net benefit is moderate to substantial.	Offer or provide this service.
C	Our committee recommends selectively offering or providing this treatment, test or strategy to improve outcomes to individual patients based on professional judgment and patient preferences. There is at least moderate certainty that the net benefit is small.	Offer or provide this service for selected patients depending on individual circumstances.
D	Our committee recommends against the intervention. There is moderate or high certainty that the service has no net benefit or that the harms outweigh the benefits.	Discourage the use of this service.
I Statement	Our committee concludes that the current evidence is insufficient to assess the balance of benefits and harms of the intervention. Evidence is lacking, of poor quality, or conflicting, and the balance of benefits and harms cannot be determined.	Read the clinical considerations section of the Recommendation Statement. If the treatment or service is offered, patients should understand the uncertainty about the balance of benefits and harms.

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Level of certainty	Description
High	The available evidence usually includes consistent results from well-designed, well-conducted studies in representative populations with suspected lumbar facetogenic pain. The studies assess the effects of the treatment, test or other intervention on treatment or other relevant outcomes. The conclusion is therefore unlikely to be strongly affected by the results of future studies.
Moderate	The available evidence is sufficient to determine the effects of the intervention on outcomes, but confidence in the estimate is constrained by such factors as: ► The number, size, or quality of individual studies; ► Inconsistency of findings across individual studies; ► Limited generalizability of findings to individuals with suspected lumbar facetogenic pain; ► High likelihood of bias; ► Lack of coherence in the chain of evidence. As more information becomes available, the magnitude or direction of the observed effect could change, and that change may be large enough to alter the conclusion.
Low	The available evidence is insufficient to assess effects on treatment and other outcomes of interest. Evidence is insufficient because of: ► The limited number or size of studies; ► Important flaws in study design or methods; ► Inconsistency of findings across individual studies; ► Gaps in the chain of evidence; ► High likelihood of bias; ► Findings not generalizable to individuals with suspected lumbar facetogenic pain; ► Lack of information on important outcome measures. More information may allow estimation of effects on treatment outcomes.

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QUESTION 1: CAN HISTORY AND PHYSICAL EXAMINATION BE USED TO IDENTIFY A PAINFUL FACET JOINT, OR TO SELECT PEOPLE FOR PROGNOSTIC BLOCKS?

Anesthesiology 2007; 106:591–614

Pathogenesis, Diagnosis, and Treatment of Lumbar Zygapophysial (Facet) Joint Pain

Steven P. Cohen, M.D., Srinivasa N. Raja, M.D.†*

Petersen *et al. BMC Musculoskeletal Disorders* (2017) 18:188
DOI 10.1186/s12891-017-1549-6

BMC Musculoskeletal Disorders

RESEARCH ARTICLE Open Access

Clinical classification in low back pain: best-evidence diagnostic rules based on systematic reviews

Tom Petersen[1*], Mark Laslett[2,3] and Carsten Juhl[4,5]

Research Report

Physical Therapy Volume 87 Number 10

Indicators of Lumbar Zygapophyseal Joint Pain: Survey of an Expert Panel With the Delphi Technique

Viktoria E Wilde, Jon J Ford, Joan M McMeeken

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Table 1.
Delphi Results: Round 2

Clinical Indicator of Lumbar Zygapophyseal Joint (LZJ) Pain	% Expert Acceptance	Average Rank	Rank Range
1. Positive response to intra-articular facet joint injection	90	4	1–14
2. Pain relieved by fluoroscopically guided double-anesthetic blocks of the medial branch of the dorsal ramus supplying the LZJ	85	2	1–15
3. Localized unilateral low back pain	80	4	1–10
4. Lack of radicular features	75	7	3–15
5. Replication or aggravation of pain by unilateral pressure over the facet joint or transverse process	75	6	2–14
6. Pain in extension, lateral flexion, or rotation to the ipsilateral side	65	7	3–12
7. Unilateral muscle spasm over the affected LZJ	55	10	5–13
8. Pain, if referred to the leg, is above the knee	40	5	3–10
9. Pain in extension	40	7	3–15
10. Palpation: local unilateral passive movement shows reduced range of motion (ROM) or increased stiffness on the side of LZJ pain	35	10	7–15
11. The following information is unable to isolate an LZJ as the source of back pain: history, including type of onset, and pattern of painful limitation of lumbar movements	30	7	2–13
12. Pain eased in flexion	30	9	5–13
13. Evidence of radiological degenerative changes at the LZJs	30	12	9–15
14. Pain: dull and deep ache	25	5	2–11
15. Pain relieved relatively quickly by joint mobilization	25	7	5–9
16. Incidence increases with age	25	8	3–15
17. Radiology is unreliable and cannot diagnose pain	25	9	6–15
18. Unpredictable sharp or catching pain	25	12	11–13
19. No clinical features or signs diagnostic of LZJ pain	15	2	1–3
20. Pain: worse in the morning, settles to an extent during the day, and may resume with stiffness by afternoon or evening	15	6	1–12
21. Apply sustained natural apophyseal glide and retest ROM: if better, then an LZJ is implicated; if not, then maybe a disk is responsible	15	8	5–13
22. Symptoms: worse in morning	15	11	5–15
23. Gradual and progressive degenerative history	15	11	10–12
24. Straight leg raising is not limited and does not reproduce symptoms early in the range	15	11	7–14
25. Absence of sacroiliac joint pain provocation signs or tests	15	12	12–15
26. Symptoms relieved by movement	15	12	8–14
27. Clinical (criteria of Revel and colleagues[37,38]): age of >65 y, pain not exacerbated by coughing, pain relieved by recumbency, pain not worsened by forward flexion, pain not worsened when rising from forward flexion, pain not worsened by hyperextension, pain not worsened by extension-rotation	10	4	3 or 4
28. Habitual posture of the spine in end-range lumbar spine extension or hyperlordotic posture	10	11	10–12
29. "Inflammatory" rather than "mechanical" history	10	14	13 or 14
30. Mechanism of injury or history of trauma	5	11	11
31. Males > females	0	0	0

Table 2.
Delphi Results: Round 3

Clinical Indicator of Lumbar Zygapophyseal Joint (LZJ) Pain	% Expert Acceptance	Average Rank	Rank Range
1. Positive response to intra-articular facet joint injection	100	3	1–11
2. Localized unilateral low back pain	94	4	1–6
3. Pain relieved by fluoroscopically guided double-anesthetic blocks of the medial branch of the dorsal ramus supplying the LZJ	94	2	1–10
4. Replication or aggravation of pain by unilateral pressure over the LZJ or transverse process	89	6	3–11
5. Lack of radicular features	89	7	2–15
6. Pain eased in flexion	78	11	6–15
7. Pain, if referred to the leg, is above the knee	72	7	2–11
8. Palpation: local unilateral passive movement shows reduced range of motion or increased stiffness on the side of LZJ pain	61	11	6–15
9. Unilateral muscle spasm over the affected LZJ	61	10	4–15
10. Pain in extension	56	9	4–12
11. Pain in extension, lateral flexion, or rotation to the ipsilateral side	56	6	3–10
12. Radiology is unreliable and cannot diagnose LZJ pain	56	11	4–15
13. Pain: dull and deep ache	50	8	5–14
14. Incidence increases with age	50	9	3–14
15. The following information is unable to isolate an LZJ as the source of back pain: history, including type of onset, and pattern of painful limitation of lumbar movements	44	7	1–15
16. Pain relieved relatively quickly by joint mobilization	39	10	4–14
17. Evidence of radiological degenerative changes at the LZJs	39	10	3–14
18. Unpredictable sharp or catching pain	33	11	2–15

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Indicators of Lumbar Zygapophyseal Joint Pain

Table 3.
Evidence-Based Justifications for Indicators of Lumbar Zygapophyseal Joint (LZJ) Pain

Criterion	Mechanism
1. Positive response to intra-articular facet joint injection	Anesthetic block of the painful LZJ provides short-term pain relief.[40,71,72]
2. Localized unilateral back pain	The nociceptive supply to the LZJ is via the medial branches of the dorsal rami, and these nerves do not cross the midline to supply tissues on the contralateral side.[17-19] This unilateral back pain does not have to be felt in the low back but rather over the affected joint.[20,22]
3. Pain relieved by fluoroscopically guided double-anesthetic blocks of the medial branch of the dorsal ramus supplying the LZJ	Each LZJ sends its nociceptive input through the medial branches of the 2 dorsal rami (the 1 above and the 1 below), except for the L5-S1 joint, which receives only 1 nerve (L5).[17-19] Thus, selective blocking of both nerves to a particular LZJ will isolate it as the source of pain. For accuracy of the technique, the anesthetic injection needs to be guided fluoroscopically.[73,74]
4. Replication or aggravation of pain by unilateral pressure over the LZJ or transverse process	This criterion is a powerful indicator for the origin of symptoms under the area of pressure and has been shown to be reliable.[75,76]
5. Lack of radicular features	Symptoms of nerve root irritation (dermatomal pain, paresthesia, or both, often worse distally) and signs of nerve root compression (dermatomal sensory loss, myotomal weakness, and loss of reflex)[46,47] are not signs of LZJ pain.
6. Pain eased in flexion	In standing, the LZJs are reported to carry 16% of the spinal compression load.[77] In sitting (flexion), the LZJs are under relatively no load.[78]
7. Pain, if referred to the leg, is above the knee	Typical of somatic referred pain and further illustrated by LZJ pain provocation studies.[20,79]
8. Palpation: local unilateral passive movement shows reduced range of motion or increased stiffness on the side of LZJ pain	With increased age, disk narrowing results in as much as 70% of the intervertebral compression force being transmitted across the LZJ. Studies have shown increased degenerative changes in such specimens.[77] Degenerative changes, such as osteoarthritis and ligamentous damage, may contribute to LZJ stiffness.[80-82] This mechanism is similar to the compressive pain and stiffness associated with osteoarthritis of the knee joint.[67]
9. Unilateral muscle spasm over the affected LZJ	Localized spasm can indicate muscle guarding to prevent movement of the symptomatic LZJ.[83] Neurophysiological mechanism is reflex excitation of spasm.[84,85]
10. Pain in extension	In standing, the facets are reported to carry approximately 16% of the spinal compressive load.[77] In extension, the compressive load on the facets increases; therefore, further pain is provoked.[17,78]
11. Pain in extension, lateral flexion, or rotation to the ipsilateral side	Maximal compression of LZJ surfaces occurs with these movements.[25] This provocation may induce pain attributable to intra-articular or extra-articular pathology.
12. Radiology is unreliable and cannot diagnose LZJ pain	Research has shown that radiology findings do not correlate with the presence or absence of symptoms.[8,32,33,80]

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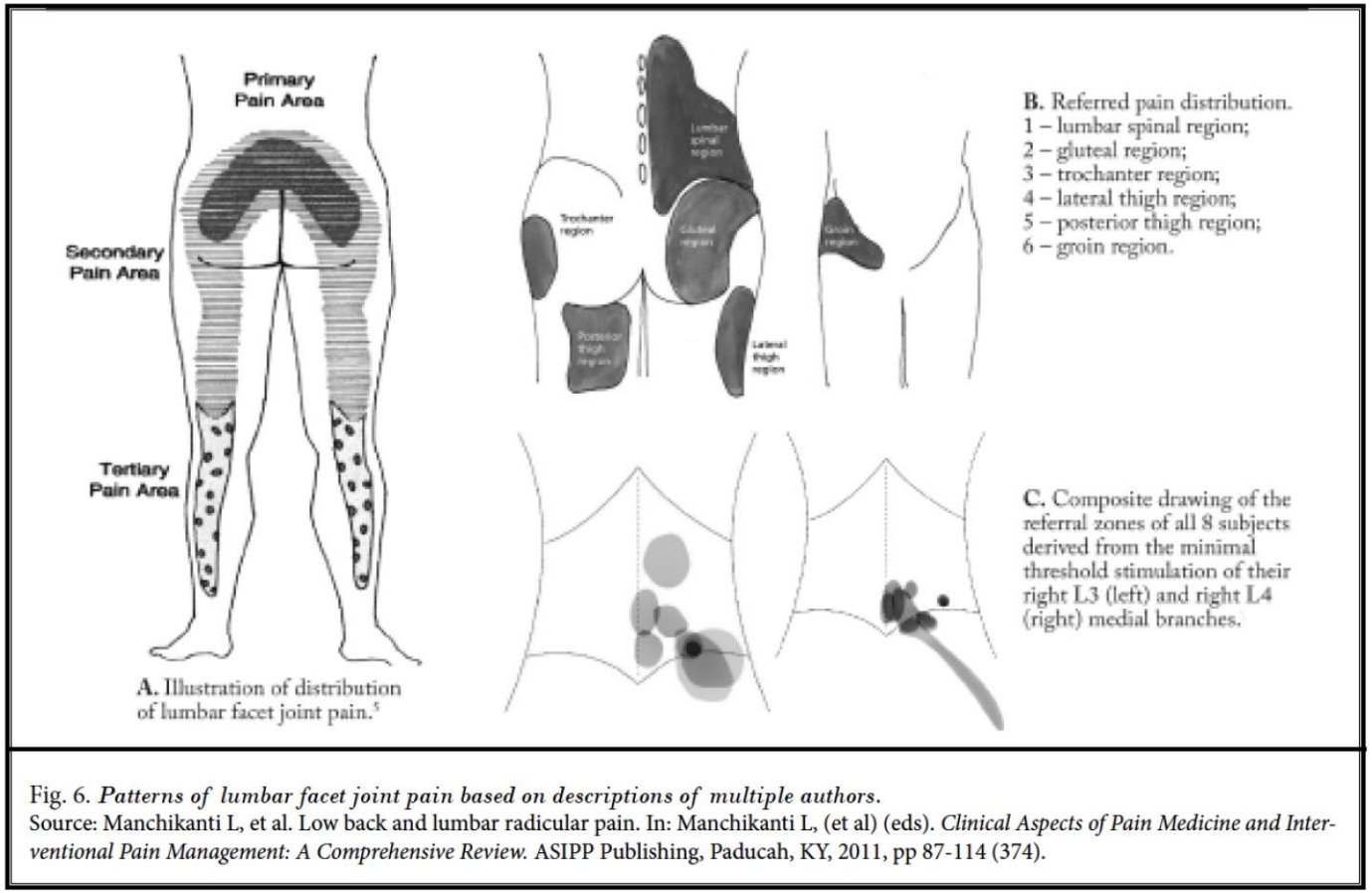

Fig. 6. *Patterns of lumbar facet joint pain based on descriptions of multiple authors.*
Source: Manchikanti L, et al. Low back and lumbar radicular pain. In: Manchikanti L, (et al) (eds). *Clinical Aspects of Pain Medicine and Interventional Pain Management: A Comprehensive Review.* ASIPP Publishing, Paducah, KY, 2011, pp 87-114 (374).

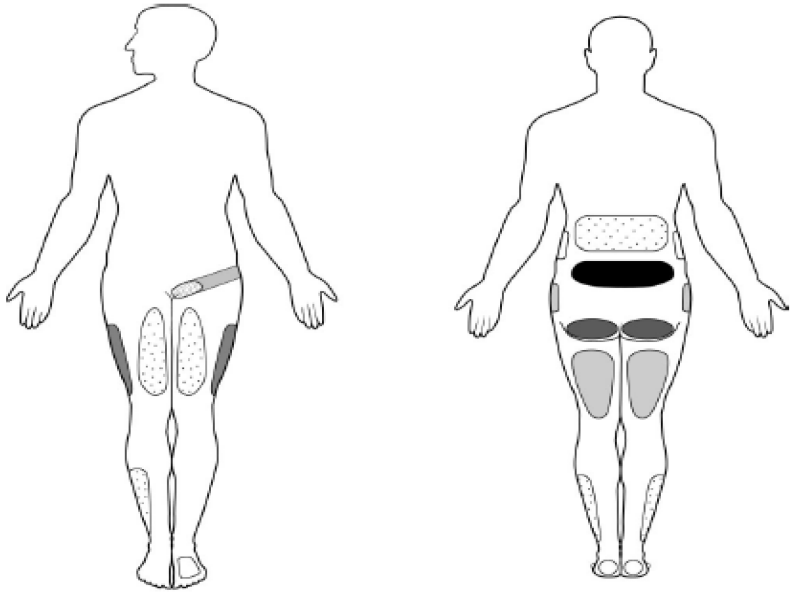

Fig. 4. Pain referral patterns from the lumbar facet joints. In descending order, the most common referral patterns extend from the *darkest* (low back) to the *lightest* regions (flank and foot). The *key* at the bottom of the figure legend is listed in order of affected frequency (*i.e.*, low back to foot). The *facet levels* next to each location represent the zygapophysial joints associated with pain in each region. Data adapted from McCall *et al.*,[10] Marks,[269] and Fukui *et al.*[270] Drawings by Specialist Frank and Angela Dill, US Army, and Frank M. Cort, M.S. (Research Associate, Department of Radiology, Johns Hopkins Hospital, Baltimore, Maryland). Low back: L5–S1, L4–L5, L3–L4 Buttock: L5–S1, L4–L5, L3–L4 Lateral thigh: L5–S1, L4–L5, L3–L4, L2–L3 Posterior thigh: L5–S1, L4–L5, L3–L4 Greater trochanter: L5–S1, L4–L5, L3–L4, L2–L3 Groin: L5–S1, L4–L5, L3–L4, L2–L3, L1–L2 Anterior thigh: L5–S1, L4–L5, L3–L4 Lateral lower leg: L5–S1, L4–L5, L3–L4 Upper back: L3–L4, L2–L3, L1–L2 Flank: L1–L2, L2–L3 Foot: L5–S1, L4–L5

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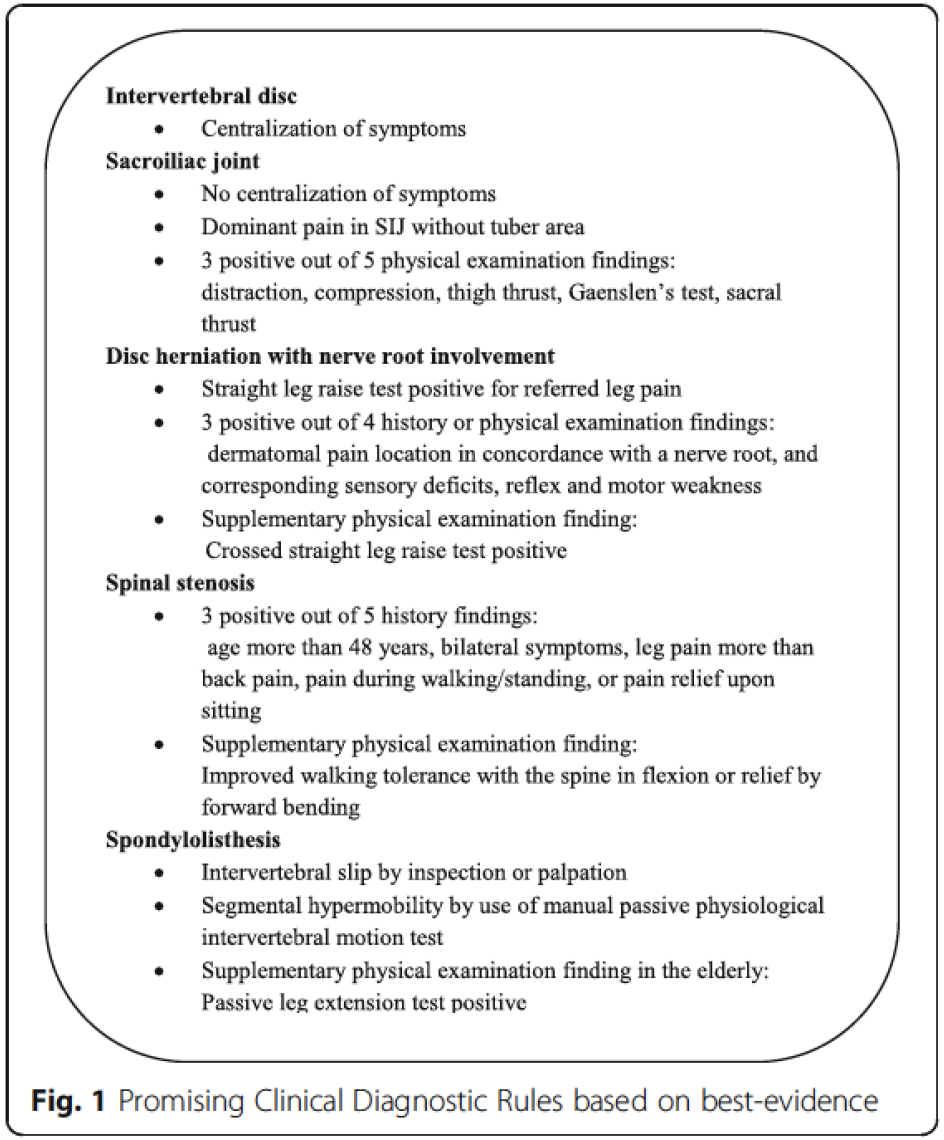

Intervertebral disc

- Centralization of symptoms

Sacroiliac joint

- No centralization of symptoms
- Dominant pain in SIJ without tuber area
- 3 positive out of 5 physical examination findings: distraction, compression, thigh thrust, Gaenslen's test, sacral thrust

Disc herniation with nerve root involvement

- Straight leg raise test positive for referred leg pain
- 3 positive out of 4 history or physical examination findings: dermatomal pain location in concordance with a nerve root, and corresponding sensory deficits, reflex and motor weakness
- Supplementary physical examination finding: Crossed straight leg raise test positive

Spinal stenosis

- 3 positive out of 5 history findings: age more than 48 years, bilateral symptoms, leg pain more than back pain, pain during walking/standing, or pain relief upon sitting
- Supplementary physical examination finding: Improved walking tolerance with the spine in flexion or relief by forward bending

Spondylolisthesis

- Intervertebral slip by inspection or palpation
- Segmental hypermobility by use of manual passive physiological intervertebral motion test
- Supplementary physical examination finding in the elderly: Passive leg extension test positive

Fig. 1 Promising Clinical Diagnostic Rules based on best-evidence

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Table 4 Studies evaluating physical examination findings and facet block results

Study	Design/criteria for positive block	Interventions	Findings
Fairbank *et al*[37]	Prospective n=25 Subjective pain relief	IA (double blocks, one injection at symptomatic level, another at a random level)	Responders: pain in the back and thigh; straight leg raising test causes back pain. Non-responders: pain in the back and leg; straight leg raising test causes leg pain
Lewinnek and Warfield[40]	Retrospective n=21 Partial or complete pain relief with resumption of activities immediately and at 3 months	IA (single block)	Patients who had no other cause of LBP or sciatica and had a combination of facet degeneration, pain and tenderness, were more likely to initially respond to injection.
Helbig and Lee[38]	Retrospective n=22 Subjective pain relief from hours to months	IA (single block)	A 100-point scorecard was developed: Back pain with groin or thigh pain: +30 Well-localized paraspinal tenderness: +20 Reproduction of pain with extension-rotation: +30 Significant corresponding radiographic changes: +20 Pain below the knee: −10 Individuals with high scores (≥60) were likely to be responders but a low score could not reliably predict negative response to facet joint injections.
Jackson *et al*[39]	Prospective n=454 Difference in pre- and post-pain scores associated with lumbar motion	IA (single block)	There were no unique characteristics identified in patients who reported either no or increased pain after injection. However, the following factors correlated significantly with greater postinjection pain relief: older age, a history of LBP, no leg pain, pain not aggravated by Valsalva maneuver, normal gait, no muscle spasm and pain on extension after forward flexion.
Lilius *et al*[41]	Prospective n=109 Outcomes (subjective, work and disability) were assessed at 3 months	IA steroid/anesthetic, IA saline or pericapsular steroid/anesthetic (single block)	Inappropriate (non-organic physical) signs and symptoms and previous back surgery were associated with treatment failure.
Schwarzer *et al*[42]	Prospective n=176 ≥50% pain relief after a confirmatory block	IA or MBB (double comparative diagnostic blocks)	Neither clinical features (range of motion and straight leg raising test) nor pain referral patterns could predict response to diagnostic blocks. No patient with central/midline spinal pain responded to a confirmatory block.
Schwarzer *et al*[43]	Prospective n=63 ≥50% LBP reduction to bupivacaine block×3 hours but no response to placebo	IA and placebo (placebo controlled: normal saline to superficial muscle)	Similar history and examination features were seen in patients with or without facet joint pain.
Revel *et al*[44]	Prospective n=40 ≥75% LBP reduction	IA (single block)	Seven characteristics (Revel's criteria) were more frequent in patients with pain relief from facet blocks: older age; absence of pain exacerbation by coughing, absence of pain exacerbation by lumbar hyperextension, absence of pain exacerbation by forward flexion and rising from forward flexion, absence of pain exacerbation by extension-rotation and pain relieved by recumbency.

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Revel *et al*[45]	Prospective, controlled n=80–42 who received lidocaine ≥75% LBP reduction	IA local anesthetic or placebo (IA saline)	The presence of at least five of the seven Revel's criteria (above) including pain reduction by recumbency resulted in 92% sensitivity and 80% specificity.
Manchikanti *et al*[50]	Prospective n=120 ≥75% pain reduction	MBB (double comparative diagnostic blocks)	The prevalence of clinical findings (pain better by sitting/lying, pain worsened by sitting/standing/walking/coughing/lumbar spine range of motion, positive straight leg raising test and pain referral pattern) were similar between positive and negative block groups. Back pain with straight leg raising was weakly associated with positive blocks.
Manchikanti *et al*[52]	Prospective n=180 ≥75% pain reduction	MBB (double comparative diagnostic blocks, lidocaine±Sarapin±steroid, bupivacaine alone)	Back or leg pain during straight leg raising was negatively associated with pain relief from facet blocks.
Manchikanti *et al*[51]	Prospective n=200 ≥75% pain reduction	MBB (double comparative diagnostic blocks)	A large number of individual clinical characteristics did not correlate with facet mediated pain diagnosed by double blocks.
Young *et al*[46]	Prospective n=23 An injection produced concordant pain and ≥80% pain reduction	IA (single block)	Absence of worsening LBP during rising from sitting was associated with a positive response to facet injections. Centralization of pain was associated with negative response to facet injections.
Laslett *et al*[47]	Prospective n=116 ≥75% pain relief or complete eradication of primary pain	IA or MBB (single block)	Revel's criteria had low sensitivity and high specificity; therefore, the authors concluded they are not appropriate for screening purposes. Age ≥65 years reached predictive significance with complete eradication of primary pain as a reference; no pain with cough/sneezing and no worsening of pain when rising from flexion approached predictive significance with ≥75% LBP relief as a reference.
Laslett *et al*[48]	Prospective n=120 ≥75% pain reduction stratified in 5% increments	IA or MBB (single block)	CPR consist of combinations of seven characteristics: age ≥50; pain is least when walking/sitting; paraspinal pain; modified somatic perception questionnaire >13; positive extension-rotation test and absence of centralization. When positive response to facet block is set at 95% pain reduction, four CPRs have 100% sensitivity, one CPR improved post-test probability by five-fold.
Cohen *et al*[54]	Retrospective n=192 Patient selection: ≥50% pain reduction RFA success: ≥50% pain relief×6 months	MBB (single block) RFA	RFA success patients were more likely to have paraspinal tenderness, whereas positive 'facet loading' (pain worsened by extension-rotation) and chronic opioid use were more prevalent in RFA failure patients.

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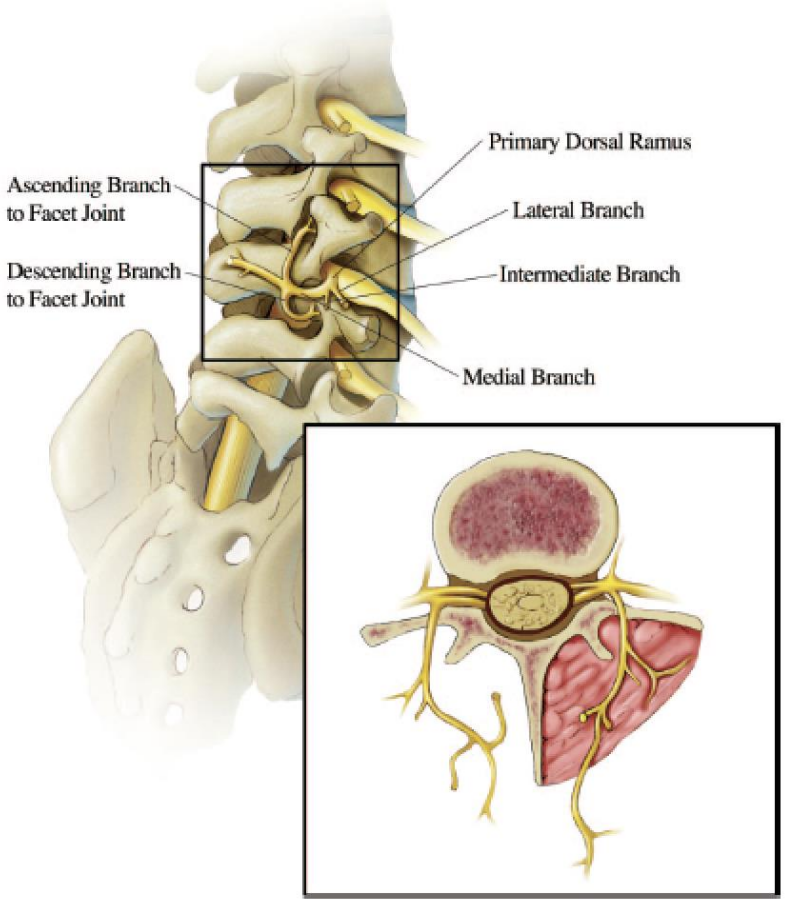

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- C EVIDENCE
- LOW CERTITUDE

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QUESTION 2: IS THERE ANY CORRELATION BETWEEN RADIOLOGICAL FINDINGS AND A PAINFUL FACET JOINT OR RADIOFREQUENCY ABLATION OUTCOMES, AND SHOULD IMAGING BE REQUIRED BEFORE PROGNOSTIC BLOCKS?

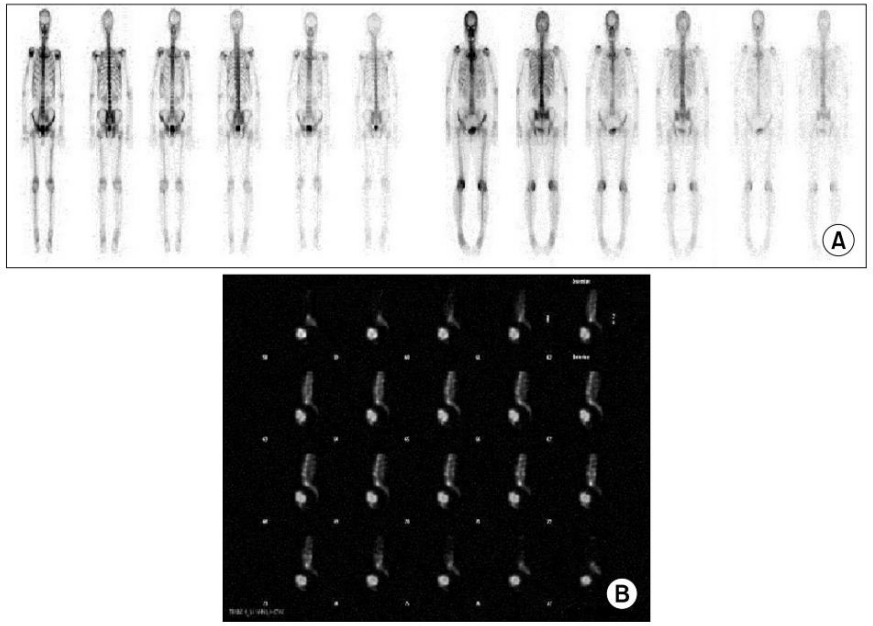

Fig. 1. (A) Negative planar bone scintigraphy. (B) Positive planar bone scintigraphy.

Bloc Facettaire/Epidural

Table 5 Studies evaluating the association between imaging pathology and facet joint block and treatment outcomes

Study	Design	Number of subjects	Results	Comments
Holder *et al*[63]	Prospective study designed to evaluate the sensitivity and specificity of PS or SPECT scans in identifying patients responsive to IA facet injections	43 patients (male=17, female 26) Mean age 55 years (range 16–18 years)	PS group: sensitivity=0.71, specificity=0.76, (+) predictive value=0.38, (–) predictive value=0.93 SPECT group: sensitivity=1.0, specificity=0.71, (+) predictive value=0.41, (–) predictive value=1.0	The authors concluded that the high sensitivity and (–) predictive value made SPECT scan a valuable screening tool before invasive facet injections. Other symptomatic abnormal areas of tracer uptake were identified in 37% of patients.
Schwarzer *et al*[67]	Single-blind, placebo-controlled trial designed to evaluate the effects of CT-confirmed facet osteoarthritis on IA facet joint injections	63 patients Median age 59 years (IQR 51–68); Female:male ratio 3:1 Median LBP duration 7 years (IQR 2–20)	32% (95% CI 20 to 44) with ≥50% pain reduction at 3 hours following IA placebo injection 40% (95% CI 27 to 53) with ≥50% pain reduction at 3 hours following IA LA injection No significant group differences in CT joint scores based on patient response to IA placebo or IA LA injections	CT not recommended in the diagnostic evaluation of facet pain.
Dolan *et al*[53]	Prospective comparison of IA facet joint injections between patients with SPECT (+) and SPECT (–) scans	SPECT (+) group=22 SPECT (–) group=36	Significant improvement in VAS and McGill pain scores in SPECT (+) group at months 1 and 3 94% SPECT (+) group reported improvement at month 1 compared with 47% in SPECT (–) group	No significant improvements evident at month 6 47% of SPECT (+) patients had osteoarthritic facet joints compared with 18% of SPECT (–) group.
Pneumaticos *et al*[66]	Prospective comparison of IA facet joint injections between patients with SPECT (+) and SPECT (–) scans	SPECT (+) group=15 SPECT (–) group=16 No SPECT comparison group=16	Significant improvement in pain at months 1 and 3 in SPECT (+) group vs SPECT (–) and no SPECT comparison groups Number of facet joints treated in SPECT (+) group reduced from 60 to 27 with cost savings of US$326/patient	No significant group differences at month 6.
Cohen *et al*[69]	Retrospective, multicenter study examining factors associated with cervical medial branch RFA outcomes	92 patients, 44 with significant facet pathology on MRI	57% success rate in overall cohort, 52% in individuals with significant MRI pathology (p=0.75)	Slightly higher success rate in the younger patients (ie, with less facet joint pathology) treated at Walter Reed may have contributed to findings.
Cohen *et al*[54]	Retrospective, multicenter study examining factors associated with lumbar medial branch RFA outcomes	192 patients, 117 with significant facet pathology on MRI	54% success rate in overall cohort, 52% in individuals with significant MRI pathology (p=0.75)	Slightly higher success rate in the younger patients (ie, with less facet joint pathology) treated at Walter Reed may have contributed to findings.

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Ackerman and Ahmad[61]	Randomized, double-blind trial of MBB vs IA facet joint injections in patients with SPECT (+) scans	IA facet injection group=23 (male=14, female=9) MBB group=23 (male=12, female=11); Median age=39.3 years Mean symptom duration=7.6 weeks	61% had ≥50% pain relief at week 12 in IA facet injection group vs 26% in MBB group 26% Sensitivity/specificity of SPECT in the IA facet joint injection group 0.79 and 0.70, respectively Pain rating and ODI scores significantly less in the IA facet group vs MBB group at week 12	All patients in the IA facet injection and MBB groups received lidocaine and triamcinolone.
Stojanovic *et al*[68]	Retrospective review of correlations between MRI and outcomes of MBB and RF denervation	127 consecutive patients Male=52% Mean age=52.9 years	Facet joint degeneration or hypertrophy on MRI significantly correlated with ≥50% pain reduction following MBB but not RF Younger patients significantly more likely to fail MBB but not RF	Prospective studies recommended to confirm study findings.
Koh *et al*[65]	Prospective comparison of MBB between patients with SPECT (+) and SPECT (–) scans	SPECT (+) group=28 (male=12, female=16); SPECT (–) group=5 (male=2, female=3) Mean age SPECT (+) group=60.4 Mean age SPECT (–) group=51.8 years	85.7% with >50% pain reduction at week 2 in SPECT (+) group vs 20% in the SPECT (–) group 78.6% with >50% pain reduction at week 4 in SPECT (+) group vs 0% in the SPECT (–) group No significant between-group differences in ODI	All MBB performed with ultrasound guidance using lidocaine and triamcinolone.
Freiermuth *et al*[62]	Randomized, double-blind, placebo-controlled trial to determine the sensitivity/specificity of SPECT/CT to identify patients with facet joint pain prior to IA facet injections	29 patients (male=16, female=13) age range=38–83 years	SPECT/CT; sensitivity 0.57 (95% CI 0.18 to 0.90), specificity 0.77 (95% CI 0.55 to 0.92) Diagnostic accuracy=0.72 (ideal value 1.0)	SPECT/CT not recommended as first-line diagnostic tool prior to IA facet joint injections.
Jain *et al*[64]	Randomized, double-blind, controlled trial of SPECT/CT to identify patients most likely to respond to comparative LA low back injections (sacroiliac joint, facet joint)	SPECT/CT group=7 Control group (no SPECT)=14	71% with ≥50% pain reduction in SPECT/CT group vs 43% in the control group ($p<0.05$) immediately following MBB	Included patients with chronic LBP. Most common diagnoses were sacroiliitis, followed by L4-5 and L5-S1 facet arthropathy.
Sawicki *et al*[70]	Retrospective study to determine if PET/MRI could predict MBB responders	10 patients with mechanical neck pain. 140 joints assessed. 6 joints in 6 patients had increased uptake of radioactive tracer and facet arthrosis, and 27 joints had arthrosis without increased uptake	The six patients with positive PET and MRI scans had better outcomes immediately after blocks, and through 3-month follow-up	Used 3 mL of LA and steroid per level.

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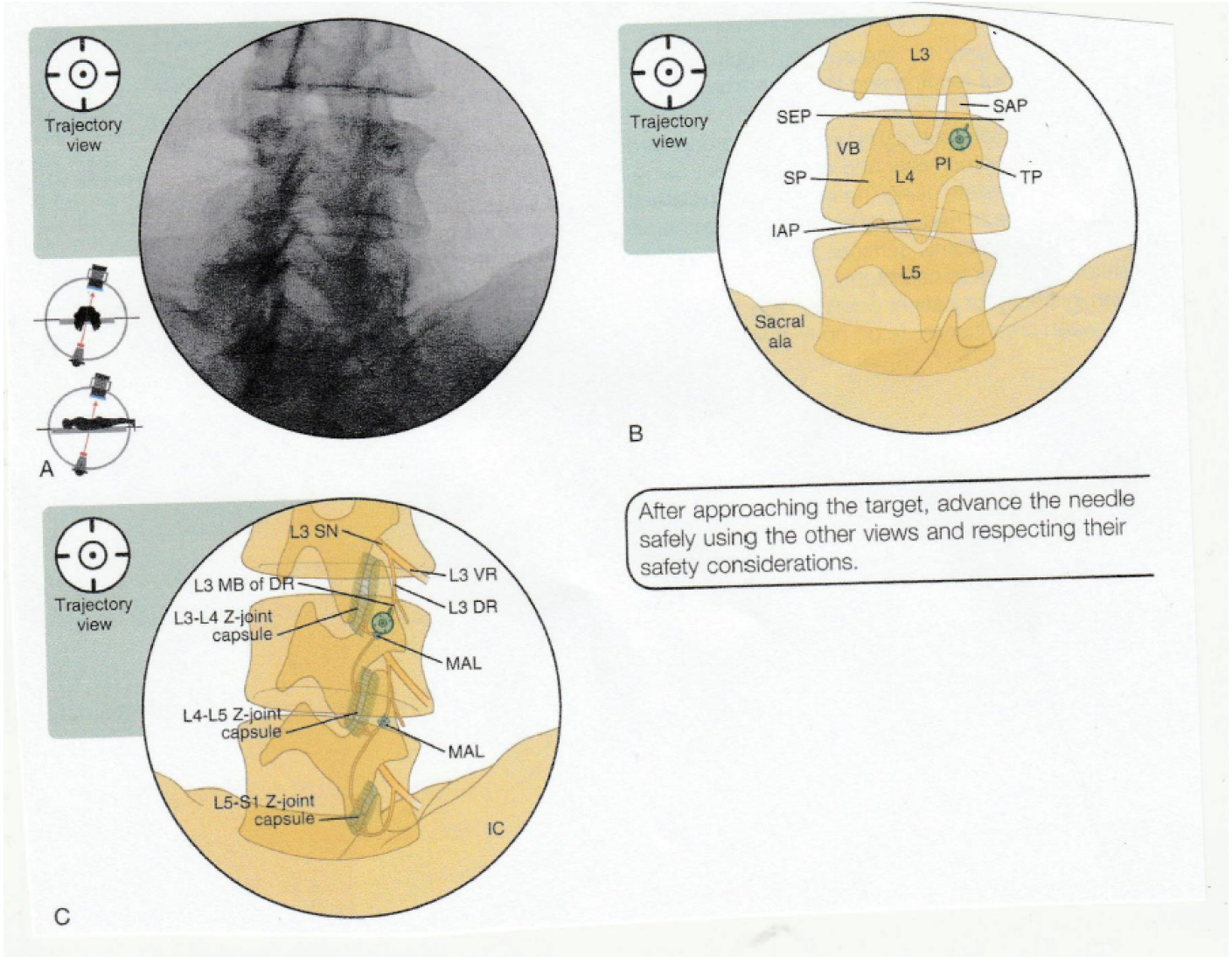

- SPECT avant BBM: C-MOD
- IRM/SCAN/SCINTI avant BBM: D-LOW

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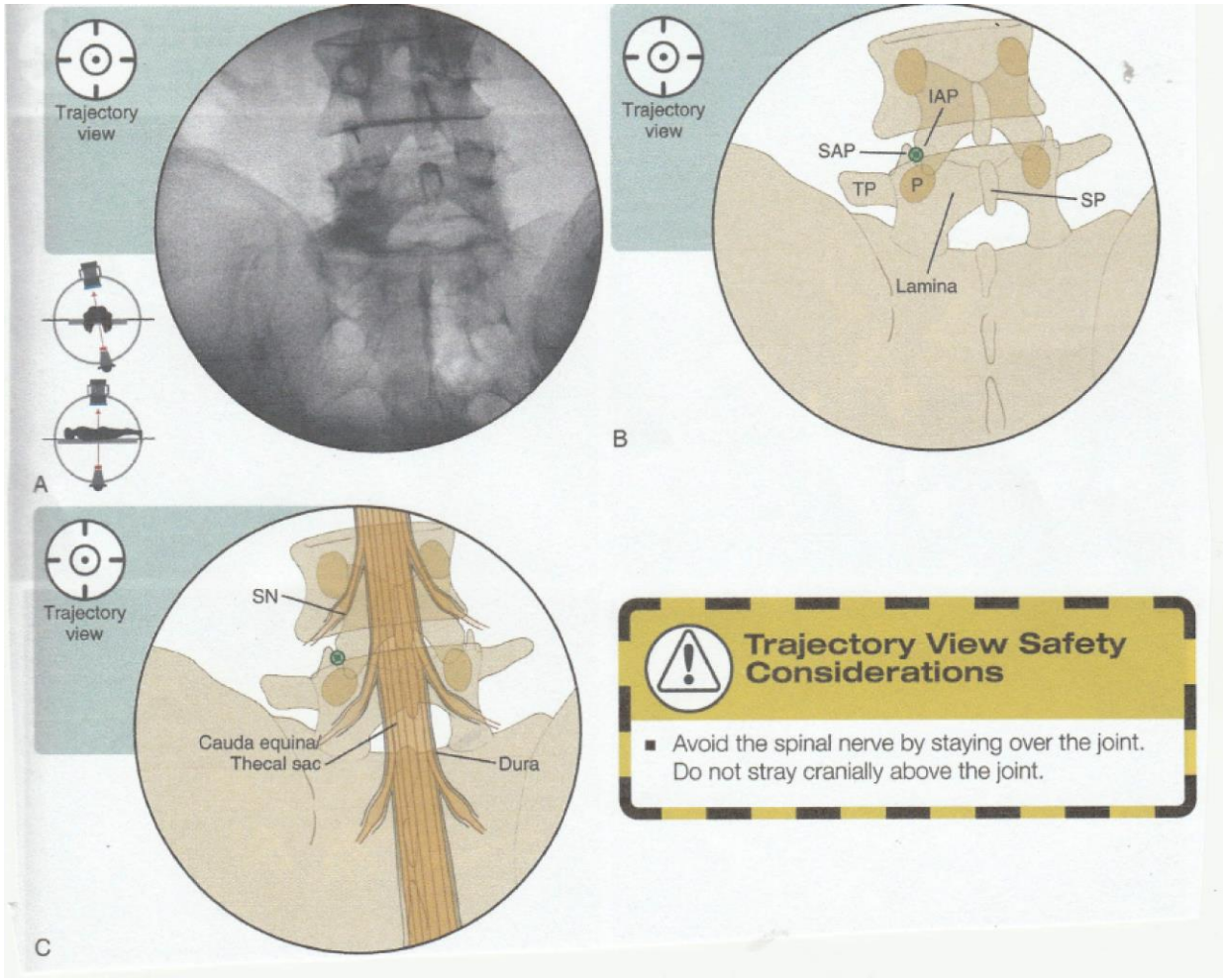

- SPECT avant IA: D-LOW
- IRM/SCAN/SCINTI avant IA: D-LOW

Bloc Facettaire/Epidural

QUESTION 3: SHOULD PHYSICAL THERAPY AND/OR PRIOR CONSERVATIVE TREATMENT BE A PREREQUISITE BEFORE PROGNOSTIC FACET BLOCKS? IF SO, FOR HOW LONG SHOULD THEY BE CONTINUED, AND SHOULD THEY BE CONCURRENT?

Bloc Facettaire/Epidural

Med/Psych Question 5. In patients with low back pain, is cognitive behavioral therapy (CBT) and/or psychosocial intervention and/or neuroscience education effective in decreasing duration of pain, decreasing intensity of pain, increasing functional outcomes, decreasing anxiety and/or depression and improving return-to-work rate?	Cognitive behavioral therapy is recommended in combination with physical therapy, as compared with physical therapy alone, to improve pain levels in patients with low back pain over 12 months. **Grade of Recommendation: A** Cognitive behavioral therapy in combination with physical therapy, compared to physical therapy alone, is suggested to improve functional outcomes (disability) and return to work in patients with low back pain. **Grade of Recommendation: B** There is conflicting evidence to make a recommendation for or against cognitive behavioral therapy for improving depression or anxiety in patients with low back pain. **Grade of Recommendation: I**

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PM&R Question 1. In patients undergoing treatment for low back pain, what is the effectiveness of the following in decreasing the duration of pain, decreasing intensity of pain, increasing functional outcomes and improving return-to-work status, as compared with natural history plus or minus medication:	Back school is recommended to provide improvements in pain and function when compared with general medical care, modality care or a simple hand-out at 6-12 months' follow-up for chronic low back pain**.** **Grade of Recommendation: A**
a. Acute vs subacute vs chronic	There is insufficient evidence that outcomes from a home-based exercise program are different than no care. **Grade of Recommendation: I**
i. Patient education and self-directed exercise program	There is insufficient evidence that a ***self-directed*** McKenzie exercise program for acute low back pain results in different outcomes compared to usual medical care. **Grade of Recommendation: I**
	There is insufficient evidence that a monitored pedometer-based exercise program with web-based feedback provides any improvement over pedometer instruction alone. **Grade of Recommendation: I**

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x. Aerobic exercise	Aerobic exercise is recommended to improve pain, disability and mental health in patients with nonspecific low back pain at short-term follow-up. **Grade of Recommendation: A** There is insufficient evidence that aerobic exercise improves pain, disability and mental health in patients with nonspecific low back pain at long-term follow-up. **Grade of Recommendation: I**
xi. Work hardening or conditioning	In patients with low back pain, work hardening may be considered to improve return to work. **Grade of Recommendation: C** There is insufficient evidence that work hardening is different than an active therapeutic exercise program or guideline-based physical therapy. **Grade of Recommendation: I**

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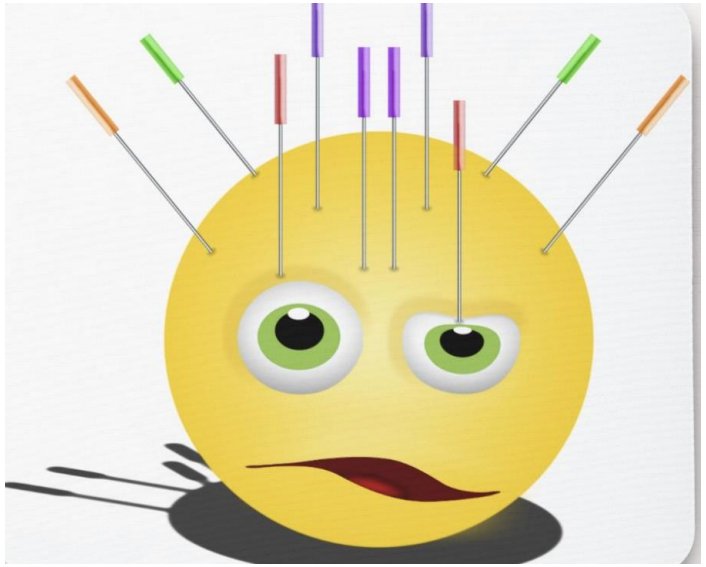


- C EVIDENCE
- LOW CERTITUDE

Bloc Facettaire/Epidural

QUESTION 4: IS IMAGE GUIDANCE NECESSARY FOR LUMBAR FACET BLOCKS AND RADIOFREQUENCY ABLATION?

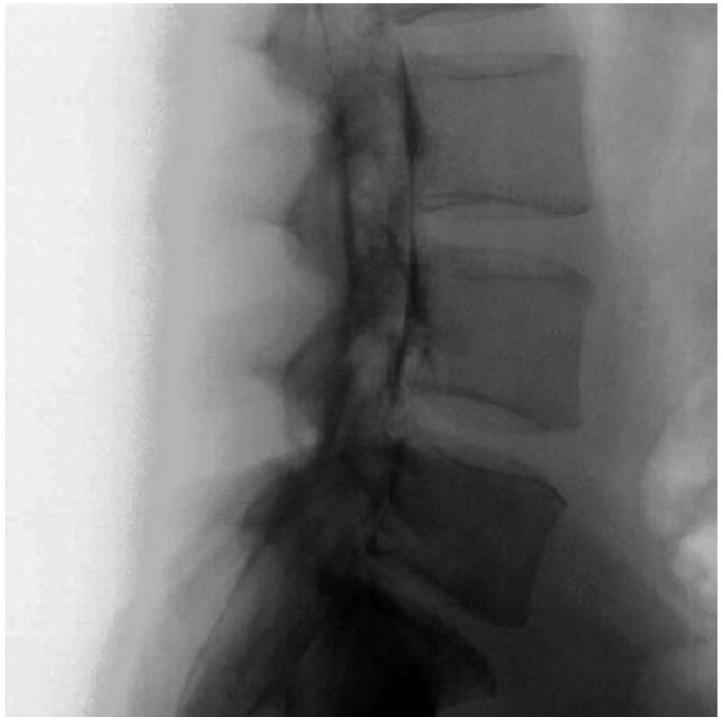
Bloc Facettaire/Epidural

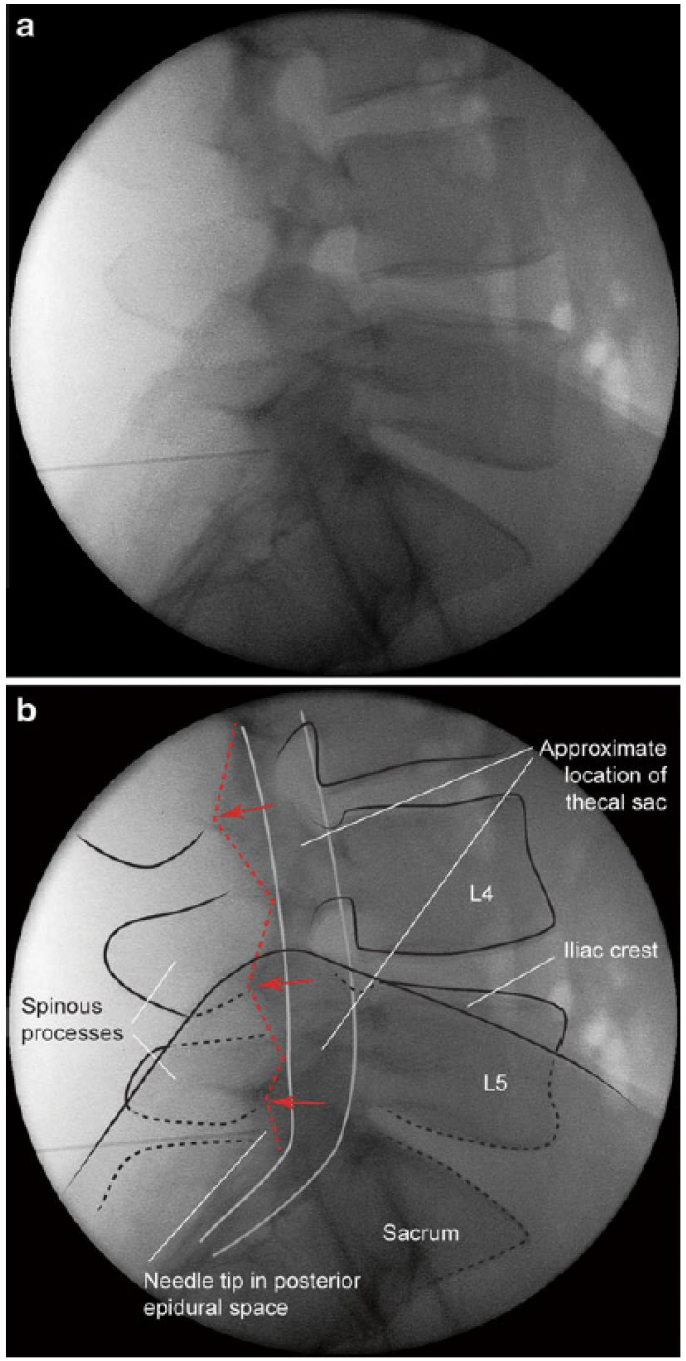
Curr Pain Headache Rep (2012) 16:9–18
DOI 10.1007/s11916-011-0241-z

ANESTHETIC TECHNIQUES IN PAIN MANAGEMENT (GJ BRENNER, SECTION EDITOR)

The Role of Image Guidance in Improving the Safety of Pain Treatment

James P. Rathmell · Smith C. Manion





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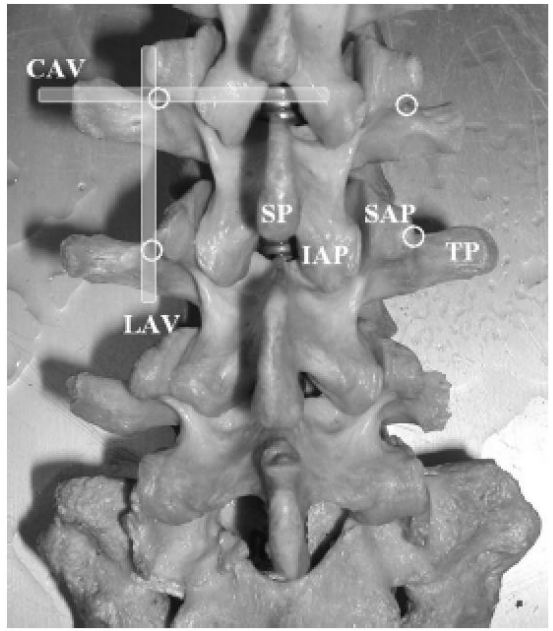


Fig. 1. Lumbar vertebral column (L3–L5): Transducer alignment for ultrasound-guided lumbar facet nerve block in the cross-axis view (CAV) and long-axis view (LAV). *Circles* indicate target points. IAP = inferior articular process; SAP = superior articular process; SP = spinous process; TP = transverse process.

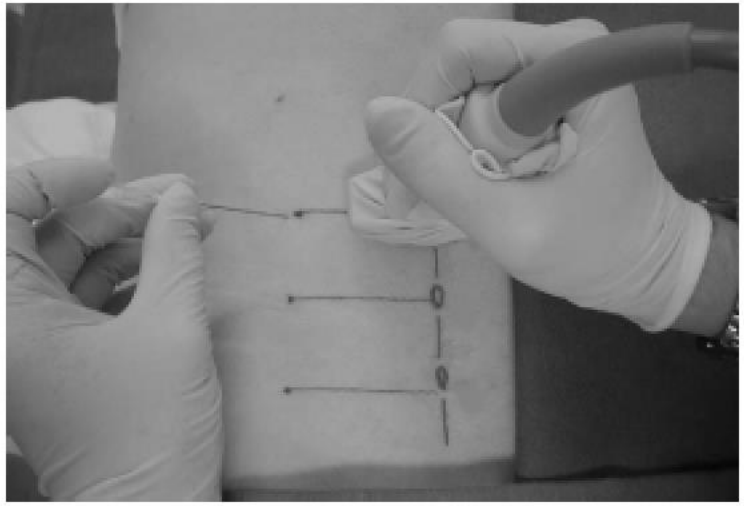
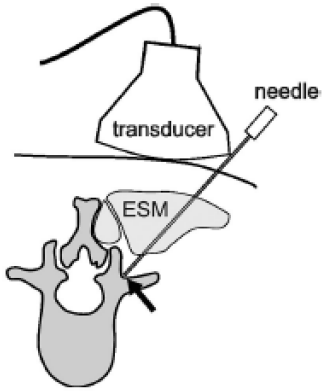
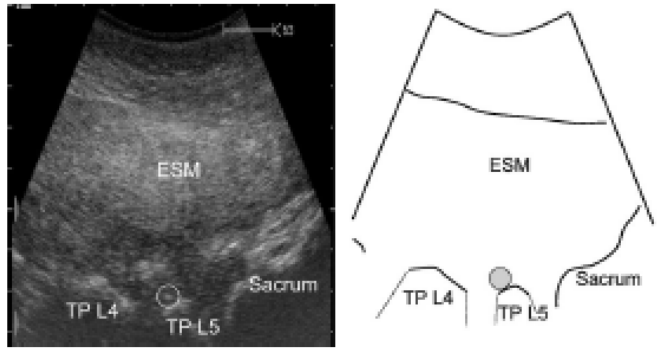
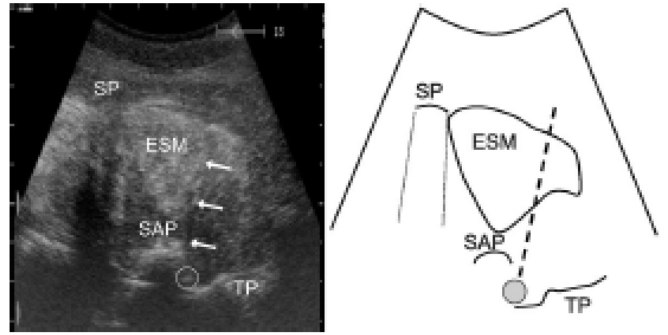


Fig. 5. Setting for ultrasound-guided lumbar facet nerve block, puncture at the L3 level, 6 cm laterally from the midline.







Bloc Facettaire/Epidural

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ACRM
AMERICAN CONGRESS OF REHABILITATION MEDICINE

Archives of Physical Medicine and Rehabilitation

journal homepage: www.archives-pmr.org

Archives of Physical Medicine and Rehabilitation 2016;97:1558-63

REVIEW ARTICLE (META-ANALYSIS)

Effectiveness of Ultrasound-Guided Versus Fluoroscopy or Computed Tomography Scanning Guidance in Lumbar Facet Joint Injections in Adults With Facet Joint Syndrome: A Meta-Analysis of Controlled Trials

Tao Wu, MD,[a,*] Wei-hua Zhao, MD,[b,*] Yan Dong, MD,[c] Hai-xin Song, MD,[a] Jian-hua Li, MD[a]

From the [a]Department of Rehabilitation Medicine, Sir Run Run Shaw Hospital, College of Medicine, Zhejiang University, Zhe Jiang; [b]Department of Rehabilitation Medicine, First Hospital of Shi Zui Shan, Ning Xia Medical University, Ning Xia Hui Autonomous Region; and [c]Department of Rehabilitation Medicine, Hangzhou Hospital of Zhejiang Chinese People's Armed Police Force, Zhe Jiang, PR China.
**Wu and Zhao contributed equally to this work.*

- SCAN/FLUORO BBM: B-MOD
- SCAN/FLUORO IA: C-LOW
- FLUORO RFA: B-LOW

Bloc Facettaire/Epidural

QUESTION 5: ARE FACET BLOCKS 'DIAGNOSTIC', 'PROGNOSTIC' OR BOTH?

Effectiveness of Lumbar Facet Joint Blocks and Predictive Value before Radiofrequency Denervation

The Facet Treatment Study (FACTS), a Randomized, Controlled Clinical Trial

Steven P. Cohen, M.D., Tina L. Doshi, M.D., Octav C. Constantinescu, M.D., Zirong Zhao, M.D., Ph.D., Connie Kurihara, R.N., Thomas M. Larkin, M.D., Scott R. Griffith, M.D., Michael B. Jacobs, M.D., William J. Kroski, D.O., Timothy C. Dawson, M.D., Ian M. Fowler, M.D., Ronald L. White, M.D., Aubrey J. Verdun, M.D., David E. Jamison, M.D., Mirinda Anderson-White, R.N., Stephanie E. Shank, R.N., Paul F. Pasquina, M.D.

Anesthesiology, V 129 • No 3 517 September 2018

Bloc Facettaire/Epidural

ORIGINAL ARTICLE

Medial Branch Blocks or Intra-Articular Injections as a Prognostic Tool Before Lumbar Facet Radiofrequency Denervation

A Multicenter, Case-Control Study

Steven P. Cohen, MD,† Jee Youn Moon, MD, PhD,‡ Chad M. Brummett, MD,§ Ronald L. White, MD,|| and Thomas M. Larkin, MD**††*

Regional Anesthesia and Pain Medicine • Volume 40, Number 4, July-August 2015

Conclusions: When used as a prognostic tool before lumbar facet radiofrequency, MBB may be associated with a higher success rate than IA injections. Our results should be confirmed by large, prospective, randomized studies.

Bloc Facettaire/Epidural

Bloc Facettaire/Epidural

- Injection IA: intervention dx
- Injection IA〈 prédictive BBM pour réponse RFA
- B évidence
- Low certitude

Bloc Facettaire/Epidural

Table 12 Summary of recommendations

Topic	Recommendation/Findings	Level of evidence and certainty
Value of history and physical examination to select patients for blocks	There are no examination or historical signs that reliably predict response to lumbar facet blocks. Paraspinal tenderness and radicular symptomatology may be weakly predictive of positive and negative blocks, respectively. The levels targeted should be based on clinical presentation (eg, tenderness, pain patterns, imaging if available).	Grade C, low level of certainty
Correlation between imaging and facet block and RFA outcomes, and whether imaging is necessary before blocks	There is moderate evidence for SPECT before MBB. There is weak evidence for SPECT before IA blocks. There is weak evidence for MRI, CT and scintigraphy before MBB and IA blocks.	Grade C, moderate level of certainty Grade D, low level of certainty Grade D, low level of certainty
Requirement of conservative treatment including physical therapy before facet blocks	Consistent with clinical practice guidelines, we recommend a 3-month trial of different conservative treatments before facet joint interventions.	Grade C, low level of certainty
Necessity of image guidance for lumbar facet blocks and RFA	We recommend CT or preferably fluoroscopy be used for lumbar MBB, although ultrasound may be considered in certain contexts. For IA injections, we recommend CT, although fluoroscopy can be considered in some cases.	Grade C, low level of certainty
	For RFA, we recommend using fluoroscopy.	Grade B, low level of certainty
Diagnostic and prognostic value of facet blocks	IA injections are theoretically more diagnostic than MBB, although they are characterized by a high technical failure rate and poorer predictive value before RFA. Both MBB and IA injections are better than saline injections as prognostic tools before RFA.	Grade B, low level of certainty
MBB vs IA injections before RFA	MBB should be the prognostic injection of choice before RFA. IA injections may be used for both diagnostic and therapeutic purposes in some individuals (eg, young people with inflammatory pain, people at risk of RFA complications).	Grade C, moderate level of certainty.

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Effect of sedation on diagnostic and prognostic utility	Consistent with guidelines, sedation should not be routinely used in the absence of individual indications.	Grade B, low-to-moderate level of certainty
Ideal volume for facet blocks	Lumbar MBB should be performed with a volume ≤0.5 mL to prevent spread to adjacent structures, and IA injections should be done with a volume <1.5 mL to prevent aberrant spread and capsular rupture.	Grade C, low level of certainty
Therapeutic benefit from MBB and IA injections	We recommend against the routine use of both therapeutic MBB and IA injections, although we acknowledge there may be some contexts in which these can be useful (eg, prolonged relief from prognostic blocks, contraindications to RFA).	Grade D, moderate level of certainty
Cut-off for designating a prognostic block as positive and use of non-pain score outcome measures	We recommend that ≥50% pain relief be used as the threshold for designating a prognostic block as positive, but recognize that using higher cut-off values may result in higher RFA success rates. Secondary outcomes such as activity levels may also be considered when deciding whether to proceed with RFA.	Grade B, moderate level of certainty
Number of prognostic blocks performed before RFA	We recommend a single block. Although using multiple blocks may improve RFA success rates, it will also result in patients who might benefit from RFA being denied treatment.	Grade C, low-to-moderate level of certainty
Evidence for large RF lesions	There is indirect evidence, and limited direct evidence, that techniques that result in larger lesions (eg, larger electrodes, higher temperatures, longer heating times, proper electrode orientation, fluid modulation) improve outcomes.	Grade C, low level of certainty that larger lesions increase the chance of capturing nerves. Grade I, low level of certainty that larger lesions increase duration of pain relief.

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Electrode orientation	We recommend positioning the electrode in an orientation near-parallel to the nerve.	Grade B, low level of certainty
Use of sensory and motor stimulation before RFA	Sensory stimulation should be used when single lesions are anticipated. When multiple lesions are planned, the evidence for sensory stimulation is inconclusive. Motor stimulation may be beneficial for safety and effectiveness purposes.	Grade C, low level of certainty Grade I, moderate level of certainty Grade B, low level of certainty
Mitigating complications	Intravascular uptake can adversely affect the validity of MBB and we recommend aspiration and real-time contrast injection.	Grade C, low levelof certainty
	Anticoagulation medications should be continued for facet blocks and RFA, and cases that might warrant discontinuation should be discussed with relevant healthcare providers.	Grade B, moderate level of certainty
	Injection of steroid after RFA may prevent neuritis.	Grade C, low levelof certainty
	Confirming electrode placement in multiple views andusing sensorimotor testing may reduce the risk of nerveroot injury.	Grade B, low levelof certainty
	RFA can result in paraspinal muscle degeneration andpossibly disc degeneration, though the clinical relevanceof this is unclear. We recommend a discussion of thispossibility with patients, and consideration of physicaltherapy before and after RFA to reduce the risk.	Grade C, low levelof certainty
	Interference with implanted electrical devices can occur,and physicians should consult with relevant healthcareteams regarding recommendations (eg, programmingpacemakers to asynchronous mode, turning offneurostimulators). Bipolar modes may be safer thanmonopolar, and grounding pads should be placed awayfrom implanted cardiac devices, but not too close to theneurotomy site (risk of tissue burn). Avoid excessivesedation.	Grade C, low levelof certainty
	Burns may occur from equipment malfunction or lesionextension to the skin (less likely). Checking equipment,and properly positioning the grounding on a dry, cleanshaven lower extremity devoid of scars may minimize thisrisk.	Grade B,moderate-to-highlevel of certainty
	Spine surgery is associated with lower RFA success rates,and physicians should check placement of RF probes inmultiple fluoroscopic views and avoid contact withhardware to prevent thermal injury.	Grade C, low levelof certainty
Difference in standards between clinical trials and clinical practice	Providers involved in clinical trials and clinical practice may have different goals that warrant different selection and performance criteria. Areas that might warrant discrepancies include the use of contrast during MBB, number of blocks performed, prognostic block cut-off for identifying an RFA candidate and use of sensorimotor stimulation.	Grade A, moderate level of certainty
Repeating RFA	We recommend repeating RFA in individuals who obtained at least 3 (and preferably 6) months of relief, up to two times per year. The success rate for repeat RFA decreases for successive procedures but remains above 50%.	Grade B, moderate level of certainty
	Repeating prognostic blocks is not routinely necessary in patients who experience a recurrence of their baseline pain in a physiological timeframe.	Grade C, low level of certainty

Bloc Facettaire/Epidural

Pain Physician 2020; 23:111-126 • ISSN 1533-3159

Health Policy Review

An Updated Analysis of Utilization of Epidural Procedures in Managing Chronic Pain in the Medicare Population from 2000 to 2018

Laxmaiah Manchikanti, MD[1], Mahendra R. Sanapati, MD[2], Amol Soin, MD[3], Maanasa V. Manchikanti, BS[4], Vidyasagar Pampati, MSc[1], Vanila Singh, MD[5], and Joshua A. Hirsch, MD[6]

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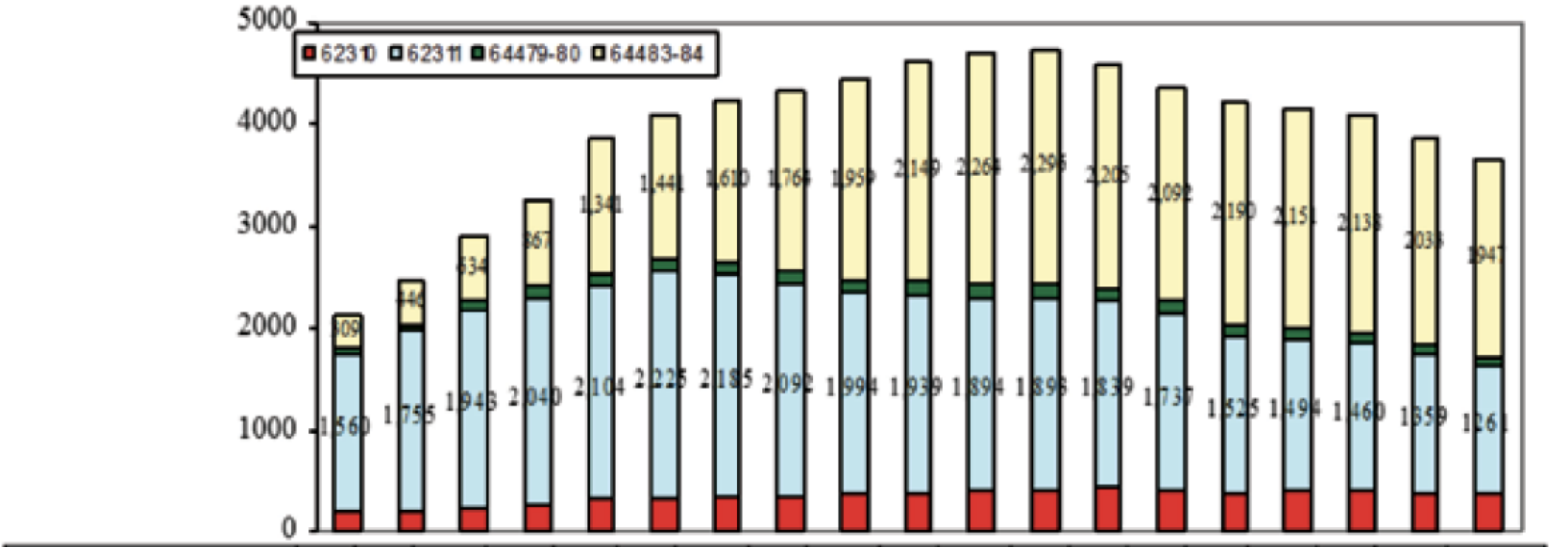


Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
C/T Interlaminar Epidurals (62310)	9.0%	8.5%	8.5%	8.2%	8.1%	8.1%	8.0%	8.2%	8.2%	8.3%	8.4%	8.7%	9.3%	9.6%	9.3%	9.5%	9.7%	9.9%	10.1%
L/S Interlaminar Epidurals (62311)	73.7%	71.1%	67.1%	62.5%	54.5%	54.1%	51.3%	48.4%	44.9%	42.0%	40.3%	39.9%	40.1%	39.9%	38.2%	38.0%	38.6%	38.1%	34.5%
C/T Transforaminal Epidurals (64479, 80)	2.7%	2.4%	2.5%	2.8%	2.7%	2.8%	2.9%	2.7%	2.8%	3.1%	3.2%	2.9%	2.5%	2.4%	2.6%	2.6%	2.6%	2.5%	2.4%
L/S Transforaminal Epidurals(64483, 84)	14.6%	18.1%	21.9%	26.6%	34.7%	36.0%	37.5%	40.6%	44.1%	46.6%	48.2%	48.5%	48.1%	48.1%	51.9%	51.9%	52.1%	52.5%	53.0%
All Epidurals (Rate)	2,118	2,470	2,894	3,265	3,883	4,113	4,255	4,327	4,442	4,612	4,701	4,740	4,582	4,354	4,216	4,146	4,100	3,875	3,669

Fig. 2. *Frequency of utilization of epidural injections by procedures from 2000 to 2018, in Medicare recipients.*

Bloc Facettaire/Epidural

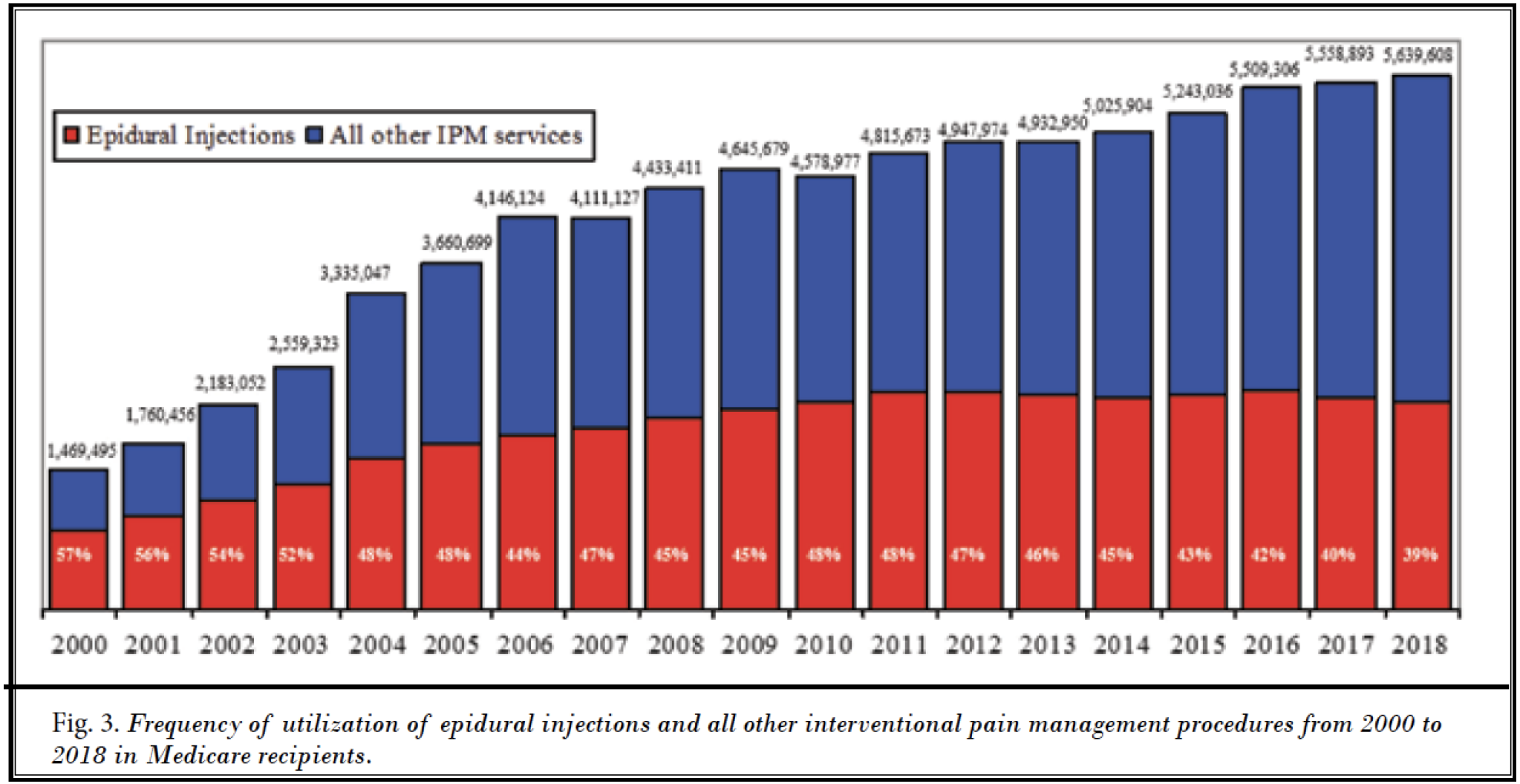


Fig. 3. *Frequency of utilization of epidural injections and all other interventional pain management procedures from 2000 to 2018 in Medicare recipients.*

Bloc Facettaire/Epidural

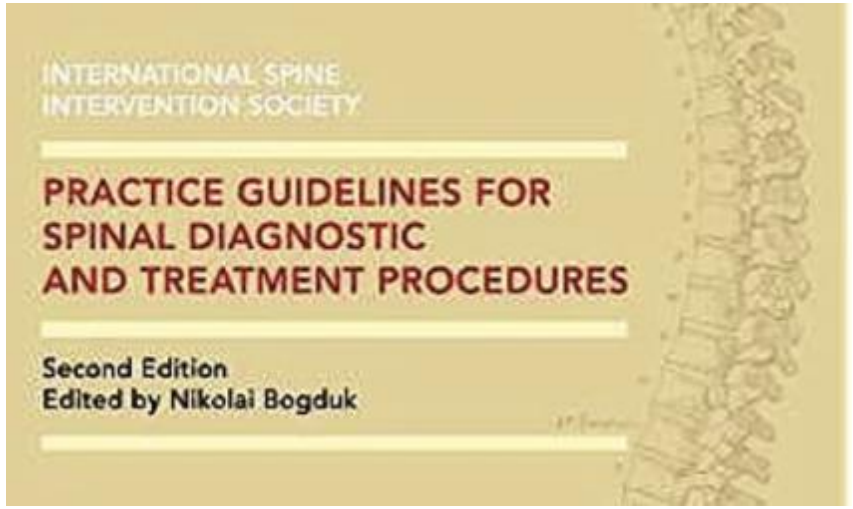
REVIEW ARTICLE

Epidural Steroids

A Comprehensive, Evidence-Based Review

Steven P. Cohen, MD,† Mark C. Bicket, MD,* David Jamison, MD,† Indy Wilkinson, MD,‡ and James P. Rathmell, MD§*

Regional Anesthesia and Pain Medicine • Volume 38, Number 3, May-June 2013



NICE National Institute for Health and Care Excellence

NICE guideline

Low back pain and sciatica in over 16s: assessment and management

NICE guideline
Published: 30 November 2016
www.nice.org.uk/guidance/ng59

North American Spine Society

Evidence-Based Clinical Guidelines for Multidisciplinary Spine Care

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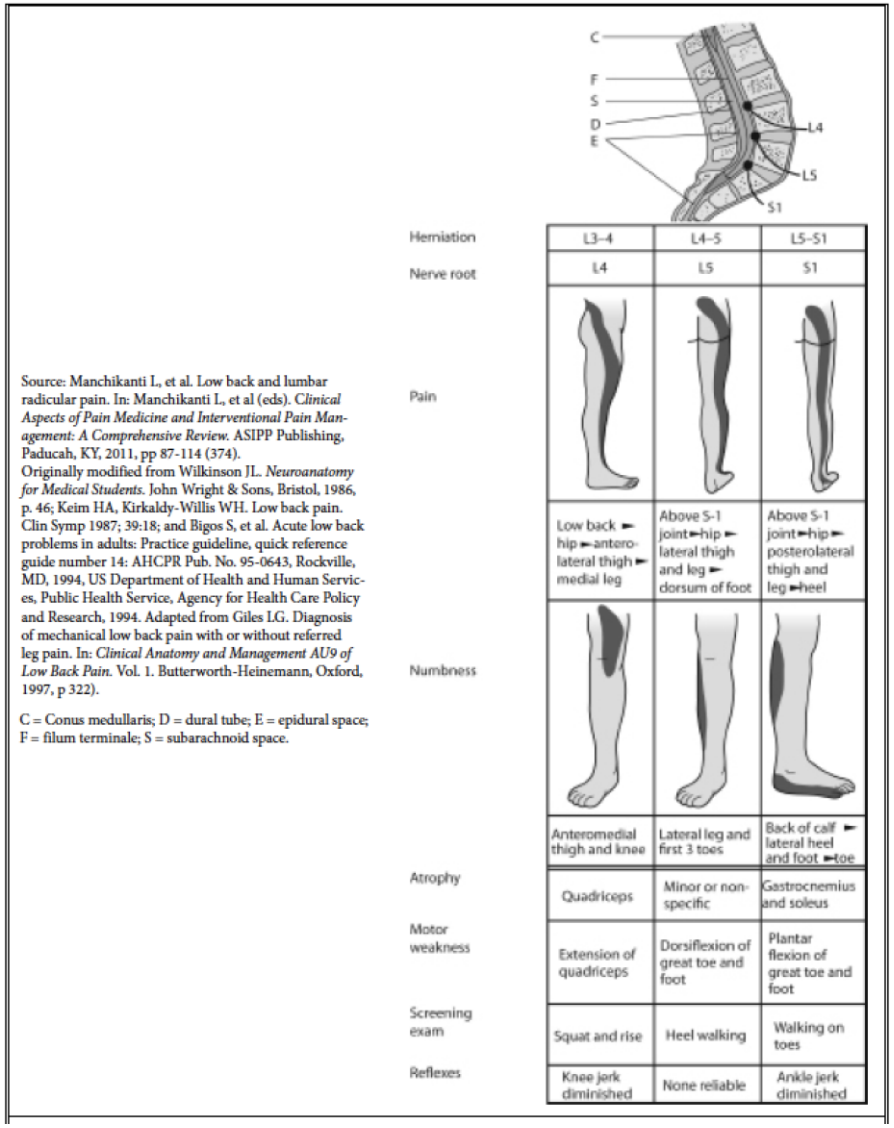
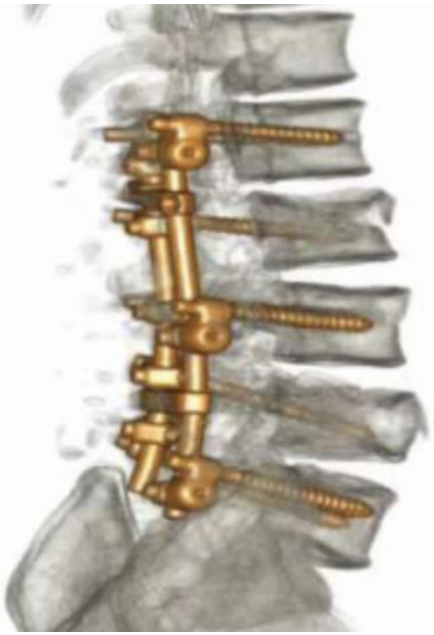


Herniation	L3–4	L4–5	L5–S1
Nerve root	L4	L5	S1
Pain	Low back ► hip ►antero-lateral thigh ► medial leg	Above S-1 joint►hip ► lateral thigh and leg ► dorsum of foot	Above S-1 joint►hip ► posterolateral thigh and leg ►heel
Numbness	Anteromedial thigh and knee	Lateral leg and first 3 toes	Back of calf ► lateral heel and foot ►toe
Atrophy	Quadriceps	Minor or non-specific	Gastrocnemius and soleus
Motor weakness	Extension of quadriceps	Dorsiflexion of great toe and foot	Plantar flexion of great toe and foot
Screening exam	Squat and rise	Heel walking	Walking on toes
Reflexes	Knee jerk diminished	None reliable	Ankle jerk diminished

Source: Manchikanti L, et al. Low back and lumbar radicular pain. In: Manchikanti L, et al (eds). *Clinical Aspects of Pain Medicine and Interventional Pain Management: A Comprehensive Review.* ASIPP Publishing, Paducah, KY, 2011, pp 87-114 (374).
Originally modified from Wilkinson JL. *Neuroanatomy for Medical Students.* John Wright & Sons, Bristol, 1986, p. 46; Keim HA, Kirkaldy-Willis WH. Low back pain. Clin Symp 1987; 39:18; and Bigos S, et al. Acute low back problems in adults: Practice guideline, quick reference guide number 14: AHCPR Pub. No. 95-0643, Rockville, MD, 1994, US Department of Health and Human Services, Public Health Service, Agency for Health Care Policy and Research, 1994. Adapted from Giles LG. Diagnosis of mechanical low back pain with or without referred leg pain. In: *Clinical Anatomy and Management AU9 of Low Back Pain.* Vol. 1. Butterworth-Heinemann, Oxford, 1997, p 322).

C = Conus medullaris; D = dural tube; E = epidural space; F = filum terminale; S = subarachnoid space.



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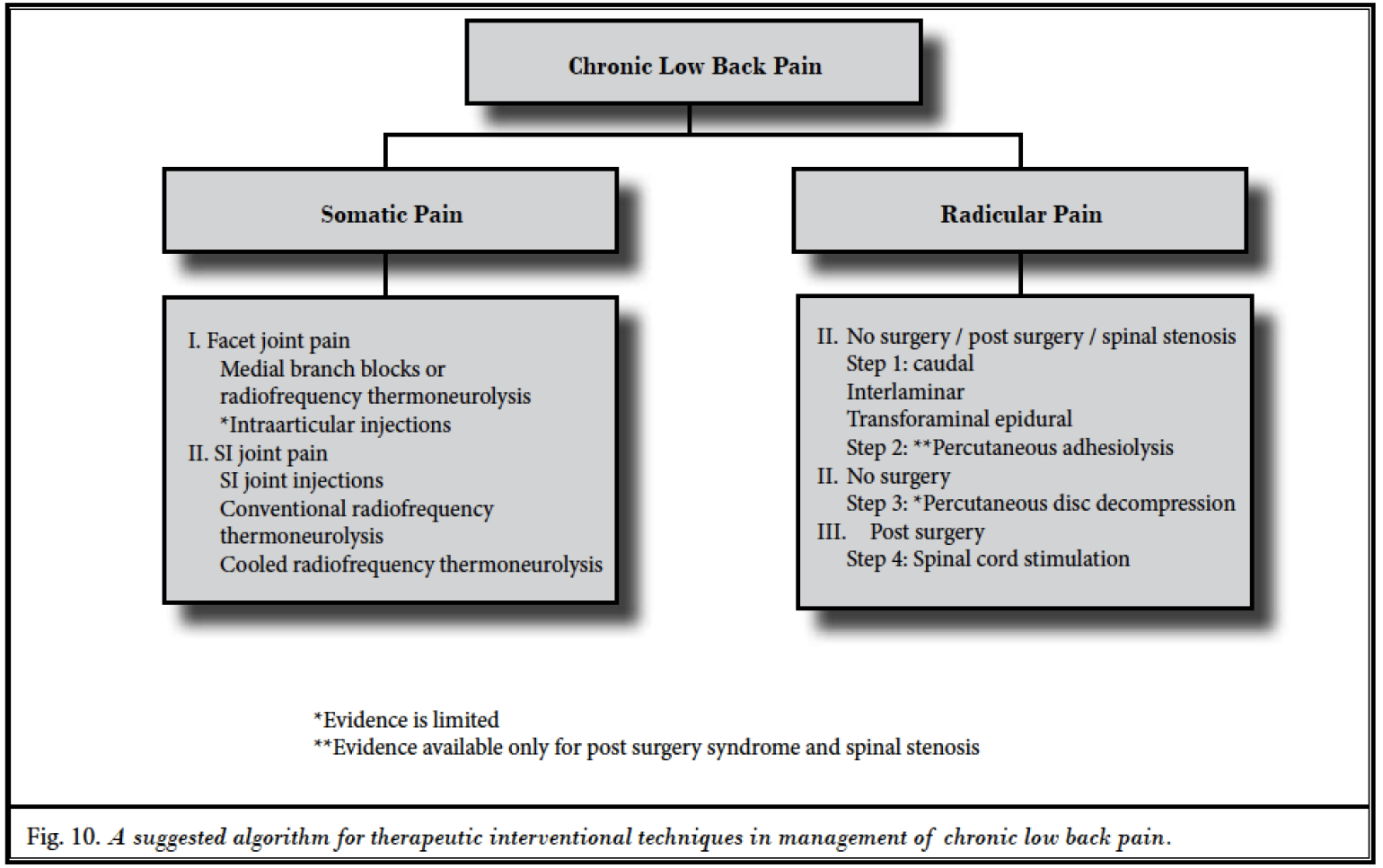

Fig. 10. *A suggested algorithm for therapeutic interventional techniques in management of chronic low back pain.*

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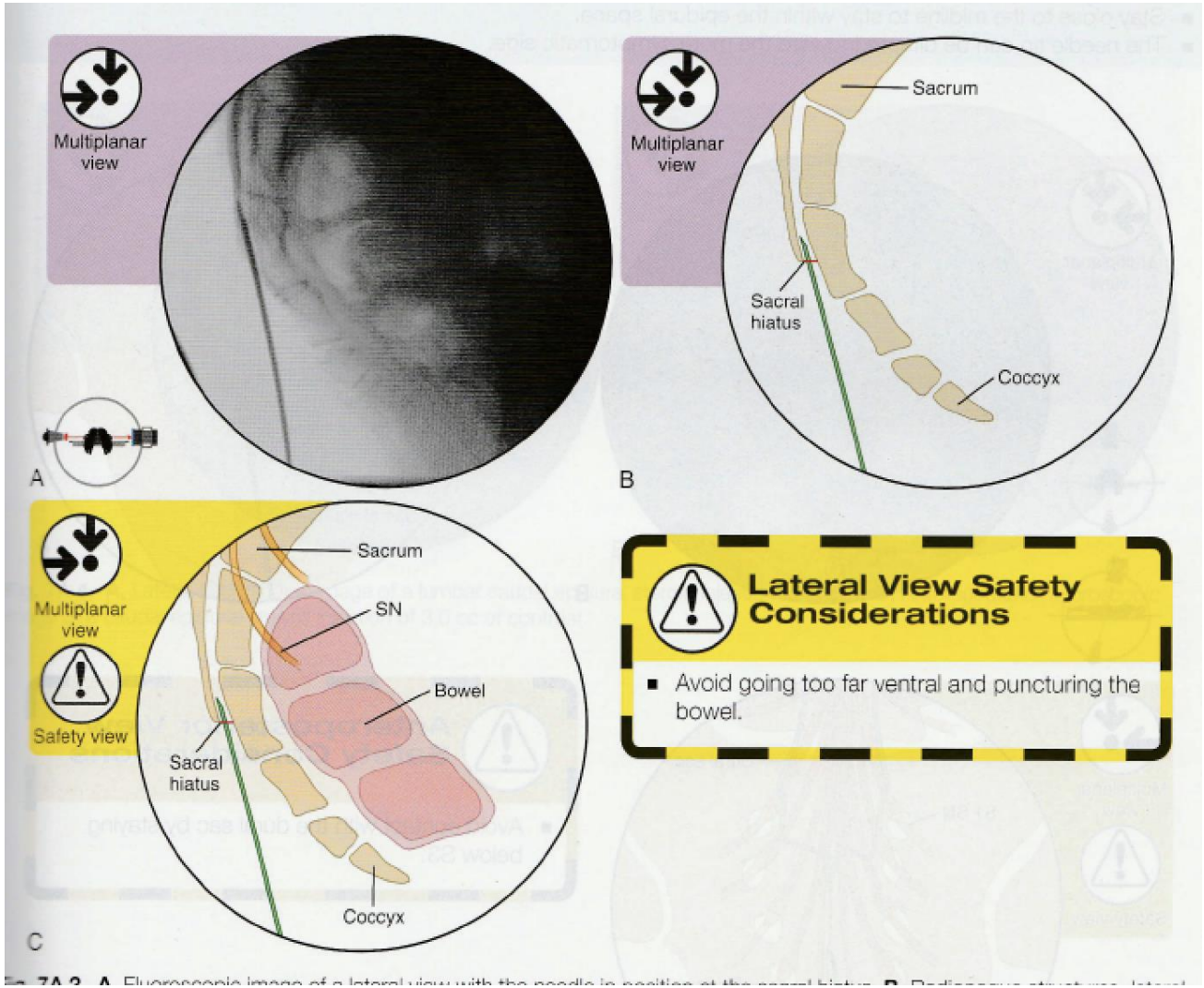

In summary, the evidence is good for radiculitis secondary to disc herniation with local anesthetics and steroids and fair with local anesthetics only, whereas it is fair for spinal stenosis with local anesthetics and steroids, for axial pain without disc herniation, and post surgery syndrome with local anesthetic with or without steroids.

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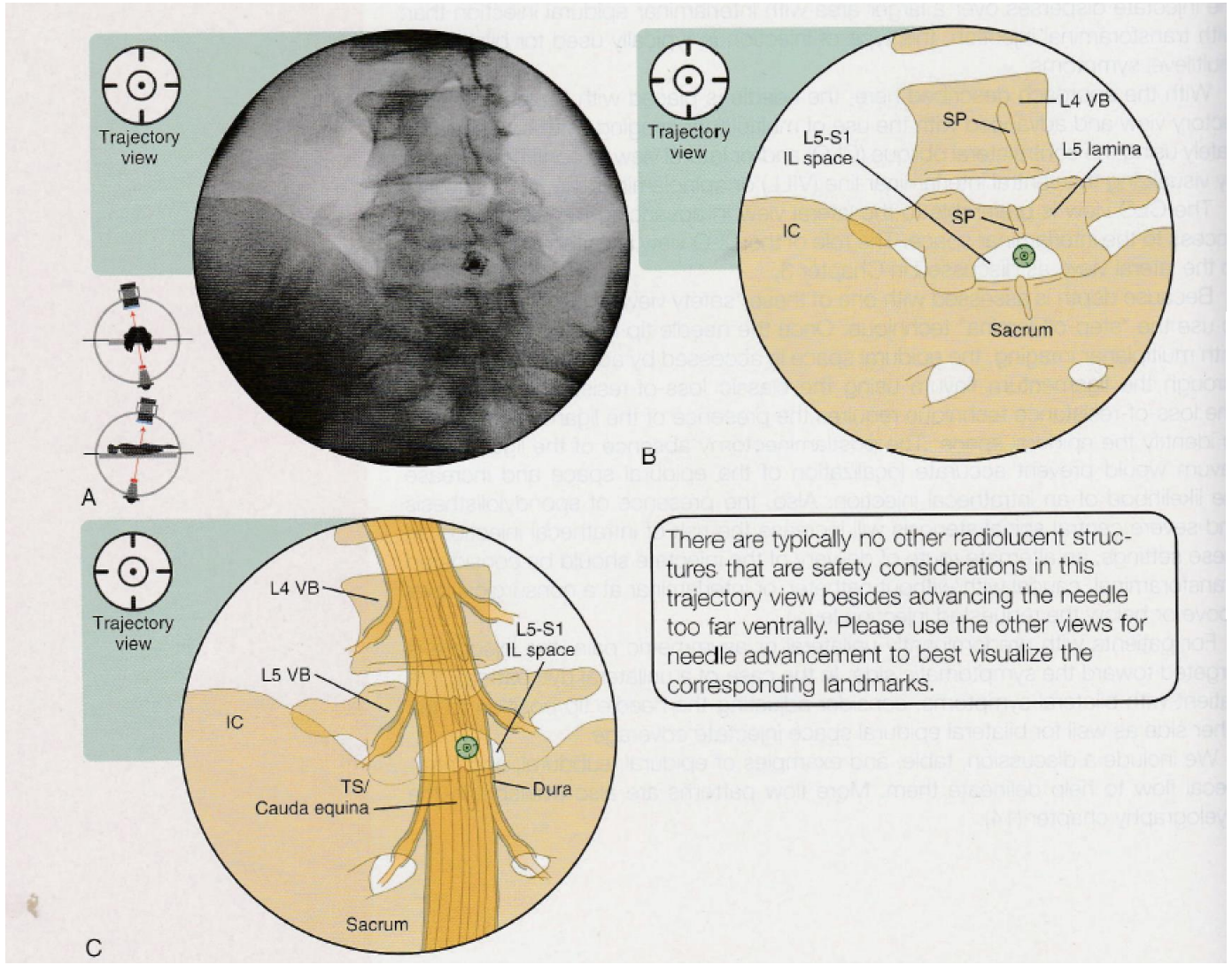

In summary, the evidence is good for radiculitis secondary to disc herniation with local anesthetics and steroids, fair with local anesthetic only, fair for spinal stenosis with local anesthetic and steroids, and fair for axial pain without disc herniation and with local anesthetic with or without steroids.

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A Prospective Evaluation of Iodinated Contrast Flow Patterns with Fluoroscopically Guided Lumbar Epidural Steroid Injections: The Lateral Parasagittal Interlaminar Epidural Approach Versus the Transforaminal Epidural Approach

Kenneth D. Candido, MD*

Meda S. Raghavendra, MD*

Mariadas Chinthagada, MD*

Soraya Badiee, DO*

Donald W. Trepashko, MD†

BACKGROUND: Lumbar midline interlaminar and transforaminal (TF) epidural steroid injections are treatments for low back pain with radiculopathy secondary to degenerative disk disease. Since pain generators are located anteriorly in the epidural space, ventral epidural spread is the logical target for placement of antiinflammatory medications. In this randomized, prospective, observational study, we compared contrast flow patterns in the epidural space using the parasagittal interlaminar (PIL) and transforaminal approaches with continual fluoroscopic guidance.

METHODS: Sixty adult patients with low back pain and unilateral radiculopathy from herniated or degenerated discs were enrolled. Subjects were randomly assigned to one of two groups: TF or PIL (30 in each). All procedures were performed using continual fluoroscopic guidance and 5 mL of contrast. Contrast spread was rated (primary outcome measure) by the interventionalist. Spread was scored 0–2, with 0 = no anterior spread; 1 = anterior spread, same level as needle insertion; and 2 = anterior spread at ≥1 segmental level. The secondary outcome measure was analgesia at 2 wk, 1, 3, and 6 mo.

RESULTS: One hundred percent (29 of 29) patients in the PIL group and 75% (21 of 28) patients in the TF group demonstrated anterior epidural spread. The mean spread grade was 1.93 (95% confidence interval [CI], 1.83–2.0) in the PIL group and 1.46 (95% CI, 1.17–1.46) in the TF group ($P = 0.003$). Mean fluoroscopy time was 28.96 s (95% CI, 23.9–34.1 s) in the PIL group and 46.25 s (95% CI, 36.27–56.23 s) in the TF group ($P = 0.003$). Visual analog scale scores were equivalent between groups.

CONCLUSIONS: The PIL approach is superior to the TF approach for placing contrast into the anterior epidural space with reduction in fluoroscopy times and an improved spread grade. With increasing attention to neurological injury associated with TF, the PIL approach may be more suitable for routine use.

(Anesth Analg 2008;106:638–44)

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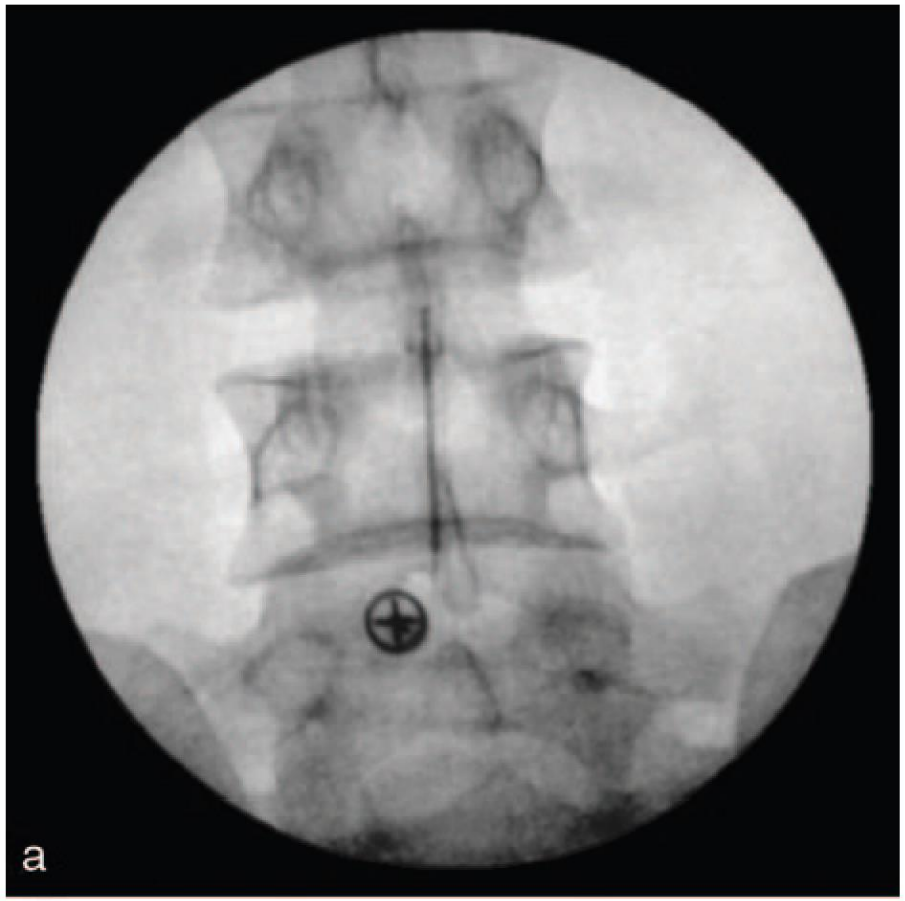

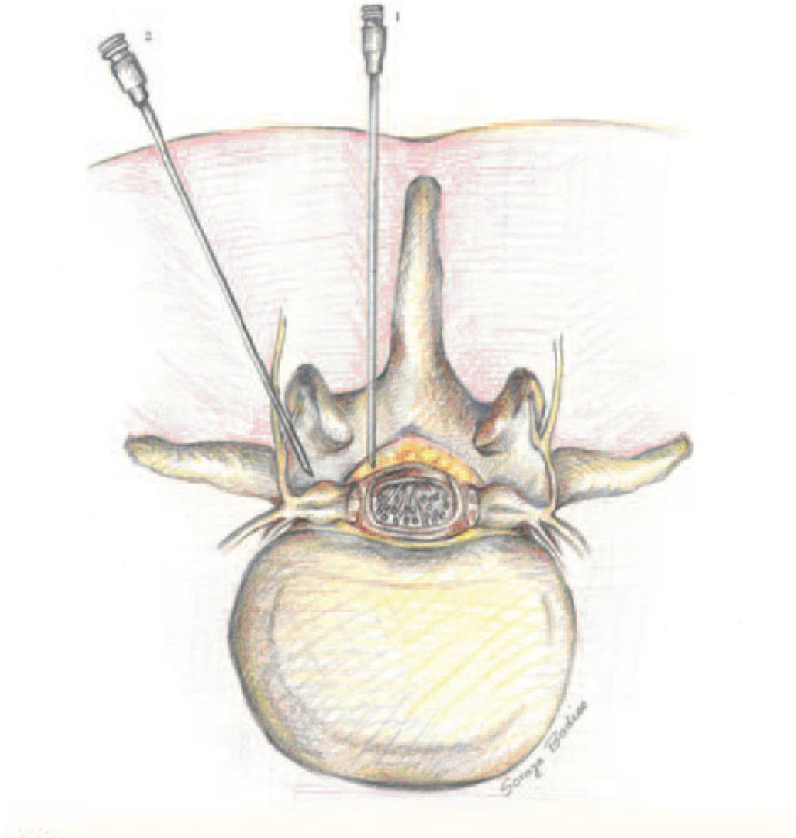

b

1: Parasagittal interlaminar approach (PIL)
2: Transforaminal approach (TF)

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Randomized Control Trial

Transforaminal Versus Lateral Parasagittal Versus Midline Interlaminar Lumbar Epidural Steroid Injection for Management of Unilateral Radicular Lumbar Pain: A Randomized Double-Blind Trial

Jeetinder Kaur Makkar, MD[1], Kalla Krishna Prasad Gourav, MD[1], Kajal Jain, MD[1], Preet Mohinder Singh, MD[2], Sarvdeep S. Dhatt, MS[3], Naresh Sachdeva, MD[4], and Sanjay Bhadada, MD[4]

Conclusions: PIL approach is equivalent to TF and superior to MIL approach in terms of effective pain relief and decrease in disability in patients with unilateral lumbar radiculopathy. This study showed no deleterious effect on BMD.

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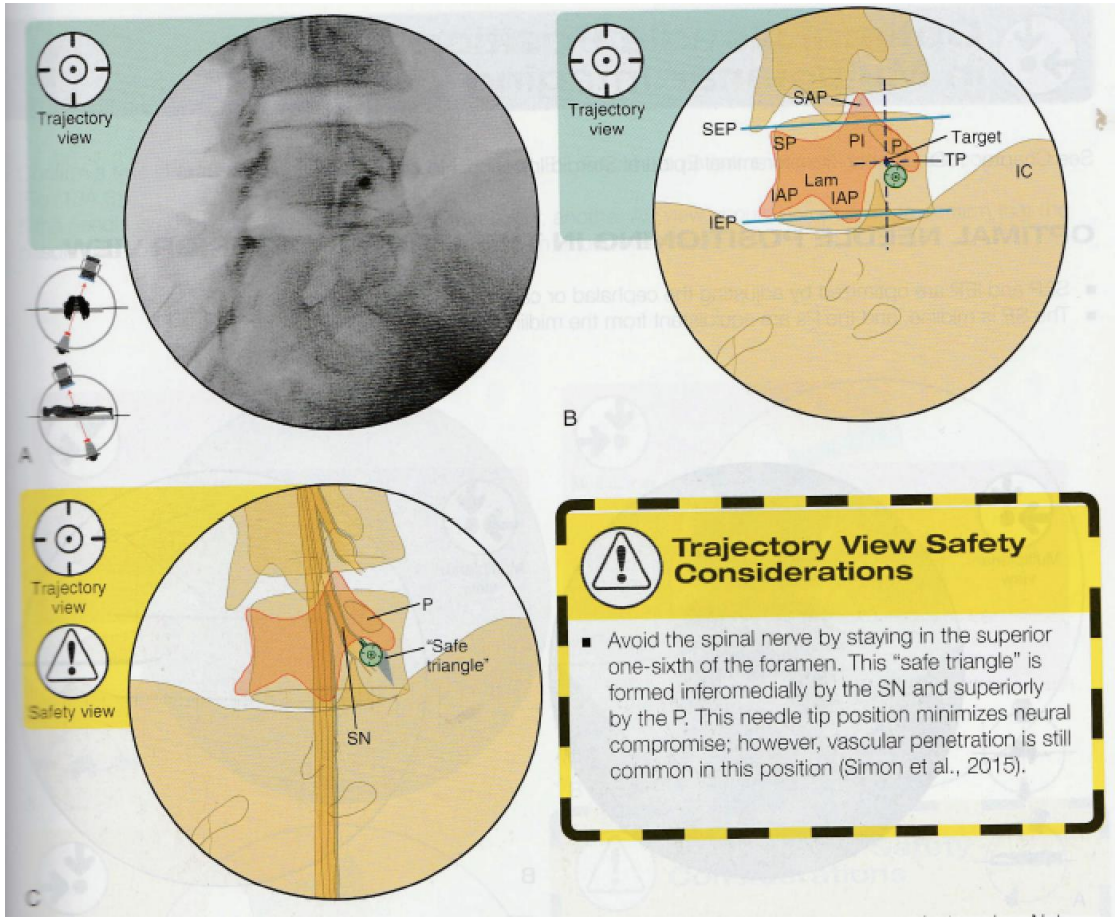

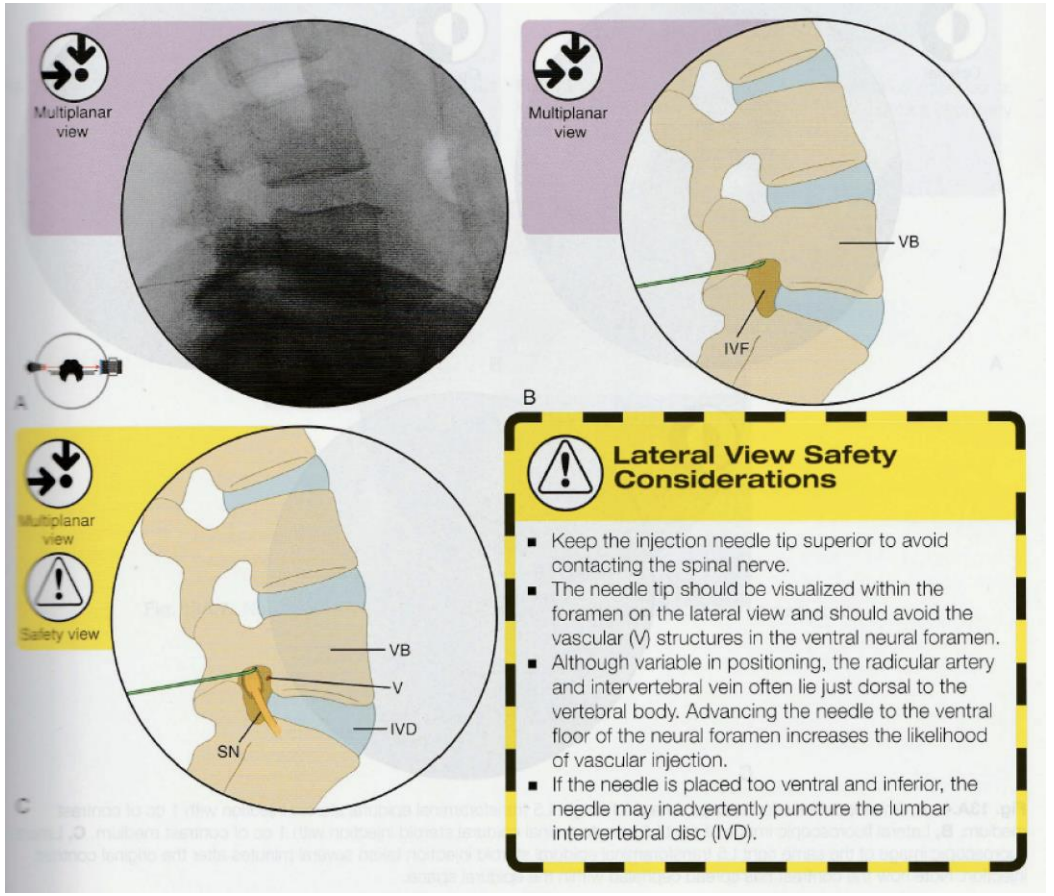

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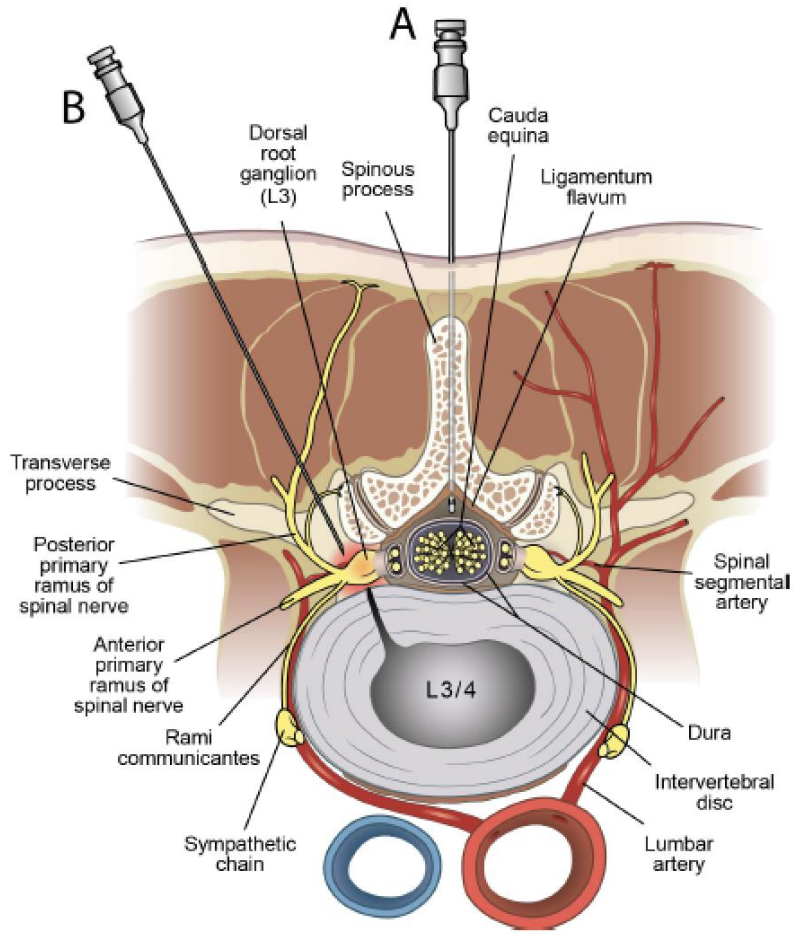

FIGURE 1. Schematic drawing illustrating L3-4 IL (A) and TF (B) epidural needle placement in relation to anatomical structures in a patient with an L3-4 herniated disk. Adapted with permission from Rathmell.[298]

In summary, the evidence is good for radiculitis secondary to disc herniation with local anesthetics and steroids and fair with local anesthetic only, fair for spinal stenosis with local anesthetic and steroids, and limited for axial pain and post surgery syndrome with local anesthetic with or without steroids for short-term and long-term relief.

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1.2.1.5 Recommendations

The evidence is good for caudal epidural, interlaminar epidural, and transforaminal epidural injections with or without steroids in managing disc herniation or radiculitis.

For axial or discogenic pain, the evidence is fair for either caudal epidural or lumbar interlaminar epidural injections with or without steroids. The evidence is limited for transforaminal epidural injections.

For spinal stenosis the evidence is fair for caudal and interlaminar injections and limited for transforaminal epidural injections with or without steroids.

For post surgery syndrome the evidence is fair for caudal epidural injections with or without steroids.

Thus, for disc herniation, one of the 3 approaches may be used; for axial or discogenic pain, either lumbar interlaminar or caudal epidural injections are recommended; for spinal stenosis any of the 3 approaches may be performed, however with transforaminal, there is limited evidence; and for post surgery syndrome, the preferred modality of treatment is with caudal epidural with or without steroids.

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