



ED Venous Thromboembolism Order Set

ACTION

Patient Population

Inclusion

- Nonpregnant adult patients with confirmed diagnosis of venous thromboembolism

Exclusion

- Patients with a history of heparin induced thrombocytopenia (HIT); refer to Thrombosis Canada: Heparin-Induced Thrombocytopenia (HIT) **TC**
- Patients with severe renal failure (CrCl less than 30 mL/minute)
- Patients who are pregnant; refer to Thrombosis Canada: Pregnancy Venous Thromboembolism Treatment **TC**
- Patients with active bleeding or high bleeding risks; refer to Thrombosis Canada: Vena Cava Filter **TC**
- Patients with a massive lower extremity DVT, iliofemoral thrombosis with severe symptoms; refer to Thrombosis Canada: Deep Vein Thrombosis Treatment **TC**
- Patients with a massive PE, extensive PE with persistent hypotension and right ventricular dysfunction¹; refer to Thrombosis Canada: Pulmonary Embolism Treatment **TC**
- Patients with cancer-associated thrombosis; refer to Thrombosis Canada: Cancer and Thrombosis **TC**
- Pediatric patients; refer to Thrombosis Canada: Pediatric Thrombosis **TC**

Nursing Care Management

- T, HR, RR, BP, SpO₂ q _____ h and PRN
- Pain Score q _____ h and PRN
- Continuous Cardiac monitoring/Telemetry
- If O₂ required, provide and titrate as per policy/procedure/medical directive
- If change in clinical status (e.g. SBP less than/equal to 90 mmHg or 40 mmHg drop from baseline SBP; HR greater than/equal to 110 beats/minute; tachypnea and/or dyspnea), notify MD/NP **TC**
- _____

Lab Investigations

- | | | | |
|---|--|--|--|
| <input checked="" type="checkbox"/> CBC TC | <input checked="" type="checkbox"/> APTT TC | <input checked="" type="checkbox"/> INR TC | <input type="checkbox"/> ALT, ALP, Bilirubin |
| <input type="checkbox"/> D-dimer TC | <input checked="" type="checkbox"/> Creatinine Clearance | <input checked="" type="checkbox"/> Creatinine TC | <input type="checkbox"/> Troponin ² |
| <input type="checkbox"/> _____ | | | |

IV Therapy

- Insert peripheral IV
- IV Fluid: _____ at _____ mL/h

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ACTION

Anticoagulation

This order set is not intended for use in the following: pregnancy, severe renal failure, active bleeding or high bleeding risks, massive lower extremity DVT, massive PE, cancer-associated thrombosis, those at risk for HIT or with a history of HIT or in pediatric patients

Weight _____ kg CrCl _____ mL/minute

Direct-acting Oral Anticoagulants **T C**

Concomitant use of apixaban, edoxaban or rivaroxaban together with drugs that are strong inhibitors or inducers of both P-glycoprotein (P-gp) and CYP3A4 should be avoided **T C**

- apixaban 10 mg PO q12h (Take with or without food) [caution-geriatric,hepatic,renal]
- edoxaban 60 mg PE q24H (30 mg PO q24 if CrCL 30 - 50 mL/min or body weight ≤ 60 kg) following a minimum of five days with a parenteral anticoagulant such as LMWH (see below) [caution-geriatric,hepatic,renal]
- rivaroxaban 15 mg PO q12h (Take with food) [caution-geriatric,hepatic,renal]
- _____

Low Molecular Weight Heparin (LMWH)

In obese patients, doses should be based on actual body weight. Twice daily dosing may be preferred

Dalteparin **T C**

- dalteparin _____ units Subcutaneous q12h (calculate 100 units/kg)
- dalteparin _____ units Subcutaneous q24h (calculate 200 units/kg)

Enoxaparin **T C**

- enoxaparin _____ mg Subcutaneous q12h (calculate 1 mg/kg) [caution-renal]
- enoxaparin _____ mg Subcutaneous q24h (calculate 1.5 mg/kg) [caution-renal]

Nadroparin **T C**

- nadroparin _____ units Subcutaneous q12h (calculate 86 units/kg)
- nadroparin _____ units Subcutaneous q24h (calculate 171 units/kg)

Tinzaparin **T C**

- tinzaparin _____ units Subcutaneous q24h (calculate 175 units/kg)
- _____

Continued...

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Warfarin TC

For initial treatment of acute VTE, warfarin should be combined with an immediate-acting anticoagulant such as LMWH for at least 5 days and until INR is greater than/equal to 2 for two consecutive days

Antiplatelet agents and NSAIDs should not be used with warfarin under most circumstances TC

warfarin _____ mg PO q24h [caution-geriatric,hepatic] _____

Heparin TC

Use solution of heparin 25,000 units in 500 mL 5% Dextrose for heparin IV solution (final concentration is 50 units/mL)

heparin _____ units IV bolus (5,000 units or calculate 80 units/kg)

Then heparin _____ units/h IV infusion for _____ hours (calculate 18 – 20 units/kg/h)

Then _____

Prescriber to complete Heparin IV Infusion for DVT or PE (Full-dose Regimen) Order Set if applicableAnticoagulation

Alternate Anticoagulant

Pain Management

Consults

Hematologist - Reason: _____ Pharmacist - Reason: _____

Internist - Reason: _____ Thrombosis Specialist - Reason: _____

Interventional Radiologist - Reason: _____ Vascular Surgeon - Reason: _____

_____ - Reason: _____ _____ - Reason: _____

Additional Orders

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Thrombosis Canada



Thrombose Canada

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ACTION

Discharge

Discharge Criteria

For patients who satisfy all of the following criteria, discharge should be considered³:

- Clinically stable with good cardiopulmonary reserve (SBP greater than 90 mmHg, HR less than 100 beats/minute, SpO₂ greater than 90%)
- No contraindications such as recent bleeding, severe renal or liver disease, or severe thrombocytopenia
- Expected to be compliant with treatment

Pulmonary Embolism Severity Index (PESI)

Thrombosis Canada: Pulmonary Embolism Severity Index (PESI), available at <http://thrombosiscanada.ca> **TC**

PESI score **TC**: _____

Discharge Information

- Discharge date: _____ (yyyy-mm-dd)
- Discharge patient home Discharge patient to: _____
- Ensure a copy of relevant documents have been sent to the primary health care provider as per policy/procedure

Discharge Referrals

Ensure primary health care provider notified _____

Anticoagulation

Direct-acting Oral Anticoagulants **TC**

*****Concomitant use of apixaban or rivaroxaban together with drugs that are strong inhibitors or inducers of both P-glycoprotein (P-gp) and CYP3A4 should be avoided*** **TC****

Initial Therapy

- apixaban 10 mg PO q12h for _____ days (Take with or without food; Total of 7 days including dose initiated in ED) [caution-geriatric,hepatic,renal]
- edoxaban 60 mg PE q24H for _____ days (30 mg PO q24 if CrCL 30 - 50 mL/min or body weight ≤ 60 kg) following a minimum of five days with a parenteral anticoagulant such as LMWH (see below) [caution-geriatric,hepatic,renal]
- rivaroxaban 15 mg PO q12h for _____ days (Take with food; Total of 21 days including dose initiated in ED) [caution-geriatric,hepatic,renal]

Maintenance Therapy

- apixaban 5 mg PO q12h for _____ days [caution-geriatric,hepatic,renal]
- edoxaban 60 mg PE q24H for _____ days (30 mg PO q24 if CrCL 30 - 50 mL/min or body weight ≤ 60 kg) following a minimum of five days with a parenteral anticoagulant such as LMWH (see below) [caution-geriatric,hepatic,renal]
- rivaroxaban 20 mg PO q24h for _____ days [caution-geriatric,hepatic,renal]

Low Molecular Weight Heparin (LMWH)

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Thrombosis Canada



Thrombose Canada

ED Venous Thromboembolism Order Set

ACTION

Warfarin **T C**

For initial treatment of acute VTE, warfarin should be combined with an immediate-acting anticoagulant such as LMWH for at least 5 days and until INR is greater than/equal to 2 for two consecutive days

Antiplatelet agents and NSAIDs should not be used with warfarin under most circumstances **T C**

- Target INR 2 – 3
- INR _____ (frequency) _____
- warfarin _____ mg PO q24h for _____ days, then request MD/NP to reassess [caution-geriatric,hepatic]

Patient Education

- Ensure applicable education and discharge instructions have been provided to the patient as per policy/procedure
- _____

Resources

- Thrombosis Canada - You have a Pulmonary Embolism (PE) **T C**:
http://thrombosiscanada.ca/wp-content/uploads/2016/10/M159-You-Have-a-PE_Oct2016.pdf
- Thrombosis Canada - You have a Deep Vein Thrombosis (DVT) **T C**:
http://thrombosiscanada.ca/wp-content/uploads/2016/10/M159-You-Have-a-DVT_Oct2016.pdf

Appointments

- | | |
|---|---|
| <input type="checkbox"/> Primary Care Practitioner: _____
<input type="checkbox"/> Arranged by hospital: Date: _____ Time: _____
<input type="checkbox"/> Patient to arrange appointment to be seen in _____ day(s) | Phone Number: _____
or <input type="checkbox"/> Patient will be notified
or _____ week(s) |
| <input type="checkbox"/> _____
<input type="checkbox"/> Arranged by hospital: Date: _____ Time: _____
<input type="checkbox"/> Patient to arrange appointment to be seen in _____ day(s) | Phone Number: _____
or <input type="checkbox"/> Patient will be notified
or _____ week(s) |

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Order Set Development and Implementation Considerations

The intent of this Order Set Development and Implementation Considerations section is to provide additional information for Order Set Committees and/or Order Set leads when implementing this order set locally. This section is not designed to be included in the actual order set and can be removed if needed.

Patient Care Considerations

- **Administration of DOACs:** Doses of rivaroxaban greater than/equal to 15 mg per day should be taken with food. Apixaban and edoxaban can be taken with or without food.
- **Diagnosis Resources:** For more information regarding the diagnosis of VTE, refer to Thrombosis Canada: Deep Vein Thrombosis Diagnosis and Pulmonary Embolism: Diagnosis, available at <http://thrombosiscanada.ca> **TC**.
- **Dual Inhibitors and Inducers of CYP3A4 and P-gp:** Use of strong dual inhibitors of CYP3A4 and P-gp (e.g. ketoconazole, itraconazole, ritonavir) increases blood levels of apixaban, edoxaban and rivaroxaban and is therefore contraindicated. Furthermore, use of strong dual inducers of CYP3A4 and P-gp (e.g. rifampin, carbamazepine, phenytoin, St. John's wort) reduces blood levels of apixaban, edoxaban and rivaroxaban and is not recommended.
- **Patients who are Pregnant:** For pregnant patients with a positive diagnosis of VTE, a different treatment plan than what is provided in this document is recommended as certain medications cross the placenta and may be teratogenic and/or harmful to the mother. Vitamin K antagonists, such as warfarin, are contraindicated for the treatment of VTE in pregnancy due to teratogenicity and bleeding risks. For more information, refer to Thrombosis Canada: Pregnancy Venous Thromboembolism Treatment, available at <http://thrombosiscanada.ca> **TC**.
- **Patients with Active Bleeding or High Bleeding Risks:** Consultation should be initiated with a hematologist, thrombosis specialist, and an interventional radiologist for patients where anticoagulation is contraindicated. A vena cava filter may be recommended to reduce the frequency of a significant PE. For more information, refer to Thrombosis Canada: Vena Cava Filter, available at <http://thrombosiscanada.ca> **TC**.
- **Patients with a Massive PE:** A massive PE is defined as an extensive PE with persistent hypotension (SBP less than/equal to 90 mmHg or a 40 mmHg drop from baseline SBP) and right ventricular dysfunction¹. IV thrombolysis should be reserved for these patients who do not have a contraindication to such treatment. For more information, refer to Thrombosis Canada: Pulmonary Embolism Treatment, available at <http://thrombosiscanada.ca> **TC**.
- **Patients with a Massive Lower Extremity DVT:** A massive lower extremity DVT is defined as an iliofemoral thrombosis with severe symptoms, e.g. entire leg swelling, severe pain. In these patients who are not at an increased risk of bleeding and with symptoms of less than 14 days duration, treatment with pharmacomechanical, catheter-directed thrombolysis (PCDT) should be considered as it rapidly relieves venous obstruction. For more information, refer to Thrombosis Canada: Deep Vein Thrombosis Treatment, available at <http://thrombosiscanada.ca> **TC**.
- **Patients with Cancer-Associated Thrombosis:** For cancer patients with a positive diagnosis of VTE, LMWH is the preferred treatment over warfarin. Edoxaban may be selectively used to treat cancer patients with not-GI active cancer who do not have a high risk of GI bleeding. For more information, refer to Thrombosis Canada: Cancer and Thrombosis,

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ED Venous Thromboembolism Order Set

ACTION


available at <http://thrombosiscanada.ca> .

- **Patients with Severe Renal Failure (CrCl Less Than 30 mL/minute):** For patients with severe renal failure, different medication/treatment regimens than what is provided in this document may be recommended. For more information regarding appropriate medications/treatments, refer to individual product monographs and/or Thrombosis Canada treatment guidelines, available at <http://thrombosiscanada.ca> .
- **Patients with Weight Greater Than 100 kg:** For patients with weight greater than 100 kg, certain medication dosages may be different than the guidance provided in this document. For more information regarding appropriate medication dosing, refer to the Thrombosis Canada treatment guidelines, available at <http://thrombosiscanada.ca> .
- **Pediatric Patients:** Diagnosis of VTE in pediatric patients is rare and treatment guidelines will differ from what is recommended in this document. Consultation with a pediatric hematologist should be made if possible in this situation. For more information, refer to Thrombosis Canada: Pediatric Thrombosis, available at <http://thrombosiscanada.ca> .
- **PESI Risk Models:** Patients with confirmed PE should be risk-stratified to determine the best possible treatment setting (in-hospital or outpatient). Patients deemed to be very low or low risk using the PESI models can be managed as outpatient or considered for early discharge. However, prescribers should consider all factors when determining the most appropriate treatment setting. For more information, refer to Thrombosis Canada: Pulmonary Embolism Severity Index (PESI), available at <http://thrombosiscanada.ca> .

Administration/Organizational Considerations

- **Discharge and Appointments Sections:** The discharge and appointment sections have been included in this document with the intention to be used by facilities as part of their discharge and follow-up process. Facilities are advised to consider their policies and procedures when implementing this order set locally and make adjustments as applicable.

Additional Considerations

- **Drug-specific Reminders:** Drug-specific reminders are intended to alert prescribers to potentially harmful drug properties for certain susceptible patients. The following caution flags are for the organization's consideration when developing an order set: [caution-geriatric,hepatic,renal]. For a comprehensive list of drug cautions and contraindications, consult product monographs and/or alternative resources.
- **Thrombosis Canada Icon Use in Document:**  These icons represent information that is recommended by Thrombosis Canada.

References

Key references¹⁻¹²

All medication guidance has been reviewed using Lexicomp and Compendium of Pharmaceuticals and Specialties (eCPS).

1. Streiff MB, Agnelli G, Connors JM, et al. Guidance for the treatment of deep vein thrombosis and pulmonary embolism. *J Thromb Thrombolysis*. 2016;41(1):32-67. doi:10.1007/s11239-015-1317-0
2. Greenberg GM, Brophy BJ, Frey KA, et al. Venous Thromboembolism: Guidelines for Clinical Care Ambulatory. University of Michigan; 2014.
3. Kearon C, Akl EA, Ornelas J, et al. Antithrombotic therapy for VTE disease. *Chest*. 149(2):315-352. doi:10.1016/j.chest.2015.11.026

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4. Thrombosis Canada. You have a DVT deep vein thrombosis. <http://thrombosiscanada.ca>. Published 2016.
5. Thrombosis Canada. You have a PE pulmonary embolism. <http://thrombosiscanada.ca>. Published 2016.
6. Thrombosis Canada. Deep vein thrombosis (DVT) diagnosis. <http://thrombosiscanada.ca>. Published 2017.
7. Thrombosis Canada. Deep vein thrombosis (DVT) treatment. <http://thrombosiscanada.ca>. Published 2017.
8. Thrombosis Canada. Pulmonary embolism (PE) diagnosis. <http://thrombosiscanada.ca>. Published 2017.
9. Thrombosis Canada. Pulmonary embolism (PE) treatment. <http://thrombosiscanada.ca>. Published 2017.
10. Thrombosis Canada. Venous thromboembolism duration of treatment. <http://thrombosiscanada.ca>. Published 2017.
11. Thrombosis Canada. Unfractionated heparin, low molecular weight heparin and fondaparinux. <http://thrombosiscanada.ca>. Published 2017.
12. Thrombosis Canada. Heparin-induced thrombocytopenia (HIT). <http://thrombosiscanada.ca>. Published 2017.

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