

## Radiofrequency Ablation and Epidural Steroid Injections for Pain Related to Degenerative Spine Disease



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### Objectives

- Participants will be able to identify indications and contraindications for different procedures for cervical or lumbar spine pain.
- Participants will be able to describe potential complications/benefits of spinal pain procedures.
- Participants will be able to state the typical monitoring for patients during and after pain procedures.
- Participants will be able to provide patient education concerning spinal pain procedures.

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### What is Radiofrequency Ablation (RFA)?

- The use of a radiofrequency lesion generator which heats tissue to a selected temperature making a discrete lesion near a nerve which results in the selective destruction of pain-carrying nerve fibers (A-delta and C fibers, not the A-beta fibers).

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## How does RFA work? (mechanism of action)

- Neural destruction
- “Frictional heat is generated by molecular movement in a field of alternating current at radio wave frequency.”
- Noe, C.E and Racz, G.B. (1996) Radiofrequency. In Ed. Raj, P.P. Pain Medicine: A Comprehensive Review. St. Louis: Mosby. P. 28.

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## Indications for RFA

- Typically considered last therapeutic option

### Signs/symptoms on exam

- Pain in the back or neck, without radiation
- Facet “loading” symptoms
  - Pain on spinal extension
  - Pain with lateral movement/twisting

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## What do you see on imaging?

- Facet disease
- Disc degeneration
- Wedge deformities
- Degenerative changes
- Osteophyte complex
- Narrowing of facet joint space
- Endplate osteophytes
- Hypertrophic changes
- Pet Scan showing positive facet arthropathy (???)

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**Contraindications—**  
(true for both RF and ESIs)

- Coagulopathies
- Infection

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**Other clinical considerations**

- Most insurance companies require two diagnostic medial branch injections with local anesthetic from which the patient gains complete pain relief before approval is given for RFA

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**Other clinical considerations**

Anticoagulation

- Stop coumadin or plavix a minimum of 5 days with PCP and/or cardiology permission
- Lovenox—?? Is it needed??
  - Check with PCP/coagulation clinic
- If pacemaker, get cardiology involved

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## How is RFA done?

- +/- IV
- Positioning:
  - Lumbar: Prone, pillow beneath abdomen
    - (unless protuberant abdomen)
  - Cervical: head on pillow, pillow beneath shoulders (breathing room)
- C-Arm fluoroscopy to locate sites and visual needle placement
- Nerve stimulator to assist with needle placement
- Heat tissue at needle site using radiofrequency
- Mild sedation (analgesia)

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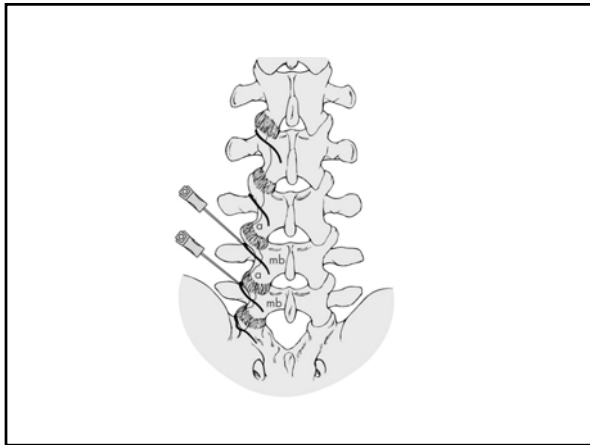
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## Advantages of RF over other neurolytic techniques

- Pinpoint the nerve using nerve stimulation
- Temperature is controlled
  - Minimizes tissue destruction and tissue overheating
- Makes a discrete lesion
- Repeatable—nerve regenerates
- Reports of increased pain after nerve regrowth is less than other neurodestructive techniques

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## Monitoring/Nursing care during and after procedure

- Conscious sedation monitoring
  - BP, P, R, Oxygen sats, ECG, verbal contact
- Maintain sterility
- Keep patient informed
- "Second eye"
  - Fluoro
  - RF machine functioning
- Distraction/humor
- Education
  - Self care—ice/heat
  - s/s complications
  - How to contact providers

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## Potential complications/side effects

- Pain flare
- Infection
- Hematoma/epidural or local
- Reaction to meds
- Tingling/numbness of legs (local anesthetic)
- Extremity weakness/paralysis (rare)

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## Procedure outcomes

- Some have immediate relief
- Some don't note the full effect for up to a month
- 17-82% benefit
- 4+ months, lumbar 4-6 most common; up to 2 years reported; cervical 6-18 months

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## Patient follow-up

- Office f/u: Clinician specific
- We will repeat every 6 months
- ?? Insurance constraints??

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## What is an Epidural Steroid Injection?

- An injection of a steroid medication into the epidural space with the intent to alleviate pain

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## How do steroids work?

- Reduce inflammation by blocking transmission of C fiber input.
- Steroids decrease inflammation by inhibiting phospholipase A<sub>2</sub> action.
- Epidural steroid injection places the medication at the site of inflammation

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## Indications for Epidural Steroid Injection

- Herniated nucleus pulposus with nerve root irritation
- Herniated nucleus pulposus with nerve root compression
- Annulus tear—hasten recovery
- Spinal stenosis—transient relief

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## Signs/symptoms on exam

- Radicular pain
  - Lumbar—pain from the back radiating to the toes
  - Cervical—pain from the neck radiating down the arm to the fingers
- Treat symptom, not an MRI

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## Other clinical considerations

- Diabetes—steroids increase glucose levels
  - Clinicians vary in beliefs about glucose control and when they will use ESI
- Epidural lipomatosis—steroids may increase the lipomatosis
- Anticoagulants—increased risk of hematoma

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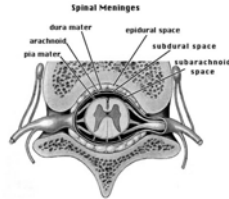
## Epidural anatomy

Spinal meninges

- Pia mater
- Arachnoid
- Dura

Epidural

“outside the dura”



Note: The epidural space is not present in the cranium.

medline.com fig. 14.2  
Practice Book, Medical Terminology 1001

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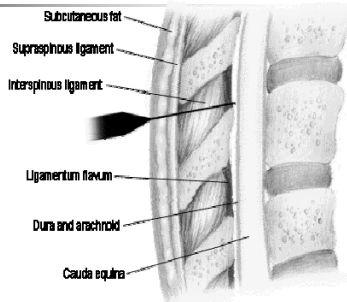
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## How is it administered?

**Translaminar: lumbar or cervical**

Needle inserted  
via the midline  
through the  
spinal ligament



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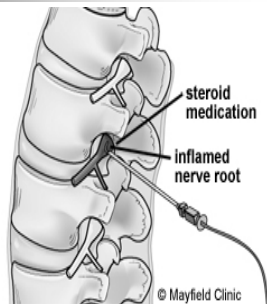
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## How is it administered?

**Transforaminal: lumbar**

- Transforaminal – lumbar
  - Needle inserted via a lateral approach to the neuroforamin
  - Cervical transforaminal steroids no longer recommended
    - Reports of steroid related strokes



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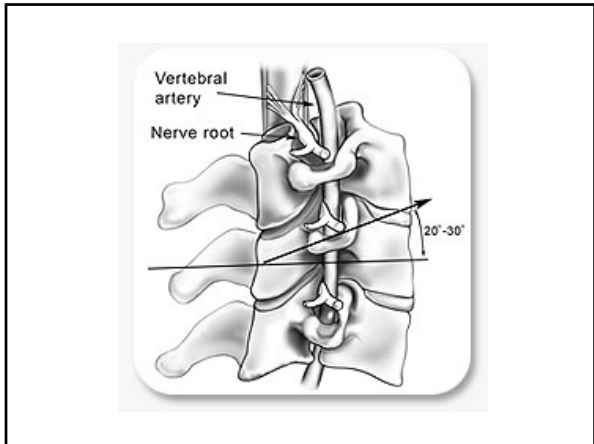
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## How is it administered? Caudal

- Needle inserted thru sacral hiatus

Sacral horns (Superior articular processes)  
Sacral ala  
Medial sacral crest  
Dorsal foramina  
Coccyx  
Sacral hiatus  
Pars lateralis  
Pedicles

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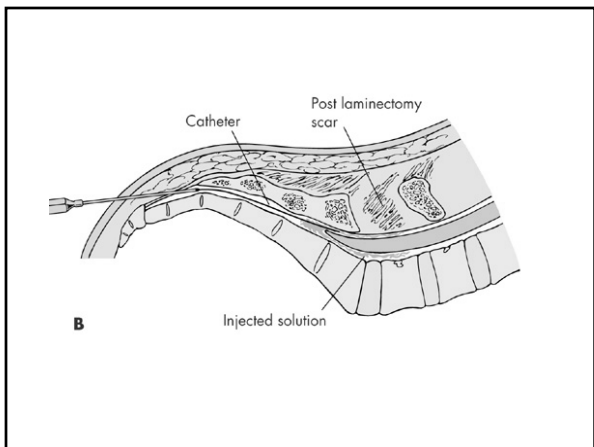
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## How is the procedure performed?

- Lumbar
  - Prone—Preferred, may use fluoro
  - Sitting—if person too heavy for procedure table, blind stick
  - Side lying—more likely used with inpatients, blind stick
  - Caudal – through sacral hiatus
  - Loss of resistance technique +/- contrast
- Cervical
  - Prone—Preferred, may use fluoro
  - Sitting
  - Loss of resistance or hanging drop technique +/- contrast

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## Patient specific needs

- Mobility issues
- Positioning
- Hearing loss or speech difficulty
- Breathing
- Allergies

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## Monitoring

- Masks—higher incidence of infection when masks not used for ESIs
- Monitor sterility
- Conscious sedation
  - Constant verbal contact
  - BP q5minutes
  - Oxygen saturation
  - ECG (+/-)

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### Post-Procedure Care

- Institutional standards for conscious sedation monitoring
- Ice for 24 hours---Ice or heat after that
- Handout to include s/s hematoma or infection
- Who/how to contact for problems

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### Potential complications/side effects

- Increased glucose levels
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- Extremity weakness (local anesthetic)

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### ESI Outcomes

- Few long-term f/u studies
- Varying results
- Typical is to see a lessening of effect with subsequent injections

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## Patient education

- What is the procedure?
- How is it done? When, where, how, monitoring, pain control during,
- Post-procedure care
- What can it do/not do?
- What can be expected of the procedure?
- How long does it last?
- Can it be repeated?
- How often can it be repeated?
- Can it be done the same time as other procedures?

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## Patient education (cont)

- In addition to the above information
  - Clinic contacts—names & numbers
  - How to access emergency care
  - If you want them to call you between visits, when and how

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## Follow-up

- Clinician specific

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