Table 1. Summary of clinical recommendations.

TOPIC	RECOMMENDATION	LEVEL OF EVIDENCE AND CERTAINTY
Cervical Facet Joint Procedures		
i. Cervical facet joint (CFJ) intra-articular (IA) injections	Though IA injections into the CFJ have high technical failure rates, these procedures can be used as a diagnostic intervention for CFJ-mediated pain.	Grade C recommendation, moderate level of certainty.
ii. Cervical facet joint medial branch blocks (MBB)/injections	a. When selecting targets for blocks, cervical facet levels should be determined based on clinical presentation	Grade C, low level of certainty
	b. Cervical MBB can be used as a diagnostic intervention for CFJ-mediated pain, though healthcare providers should be aware that the nerves that innervate the facet joints innervate other potential pain-generating structures.	Grade C recommendation, moderate level of certainty
	c. Cervical MBB with local anesthetics can be used as a prognostic tool for predicting response to RFAand at least 50% reduction in pain should be considered a positive prognostic block.	Grade C recommendation, moderate level of certainty
iii. Cervical facet joint medial branch radiofrequency ablation (RFA)	RFA of the innervation to the CFJs can provide pain relief for at least 4 months.	Grade B recommendation, moderate level of certainty
Lumbar Facet Joint Procedures		
i. Lumbar facet joint (LFJ) intra-articular (IA) injections	a. Diagnostic role: IA injections with LA and steroids are a diagnostic intervention for LFJ-mediated pain.	Grade C recommendation, moderate level of certainty
	b. Prognostic role: IA injections with LA and steroids are less predictive than MBB for response to medial branch RFA for LFJ mediated pain.	Grade C recommendation, moderate level of certainty

ii. Lumbar facet joint medial branch blocks (MBB)/injections	a. When selecting targets for blocks, lumbar facet levels should be determined based on clinical presentation.	Grade C recommendation, low level of certainty
	b. Lumbar MBB can be used as a diagnostic intervention for LFJ-mediated pain, though healthcare providers should be aware that the MBBs suffer from limitations related to aberrant LFJ innervation. Compared with saline controls, medial branch injections with LA provide better predictive information for medial branch RFA with increasing specificity and costs and decreasing sensitivity as the MBBs are repeated.	Grade B recommendation, moderate level of certainty
iii. Lumbar facet joint medial branch radiofrequency ablation (RFA)	RFA of the innervation to the LFJs can provide pain relief for at least 4 months.	Grade B recommendation, moderate level of certainty.
Sacroiliac Joint Procedures		
i. Sacroiliac joint (SIJ) intra and peri-articular (IA/PA) injections	a. For patients with suspected SIJ pain based on appropriate history and at least three provocation tests, IA injections may not have additional diagnostic value. IA injections may have diagnostic value in selected patients with less than three positive provocation tests.	Grade C recommendation, moderate level of certainty
	b. Both IA and PA injections have similar efficacy in patients with SIJ pain. Based on existing evidence, the use of PA or IA injections can be recommended for short- term relief (up to 2 months) from SIJ pain.	Grade C recommendation, moderate level of certainty
ii. Sacroiliac joint lateral branch blocks (LBB)/injections	Repeat LBB (with or without steroid) cannot be recommended as a therapeutic procedure for SIJ pain.	Grade D recommendation,* moderate level of certainty
iii. Sacroiliac joint lateral branch radiofrequency ablation (RFA)	In appropriately selected patients, RFA of S1, S2, S3 lateral branches (using cooled RF, bipolar palisade technique or multiple electrode probe) along with L5 dorsal ramus is recommended for intermediate to long-term pain relief of SIJ pain.	Grade B recommendation, moderate level of certainty.

Lumbar Epidural Steroid Injections		
i. Interlaminar lumbar epidural steroid (L-ILESI) injections	a. For the treatment of discogenic low back pain, the evidence for L-ILESI is weak. Healthcare providers and patients should discuss the balance of benefits and harms of this intervention before making a decision.	Grade C recommendation, low level of certainty
	b. For the treatment of sciatica (radicular pain) secondary to herniated disc or from spinal stenosis, L-ILESI can offer a mild-to-moderate, short-term reduction in pain and improvement in function from one to three months.	Grade C recommendation, moderate level of certainty
ii. Transforaminal epidural steroid injections (L-TFESI) and selected nerve root blocks	a. For the treatment of sciatica due to herniation of an intervertebral disc compressing the nerve root, L-TFESI can provide pain relief for up to six months and reduce the need for surgical procedures. Evidence indicates that L-TFESI are more effective than L-ILESI.	Grade B recommendation, moderate level of certainty
	b. For the treatment of sciatica due to spinal foraminal stenosis, the evidence is insufficient to make a recommendation.	Grade I recommendation, low level of certainty
	c. For the treatment of sciatica due to spinal canal stenosis, L-TFESI can provide pain relief from one to three months.	Grade C recommendation, moderate level of certainty
iii. Caudal epidural steroid injections (C-ESI)	No recommendation can be made due to lack of evidence	
Paravertebral Nerve and Erector Spinae Plane Injections		
i. Paravertebral nerve injection	a. PVNB can be performed for the prevention of post-herpetic neuralgia during the acute phase of herpes zoster.	Grade C recommendation, low level of certainty
	b. Paravertebral injections should not be performed for the treatment of chronic back pain.	Grade D recommendation,* low level of certainty

ii. Erector spinal plane injection	No recommendation can be made due to lack of evidence	Grade I recommendation

*A Grade D recommendation for a procedure is a recommendation against performing the procedure under consideration.

Table 2. Summary of Good Clinical Practice statements for specific procedures.

TOPIC	RECOMMENDATION
Cervical Spine Facet Procedures	
i. Cervical facet joint (CFJ) intra-articular (IA) injections	Given the limited duration of therapeutic benefit, we recommend against the routine use of IA injections as a standard treatment for facet joint-mediated neck pain. Notes: There is limited duration of therapeutic benefit with this treatment, although IA injection can be considered as treatment in certain circumstances: in patients who may be at risk of adverse consequences from RFA (e.g., older individuals on anticoagulation therapy for whom the smaller bore needles for IA injections may pose a smaller risk of hematoma, or those with implantable cardiac devices in whom RFA may have deleterious effects on the implant); in whom there is a strong likelihood of success (e.g., individuals who obtained prolonged relief from previous diagnostic injections with or without steroids); and/ or patients who do not have readily available access to cervical medial branch RFA; or those who have a sustained effect from the previous IA injection (≥3 months). IA CFJ injections with steroids should be performed no more than 4 times a year.
ii. Cervical facet joint medial branch blocks (MBB)/injections	At least one cervical MBB with local anesthetic with at least 50% pain relief appropriate for the duration of local anesthetic is advised prior to proceeding with RFA. Cervical MBB injections may be more predictive than IA injections for response to medial branch RFA for CFJ-mediated pain. Notes: The recently published multi-society guidelines recommend at least one cervical MBB with at least 50% pain relief to prognosticate pain relief with RFA. While recognizing that using two diagnostic blocks on separate occasions (one block with a shorter-acting LA such as lidocaine and the other with a longer-acting LA such as bupivacaine) may increase the RFA success rate but result in a significant proportion of false-negative procedures and a decreased overall success rate (1). Cervical facet joint IA injections and MBB have been used to prognosticate the response to RFA. However, IA injections have high technical failure rates as the injectate may extravasate out of the joint and spread to other potential pain generators, resulting in reduced specificity.
iii. Cervical facet joint medial branch	Repeat CFJ RFA should be offered to patients who had at least 50% pain relief in a 0-10 pain score from their pre-RFA pain intensity for

radiofrequency ablation (RFA)	at least 6 months along with evidence of function improvement and then experience return of their cervical pain. There is no need to repeat diagnostic MBB if the patient presents with similar pain location, historical symptoms and no change in physical examination signs. Given the mean duration of benefit and drop-off in success rates noted in some studies with repeat RFA, we recommend no more than two CFJ RFA denervation procedures a year for each facet joint. Notes: Pain can recur after a period of time following RFA of innervation to the CFJs. The lower end of the range for this period is around 4 months (1). Patients should be made aware about the duration of expected relief and the potential need for repeated treatment(s). Several studies have also identified a modest reduction in the duration of meaningful pain relief with repeat RFA as compared to the original procedure (1,2). In general, an average of 84% of patients have a successful repeat RFA after an initial successful RFA (1).
Role of imaging for cervical facet joint procedures	a. Cervical facet joint injection (medial branch or joint) should be performed under fluoroscopy for procedural guidance. Ultrasound can be used as a primary imaging modality to perform cervical medial branch blocks in situations when ultrasound can be performed safely and accurately (e.g. experienced provider, long neck, low BMI, no previous cervical spine surgery and absence of aberrant anatomy). b. Cervical facet RFA should be performed under fluoroscopy. Ultrasound can be used as an adjunctive imaging modality with fluoroscopy to enhance patient safety, but not as a sole modality.
Lumbar Facet Joint Procedures	
i. Lumbar facet joint (LFJ) intra-articular (IA) injections	Given the limited duration of therapeutic benefit, we recommend against the routine use of IA injections as a standard treatment for FJ-mediated low back pain. Notes: IA injection can be considered as treatment in certain circumstances: in patients who may be at risk of adverse consequences from RFA (e.g., older individuals on anticoagulation therapy for whom the smaller bore needles for IA injections may pose a smaller risk of hematoma, or those with implantable cardiac devices in whom RFA may have deleterious effects on the implant); in whom there is a strong likelihood of success (e.g., individuals who obtained prolonged relief from previous diagnostic injections with or without steroids); and/ or patients who do not have readily available access to lumbar medial branch RFA; or those who have a sustained effect

	from the previous IA injection (≥3 months). IA LFJ injections with steroids should be performed no more than 4 times a year.
ii. Lumbar facet joint medial branch blocks (MBB)/injections	a. At least one lumbar MBB with at least 50% pain relief appropriate for the duration of local anesthetic is advised prior to proceeding with RFA. b. Lumbar MBB injections may be more predictive than IA injections for response to medial branch RFA for LFJ-mediated pain. Notes: The recently published multi-society guidelines recommend at least one lumbar MBB with at least 50% pain relief to prognosticate pain relief with RFA. While recognizing that using two diagnostic blocks on separate occasions (one block with a shorter-acting LA such as lidocaine and the other with a longer-acting LA such as bupivacaine) may increase the RFA success rate but result in a significant proportion of false-negative procedures and a decreased overall success rate (3). Lumbar facet joint IA injections and MBB have been used to prognosticate the response to RFA. However, IA injections have high technical failure rates as the injectate may extravasate out of the joint and spread to other potential pain generators, resulting in reduced specificity.
iii. Lumbar facet joint medial branch radiofrequency ablation (RFA)	It is recommended that repeat RFA of innervation to the LFJ should be offered to patients who had at least 50% pain relief in a 0-10 pain score from their pre-RFA pain intensity for at least 6 months along with evidence of functional improvement, who experience return of their lumbar pain after a successful RFA. Given the mean duration of benefit and drop-off in success rates noted in some studies with repeat RFA, we recommend no more than two CFJ RFA procedures a year. Notes: Pain can recur after a period of time following RFA of innervation to the LFJs. The lower end of the range for this period is around 3 months (3). An average of 80% of patients who reported at least 50% pain relief for at least three months have a successful repeat lumbar RFA after an initial successful RFA (3).
Role of imaging for lumbar facet joint procedures	a. Lumbar facet joint injection (medial branch or joint) and RFA should be performed under fluoroscopy as an imaging guidance modality. USG can be used as a primary imaging modality for medial branch and facet blocks in selected patients in whom the required sonographic landmarks can be visualized (e.g. low BMI, absence of post-surgical changes, transitional anatomy or significant degenerative changes).

	b. The use of ultrasound for RFA has not been validated in the lumbar spine.
Sacroiliac Joint Procedures	
i. Sacroiliac joint (SIJ) intra/peri-articular (IA/PA) injections	Number of IA or PA injections for a SIJ should be limited to 4 in one year. Any repeat injection should only be offered if IA or PA injection provides significant improvement in pain (≥ 50% pain relief) and function for at least 3 month and the patient presents with similar pain location, historical symptoms and no change in physical examination. Notes: Frequency of injections should be based on safety considerations that include the dose of steroid administered in the SIJ and any other steroid injections received by the patient around the same time interval. History of exposure to corticosteroids, including at other injection sites or surgical, should be obtained from any patient prior to a steroid injection.
ii. Sacroiliac joint lateral branch blocks (LBB)/ injections	At least one LBB targeting lateral branches of the S1, S2, and S3 nerves associated with at least 50% reduction in the intensity of pain can be considered to prognosticate the outcome of RFA of innervation to the SIJ. If there is incomplete relief in a patient in whom SIJ is deemed likely to be the source of low back pain, a repeat block involving L5, in addition to S1, S2, and S3 can be considered.
iii. Sacroiliac joint lateral branch radiofrequency ablation (RFA)	RFA of innervation to the SIJ should be conducted following a diagnostic block associated with at least 50% reduction in the intensity of pain on a 0-10 pain score. It is recommended that repeat RFA of innervation to the SIJ should be offered to patients who had at least 50% pain relief in a 0-10 pain score from their pre-RFA pain intensity for at least 6 months along with evidence of functional improvement and then experience return of their SIJ pain. There is no need to repeat diagnostic block if the patient present with similar pain location, historical symptoms and no change in physical examination signs. Given the mean duration of benefit and drop-off in success rates noted in some studies with repeat RFA, we recommend no more than two SIJ lateral branch RFA procedures a year.
Role of imaging guidance for SIJ procedures	Procedures on the SIJ should be performed under fluoroscopy and/or ultrasound or a combination of both image-guidance modalities to enhance accuracy and safety of these procedures.

Lumbar Epidural Steroid Injections	
Caudal epidural steroid injections (C-ESI)	Caudal ESI can be used as a therapeutic intervention for disc-related radicular pain in the lower leg, but the evidence is weak and only indicates short-term improvement. The caudal route can be used in case of technical difficulties accessing the epidural space but has been demonstrated to be inferior to interlaminar or transforaminal approaches Notes: The caudal approach to epidural space should only be offered to patients with severe radicular pain when there are technical difficulties in performing interlaminar or transforaminal approach (e.g., previous lumbar spine surgery or severe degenerative lumbar spine disease).
Role of imaging guidance for lumbar epidural steroid injections	Fluoroscopic guidance for epidural injections through interlaminar, and transforaminal, and caudal routes should always be used because it greatly improves accuracy and safety versus anatomic-landmark guided injections. It ensures procedures at the correct vertebral level, mitigates the risk of injection into non-epidural compartments especially in patients with spinal pathology, and allows visualization of injectate flow. For caudal epidural, the use of fluoroscopy guidance is highly recommended. Given the limited access of fluoroscopy in the community, the use of ultrasound guidance can be accepted. Notes: Real-time fluoroscopy and or digital subtraction imaging during epidural injections can further enhance accuracy and reduce complications.

Table 3. Good Clinical Practice statements on practice aspects related to spinal procedures to relieve pain.

TOPIC	RECOMMENDATION
Training and credentialing requirements	A minimum of 12 months in clinical and interventional pain management is necessary to gain proficiency in commonly performed interventional axial procedures for pain
Corticosteroid dose and safety in axial interventions for pain	Corticosteroid doses equivalent to a maximum of 200 to 320 mg of methylprednisolone over a period of 12 months can be utilized for axial interventions to relieve pain (epidural steroid or nerve root or facet joint or sacroiliac joint injections). Reduction in bone mineral density with an increase in risk of osteoporotic fractures may occur with annual doses of greater than 200 mg of methylprednisolone in postmenopausal females and this dose should be the upper limit in this population. Notes: Practitioners must take into consideration lifestyle (smoking, alcohol intake, and exercise), medical comorbidities and other sources of exposure to corticosteroids and have an informed discussion with their patients about the anticipated benefits and risks. Practitioners should also consider starting bone-strengthening treatment in patients at greatest risk of osteoporosis and fragility fractures.
Standards of sterility for spinal interventions for pain	**Hand Hygiene:** A physician performing spine interventions should apply an alcohol-based hand rub to decontaminate hands when hands are not visibly soiled. Handwash with soap and water should be used when hands are visibly soiled. Sterile gloves should be worn for spine interventions. **Masks, Gown and Cap:** The proceduralist and others including those who are in close proximity to the injection site or injection material should wear a mask. Providers may consider wearing caps during procedures especially given the fact that caps are low cost and there are no expected side effects from wearing them. Gowning is not necessary for most of the spine intervention procedures except advanced procedures that require lengthy access to the epidural space, such as percutaneous stimulator insertion, intrathecal pump insertion and discography. **Preparation of the Procedure Site:** The procedure site should be prepped with chlorhexidine-alcohol mixture. Providone-iodine in alcohol is a reasonable alternative to chlorhexidine in alcohol prep for patients sensitive to chlorhexidine. Chlorhexidine should be applied systematically for 30 seconds (2 minutes for moist sites), while avoiding solution pooling and allowing at least 3 minutes for complete drying.

Equipment: For percutaneous spine intervention procedures under ultrasound-guidance, the probe should be cleansed with low-level disinfection and used in conjunction with a single-use transducer cover. Care should be taken to avoid making contact with the fluoroscopy C-arm to minimize contamination of the sterile field. The C-arm should be appropriately covered to protect the integrity of the sterile field in higher risk procedures (e.g., spinal cord stimulator or intrathecal pump).

References:

1. Hurley RW, Adams MCB, Barad M, Bhaskar A, Bhatia A, Chadwick A, et al. Consensus practice guidelines on interventions for cervical spine (facet) joint pain from a multispecialty international working group. Reg Anesth Pain Med. 2022 Jan 1;47(1):3–59.

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3. Cohen SP, Bhaskar A, Bhatia A, Buvanendran A, Deer T, Garg S, et al. Consensus practice guidelines on interventions for lumbar facet joint pain from a multispecialty, international working group. Reg Anesth Pain Med. 2020 June;45(6):424–67.