Facet Pain and Radiofrequency Ablation

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Multidisciplinary Evaluation and Management of Spine Pain

Basic Pain Injections:
Facet Pain and Radiofrequency Ablation

Epidemiology

Most episodes of low back pain will be short-lived

80% resolve in about 6 weeks, irrespective of treatment

Pain will recur 24-33% of the time over a 12 month period

5% to 10% of patients develop persistent back pain

Low Back Pain in the working population

age 20-64: **15%,** or **26 million**
age 65 and older: **27%,** or **60 million**
11% demonstrate high pain intensity and significant disability

Shekelle PG, Markovich M, Louie R. An epidemiologic study of episodes of back pain care. *Spine* 1995; 20:1668-1673.
Stanton TR, Henschke N, Maher CG, Refshauge KM, Latimer J, McAuley JH. After an episode of acute low back pain, recurrence is unpredictable and not as common as previously thought. *Spine* 2008; 33:2923-2928.
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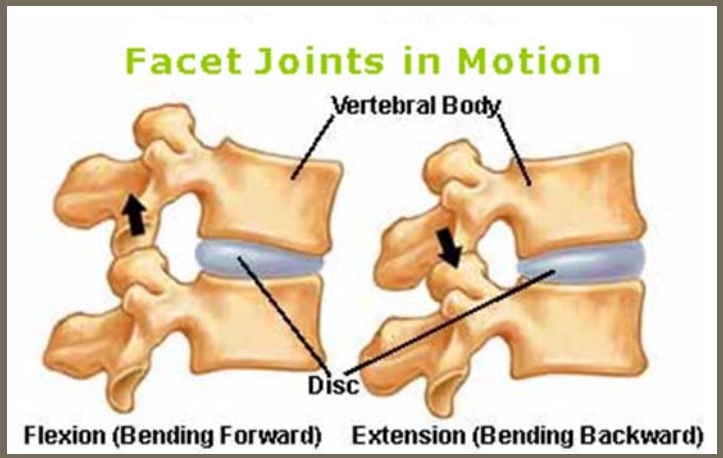
Causes of Low Back Pain

Back Pain is often multifactorial and symptoms related for facet joint pathology can overlap with other degenerative disorders of the spine:

Facet syndrome	40%
Discogenic pain	26%
Sacroiliitis	2%
Nerve root irritation	13%
Unknown	19%



Manchikanti L, Singh V, Pampati V, Damron K, Barnhill R, Beyer C, Cash K. Evaluation of the relative contributions of various structures in chronic low back pain. *Pain Physician* 2001;4:308-316.

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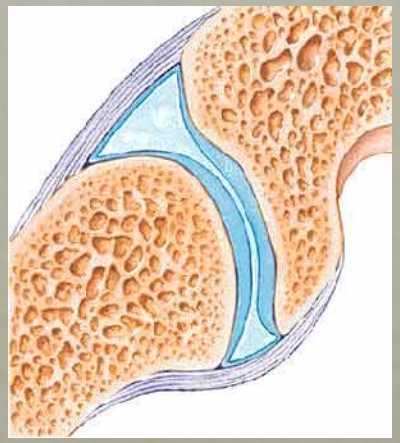
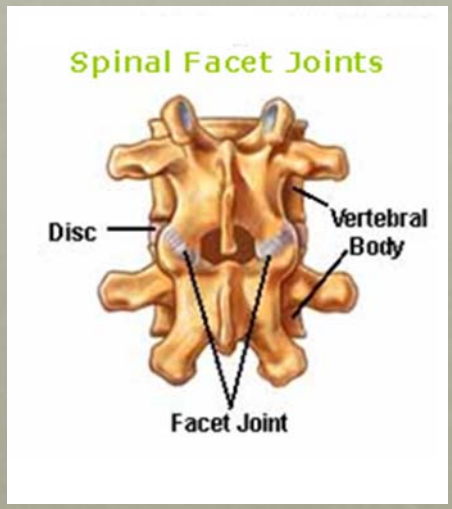
Facet Joints

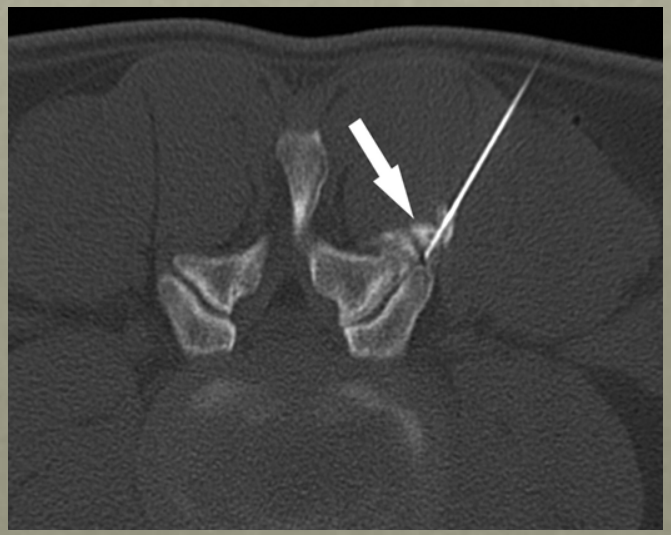


Facet joints are synovial joints

Each joint is surrounded by a capsule of connective tissue and produces a fluid to nourish and lubricate the joint

Joint surfaces are coated with cartilage allowing joints to articulate smoothly





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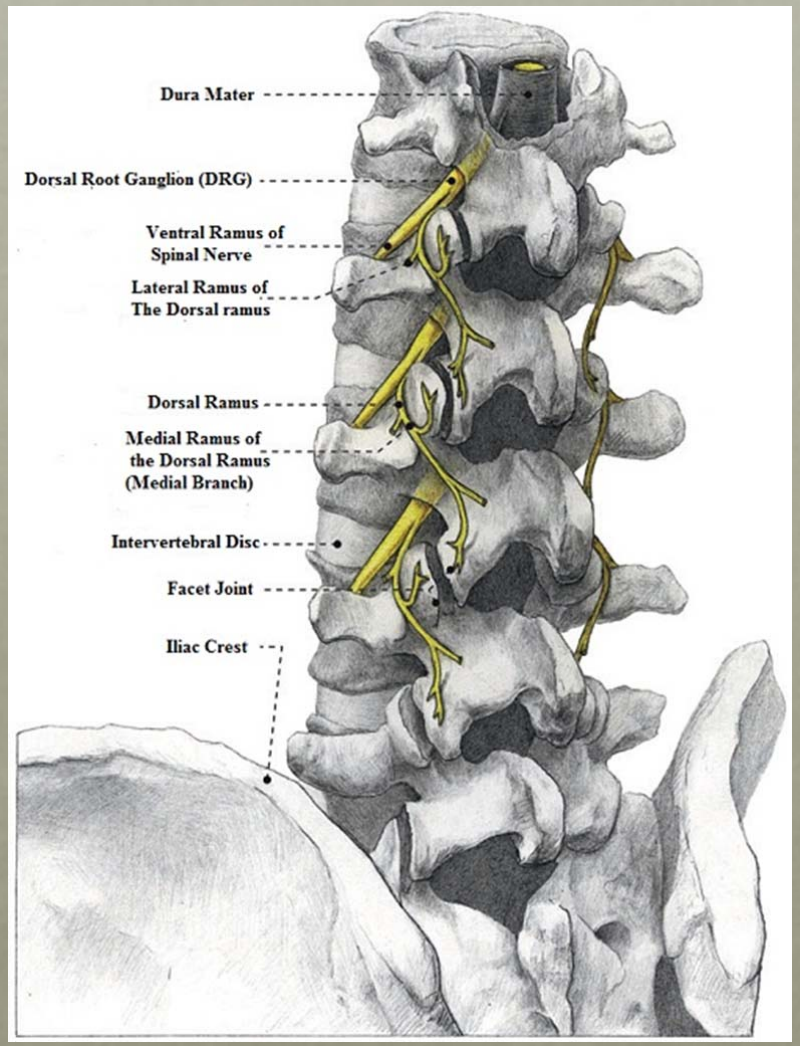
Facet Joints



Each joint receives innervation from two spinal levels

the medial branch of the dorsal ramus at the same level as the corresponding vertebra
as well as from the level above

In the absence of other pathology the neurological examination is normal

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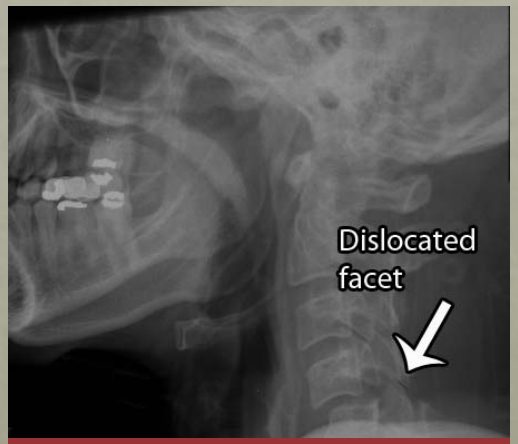
Cervical Facet Syndrome



differential diagnosis:

Unilateral or bilateral neck pain

Decreased range of motion

Tenderness over the affected facet joint(s)

Headaches

Can radiate to head, shoulder or proximal upper arm

ill-defined in character

often associated with myofacial pain or spasms

Pain is exacerbated by flexion, extension, lateral bending of the cervical spine

worse in the morning and after physical activity

no sensory or motor deficits (unless coexisting disease)

Cervicalgia, cervical bursitis, cervical fibromyosotis, inflammatory arthritis, disorders of the cervical spinal cord, roots, plexus, and nerves

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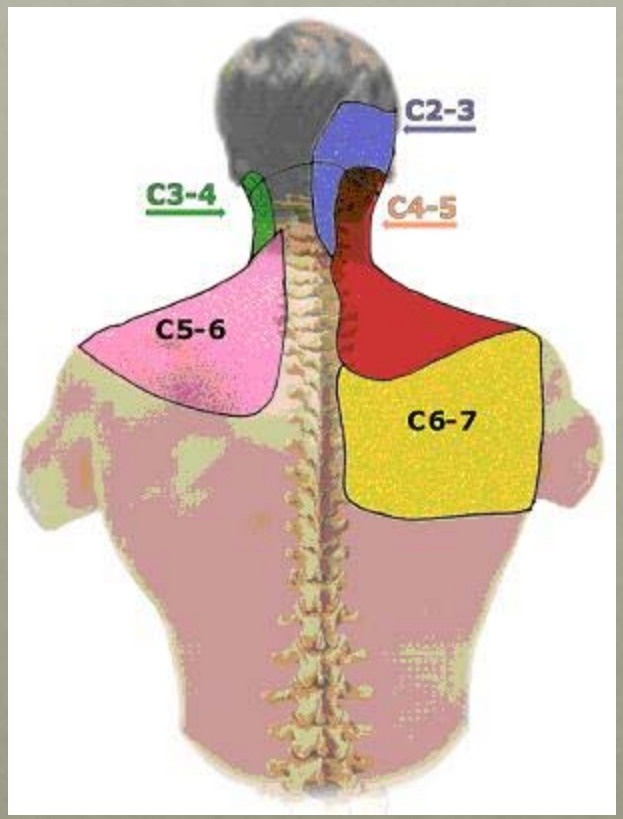
Cervical Facet Syndrome



Pain referral pattern:

C1-C2 facet joints refer to the posterior auricular and occipital region

C2-C3 facet joints refer to the forehead and eyes

C3-C4 facet joints refer superiorly to the sub-occipital region and inferiorly to the posterolateral neck

C4-C5 facet joints radiate to the base of the neck

C5-C6 facet joints refer to the shoulders and interscapular region

C6-C7 facet joints radiate to the supra-spinous and infra-spinous fossa

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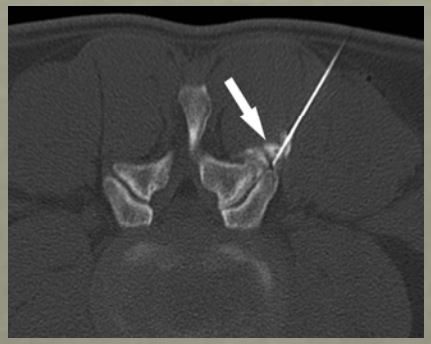
Lumbar Facet Syndrome

Most common disease affecting the facet joints is arthritis.
This is a degenerative, inflammatory condition that over time results in loss of joint cartilage, bone overgrowth ('osteophytes' or 'spurs'), erosions of the joint, and ultimately instability of the joint itself.
Facet joints are also damaged by trauma, and frequently are the source of pain after whiplash type injuries.



Facet joints are responsible for pain in 15-45% of patients with chronic low back pain

The disorder is more frequent at older ages and may be due to degeneration, strain and inflammation

Radiological examinations are not diagnostic. They often show osteoarthritic findings and facet joint degeneration in both symptomatic and asymptomatic patients

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Lumbar Facet Syndrome

Low back pain can radiate to the buttocks and posterior thighs down to the knees

When the superior articular processes are affected, the pain may radiate to the hips and lateral thighs down to the knees

Pain worsened by twisting or rotation, and exacerbated by moving from sitting to standing position

Pain is relieved when lying down

Getting up in the morning, the patient usually feels stiff and in pain

During the physical examination, patients report pain when pressure is exerted paravertebrally and during the extension and rotation of the spine, while the pain is relieved at spinal flexion

Pain directly over involved facet joint

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Conservative Treatment

Conservative treatment initiated with

- Physical therapy including heat and massage
- NSAIDs and muscle relaxants
- Underlying sleep disturbance and depression can be treated with tricyclic antidepressants.

Treat co-existing disease

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Common indications for diagnostic facet joint interventions

Non radicular pain in the neck, upper back or lower back that can be associated respectively with headache, proximal upper or lower extremity pain

Duration of pain of at least three months

Average pain levels of six or more out of 10

Intermittent or continuous pain causing functional disability

Failure to respond to more conservative management, eg. physical therapy

Lack of either for discogenic or sacroiliac joint pain

Lack of disc herniation radiculitis

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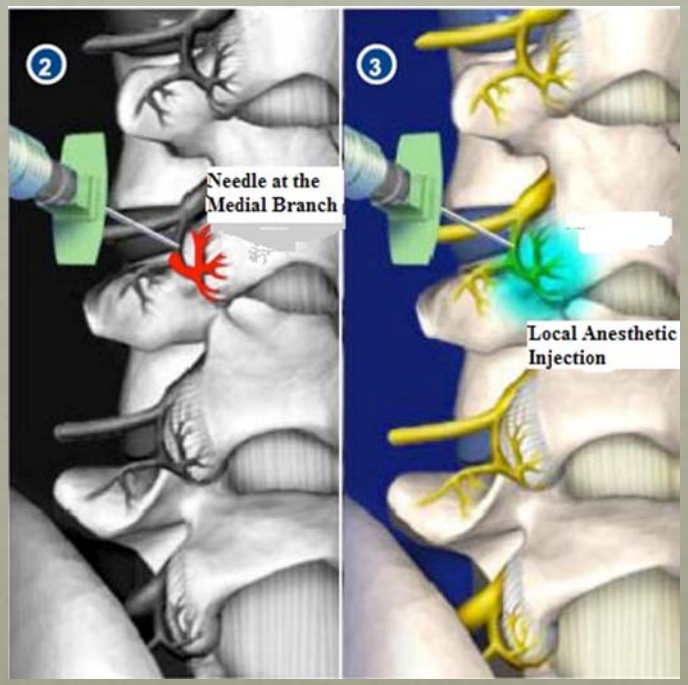
Diagnostic medial branch blocks



blocking the nerve branches that innervate the suspicious joints with the use of local anesthetics

positive response to controlled local anesthetic blocks (<1 ml per nerve)

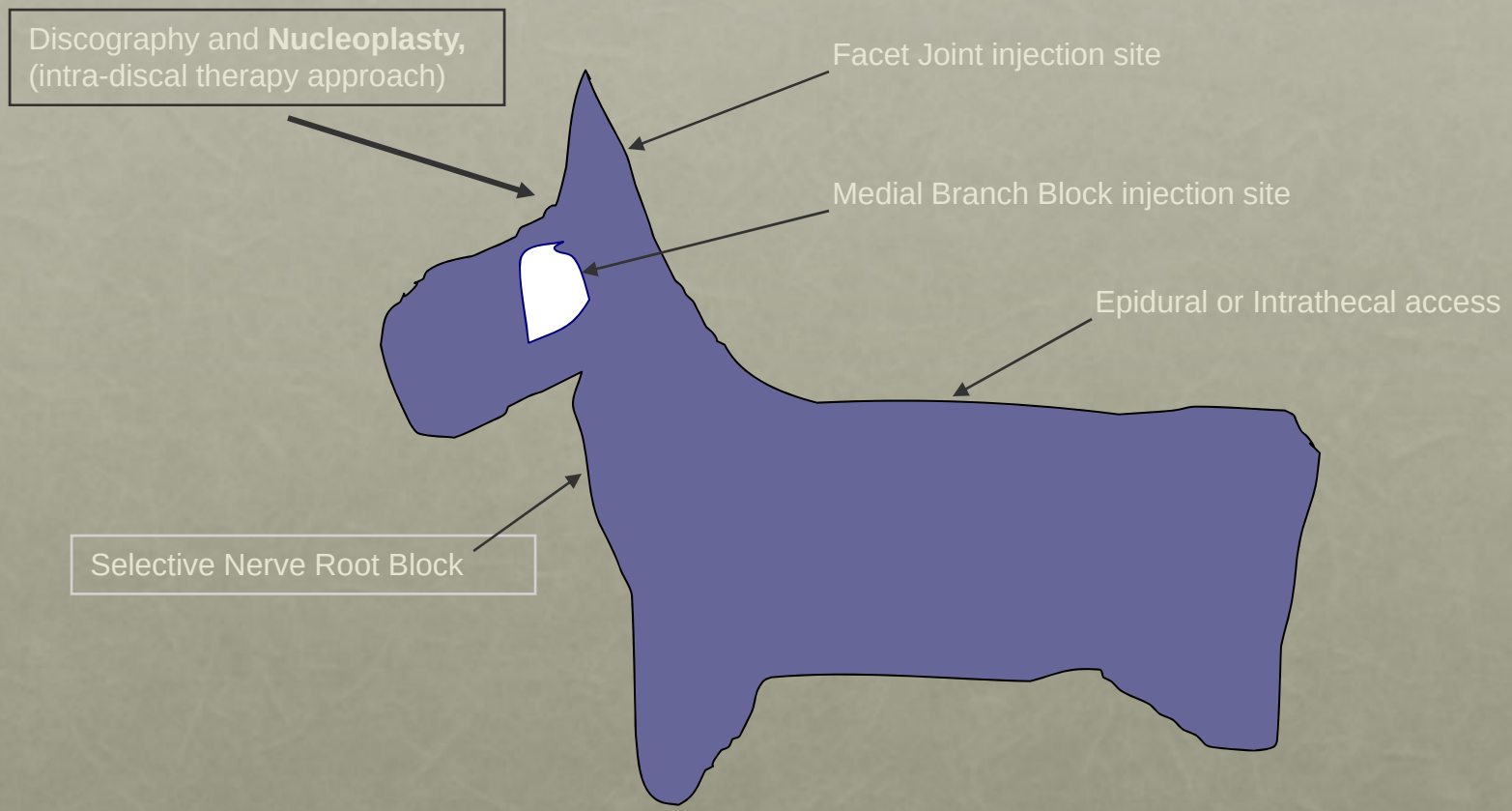
80% pain relief

ability to perform prior painful movements without any significant pain

Greher M, Kirchmair L, Enna B, et al. Ultrasoundguided lumbar facet nerve block: accuracy of a new technique confirmed by computed tomography. Anesthesiology. 2004; 101:1195–1200.
Shim JK, Moon JC, Yoon KB, Kim WO, Yoon DM. Ultrasound-guided lumbar medial-branch block: a clinical study with fluoroscopy control. Reg Anesth Pain Med. 2006;31:451–454.
Kaplan M, Dreyfuss P, Halbrook B, Bogduk N. The ability of lumbar medial branch blocks to anesthetize the zygapophysial joint. A physiologic challenge. Spine (Phila Pa 1976). 1998;23:1847–1852.
Dreyfuss P, Schwarzer AC, Lau P, Bogduk N. Specificity of lumbar medial branch and L5 dorsal ramus blocks. A computed tomography study. Spine. 1997;22:895–902.
Ackerman WE, Munir MA, Zhang JM, Ghaleb A. Are diagnostic lumbar facet injections influenced by pain of muscular origin? Pain Pract. 2004;4:286–291.
Cohen SP, Larkin TM, Chang AS, Stojanovic MP. The causes of false-positive medial branch (facet joint) blocks in soldiers and retirees. Mil Med. 2004;169:781–786.

SCOTTIE DOG *FLUOROSCOPIC IMAGE*

VIEW OF FACETS (superior and inferior), LAMINA and PARS INTERARTICULARIS



Oblique View - Scottie Dog

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Radiofrequency Ablation

Treatment of choice is radiofrequency facet joint denervation using a needle-electrode on the nerve branches that innervate the painful joints

Requires percutaneous local anesthesia and radiological guidance

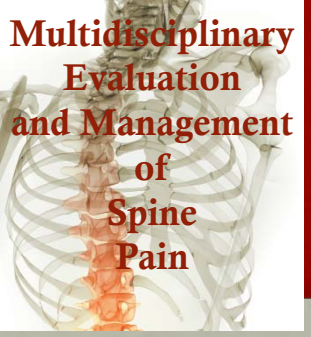
Absolutely safe when conducted by a skilled Interventional Pain Physician

Results lasts 9-24 months

Nerves regenerate. If pain recurs this treatment can be repeated.

The RF ablation technique is scientifically evidence-based and is strongly recommended by the international scientific community.

Gallagher J, Vadi PLP, Wesley JR. Radiofrequency facet joint denervation in the treatment of low back pain—a prospective controlled double-blind study to assess its efficacy. Pain Clinic. 1994;7:193–198.
van Kleef M, Barendse GA, Kessels F, Voets HM, Weber WE, de Lange S. Randomized trial of radiofrequency lumbar facet denervation for chronic low back pain. Spine.1999;24:1937–1942.
Leclaire R, Fortin L, Lambert R, Bergeron YM, Rossignol M. Radiofrequency facet joint denervation in the treatment of low back pain: a placebo-controlled clinical trial to assess efficacy. Spine. 2001;26:1411–1416, discussion 7.
van Wijk RM, Geurts JW, Wynne HJ, et al. Radiofrequency denervation of lumbar facet joints in the treatment of chronic low back pain: a randomized, double-blind, sham lesion-controlled trial. Clin J Pain. 2005;21:335–344.
Tekin I, Mirzai H, Ok G, Erbuyun K, Vatansever D. A comparison of conventional and pulsed radiofrequency denervation in the treatment of chronic facet joint pain. Clin J Pain. 2007;23:524–529.
Kroll HR, Kim D, Danic MJ, Sankey SS, Gariwala M, Brown M. A randomized, double-blind, prospective study comparing the efficacy of continuous versus pulsed radiofrequency in the treatment of lumbar facet syndrome. J Clin Anesth. 2008;20:534–537.
Chou R, Atlas SJ, Stanos SP, Rosenquist RW. Nonsurgical interventional therapies for low back pain: a review of the evidence for an American Pain Society clinical practice guideline. Spine (Phila Pa 1976). 2009;34:1078–1093.
Van Zundert J, Vanelderen P, Kessels A. Re: Chou R, Atlas SJ, Stanos SP, et al. Nonsurgical interventional therapies for low back pain: a review of the evidence for an American Pain Society clinical practice guideline. Spine (Phila Pa 1976) 2009;34:1078–1093. Spine (Phila Pa 1976) 2010;35:841; author reply 841–842.



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Frequency of Interventions

diagnostic phase, some insurances require 2 diagnostic facet procedures (either medial branch blocks or facet joint injections) at intervals of no sooner than one week or preferably 2 weeks

therapeutic phase (after the diagnostic phase is completed), the suggested frequency would be 2-3 months or longer between facet joint injections, provided that ≥ 50% relief is obtained for 8 weeks

medial branch neurotomy may be repeated after 6 months or longer, provided that 50% or greater relief is obtained for at least 10 to 12 weeks

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Side Effects and Complications

Proximity to the spinal cord and exiting nerve roots

Vascular nature of the neck

These procedures should be performed by practitioners who are well-versed in the regional anatomy and experienced in performing interventional pain management techniques

Allergic reactions to medication or dye used

Infection (occurs in less than 1 per 15,000 injections)

Post-injection flare (joint swelling and pain hours after the corticosteroid injection)

Depigmentation (a whitening of the skin)

Local fat atrophy (thinning of the skin)

Rupture of a tendon or capsule located in the path of the injection