Introduction

This guideline is specifically for ITAPS. It aims to provide an evidence-based set of recommendations to practice regional anaesthesia and analgesia techniques in patients receiving antithrombotic drugs.

Guideline Standards and Procedures

Adopted from Joint guidelines introduced by **"European Society of Anaesthesiology and Intensive Care and the European Society of Regional Anaesthesia".**

Depending on bleeding risk involved with every procedure, blocks are categorised into

- Blocks that have a High-risk of bleeding (**Deep PNB's/neuraxial blocks**)
- Blocks that have a Low risk of bleeding (**superficial PNB's**)

1. Deep nerve blocks/Neuraxial blocks

- These have **high risk of bleeding** in a patient on antithrombotic drugs.
- Consequence of bleeding following these blocks is significant. Management of bleeding is difficult because the site is **deep/non compressible**. Surgical intervention may be needed.

The following are examples of deep nerve blocks/neuraxial blocks.

Table 1

Head, neck	Stellate ganglion Deep cervical plexus Cervical paravertebral
Upper limb	Infraclavicular brachial plexus
Thorax	Epidural Thoracic Paravertebral
Lower limb, back	Lumbar plexus Psoas compartment Lumbar sympathectomy Lumbar paravertebral Quadratus lumborum Fascia transversalis

	Sacral plexus Pericapsular nerve group (PENG) Sciatic (proximal approaches Spinal Epidural Lumbar paravertebral

2. Superficial nerve blocks

- **Low risk of bleeding** in a patient on antithrombotic drugs.
- Consequence of bleeding following block is less significant clinically. Bleeding site is easily **compressible**; less likely to require surgical intervention.

The following are examples of superficial nerve blocks

Table 2

Head, neck	Occipital Peribulbar Sub-Tenon's Superficial cervical plexus
Upper limb	Interscalene Supraclavicular Axillary Suprascapular Ulnar,radial,medial (forearm or wrist level)
Thorax	Parasternal intercostal plane (deep, superficial) Serratus anterior (deep, Superficial) Erector Spinae plane Intercostal Interpectoral plane and pecto serratus plane
Abdomen, Pelvic	Ilioinguinal Iliohypogastric Transversus abdominis plane (TAP) Rectus sheath Genital branch of genitofemoral nerve Pudendal nerve
Lower limb, back	Femoral Femoral triangle

	Adductor canal Sciatic (subgluteal, popliteal level) Fascia iliaca Lateral cutaneous nerve of thigh Femoral branch of genitofemoral nerve Sural, saphenous tibial, peroneal (deep, superficial)

3. Guidance for the following anticoagulants treatment

- Vitamin k antagonists (VKA): Warfarin, Acenocoumerol.
- Direct oral anticoagulants (DOAC): rivaroxaban, apixaban, endoxaban,dabigatran
- Low molecular weight heparins (LMWH) :Dalteparin
- Unfractionated heparin (UFH)
- Aspirin
- P2Y12 inhibitors: clopidogrel, prasugrel, ticagrelor

3.1 Vitamin K antagonists (VKA)

Table 3

	Time from last drug intake to intervention	**Target lab value at intervention**	**Time from intervention to next drug dose**
Deep nerve block/Neuraxial block	5 days - Warfarin	Normal INR <1.5	Next dose of VKA should be given as per guidelines on postoperative VTE prophylaxis or therapeutic anticoagulation. In the presence of Indwelling neuraxial catheter, next dose of VKA should be given only after catheter removal. LMWH can be used to bridge till catheter remains in place.(timing of VKA to be discussed with hematology)*
Superficial nerve block	Zero	No testing (testing can be considered in conditions like	At routinely next prescribed time.

		renal insufficiency where drug accumulation is suspected.	

3.2 Direct oral anticoagulants (DOAC)

Recommendations to perform any regional anaesthesia procedure varies between low and high dose of DOAC. DOAC are classified as low and high doses as per table given below.

Table 4

	Low dose	High dose	High dose in Renal impairment (Creatinine clearance 15-50 ml/min)
Rivaroxaban	≤ 20mg/day	≥ 20mg/day	≥ 15 mg/day
Apixaban	≤ 5mg/day	≥ 5mg/day	≥ 5mg/day
Endoxaban	< 60mg/day	≥ 60mg/day	≥ 30mg/day
Dabigatran	< 300 mg/day	>300mg/day	> 150 mg/day

3.2.1 Recommendations to stop and restart "low dose DOAC" before regional anaesthesia intervention is given below.

Table 5

	Time from last drug intake to intervention	**Target lab value at intervention**	**Time from intervention to next drug dose**
Deep nerve block/Neuraxial block	Rivaroxaban: 24 hours Endoxaban: 24hours(30hr if Cr cl<30) Apixaban: 36hours Dabigatran: 48 hours	No testing needed	6 to 8 hours (prolonged time interval after bloody tap)
Superficial nerve block	Zero	No testing (testing can be considered in conditions like renal insufficiency where drug accumulation is suspected	At routinely next prescribed time

3.2.2 Recommendations to stop and restart "High dose DOAC" before regional anaesthesia intervention is given below.

Table 6

	Time from last drug intake to intervention	Target lab value at intervention	Time from intervention to next drug dose
Deep nerve block/Neuraxial block	72 hours or until target laboratory value	DTI < 30ng/ml Or normal thrombin time	24 hours post op
Superficial nerve block	Zero	No testing (testing can be considered in conditions like renal insufficiency where drug accumulation is suspected	At routinely next prescribed time

DTI: Direct thrombin inhibitor

3.3 Low molecular weight Heparin (LMWH)

Table 7

	LMWH Dose	Time from last drug intake to intervention	Target lab value at intervention	Time from intervention to next drug dose
Deep nerve block/Neuraxial block	LMWH low dose ≤ 50 IU/kg/day Enoxaparin<40 mg/day	12 hours(24 hr if CrCl<30)	No testing	4 hours
	LMWH high dose ≥ 50 IU/kg/day	24 hours(48hr if CrCl<30)	Anti Xa ≤ 0.1IU/ml	Withold in case of indwelling catheter, in the interim can administer low dose LMWH
Superficial nerve block	LMWH low/high dose	zero	No testing (testing can be considered in conditions like renal insufficiency where drug accumulation is suspected	At routinely next prescribed time

3.4 Unfractionated Heparin (UFH)

Table 8

	UFH dose	Time from last drug intake to intervention	Target lab value at intervention	Time from intervention to next drug dose
Deep nerve block/Neuraxial block	UFH low dose ≤200 IU/kg/day sc, ≤100IU/kg/day iv	4 hours	No testing	1 hr for IV in cardiovascular surgery
	UFH high dose ≥200 IU/kg/day sc, ≥100IU/kg/day	Until target lab value (6 hours – iv dose 12 h hours sc dose)	aPTT or ACT or anti Xa in normal range	Withold in case of indwelling catheter, in the interim can administer low dose UFH or LMWH
Superficial nerve block	UFH low/high dose	zero	No testing (testing can be considered in conditions like renal insufficiency where drug accumulation is suspected	At routinely next prescribed time

Sc: subcutaneous, I.v:intravenous, aPTT: activated partial thromboplastin time, ACT: activated clotting time

3.5 Fondaparinux

Table 9

	Fondaparinux dose	Time from last drug intake to intervention	Target lab value at intervention	Time from intervention to next drug dose
Deep nerve block/Neuraxial block	Low dose ≤2.5mg/day	36 hours	No testing	6 hrs
	High dose ≥2.5mg/day	Until target lab value (4days)	Calibrated anti Xa ≤0.1 IU/ml	Hematology discussion*
Superficial nerve block	Low/High dose	Zero	No testing (testing can be considered in conditions like	At routinely next prescribed time

			renal insufficiency where drug accumulation is suspected	

3.6 Aspirin

Table 10

	Asiprin dose	**Time from last drug intake to intervention**	**Target lab value at intervention**	**Time from intervention to next drug dose**
Deep nerve block/Neuraxial block	Low dose ≤200mg/day	0	No testing	At routinely next prescribed time
	High dose ≥ 200mg/day	3 days (normal platelet count) - 7days	Specific platelet function test in normal range	6 hours
Superficial nerve block	Low/High dose	0	No testing (testing can be considered in conditions like renal insufficiency where drug accumulation is suspected	At routinely next prescribed time

3.7 P2Y12 inhibitors

Table 11

	Time from last drug intake to intervention	**Target lab value at intervention**	**Time from intervention to next drug dose**
Deep nerve block/Neuraxial block	Ticagrelor 5days Clopidogrel 5-7days Prasugrel 7days		0 – clopidogrel 75mg, 24 hours-prasugrel, ticagrelor 2 days-clopidogrel 300mg.
Superficial nerve block	Zero	No testing (testing can be considered in conditions like renal insufficiency where drug accumulation is suspected	At routinely next prescribed time

3. Education and Training

Communications will be sent out to ITAPS team after approval and uploading of the guideline PAGL

4. Monitoring Compliance

What will be measured to monitor compliance	How will compliance be monitored	Monitoring Lead	Frequency	Reporting arrangements
Audit of last anticoagulant dose intake to block intervention	Audit: survey	Dr. Patel	2 years	

5. Supporting References

Regional Anaesthesia in patients on antithrombotic drugs, Joint ESAIC/ESRA guidelines (Eur J Anaesthesiology 2022;39:100-132) (Sibylle Kietaibl, Raquel Ferrandis, Anne Godier, Juan Llau, Clara Lobo, Alan JR Macfarlane, Christoph J. Schlimp, Erik Vandermeulen, Thomas Volk, Christian von Heymann, Morne Wolmarans and Arash Afshari)

6. Key Words

Regional, antithrombotic, anticoagulants, DOAC, superficial blocks, deep blocks, neuraxial, chronic pain.

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Details of Changes made during review: **New guidance**	