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ASRA Guidelines Regarding Anticoagulation and Pain Procedures

Alexander Kim MD

Brigham and Women's Hospital

CHRONIC AND INTERVENTIONAL PAIN

SPECIAL ARTICLE

Interventional Spine and Pain Procedures in Patients on Antiplatelet and Anticoagulant Medications (Second Edition)

Guidelines From the American Society of Regional Anesthesia and Pain Medicine, the European Society of Regional Anaesthesia and Pain Therapy, the American Academy of Pain Medicine, the International Neuromodulation Society, the North American Neuromodulation Society, and the World Institute of Pain

Samer Narouze, MD, PhD, Honorio T. Benzon, MD,† David Provenzano, MD,‡ Asokumar Buvanendran, MD,§ José De Andres, MD,|| Timothy Deer, MD,** Richard Rauck, MD,†† and Marc A. Huntoon, MD‡‡*

Key Points

- Data on this subject, and certain points are extrapolated from surgical and medical literature
- The recommendations were evidence-based when available, and pharmacology- or physiology-driven otherwise
  - 10% daily platelet turnover
  - 5 half-life principle
- The conclusions obtained by 1 group of experts may differ from another set of equally qualified experts
- These recommendations do not define standard of care and are not intended to replace clinical judgment in a specific patient scenario. They are intended to facilitate decision-making and encourage optimal patient care, but cannot ensure avoidance of adverse outcomes
- The panel tended toward conservative recommendation

Example of Disagreement

- Q1: There is no need to routinely stop NSAIDs prior to high risk category procedures (SCS trial, intrathecal catheter, kyphoplasty)
  - True/False
- Q2: There is no need to routinely stop anticoagulants for cervical facet procedures, which are categorized by ASRA as intermediate risk procedures (same category as ESI)
  - True/False
- Q3: There is no need to routinely stop aspirin 81mg (either primary or secondary prophylaxis) for cervical epidural steroid injection.
  - True/False
- Q4: Aspirin 81mg should be held for high risk procedures (SCS trial, intrathecal catheter, kyphoplasty)
  - True/False
- Q5: Ganglion impar block should be categorized as low risk, thus not requiring holding of anticoagulants.
  - True/False
- Q6: There is no need to stop anticoagulants for trigeminal nerve blocks, which is categorized by ASRA as an intermediate risk procedure.
  - True False

- Q1: There is no need to routinely stop NSAIDs prior to high risk category procedures (SCS trial, intrathecal catheter, kyphoplasty)
  - True 78%, False 22%
- Q2: There is no need to routinely stop anticoagulants for cervical facet procedures, which are categorized by ASRA as intermediate risk procedures (same category as ESI)
  - True 63%, False 37%
- Q3: There is no need to routinely stop aspirin 81mg (either primary or secondary prophylaxis) for cervical epidural steroid injection.
  - True 100%, False 0%
- Q4: Aspirin 81mg should be held for high risk procedures (SCS trial, intrathecal catheter, kyphoplasty)
  - True 22%, False 78%
- Q5: Ganglion impar block should be categorized as low risk, thus not requiring holding of anticoagulants.
  - True 100%, False 0%
- Q6: There is no need to stop anticoagulants for trigeminal nerve blocks, which is categorized by ASRA as an intermediate risk procedure.
  - True 37%, False 63%

- Key Points continued

- Consider the individual patient
  - Examples:
    - Recent cardiac stent
    - History of numerous CVA
    - Inpatient DVT prophylaxis
    - Aspirin primary vs secondary prophylaxis
    - Mechanical valve
    - Distant history of DVT
- Consider risk/benefit ratio of pain intervention, potential bleeding, and potential adverse effects of holding the anticoagulant
- Pain interventions are **always** elective
- Shared decision-making with the anticoagulant/antiplatelet medication prescriber (cardiology, neurology, vascular, primary care, psychiatrist)

TABLE 1. Pain Procedures Classification According to the Potential Risk of Serious Bleeding

High-Risk Procedures	Intermediate-Risk Procedures*	Low-Risk Procedures*
Spinal cord stimulation trial and implant	Interlaminar ESIs (C, T, L, S)	Peripheral nerve blocks
Dorsal root ganglion stimulation	Transforaminal ESIs (C, T, L, S)	Peripheral joints and musculoskeletal injections
Intrathecal catheter and pump implant	Cervical† facet MBNB and RFA	Trigger point injections including piriformis injection
Vertebral augmentation (vertebroplasty and kyphoplasty)	Intradiscal procedures (C, T, L)	Sacroiliac joint injection and sacral lateral branch blocks
Percutaneous decompression laminotomy	Sympathetic blocks (stellate, T, splanchnic, celiac, lumbar, hypogastric)	Thoracic and lumbar facet MBNB and RFA
Epiduroscopy and epidural decompression	Trigeminal and sphenopalatine ganglia blocks	Peripheral nerve stimulation trial and implant‡
		Pocket revision and implantable pulse generator/intrathecal pump replacement

*Patients with high risk of bleeding (eg, old age, history of bleeding tendency, concurrent uses of other anticoagulants/antiplatelets, liver cirrhosis or advanced liver disease, and advanced renal disease) undergoing low- or intermediate-risk procedures should be treated as intermediate or high risk, respectively.

†There is rich neck vascularity in the vicinity of the target structure(s) (refer to the section entitled Anatomical Considerations for Hematoma Development in Spinal and Nonspinal Areas).

‡Peripheral neuromodulation is low to intermediate risk, depending on the location of the targeted nerve in relation to critical vessels and the invasiveness of the procedure.

C indicates cervical; L, lumbar; S, sacral; T, thoracic.

TABLE 8. Summary of Periprocedural Management of Anticoagulants and Antiplatelet Medications

Drug	When to Stop			When to Restart
	High-Risk Procedures	Intermediate-Risk Procedures	Low-Risk Procedures	
ASA and ASA combinations	Primary prophylaxis: 6 d Secondary prophylaxis: shared assessment and risk stratification	Shared assessment and risk stratification*†	No	24 h
NSAIDs	5 Half-lives	No‡	No	24 h
Diclofenac	1 d			
Ketorolac	1 d			
Ibuprofen	1 d			
Etodolac	2 d			
Indomethacin	2 d			
Naproxen	4 d			
Meloxicam	4 d			
Nabumetone	6 d			
Oxaprozin	10 d			
Piroxicam	10 d			
Phosphodiesterase inhibitors				
Cilostazol	2 d	No	No	24 h
Dipyridamole	2 d	No	No	
ASA combinations	Follow ASA recommendations	Shared assessment and risk stratification*		
Anticoagulants				
Coumadin	5 d, Normal INR	5 d, Normal INR	No Shared assessment and risk stratification*	6 h
Acenocoumarol	3 d, Normal INR	3 d, Normal INR	No Shared assessment and risk stratification*	24 h
IV heparin	6 h	6 h	6 h	2 h§
Subcutaneous heparin, BID & TID	24 h	6 h	6 h	2 h (Low-risk procedures) 6–8 h (Intermediate- and high-risk procedures)
LMWH				
Enoxaparin (prophylactic)	12 h	12 h	12 h	4 h (Low risk) 12–24 h (Intermediate-/high-risk procedures)
Enoxaparin (therapeutic)	24 h	24 h	24 h	4 h (Low-risk procedures) 12–24 h (Intermediate-/high-risk procedures)
Dalteparin	24 h	24 h	24 h	4 h (Low-risk procedures) 12–24 h (Intermediate-/high-risk procedures)
Fibrinolytic agents	48 h	48 h	48 h	NA‖

TABLE 8. *(Continued)*

Drug	When to Stop			When to Restart
	High-Risk Procedures	Intermediate-Risk Procedures	Low-Risk Procedures	
Fondaparinux	4 d	4 d	Shared assessment and risk stratification	6 h (Low-risk procedures) 24 h (Intermediate- and high-risk procedures)
P2Y12 inhibitors				
Clopidogrel	7 d	7 d	No Shared assessment and risk stratification	12–24 h*
Prasugrel	7–10 d	7–10 d	No Shared assessment and risk stratification	24 h
Ticagrelor	5 d	5 d	No Shared assessment and risk stratification	24 h
Cangrelor	3 h	3 h	Shared assessment and risk stratification	24 h
NOACs				
Dabigatran	4 d 5–6 d (Impaired renal function)	4 d 5–6 d (Impaired renal function)	Shared assessment and risk stratification*	24 h
Rivaroxaban	3 d	3 d	Shared assessment and risk stratification*	24 h
Apixaban	3 d	3 d	Shared assessment and risk stratification*	24 h
Edoxaban	3 d	3 d	Shared assessment and risk stratification*	24 h
GP IIb/IIIa inhibitors				
Abciximab	2–5 d	2–5 d	2–5 d	8–12 h
Eptifibatide	8–24 h	8–24 h	8–24 h	8–12 h
Tirofiban	8–24 h	8–24 h	8–24 h	8–12 h
Antidepressants and SRIs	See text and Table 7	No	No	See text and Table 7

Major areas of differences from the ASRA guidelines for regional anesthesia are in yellow boxes.

*See detailed text in the corresponding section.

†Consideration should be given to the discontinuation of ASA for certain intermediate-risk procedures including interlaminar cervical ESIs and stellate ganglion blocks where specific anatomical configurations may increase the risk and consequences of procedural bleeding.

‡Consideration should be given to the discontinuation of NSAIDs for certain intermediate-risk procedures including interlaminar cervical ESIs and stellate ganglion blocks where specific anatomical configurations may increase the risk and consequences of procedural bleeding (refer to the section entitled Anatomical Considerations for Hematoma Development in Spinal and Nonspinal Areas).

§If a moderate- or high-risk procedure was bloody, then a 24-hour interval should be observed.

‖After an intervention, the usual daily dose (75 mg) of clopidogrel can be started 12 hours later. If a loading dose of clopidogrel is given, then the interval should be 24 hours.

Anticoagulants

- Coumadin
  - High and intermediate risk procedures: hold for 5 days, and normal INR (1.2 or less)
  - Low risk procedures: do not routinely need to hold (assuming non-supratherapeutic INR of <3)
  - Restart: 6 hours
  - May consider bridge therapy with LMWH
- LMWH
  - Therapeutic Enoxaparin (Lovenox) or dalteparin
    - High, intermediate and low risk procedures: hold for 24 hours
    - Restart: 12-24 hours for high/intermediate risk procedures, 4 hours for low risk procedures
  - Prophylactic Enoxaparin
    - High, intermediate and low risk procedures: hold for 12 hours
    - Restart: 12-24 hours for high/intermediate risk procedures, 4 hours for low risk procedures
- Heparin
  - Intravenous
    - High, intermediate, low risk procedures: hold for 6 hours
    - Restart: 2 hours (24 hours if high/intermediate risk procedure was bloody)
  - Subcutaneous (BID or TID)
    - High risk procedure: hold for 24 hours
    - Intermediate and low risk procedures: hold for 6 hours
    - Restart: 6-8 hours for high/intermediate risk procedures, 2 hours for low risk procedure
- Fondaparinux (Arixtra)
  - Used for DVT/PE prophylaxis/treatment
  - High and intermediate risk procedures: hold for 4 days
  - Low risk procedure: may consider shorter hold of 2 days (2 half-lives)
  - Restart: 24 hours for high/intermediate risk procedures, 6 hours for low risk procedures

• Novel Oral Anticoagulants (NOACs)

- Rivaroxaban (Xarelto), Apixaban (Eliquis), Edoxaban (Savaysa)
  - High and intermediate risk procedures: hold for 3 days
  - Low risk procedures: do not need to routinely hold (if held, can shorten to 2 half-lives or 1 day)
  - Restart: 24 hours (12 hours with half dose if very high risk of thromboembolic event)
- Dabigatran (Pradaxa)
  - High and intermediate risk procedures: hold for 4 days (5-6 days if renal insufficiency)
    - CrCl < 50ml/min
  - Low risk procedures: do not need to routinely hold (if held, can shorten to 2 half-lives or 2 days)
  - Restart: 24 hours (12 hours if very high risk of thromboembolic event)
- May consider bridge therapy with LMWH
- Betrixaban (Bevyxxa): 5-6 day hold for high/intermediate risk, 3 day hold for low risk. Resume after 12-24 hours

P2Y12 Inhibitors

- Clopidogrel (Plavix)
  - High and intermediate risk procedures: hold for 7 days
    - If held for 5 days (high risk of thromboembolic event), perform platelet function tests (PFA II, P2Y12 assay)
  - Low risk procedures: do not need to routinely hold
  - Restart: 12 hours if usual 75mg dose, 24 hours if loading dose (300-600mg)
- Prasugrel (Effient)
  - High and intermediate risk procedures: hold for 7-10 days
  - Low risk procedures: do not need to routinely hold
  - Restart: 24 hours
- Ticagrelor (Brilinta)
  - High and intermediate risk procedures: hold for 5 days
  - Low risk procedures: do not need to routinely hold
  - Restart: 24 hours
- May consider bridge therapy with LMWH

Aspirin

- Very important to establish if it is being taken for primary or secondary prophylaxis
  - Significant risk associated with discontinuation of aspirin used for secondary prophylaxis (1)
  - 10% of acute cardiovascular syndromes preceded by withdrawal of aspirin
- Aspirin:
  - High risk procedures: hold for 6 days if primary prophylaxis, risk stratification and shared-decision making if secondary prophylaxis
  - intermediate risk procedures: consider holding for cervical ESI and stellate ganglion block if primary prophylaxis, risk stratification and shared-decision making if secondary prophylaxis (can shorten hold to 4 days)
  - Low risk procedures: do not need to routinely hold
  - Restart: 24 hours
  - No specific distinction made between 81mg and 325mg

1. Lotrionte M, Biondi-Zoccai GG. The hazards of discontinuing acetylsalicylic acid therapy in those at risk of coronary artery disease. Curr Opin Cardiol. 2008;23:487-493)

Phosphodiesterase Inhibitors

- Cilostazol, dipyridamole (without aspirin)
  - Cilostazol used for vascular claudication
  - Dipyridamole used for CVA prophylaxis
  - High risk procedures: hold for 2 days
  - Intermediate and low risk procedures: do not need to routinely hold
  - Restart: 24 hours
- If combined with aspirin, refer to aspirin guidelines

GIIb/IIIa Inhibitors

- Usually given intravenously during interventional cardiology procedures
- Abciximab
  - High, intermediate, and low risk procedures: hold for 2-5 days
  - Restart: 8-12 hours
- Eptifibatide (Integrelin), Tirofiban (Aggrestat)
  - High, intermediate, and low risk procedures: hold for 8-24 hours
  - Restart: 8-12 hours

NSAIDs

- Usually "elective" medications, not used for cardiac/cerebral protection
- High risk procedures: hold for 5 half-lives
- Intermediate risk procedures: consider holding for cervical ESI and stellate ganglion block
- Low risk procedures: do not need to routinely hold
- Restart: 24 hours
- May consider longer hold for individuals with hypoalbuminemia, nephrotic syndrome, hepatic dysfunction, renal dysfunction

TABLE 2. Half-lives of Commonly Administered Non-ASA NSAIDs

Agent	Half-life, h	Discontinuation Time 5 Half-lives, h	Recommended Discontinuation Time, d
Diclofenac[119]	1–2	5–10	1
Etodolac[120]	6–8	30–40	2
Ibuprofen[121]	2–4	10–20	1
Indomethacin[122]	5–10	25–50	2
Ketorolac[123]	5–6	25–30	1
Meloxicam[124]	15–20	75–100	4
Nabumetone[125]	22–30	110–150	6
Naproxen[126]	12–17	60–85	4
Oxaprozin[127]	40–60	200–240	10
Piroxicam[128]	45–50	225–250	10

Antidepressants

- SSRI and SNRI have been associated with increased bleeding risk
  - Bleeding risk equivalent to low dose ibuprofen
  - Small increased risk of bleeding in breast (1) and orthopedic surgery (2)
  - Risk increases with advanced age, hepatic dysfunction concurrent use with aspirin or other antiplatelet medications (3)
- TCAs and other non-serotonergic antidepressants have not been associated with increased bleeding risk
- Routine discontinuation of SRI before any pain procedure is not recommended, due to risk of uncontrolled depression, suicidal risk, and discontinuation syndrome
- May consider stopping if high risk factors (concurrent use of anticoagulants, elderly, significant hepatic dysfunction), and higher risk procedure
  - In this case, carefully consult with the prescribing physician about switch to non-serotonergic antidepressant (mirtazapine, bupropion, etc), or gradual tapering

1. Basile et al. Use of selective serotonin reuptake inhibitors antidepressants and bleeding risk in breast cosmetic surgery. Aesthetic Plast Surg. 2013;37:561-566.
2. Movig et al. Relationship of serotonergic antidepressants and need for blood transfusion in orthopedic surgical patients. Arch Intern Med. 2003;163:2354-2358.
3. De Abajo et al. Association between selective serotonin reuptake inhibitors and upper gastrointestinal bleeding: population based case-control study. BMJ. 1999;319:1106-1109.

Supplements

- Inquire about use of herbals and supplements
- Dong Quai, Danshen: potentiates coumadin effects
- Garlic, gingko biloba, vitamin E, fish oil: effect on platelet aggregation
- Consider stopping for high risk procedure, for 1 week

Conclusion

- Always consider the individual patient and their risk factors – use your clinical judgment
- Involve the prescribing clinician in any decision to hold anticoagulant and antiplatelet medications
- Use the information as guidelines, not necessarily as standard of care.
- Understand the reasoning behind the recommendations
- Interspinous spacers, basivertebral ablation

The Neurostimulation Appropriateness Consensus Committee (NACC): Recommendations on Bleeding and Coagulation Management in Neurostimulation Devices

Timothy R. Deer, MD*; Samer Narouze, MD, PhD†; David A. Provenzano, MD‡; Jason E. Pope, MD§; Steven M. Falowski, MD¶; Marc A. Russo, MD**; Honorio Benzon, MD††; Konstantin Slavin, MD‡‡; Julie G. Pilitsis, MD§§; Kenneth Alo, MD¶¶; Jonathan D. Carlson, MD***; Porter McRoberts, MD†††; Shivanand P. Lad, MD, PhD‡‡‡; Jeffrey Arle, MD, PhD§§§; Robert M. Levy, MD, PhD¶¶¶; Brian Simpson, MD****; Nagy Mekhail, MD, PhD††††

Introduction: The Neurostimulation Appropriateness Consensus Committee (NACC) was formed by the International Neuromodulation Society (INS) in 2012 to evaluate the evidence to reduce the risk of complications and improve the efficacy of neurostimulation. The first series of papers, published in 2014, focused on the general principles of appropriate practice in the surgical implantation of neurostimulation devices. The NACC was reconvened in 2014 to address specific patient care issues, including bleeding and coagulation.

Methods: The INS strives to improve patient care in an evidence-based fashion. The NACC members were appointed or recruited by the INS leadership for diverse expertise, including international clinical expertise in many areas of neurostimulation, evidence evaluation, and publication. The group developed best practices based on peer-reviewed evidence and, in the absence of specific evidence, on expert opinion. Recommendations were based on international evidence in accordance with guideline creation.

Conclusions: The NACC has recommended specific measures to reduce the risk of bleeding and neurological injury secondary to impairment of coagulation in the setting of implantable neurostimulation devices in the spine, brain, and periphery.

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Guidelines

Responsible, Safe, and Effective Use of Antithrombotics and Anticoagulants in Patients Undergoing Interventional Techniques: American Society of Interventional Pain Physicians (ASIPP) Guidelines

Alan D. Kaye, MD, PhD[1], Laxmaiah Manchikanti, MD[2], Matthew B. Novitch[3], Imran N. Mungrue[4], Muhammad Anwar, MBBS[5], Mark R. Jones, MD[6], Erik M. Helander, MBBS[7], Elyse M. Cornett, PhD[8], Matthew R. Eng, MD[9], Jay S. Grider, DO, PhD[10], Michael E. Harned, MD[11], Ramsin M. Benyamin, MD[12], John R. Swicegood, MD[13], Thomas T. Simopoulos, MD[14], Salahadin Abdi, MD, PhD[15], Richard D. Urman, MD[16], Timothy R. Deer, MD[17], Cyrus Bakhit, MD[18], Mahendra Sanapati, MD[19], Sairam Atluri, MD[20], Ramarao Pasupuleti, MD[21], Amol Soin, MD[22], Sudhir Diwan, MD[23], Ricardo Vallejo, MD, PhD[24], Kenneth D. Candido, MD[25], Nebojsa Nick Knezevic, MD, PhD[26], Douglas Beall, MD[27], Sheri L. Albers, DO[28], Richard Latchaw, MD[29], Hari Prabhakar, MD[30], and Joshua A. Hirsch, MD[31]

Table 13. *Classification of interventional techniques based on the potential risk for bleeding.*

Low-Risk Procedures	Intermediate-Risk Procedures*	High-Risk Procedures*
1. Trigger point and muscular injections (including piriformis injection) 2. Peripheral joints 3. Peripheral nerve blocks 4. Sacroiliac joint and ligament injections and nerve blocks 5. Caudal epidural injections 6. Ganglion impar blocks	1. Facet joint interventions (intraarticular injections, nerve blocks and radiofrequency neurotomy) 2. Lumbar transforaminal epidural injections at L4, L5, S1 3. Lumbar intradiscal procedures 4. Hypogastric plexus blocks 5. Lumbar sympathetic blocks 6. Peripheral nerve stimulation trial and implant 7. Pocket revision and implantable pulse regenerator/ intrathecal pump replacement 8. Caudal percutaneous adhesiolysis 9. Lumbar percutaneous disc decompression (L4/5 or below) 10. Lumbar vertebral augmentation (below L4) 11. Intervertebral spinous prosthesis 12. Lumbar discography 13. Lumbar interlaminar epidural injections at L5-S1	1. Cervical, thoracic, and high lumbar (above L4-L5) interlaminar epidurals 2. Cervical, thoracic and lumbar above L3 transforaminal epidural injections 3. Spinal cord stimulator trial and implant 4. Percutaneous adhesiolysis with interlaminar or transforaminal approach 5. Percutaneous disc decompression (above L4/5) 6. Sympathetic blocks (stellate ganglion; thoracic splanchnic, celiac plexus) 7. Thoracic and cervical intradiscal procedures 8. Vertebral augmentation, lumbar (above L4), thoracic and cervical 9. Intrathecal catheter and pump implant 10. Interspinous prosthesis and MILD®

*Patients with high risk of bleeding (e.g., old age, history of bleeding tendency, concurrent uses of other anticoagulants/antiplatelets, liver cirrhosis or advanced liver disease, and advanced renal disease) undergoing low or intermediate-risk procedures should be treated as intermediate or high risk, respectively.