

# Follow-Up After Epidural Steroid Injections

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**Myth:** Epidural steroid injections are routine procedures, which do not require follow-up.

**Fact:** Although generally safe, epidural steroid injections do pose risks ranging from mild adverse effects to severe neurologic compromise, even when clinical practice guidelines are followed. Appropriate post-procedure follow-up is critical to ensuring the safest possible outcome.

Lumbar and cervical epidural steroid injections (ESI) are utilized to decrease pain and improve function in patients with radicular pain [1-3]. Approximately 45% of all interventional spine techniques to treat spinal pain were epidural steroid injections in 2014 [4]. This represents a large volume of procedures and underscores the importance of appropriate patient follow-up after these interventions. Although these injections are performed frequently, no standard follow-up protocol has been established. The Agency for Healthcare Research and Quality (AHRQ) defines follow-up as "making contact with a patient or caregiver at a later, specified date to check on the patient's progress since their last appointment" [5]. The follow-up encounter is useful to evaluate the outcomes of the injection, recognize any delayed complications, and identify any new neurologic signs and symptoms. The preferred follow-up method is an in-person evaluation, but telephone conversation, electronic messaging through a portal system, or even postal mail are also acceptable.

## Complications & Adverse Events

The largest cohort of just over 16,000 ESI performed at all spinal segments in accordance with the standards outlined in the SIS evidence-based practice guidelines via interlaminar and transforaminal approaches demonstrated an immediate adverse event incidence of 2.4% [6,7]. Vasovagal responses accounted for just over half of these events. Other immediate adverse effects included aborted procedure (0.7%), lumbar puncture (<0.1%), and transfer to emergency department (<0.1%). Delayed adverse events were assessed at either a 24-72 hour window after the procedure in two of the institutions involved in the study or at two weeks at the third institution. Follow-up was conducted via a telephone query performed by a paramedical assessor. Central steroid effects, including flushing and non-positional headaches, were the most common delayed adverse events, which occurred in 2.6% of patients. These symptoms are typically self-limited and improve within days of onset [8,9]. Increased pain without an associated complication was reported in 2.1% of the procedures. No major adverse effects (neurologic injury, hemorrhagic event, or infection) were noted.

Though rare, catastrophic events resulting in paralysis have been reported with ESIs [10-13]. These complications

may occur immediately, however, delayed complications such as infection or hematoma can be discovered through proper follow-up. Epidural hematoma has been noted as an infrequent but serious complication of epidural steroid injections. Although it is reported more often following interlaminar ESI there are case reports describing this complication after transforaminal ESI. Presenting symptoms included worsening pain, numbness, or weakness, which occurred immediately or even days after the procedure [14-17]. Delay in identifying these symptoms could result in long-term neurologic deficits.

Infection is another delayed, but serious complication. A multistate epidemic of spinal infections appeared after contamination of injectates at the manufacturing site. Even though this appeared to be independent of the spinal injection technique or sterility of the procedure, the need for follow-up became evident to identify patients who have symptoms of infection [18]. The incubation period was noted to be 1-4 weeks at initial presentation for symptomatic patients who were infected [18]. This marks an important timeframe to identify patients who may develop symptoms.

Metabolic adverse effects from the steroid administration including hyperglycemia and adrenal insufficiency should be discussed with patients if applicable. These issues can

diabetic patients may elevate blood sugars after an ESI for up to two weeks. In the case of adrenal insufficiency, cortisol levels may be decreased for weeks after an injection. These two topics are discussed in more depth in other FactFinders addressing systemic effects of corticosteroids [19] and hyperglycemia [20].

The mitigation of immediate adverse events is best addressed with proper procedural technique and assessment of patient risk factors rather than post-procedural follow-up. However delayed events, as noted above, can have a much more variable course and require patient follow-up as well as patient education in their prompt identification.

### Clinical Evaluation

The physical exam can play a significant role in patient follow-up after an ESI. As noted earlier, these injections are targeted interventions to alleviate radicular pain. Occasionally this pain may be associated with numbness or weakness. Following this up clinically is important, as acute or progressive decline may change the course of patient care. For patients on anticoagulants, it may be valuable to consider in-person follow-up, although prognostic significance of such objective signs of bleeding as bruising might be questionable [21].

### Conclusions

Patient follow-up after ESI varies across providers and physicians must determine appropriate post-injection follow-up for each patient. The time course of complications can be quite variable making patient education crucial. Patients should be informed about signs and symptoms of possible late-onset complications such as infection as well as who to contact and what steps to take if they develop any of these symptoms. As described in the fungal outbreak, initial presenting symptoms of a complication such as infection can occur weeks after the procedure. Most adverse events are self-limiting and do not require aggressive management. In-person follow-up is most critical in patients with existing neurologic deficits in order to assess for any progression of deficits or in patients reporting new symptoms that require evaluation. Given that complications and adverse events are possible, albeit rare, all patients should be provided clear post-procedure instructions and have at least some type of follow-up via phone call or through a patient portal within the first two weeks to maximize patient safety. Proper follow-up is dependent on a bi-directional relationship between a well-informed patient and physician to effectively communicate any adverse effects or complications.

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