

TITLE

VENOUS THROMBOEMBOLISM PROPHYLAXIS FOR ADULT PATIENTS

SCOPE

Provincial: Acute, Sub-acute, Post-acute Care Facilities

DOCUMENT

PS-09

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NOTE: The first appearance of terms in bold in the body of this document (except titles) are defined terms – please refer to the Definitions section.

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OBJECTIVES

- To minimize the risk of **venous thromboembolism (VTE)** to adult **patients** admitted to Alberta Health Services' (AHS) Acute, Sub-acute, and Post-acute care facilities by requiring assessment for risk of VTE.
- To outline the three (3) step approach to VTE prophylaxis (i.e., **thromboprophylaxis**) for adult patients admitted to AHS Acute, Sub-acute, and Post-acute care facilities.

PRINCIPLES

Patient Safety: VTE is one of the most common complications of hospitalization and the most common preventable cause of hospital death. AHS aims to minimize VTE in at-risk adult patients admitted to Acute, Sub-acute, and Post-acute care facilities through the use of thromboprophylaxis.

APPLICABILITY

Compliance with this document is required by all Alberta Health Services employees, members of the medical and midwifery staffs, students, volunteers, and other persons acting on behalf of Alberta Health Services (including contracted service providers as necessary).

ELEMENTS**1. Points of Emphasis**

- 1.1 Optimal, evidence-based thromboprophylaxis shall be provided to every Acute, Sub-acute, and Post-acute adult patient in whom it is indicated based on their risk of VTE, their risk of bleeding, and available thromboprophylaxis options.

- 1.2 The **most responsible health practitioner** (MRHP) shall assess every adult inpatient for VTE risk, at the time of:
- admission;
 - significant change in clinical status or after a procedural intervention;
 - transfer from one type of care to another; and
 - at discharge.
- 1.3 The MRHP shall obtain informed consent to provide thromboprophylaxis therapy to adult patients in accordance with the AHS *Consent to Treatment/Procedure(s)* Policy Suite.
- 1.4 The MRHP may use validated risk screening tools and order sets to support clinical decision making and minimize the risk of harm to adult patients.
- Refer to the AHS *Venous Thromboembolism (VTE) Prophylaxis* Insite page to access the Caprini, Khorana, Padua, and Improve risk assessment tools.
- 1.5 **Health care professionals** should identify adult patients who are at risk of VTE that are not receiving thromboprophylaxis therapy or whose bleeding risk has subsided.
- If the health care professional has identified an adult patient who is at risk of VTE and is not receiving thromboprophylaxis therapy or whose bleeding risk has subsided, the health care professional shall report the identified adult patient to the MRHP immediately.

2. Three (3) Step Approach To Thromboprophylaxis

- 2.1 The MRHP should use the three (3) step approach outlined below to assess for VTE and bleeding risk.
- 2.2 Step 1 - Assess if thromboprophylaxis therapy is not indicated for the adult patient.
- For adult patients who are fully mobile and expected to have a length of stay less than 48 hours, thromboprophylaxis treatment is generally not indicated unless major risk factors for VTE are present.
 - If the MRHP has assessed that thromboprophylaxis therapy is not indicated for the adult patient, the patient should be encouraged to be as mobile as possible.
 - For adult patients who have a C1 **Goals of Care Designation** [GCD] "Medical Care and Interventions, Focused on Comfort," the individual patient circumstances need to guide thromboprophylaxis management.

Refer to the AHS *Advance Care Planning and Goals of Care Designation Policy and Procedure*.

- (i) VTE prophylaxis is not indicated for adult patients with a C2 GCD as they are imminently dying.
- d) If the adult patient's clinical status changes significantly, thromboprophylaxis therapy should be reassessed by the MRHP.

2.3 Step 2 - Assess if thromboprophylaxis is contraindicated for the adult patient.

- a) Absolute contraindications to anticoagulant thromboprophylaxis are:
 - (i) active bleeding;
 - (ii) severe thrombocytopenia (i.e., platelets less than 50×10^9 /litre [L]); and/or
 - (iii) recent major bleeding within two (2) weeks.
- b) Relative contraindications to thromboprophylaxis are:
 - (i) recent intraocular or intracranial surgery (less than two [2] weeks) or haemorrhage;
 - (ii) recent paraspinal bleeding; and/or
 - (iii) recent high-risk bleeding surgery.
- c) For adult patients with heparin-induced thrombocytopenia (HIT), either currently or in the past, unfractionated heparin (UFH) or low molecular weight heparin (LMWH) is contraindicated. In this setting, Internal Medicine or Haematology should be contacted for advice; the most appropriate anticoagulant thromboprophylaxis in the setting of HIT is generally fondaparinux or intravenous argatroban.
 - (i) In order to avoid the higher risk of HIT, the use of unfractionated heparin should be restricted to those with creatinine clearance less than 20 milliliters/minute (mL/min) or imminent need for spinal invasion (neuraxial blockade or spinal tap).
- d) For adult patients who are actively bleeding or have a high risk of bleeding, anticoagulant prophylaxis is contraindicated (refer to Section 2.3 [e] below for high risk bleeding considerations).
 - (i) In this situation, intermittent pneumatic compression devices or bilateral, properly measured and fitted, calf-length graduated compression stockings should be placed as soon as possible.

- (ii) These patients should be reassessed by the MRHP daily for proper use of the stockings / compression device and ongoing bleeding risk. When the high bleeding risk decreases, anticoagulants should be started.
- e) Additional risk factors for bleeding, which may need to be considered in addition to indication for admission, include (*indicates high bleeding risk, either as a single factor or associated with other risk factors):
- (i) history of peptic ulcer disease *;
 - (ii) prior bleeding history *;
 - (iii) thrombocytopenia (50-100 x 10⁹/L) *;
 - (iv) hepatic failure;
 - (v) rheumatic diseases;
 - (vi) active cancer;
 - (vii) age greater than 80;
 - (viii) renal failure;
 - (ix) Intensive Care Unit / Cardiac Care Unit stay;
 - (x) coagulopathy; and/or
 - (xi) need for spinal puncture.

Note: Consider using the Improve bleeding risk assessment score for adult patients who have one or more of the above risk factors.

- 2.4 Step 3 - Assess for level of clotting risk and recommend appropriate thromboprophylaxis therapy.
- a) Assess for risk of VTE based on known risk factors. Refer to Table 1: *Levels of VTE Risk and Recommended Thromboprophylaxis Therapy in Adult Patients.*

Table 1: Levels of VTE Risk and Recommended Thromboprophylaxis Therapy in Adult Patients

Level of VTE Risk (i.e., approximate deep vein thrombosis risk without prophylaxis)	Risk Factors for VTE	Suggested Thromboprophylaxis Therapy Options
Low (Less than 10 percent [%])	Expected length of stay less than 72 hours Minor surgery Mobile medical patient Age less than 60 years without additional risk factors for VTE	Early ambulation
Moderate (10-40%)	One (1) minor and no major risk factors (refer to Section 2.4 a) [i]-[ii] below for a list of risk factors) Most general, gynaecological or urological surgery patients Immobilized medical patients	Low molecular weight heparin
High (40-60%)	One (1) major or two (2) or more minor risk factors (refer to Section 2.4 a) [i]-[ii] below for a list of risk factors) Age greater than 75 years Active COVID-19 infection	Low molecular weight heparin Consider once daily, weight based low molecular weight heparin for active COVID-19 infection patients
Very High (40-80%)	Multiple major risk factors (refer to Section 2.4 a) [i]-[ii] below for a list of risk factors) Major trauma Spinal cord injury Major cancer surgery	Low molecular weight heparin Consider extended prophylaxis
	Hip fracture	Also consider: fondaparinux

	Hip arthroplasty Knee arthroplasty	Also consider: rivaroxaban apixaban (Anti-Xa inhibitors)
High Bleeding Risk		Mechanical prophylaxis with intermittent pneumatic compression

(i) Major risk factors for VTE:

- active cancer and its treatment;
- ischemic stroke or paralysis;
- trauma (especially of abdomen, pelvis and/or lower extremity);
- age greater than 75 years;
- major surgery (especially of abdomen, pelvis and/or lower extremity);
- congenital and/or acquired thrombophilia states;
- prior VTE;
- intubated and mechanically ventilated;
- spinal cord injury; and/or
- active COVID-19 infection.

(ii) Minor risk factors for VTE:

- age 60 to 74 years;
- general anesthesia greater than one (1) hour;
- obesity;
- sepsis;
- collagen vascular disease;
- inflammatory bowel disease;
- postpartum (up to six [6] weeks);

- severe respiratory disease;
 - congestive heart failure;
 - myeloproliferative disorders;
 - pregnancy;
 - varicose veins;
 - estrogen therapy;
 - nephrotic syndrome; and/or
 - prolonged immobility greater than 24 hours.
- b) After assessing for level of clotting risk, recommend appropriate thromboprophylaxis therapy.
- (i) For most adult patients, the recommended thromboprophylaxis therapy is LMWH once daily.
 - (ii) For recommended thromboprophylaxis therapy by patient group, refer to Appendix A: *Recommended Thromboprophylaxis Therapy by Adult Patient Group*.
 - (iii) For recommended thromboprophylaxis therapy for adult patients with reduced renal function or extremes of weight, refer to Appendix B: *Thromboprophylaxis Pharmacologic Dosing in Adult Patients with Reduced Renal Function or Extremes of Weight*.
 - In general, for weight less than 40 kilograms, it is recommended that a dose reduction be considered.
 - In general, for weight greater than 100 kilograms (and body mass index [BMI] greater than 35), it is recommended that a dose increase be considered. Weight based dosing or **weight band dosing** is recommended.
 - For adult patients with creatinine clearance less than 20 mL/min, low dose unfractionated heparin prophylaxis may be preferred over LMWH.
 - (iv) For adult patients undergoing hip or knee arthroplasty surgery, the first dose of LMWH is generally given twelve hours post-operatively and then daily.
 - (v) If adult patients are already receiving LMWH and are scheduled for an epidural insertion, it is recommended that the anticoagulant be held for 18 to 24 hours prior to insertion.

- (vi) For adult patients with epidural catheters, the LMWH dose is held to facilitate catheter removal in the morning and to allow for at least 12 to 24 hours after the previous LMWH dose before catheter removal. For adult patients who have had an epidural catheter removed, the next dose of low molecular weight heparin should be delayed for at least four (4) hours after removal.

DEFINITIONS

Deep vein thrombosis means a thrombus (“blood clot”) occurring in one or more deep veins, especially in the legs, where it may produce leg swelling and/or pain.

Goals of care designation means one of a set of short-hand instructions by which health care providers describe and communicate general care intentions, specific clinically indicated health interventions, transfer decisions, and locations of care for a patient as established after consultation between the most responsible health practitioner and patient or alternate decision-maker.

Health care professional means an individual who is a member of a regulated health profession, as defined by the *Health Professions Act* (Alberta), and who practises within scope and role.

Most responsible health practitioner means the health practitioner who has responsibility and accountability for the specific treatment/procedure(s) provided to a patient and who is authorized by AHS to perform the duties required to fulfill the delivery of such a treatment/procedure(s) within the scope of their practice.

Patient means an adult or child who receives or has requested health care or services from Alberta Health Services and its health care providers or individuals authorized to act on behalf of Alberta Health Services. This term is inclusive of residents, clients and outpatients.

Thromboprophylaxis means the use of mechanical methods or anticoagulant medication to prevent venous thromboembolism from developing in patients who are at risk.

Venous thromboembolism (VTE) means a thromboembolic event (“blood clot”) that develops within the venous system and includes both deep vein thrombosis and pulmonary embolism.

Weight band dosing means the use of prefilled syringes, rounded to provide a dose within plus or minus 10 percent of the patient’s recorded weight based dose.

REFERENCES

- Appendix A: *Recommended Thromboprophylaxis Therapy by Adult Patient Group*
- Appendix B: *Thromboprophylaxis Pharmacologic Dosing in Adult Patients with Reduced Renal Function or Extremes of Weight*
- Alberta Health Services Governance Documents:
 - *Advance Care Planning and Goals of Care Designation Policy* (#HCS-38)
 - *Advance Care Planning and Goals of Care Designation Procedure* (#HCS-38-01)

- *Consent to Mental Health Treatment/Procedure(s): Formal Patients and Persons Subject to Community Treatment Orders Under the Mental Health Act Policy (#PRR-01-04)*
- *Consent to Treatment/Procedure(s): Adults with Impaired Capacity and Adults who Lack Capacity Procedure (#PRR-01-02)*
- *Consent to Treatment/Procedure(s): Deceased Donation of Human Organs and Tissues Policy (#PRR-01-05)*
- *Consent to Treatment/Procedure(s): Minors/Mature Minors Procedure (#PRR-01-03)*
- *Consent to Treatment/Procedure(s) Policy (#PRR-01)*
- **Alberta Health Services Resources:**
 - *COVID-19 Scientific Advisory Group Rapid Evidence Brief*
 - *Venous Thromboembolism (VTE) Prevention and Screening in COVID-19 Patients*
 - *Venous Thromboembolism (VTE) Prophylaxis (Insite Page)*

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Recommended Thromboprophylaxis Therapy by Adult Patient Group

General Considerations:

1. Although the recommended options apply to most patients in each group, individual patient factors may suggest an alternate approach.
2. For all patients in whom it is possible and appropriate, early and frequent mobilization and ambulation are essential.

In general, for adult patients weighing less than 40 kg, it is recommended that a dose reduction be considered. In general, for adult patients weighing greater than 100 kg (and/or body mass index [BMI] greater than 35), it is recommended that a dose increase be considered. Weight based dosing or weight band dosing is recommended. For adult patients with creatinine clearance less than 20 mL/minute, low dose unfractionated heparin (LDUH) prophylaxis may be preferred over LMWH. (Prescribers may choose either tinzaparin or LDUH at creatinine clearance less than 20 mL/min or when the patient is on hemodialysis)

3. The duration of thromboprophylaxis is not based on pre-hospitalization mobility status alone.

Given evidence suggesting low to moderate bleeding risk associated with use of prophylactic dosages of low molecular weight heparin, in absence of clinically significant bleeding or in setting of procedures involving critical areas where achieving hemostasis is limited or potentially catastrophic bleeding is possible, in most instances, thromboprophylaxis should not be withheld (Bump, 2008).

Patient group	Recommended Thromboprophylaxis Option	Initiation	Duration
Burn unit patients	• Low molecular weight heparin <u>or</u> unfractionated heparin	• When there is evidence of primary hemostasis	• Until discharge
Cardiovascular surgery	• Low molecular weight heparin	• Primary hemostasis	• Until discharge
Chronic kidney disease	• Low molecular weight heparin <u>or</u> unfractionated heparin bid / tid	• On admission	• Until discharge
COVID-19 infection	• Once daily, weight based low molecular heparin	• On admission	• Until discharge

TITLE VENOUS THROMBOEMBOLISM PROPHYLAXIS FOR ADULT PATIENTS	EFFECTIVE DATE August 27, 2021	DOCUMENT # PS-09-01	POLICY
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Critical care	<ul style="list-style-type: none"> • Use VTE Prophylaxis / Critical Care order sets • In most cases, the prophylaxis is low molecular weight heparin or low dose unfractionated heparin • For patients at high risk of bleeding, intermittent pneumatic compression <u>or</u> properly-fitted, bilateral calf-length graduated compression stockings until pharmacological prophylaxis may be started 	<ul style="list-style-type: none"> • First dosing time after admission, if possible • See Critical Care order sets 	<ul style="list-style-type: none"> • Until discharge • Include thromboprophylaxis in transfer orders
General surgery (major)	<ul style="list-style-type: none"> • Use VTE Prophylaxis / General Surgery order sets • In most cases, the prophylaxis is low molecular weight heparin • For patients at high risk of bleeding, intermittent pneumatic compression or properly-fitted, bilateral calf-length graduated compression stockings until low molecular weight heparin may be started 	<ul style="list-style-type: none"> • Zero (0) to one (1) hour pre-op (if no epidural) <u>or</u> four (4) hours after insertion of epidural • On <u>or</u> after post-op day one (1) if bleeding concerns 	<ul style="list-style-type: none"> • Until discharge • Consider extended prophylaxis for abdominopelvic cancer surgeries
Gynaecology	<ul style="list-style-type: none"> • Use VTE Prophylaxis / Gynaecology order sets • In most cases, the prophylaxis is low molecular weight heparin • For patients at high risk of bleeding, intermittent pneumatic compression <u>or</u> properly-fitted, bilateral calf-length graduated compression stockings <u>or</u> intermittent pneumatic compression until pharmacological prophylaxis may be started 	<ul style="list-style-type: none"> • First dosing time after emergency room admission or post-op <u>or</u> the following morning if there are bleeding concerns 	<ul style="list-style-type: none"> • Consider extended prophylaxis for abdominopelvic cancer surgeries

TITLE	EFFECTIVE DATE	DOCUMENT #	POLICY
VENOUS THROMBOEMBOLISM PROPHYLAXIS FOR ADULT PATIENTS	August 27, 2021	PS-09-01	

Heparin-induced thrombocytopenia (HIT)	<ul style="list-style-type: none"> • Suggest Haematology / Internal Medicine consult • No heparin or low molecular weight heparin • fondaparinux (previous heparin-induced thrombocytopenia) • argatroban IV (current heparin-induced thrombocytopenia) 	<ul style="list-style-type: none"> • As soon as the diagnosis of HIT considered 	<ul style="list-style-type: none"> • Discharge and platelet count greater than 120 x 10⁹/L
High bleeding risk	<ul style="list-style-type: none"> • Intermittent pneumatic compression <u>or</u> properly-fitted, bilateral calf-length graduated compression stockings used continuously (except for bathing or ambulating) 	<ul style="list-style-type: none"> • <u>As soon as possible</u> after emergency admission • Just prior to surgery for elective surgical procedures 	<ul style="list-style-type: none"> • Until bleeding risk allows the use of anticoagulants
Hip & knee arthroplasty	<ul style="list-style-type: none"> • Use VTE Prophylaxis / Arthroplasty order sets • In most cases, the prophylaxis is low molecular weight heparin <u>or</u> fondaparinux (prior HIT) <u>or</u> rivaroxaban / apixaban <u>or</u> vitamin K antagonist • Aspirin alone is not recommended, but could follow short term low molecular weight heparin or direct oral anticoagulant (DOAC) 	<ul style="list-style-type: none"> • Six (6) to 12 hours post-op 	<ul style="list-style-type: none"> • 15 days • 28 days if higher risk and total hip replacement
Hip fracture	<ul style="list-style-type: none"> • Use VTE Prophylaxis order set / Hip Fracture admission and post-op order sets or fondaparinux or warfarin • For most patients, low molecular weight heparin every 24 hours 	<ul style="list-style-type: none"> • If surgery is delayed, start low molecular weight heparin on admission 	<ul style="list-style-type: none"> • 28 to 35 days

Internal medicine (and medical subspecialties)	<ul style="list-style-type: none"> • Use VTE Prophylaxis / Medicine admission order sets / Deep Vein Thrombosis Prophylaxis order sets • For most patients, low molecular weight heparin every 24 hours • For patients at high risk of bleeding, intermittent pneumatic compression <u>or</u> properly-fitted, bilateral calf-length graduated compression stockings until pharmacological prophylaxis may be started 	<ul style="list-style-type: none"> • First dosing time after admission 	<ul style="list-style-type: none"> • Until discharge • Consider extended prophylaxis for cancer or stroke
Neuraxial blockade / spinal anaesthesia	<ul style="list-style-type: none"> • May use low molecular weight heparin after epidural removed 	<ul style="list-style-type: none"> • Unfractionated heparin hold 12 to 24 hours <u>prior</u> to procedure and hold four (4) hours <u>post</u> procedure • Low molecular weight heparin hold 12 to 24 hours <u>prior</u> to procedure and hold at least two (2) hours <u>post</u> procedure 	<ul style="list-style-type: none"> • Until discharge
Neurosurgery	<ul style="list-style-type: none"> • For patients at high risk of bleeding, intermittent pneumatic compression <u>or</u> properly-fitted, bilateral calf-length graduated compression stockings until pharmacological prophylaxis may be started low molecular weight heparin <u>or</u> start with intermittent pneumatic compression / bilateral calf-length graduated compression stockings and switch to low molecular weight heparin when risk of bleeding decreases 	<ul style="list-style-type: none"> • For intermittent pneumatic compression / graduated compression stockings, start just <u>prior</u> to surgery for elective surgical procedure and <u>as soon as possible</u> after admission for major neurotrauma or non-traumatic intracranial haemorrhage 	<ul style="list-style-type: none"> • Until discharge

		<ul style="list-style-type: none"> • For low molecular weight heparin, no sooner than day after surgery 	
Obstetrics	<ul style="list-style-type: none"> • Low molecular weight heparin 	<ul style="list-style-type: none"> • Initial dose of unfractionated heparin given immediately post caesarean for high risk individuals • Low molecular weight heparin started at least four (4) hours after epidural removed 	<ul style="list-style-type: none"> • Until discharge • Extended for six (6) weeks and/or converted to warfarin for those with prior venous thromboembolism or with thrombophilia
Oncology (medical and radiation)	<ul style="list-style-type: none"> • Low molecular weight heparin • For patients at high risk of bleeding, intermittent pneumatic compression <u>or</u> properly-fitted, bilateral calf-length graduated compression stockings until pharmacological prophylaxis may be started 	<ul style="list-style-type: none"> • First dosing time after admission 	<ul style="list-style-type: none"> • Until discharge • Consider benefits versus risk of post-discharge or extended thromboprophylaxis
Plastic surgery	<ul style="list-style-type: none"> • Low molecular weight heparin 	<ul style="list-style-type: none"> • Pre-op <u>or</u> post-op six (6) to 12 hours 	<ul style="list-style-type: none"> • Until discharge
Spinal cord injury	<ul style="list-style-type: none"> • Low molecular weight heparin 	<ul style="list-style-type: none"> • <u>As soon as possible</u> after admission (once hemostasis is evident) 	<ul style="list-style-type: none"> • Until discharge from rehab • Consider extended prophylaxis six (6) to 12 weeks
Spine surgery	<ul style="list-style-type: none"> • Low molecular weight heparin 	<ul style="list-style-type: none"> • Evening <u>or</u> morning after surgery 	<ul style="list-style-type: none"> • Until discharge

Stroke – haemorrhagic	<ul style="list-style-type: none"> • Use Stroke admission order sets • Intermittent pneumatic compression <u>or</u> bilateral, properly-fitted, calf-length graduated compression stockings • After approximately five (5) to seven (7) days, consider switch to low molecular weight heparin as for ischemic stroke 	<ul style="list-style-type: none"> • On admission 	<ul style="list-style-type: none"> • Until discharge
Stroke – ischemic	<ul style="list-style-type: none"> • Use VTE Prophylaxis / Stroke admission order sets • For most patients, low molecular weight heparin every 24 hours • For patients at high risk of bleeding, intermittent pneumatic compression <u>or</u> properly-fitted, bilateral calf-length graduated compression stockings until pharmacological prophylaxis may be started 	<ul style="list-style-type: none"> • First dosing time after admission • For patients who have received thrombolysis, hold and reassess VTE prophylaxis therapy until after repeat CT imaging 	<ul style="list-style-type: none"> • Until discharge • Consider extended prophylaxis for hemiplegia for six (6) to 12 weeks
Sub-acute care	<ul style="list-style-type: none"> • Low molecular weight heparin for extended prophylaxis in spinal cord injury, stroke associated with paralysis, hip fracture or total joint and abdominal / pelvic cancer therapy 	<ul style="list-style-type: none"> • Continuation of prophylaxis at transitions 	<ul style="list-style-type: none"> • 10 to 35 days
Trauma	<ul style="list-style-type: none"> • For patients at high risk of bleeding, intermittent pneumatic compression <u>or</u> properly-fitted, bilateral calf-length graduated compression stockings until pharmacological prophylaxis may be started • Moderate to high risk patients: low molecular weight heparin every 12 hours 	<ul style="list-style-type: none"> • <u>As soon as possible</u> after admission (once hemostasis is evident) 	<ul style="list-style-type: none"> • Until discharge from rehabilitation
Urology	<ul style="list-style-type: none"> • Use VTE Prophylaxis / Urology order sets • In most cases, the prophylaxis is low molecular weight heparin every 24 hours 	Options: <ul style="list-style-type: none"> • First dosing time after surgery 	<ul style="list-style-type: none"> • Until discharge

TITLE	EFFECTIVE DATE	DOCUMENT #	POLICY
VENOUS THROMBOEMBOLISM PROPHYLAXIS FOR ADULT PATIENTS	August 27, 2021	PS-09-01	

	<ul style="list-style-type: none"> • For patients at high risk of bleeding, intermittent pneumatic compression <u>or</u> properly-fitted, bilateral calf-length graduated compression stockings until low molecular weight heparin may be started 	<ul style="list-style-type: none"> • Morning after surgery if there are bleeding concerns • First dosing time after emergency room admission or post-op 	
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APPENDIX B

Thromboprophylaxis Pharmacologic Dosing in Adult Patients with Reduced Renal Function or Extremes of Weight

Drug	Reduced Renal Function Creatinine Clearance (CrCL) less than 20 mL/min	Obesity (Weight greater than 100 kg)	Low Weight (Weight less than 40 kg)
tinzaparin	No adjustment	75 units/kg subcutaneously daily	75 units/kg subcutaneously daily
enoxaparin	<u>DO NOT</u> use with CrCl less than 30 mL/min	40–80 mg subcutaneously twice daily with CrCl greater than 30 mL/min	NOT recommended
unfractionated heparin	5000 units subcutaneously twice daily	5000 units subcutaneously every eight (8) hours	5000 units subcutaneously twice daily

Note: Monitoring anti-XA levels is not useful in most patients even on extended prophylaxis.