

## EPIDURAL STEROID INJECTIONS

These safety practices have been developed to highlight the important elements in the safe performance of interventional pain procedures. Adherence to these practices will help decrease the risk of preventable complications. For additional information about the indications and technical aspects that yield improved treatment outcomes, refer to the *SIS Practice Guidelines for Spinal Diagnostic and Treatment Procedures*.

### PERSONNEL

- Only physicians trained in the performance and interpretation of epidural steroid injections (ESI) should perform this procedure.
- Appropriately trained personnel are needed for the operation of the fluoroscopy unit and to assist the physician.

### CONTRAINDICATIONS

- Concurrent treatment with anticoagulants constitutes a contraindication for injections involving interlaminar access. Anticoagulants should be stopped in advance of an interlaminar injection with prior approval from the patient's cardiologist and/or primary care provider.
- Concurrent treatment with anticoagulants constitutes a relative contraindication for injections involving transforaminal access.
- An active systemic infection or a localized infection within the procedural field
- Uncooperative patient
- Allergy to medication(s) that cannot safely be mitigated by pre-treatment

### SEDATION

- Sedation is not intrinsically necessary for ESIs, but if employed in unique circumstances (e.g. movement disorder, cases of extreme anxiety, previous vasovagal response), the patient should remain able to communicate pain or other adverse sensations or events.
- The decision to use sedation should be made on a case-by-case basis.
- If the physician performing the procedure decides to administer and supervise the sedation, they should be trained and qualified to do so. In these situations, a separate healthcare provider is required to assist with the administration of the medications and monitoring of the patient.
- Resuscitation drugs, monitoring equipment, and oxygen must be available if sedation is utilized.

### SAFE, ASEPTIC PRACTICES

- Strict aseptic technique should be followed at all times as they pertain to the facilities, materials, patient preparation, physician preparation, personnel, and injectate/syringe preparation. Examples include, but are not limited to:
  - o Skin overlying the target region should be prepared for an aseptic procedure, preferably using chlorhexidine in alcohol. The area should then be draped to create a sterile field.



- o A face mask and sterile gloves must be worn during the procedure.
- o Sterile single-use syringes and needles are required, and single-dose vials should be utilized when available. Centers for Disease Control and Prevention (CDC) guidelines for safe injection practices must be followed.
- o Acquisition, storage, and utilization of medications should be in accordance with relevant governmental guidelines such as those of the CDC in the United States.

## IMAGING

- Use of image guidance is critical to ensuring appropriate needle placement and monitoring injectate flow patterns. Image guidance reduces the risk of complications, allowing the physician to avoid vulnerable vascular or neural structures before any agent is injected or inserted, and to ensure injectate is delivered to the target.
- The imaging technique should follow the ALARA protocols (as low as reasonably achievable) to minimize x-ray exposure for both the patient and the healthcare team.
- Fluoroscopic guidance has been used in the primary literature validating the safety and efficacy of ESI; if alternative imaging guidance is to be used (e.g. CT or US), it must be utilized so as to exclude vascular or intrathecal uptake and document flow reaching the target tissue.
- Obtain images documenting final needle position and satisfactory contrast spread.

## INJECTIONS

- The ultimate choice of approach or technique (interlaminar vs. transforaminal) to use should be made by the treating physician by balancing potential risks and benefits with each technique for each patient.

## CERVICAL EPIDURAL INJECTION PROCEDURES

- All cervical interlaminar ESIs should be performed using image-guidance, with appropriate AP, lateral, or contralateral oblique views, and a test dose of contrast medium.
  - o Cervical interlaminar ESIs can be performed without contrast in patients with a documented contraindication to use of iodinated, non-ionic contrast and gadolinium-based contrast media (e.g. significant history of contrast allergy or anaphylactic reaction) by physicians that are experienced with loss of resistance technique. In these circumstances, particulate steroids are contraindicated and only preservative-free, particulate-free steroids should be used.
- No cervical interlaminar ESI should be undertaken at any segmental level without reviewing, before the procedure, prior imaging studies (in particular, axial and sagittal MRI sequences at the target level) that show there is adequate epidural space for needle placement at the target level. If possible, the actual images, in addition to radiology reports, should be reviewed to determine the location of pathology and targets for contrast and medication spread with risks/benefits of specific approach.
- Cervical interlaminar ESIs are recommended to be performed at C7-T1, but preferably not higher than the C6-C7 level.
- The actual spinal level where the epidural space is entered should be determined based on imaging review.



- Cervical transforaminal ESIs should be performed by injecting contrast medium under real-time fluoroscopy and/or DSA, using an AP view, before injecting any substance that may be hazardous to the patient.
  - For patients with a documented contraindication to use of iodinated, non-ionic contrast and gadolinium-based contrast media (e.g. significant history of contrast allergy or anaphylactic reaction), cervical transforaminal ESIs should not be performed.
- Particulate steroids should not be used in cervical transforaminal injections.
- Dexamethasone should not be mixed with ropivacaine because of the risk of precipitating the steroid so it acts as a particulate.
- Extension tubing is recommended for all transforaminal ESIs to minimize movement of the needle tip once it has reached its appropriate target.

## **LUMBAR EPIDURAL INJECTION PROCEDURES**

- All lumbar interlaminar ESIs should be performed using image-guidance, with appropriate AP, lateral or contralateral oblique views, and contrast medium.
  - Lumbar interlaminar ESIs can be performed without contrast in patients with a documented contraindication to use of iodinated, non-ionic contrast and gadolinium-based contrast media (e.g. significant history of contrast allergy or anaphylactic reaction) by physicians that are experienced with loss of resistance technique. It is advisable that in this case no local anesthetic be employed and it is preferable to use a non-particulate, preservative-free steroid (e.g. dexamethasone solution).
- Lumbar transforaminal ESIs should be performed by injecting contrast medium under real-time fluoroscopy and/or DSA, using an AP view, before injecting any substance that may be hazardous to the patient.
  - Transforaminal ESIs can be performed without contrast in patients with a documented contraindication to iodinated, non-ionic contrast and gadolinium-based contrast media (e.g. significant history of contrast allergy or anaphylactic reaction), but in these circumstances, only preservative-free, particulate-free steroids should be used.
- A non-particulate steroid (e.g. dexamethasone) should be used for the initial injection in lumbar transforaminal ESIs.
- Dexamethasone should not be mixed with ropivacaine because of the risk of precipitating the steroid so it acts as a particulate.
- There are situations where particulate steroids could be used in the performance of lumbar transforaminal ESIs. However, because transforaminal ESI using particulate steroids is associated with a rare risk of catastrophic neurovascular complications, efforts should be made to minimize their use in transforaminal injections.
- Extension tubing is recommended for all transforaminal ESIs to minimize movement of the needle tip once it has reached its appropriate target.



## POST-PROCEDURE MONITORING/FOLLOW-UP

- Patients should be monitored for an appropriate time following the procedure depending upon the nature of the intervention and the agents utilized.
- Provide detailed oral and written discharge instructions to patients that outline:
  - activity restrictions for the immediate post-injection period (e.g. not to operate a motor vehicle or machinery for the remainder of the day of the procedure),
  - potential expected side effects that may occur immediately post-injection and in the first few days following the procedure (e.g. pain at injection site, increased blood glucose level),
  - symptoms that merit immediate medical attention,
  - when to resume usual medications and anticoagulants if discontinued for the procedure, and
  - special instructions for diabetic patients.
- Ensure patients have a follow-up plan.

## SOURCES

Bogduk N (ed). Practice Guidelines for Spinal Diagnostic and Treatment Procedures, 2nd edn. International Spine Intervention Society, San Francisco, 2013.

Rathmell JP, Benzon HT, Dreyfuss P, Huntoon M, Wallace M, Baker R, et al. Safeguards to prevent neurologic complications after epidural steroid injections: consensus opinions from a multidisciplinary working group and national organizations. *Anesthesiology*. 2015;122(5):974-84.

## DISCLAIMER

While these Safety Practices are intended to identify elements critical to the safe performance of interventional spine procedures, they are not intended to be inclusive of all proper methods relevant to the safe performance of spine procedures, or exclusive of other methods of care reasonably utilized to obtain the same results. Nothing contained in these documents is intended to be used as a substitute for the care and knowledge of the individual clinician. They are guidelines based on evidence-informed expert consensus. SIS makes no representation and assumes no responsibility for the accuracy of the information contained or available through this website, and such information is subject to change without notice. The clinician's independent medical judgment, given the individual patient's clinical circumstances and preferences, should always determine patient care and treatment. Practitioners are advised to consider management options in the context of their own training and background and institutional capabilities when selecting recommended treatment options. SIS is not responsible nor does it assume any legal liability or responsibility for the accuracy, completeness, clinical efficacy, or value of any such information or any apparatus, product, or process described or referenced through this website or the information contained therein.



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## SAFETY PRACTICES FOR INTERVENTIONAL PAIN PROCEDURES

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MODULE 2.1 FACET INTERVENTIONS: MEDIAL BRANCH BLOCKS  
MODULE 2.2 FACET INTERVENTIONS: INTRA-ARTICULAR (ZYGAPOPHYSIAL) JOINT INJECTIONS  
MODULE 2.3 FACET INTERVENTIONS: MEDIAL BRANCH RADIOFREQUENCY NEUROTOMY  
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MODULE 4.2 NEUROSTIMULATION: PERIPHERAL NERVE STIMULATION  
MODULE 5 PROVOCATION DISCOGRAPHY  
MODULE 6 VERTEBRAL AUGMENTATION

## THE INTERVENTIONAL SPECIALISTS' FREE RESOURCE TO HELP DECREASE THE RISK OF PREVENTABLE COMPLICATIONS

For additional information about the indications and technical aspects that yield improved treatment outcomes, refer to the *SIS Practice Guidelines for Spinal Diagnostic and Treatment Procedures*.

