

DIVISION OF ACUTE CARE SURGERY

Surgical Intensive Care Unit

Practice Management Guideline: Venous Thromboembolism Prophylaxis

I. Purpose

To prevent pulmonary embolism (PE) and deep vein thrombosis (DVT) in patients in the surgical intensive care unit (SICU)

II. Recommendation

All adult patients admitted to the SICU should be initiated on VTE prophylaxis, unless contraindicated. Mechanical VTE prophylaxis with sequential compression devices (SCDs) is recommended as an alternative when pharmacologic VTE prophylaxis is contraindicated.

III. VTE Risk Assessment and Stratification

Risk Category	Procedure-specific Factors	Patient-specific Factors
Low	<ul style="list-style-type: none"> • Appendectomy • Inguinal herniorrhaphy • Laparoscopic cholecystectomy • Mastectomy (unilateral/bilateral) • Transurethral prostatectomy 	<ul style="list-style-type: none"> • Age < 40 years w/o additional risk factors • Ambulation/Mobilization
Moderate	<ul style="list-style-type: none"> • Surgery type <ul style="list-style-type: none"> ○ Bariatric ○ Cardiac ○ Gynecologic ○ Thoracic ○ Spinal 	<ul style="list-style-type: none"> • Age 40 – 60 years w/o additional risk factors • Hormone replacement therapy • Obesity (BMI > 25 kg/m²)
High	<ul style="list-style-type: none"> • Open abdominal/pelvic • Orthopedic 	<ul style="list-style-type: none"> • Age > 60 years • COVID-19 PCR positive • Hip, pelvis, or long bone fracture • History of DVT/PE • Immobility • Malignancy • Multi-trauma • Pregnancy or postpartum • Spinal cord injury w/ paralysis

IV. Contraindications for Pharmacologic VTE Prophylaxis

Enoxaparin	Heparin
<ul style="list-style-type: none"> • Active bleeding • Heparin-induced thrombocytopenia • May consider holding for platelet count less than 50,000 • Neuraxial anesthesia/Epidural catheter • Lumbar drain • External ventricular drain (EVD) • Intra-cranial pressure (ICP) monitor 	<ul style="list-style-type: none"> • Active bleeding • Heparin-induced thrombocytopenia • May consider holding for platelet count less than 50,000

V. VTE Prophylaxis Anticoagulant Selection and Dosing Guideline Summary

	CrCl ≥ 30 mL/min	CrCl 20-29 mL/min	CrCl < 20 mL/min or RRT	Epidural
Low Risk	SCDs and Early Post-operative Ambulation			
Moderate Risk	Enoxaparin 40 mg SQ Q24H	Enoxaparin 30 mg SQ Q24H	Heparin 5,000 units SQ Q8H	Heparin 5,000 units SQ Q8H
High Risk	Enoxaparin 40 mg SQ Q24H	Enoxaparin 30 mg SQ Q24H	Heparin 5,000 units SQ Q8H	
Obesity (BMI ≥ 40 kg/m²)	Enoxaparin 40 mg SQ Q12H <u>OR</u> Heparin 7,500 units SQ Q8H	Enoxaparin 40 mg SQ Q24H <u>OR</u> Heparin 7,500 units SQ Q8H	Heparin 7,500 units SQ Q8H	
Weight < 50 kg	Heparin 5,000 units SQ Q12h			
Trauma	Follow the Trauma VTE Prophylaxis Guidelines: (https://www.vumc.org/trauma-and-scc/trauma-and-surgical-critical-care-practice-management-guidelines)			
Abbreviations: BMI, body mass index; CrCl, creatinine clearance; RRT, renal replacement therapy; SCDs, sequential compression devices; SQ, subcutaneously; VTE, venous thromboembolism				

VI. Special Populations

- a. Trauma Patients
 - i. All trauma patients, unless otherwise specified, should receive VTE prophylaxis, according to the Trauma VTE Prophylaxis Practice Management Guidelines.
- b. Obese Patients (BMI \geq 40 kg/m²)
 - i. Patients with a BMI \geq 40 kg/m² may benefit from higher doses of enoxaparin or heparin for VTE prophylaxis. See dosing table above.
- c. Low body weight (< 50kg)
 - i. Patients with low body weight may have abnormal coagulation labs on standard prophylactic dosing and require lower doses.
 - ii. Heparin 5,000 units SQ Q12h is preferred; however, enoxaparin 30mg daily may be appropriate for very high risk patients without renal impairment.
- d. Patients with a history of heparin-induced thrombocytopenia (HIT)
 - i. Fondaparinux 2.5mg SQ daily may be used in patients with a history of HIT and CrCl > 30 ml/min.

VII. Epidural Catheter or Paravertebral Block and VTE Prophylaxis Administration*

	Enoxaparin	Heparin
Placement	<u>Hold</u> enoxaparin for 12 hours prior to placement	<u>Hold</u> heparin for 4-6 hours prior to placement
Receive While Catheter in Place?	<u>No</u> , enoxaparin is contraindicated due to risk of epidural hematoma	Yes, may initiate 1 hour following catheter placement
Removal	N/A	<u>Hold</u> heparin for 4 hours prior to removal
Post-Removal VTE Prophylaxis	May initiate 4 hours after removal	May initiate 1 hour following catheter removal
*See Appendix Table 1 for further guidance on acceptable anticoagulation during regional anesthesia at VUMC		

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Appendix

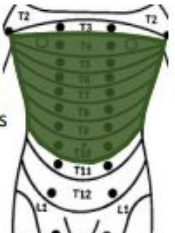
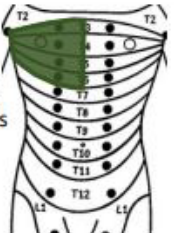
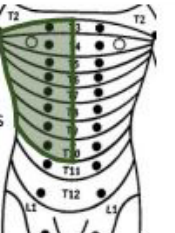
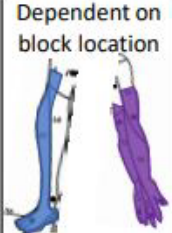
Table 1.



VUMC Regional Anesthesia in Trauma

Understanding differences between TEC, PVB, ESPB, Peripheral techniques

This document is NOT intended to decide which patients should receive a block. Once it is determined that a clinical situation warrants a procedure, this document can help guide 1) the decision to perform **one technique over another** and 2) the **anticoagulation implications** of this choice.

Procedure Type:	Thoracic Epidural (TEC)	Paravertebral (PVB)	Erector Spinae (ESPB)	Peripheral (PNB)
Indications	>3 Rib fx, especially below T3 Bilateral rib fx or chest tube Moderate or high-risk* patients with any # rib fx Exploratory Laparotomy	2-5 Rib fx, any location Unilateral rib fx or chest tube Moderate or high-risk* patients with small # rib fx Bilateral placement possible May be placed at or above T4	2-10 Rib fx, any location Chest tube Low or moderate-risk patient, any # rib fx Bilateral placement possible	Injury to extremity or joint (e.g. ankle, knee, shoulder, hand) Laparoscopy
Prerequisites	1) Lateral decub or sitting positioning possible, 2) No thoracic spine surgery planned, 3) NO Enoxaparin ordered until after APS eval as it precludes TEC & PVB placement			N/A
Contraindications	Anticoagulants (see below) T-spine pathology or surgery Elevated ICP	Anticoagulants (see below) T-spine pathology or surgery	Recent or anticipated T-spine surgery	Compartment syndrome
Region Covered	 4-10 Levels	 2-5 Levels	 6-10 Levels	 Dependent on block location
Laterality	Bilateral	Unilateral (Bilateral with multiple catheters)	Unilateral (Bilateral with multiple catheters)	Unilateral
Intensity	Dense	Dense	Diffuse/inconsistent	Dense
Hypotension	Potentially significant	Minimal	Minimal	Minimal
Acceptable Anticoagulation at VUMC				
Enoxaparin	X	X	✓	✓
Clopidogrel	X	X	✓	✓
Heparin IV gtt	X	X	✓	✓
Heparin subQ	✓	✓	✓	✓
ASA, NSAIDs	✓	✓	✓	✓
Other anticoagulants	Typically no, call APS w/ ?'s	Typically no, call APS w/ ?'s	✓	✓
Recommended:	Heparin, max 5000 U subQ TID		Enoxaparin subQ, prophylactic or therapeutic	

* High risk denotes patients either at high risk for deterioration requiring intubation/respiratory support or at high risk for morbidity or mortality should deterioration occur

Block Selection**

Epidural vs. Paravertebral		Epidural vs. Erector Spinae		Paravertebral vs. Erector Spinae	
TEC preferred:	PVB preferred:	TEC preferred:	ESPB preferred:	PVB preferred:	ESPB preferred:
Bilateral rib fx	Unilateral rib fx	Bilateral rib fx	Unilateral fx	< 6 rib fx	6+ rib fx
High # rib fx (6+)	Low # rib fx (2-5)	No anticoagulation	Anticoagulated	No anticoagulation	Anticoagulated
Diffuse pain	Limited area of pain	Significant pain relief needed	Modest pain relief needed	Significant pain relief needed in a limited area (2-5 dermatomes)	Modest pain relief needed in a broad area (>5 dermatomes)
Rib fx at T4 or below	Analgesic coverage needed above T4	High risk patient	Low risk patient		
Open surgery		High injury severity	Analgesic coverage needed above T4		
		Open surgery			

**Provider preference plays a significant role, but listed factors may impact procedure selection