

Venous Thromboembolism (VTE) Prophylaxis for Adult Patients

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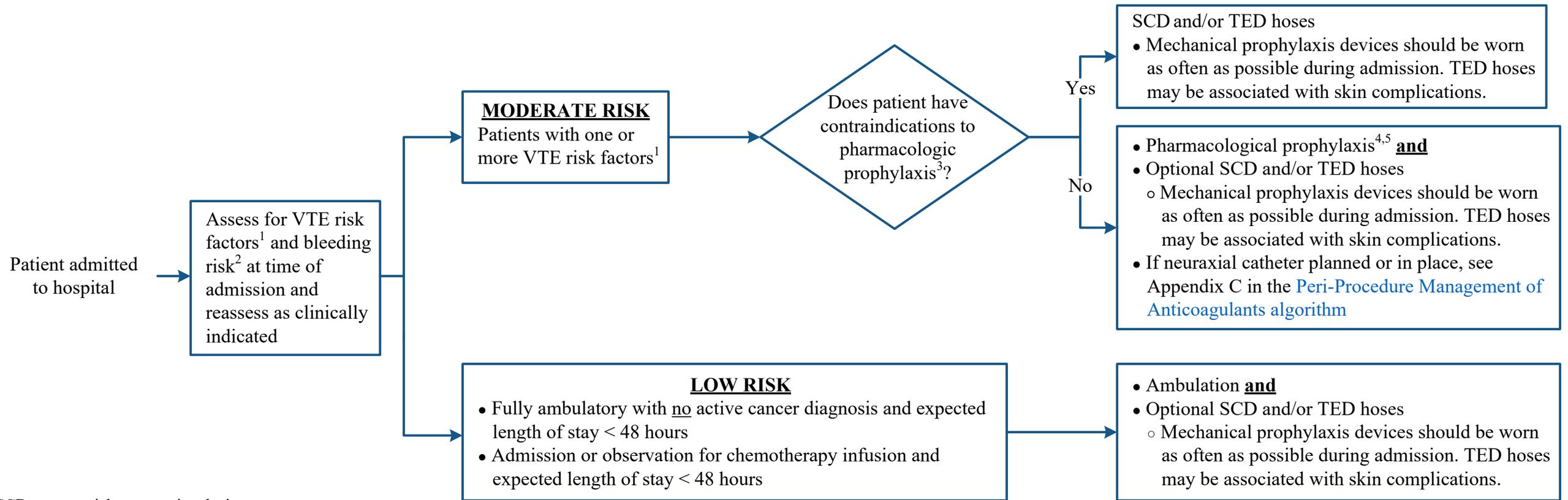
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NON-SURGICAL HOSPITALIZED PATIENTS

INITIAL EVALUATION

VTE RISK

MANAGEMENT



SCD = sequential compression device

¹ See [Appendix A](#) for VTE Risk Factors

² See [Appendix B](#) for Factors with a Strong Association with Bleeding Risk in Hospitalized Medical Patients

³ See [Appendix C](#) for Contraindications to Pharmacologic Options for VTE Prophylaxis

⁴ See [Appendix D](#) for Pharmacological Options for VTE Prophylaxis

⁵ See [Appendix E](#) for Dosing Recommendations for Renal Impairment, Obesity, and Underweight Patients

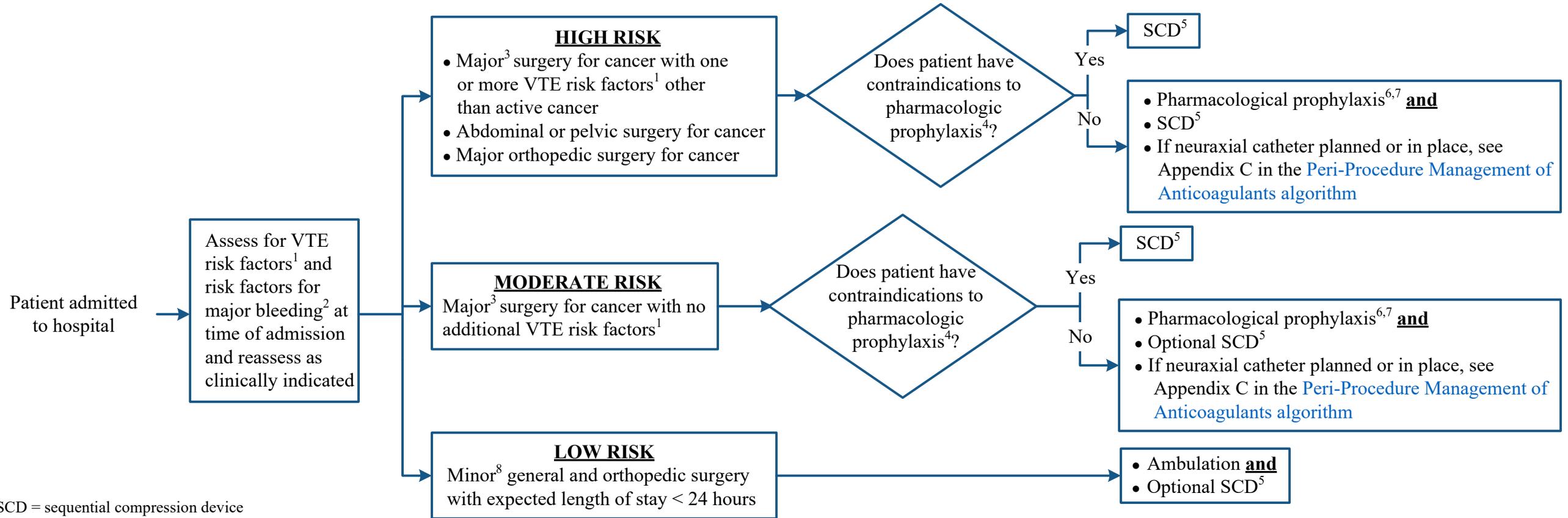
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SURGICAL HOSPITALIZED PATIENTS

INITIAL EVALUATION

VTE RISK

MANAGEMENT



SCD = sequential compression device

¹ See [Appendix A](#) for VTE Risk Factors

² See [Appendix F](#) for Risk Factors for Major Bleeding Complications in Surgical Patients

³ Major surgeries are usually extensive and warrant an overnight or extended stay in a hospital. These surgeries include extensive work such as entering a body cavity, removing an organ or altering the body's anatomy. Patients undergoing major surgeries usually require admission to the hospital, anesthesia and respiratory assistance.

⁴ See [Appendix C](#) for Contraindications to Pharmacologic Options for VTE Prophylaxis

⁵ Mechanical prophylaxis devices should be worn as often as possible during admission. TED hoses are available if needed for appropriate patients; they may be associated with skin complications.

⁶ See [Appendix D](#) for Pharmacological Options for VTE Prophylaxis

⁷ See [Appendix E](#) for Dosing Recommendations for Renal Impairment, Obesity, and Underweight Patients

⁸ Minor surgeries are generally superficial and do not require penetration of a body cavity. Patients are often discharged home the same day as the procedure. For example: visual inspections performed inside in rectum, vagina, uterus, or bladder would be considered minor. They do not involve assisted breathing or anesthesia and are usually performed by a single doctor.

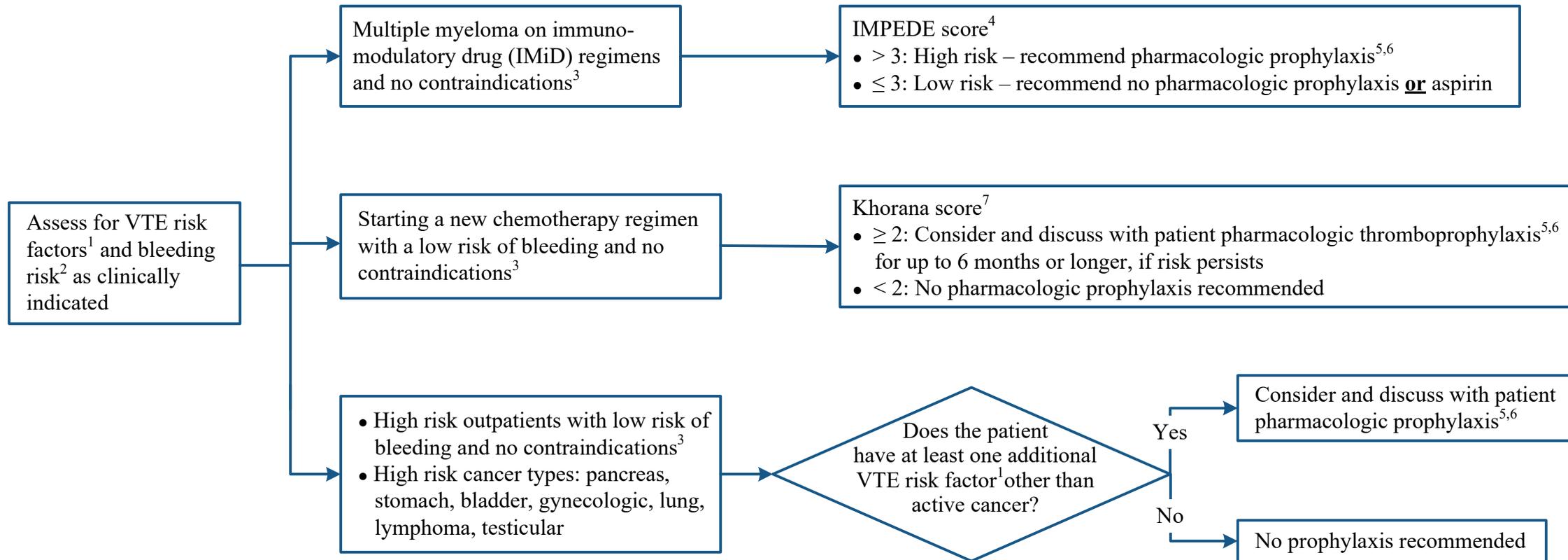
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AMBULATORY CANCER PATIENTS

INITIAL EVALUATION

VTE RISK

MANAGEMENT



¹ See Appendix A for VTE Risk Factors

² Currently no recommended method to assess bleeding risk for ambulatory cancer patients. However, the following factors that may put the patient at a higher risk of bleeding should be considered: anemia, age ≥ 75 years old, prior hemorrhage, bleeding disorder, hypertension, severe renal disease, and concurrent antiplatelet therapy.

³ See Appendix C for Contraindications to Pharmacologic Options for VTE Prophylaxis

⁴ See Appendix G for IMPEDE VTE Score

⁵ See Appendix D for Pharmacological Options for VTE Prophylaxis

⁶ See Appendix E for Dosing Recommendations for Renal Impairment, Obesity, and Underweight

⁷ Khorana Risk Score calculator: <https://www.mdcalc.com/khorana-risk-score-venous-thromboembolism-cancer-patients>

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APPENDIX A: VTE Risk Factors

- Active cancer (or suspicion of cancer); excludes basal/squamous cell skin cancer
- Age 60 years or older
- Prior VTE
- Advanced stage of cancer
- Medical comorbidities (infection, renal disease, pulmonary disease, congestive heart failure, arterial thromboembolism)
- Familial and/or acquired hypercoagulability
- Major surgery
- Central venous catheter/IV catheter
- Treatment factors (chemotherapy, protein kinase inhibitors, immunotherapy and/or antiangiogenic agents)
- Exogenous estrogen compounds (hormone replacement, contraceptives, tamoxifen/raloxifene, diethylstilbestrol)
- Erythropoietin stimulating agents
- Poor performance status
- Nephrotic syndrome
- Major trauma
- Spinal cord injury
- Smoking, tobacco use
- Obesity (BMI > 30 kg/m²)
- Pregnancy
- Immobility for at least 3 days

APPENDIX B: Factors With a Strong Association With Bleeding Risk in Hospitalized Medical Patients

- Active gastroduodenal ulcer
- Bleeding in the previous 3 months prior to admission
- Platelet count < 50 K/microliter
- Age > 85 years
- Hepatic failure
- Severe renal failure
- ICU admission
- Coagulopathy

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APPENDIX C: Contraindications to Pharmacological Options for VTE Prophylaxis

- Active bleeding
- Patient currently on treatment dose anticoagulation
- Thrombocytopenia (platelets < 20 K/microliter or clinical judgement)
- Anticipated thrombocytopenia
- Recent high-risk surgery or bleeding event
- Recent CNS bleed¹
- Recent neurosurgery¹
- Intracranial or spinal lesion at high risk of bleeding
- Underlying coagulopathy or known bleeding disorder in the absence of replacement therapy (e.g. hemophilia, Von Willebrand Disease)
- Patient on protocol that prohibits anticoagulation
- Severe uncontrolled malignant hypertension
- Risk outweighs benefit in patients when death is imminent

¹ Consult/refer to Neurosurgery if any evidence of acute bleed on CT scans. For any other concerns about starting VTE prophylaxis, consult/refer to Benign Hematology.

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APPENDIX D: Pharmacological Options for VTE Prophylaxis

Patient Group	Medication Regimen ¹	Peri-operative Considerations	Extended Prophylaxis
Surgical Patients			
High risk - Major surgery for cancer with one or more VTE risk factors ² other than active cancer	<ul style="list-style-type: none"> • Enoxaparin 40 mg SQ every 24 hours or • Heparin 5000 units SQ every 8 hours • Add SCDs during hospital stay 	<ul style="list-style-type: none"> • First dose of VTE prophylaxis agent may be given preoperatively, intraoperatively, or postoperatively. If given postoperatively, it is recommended to be given with 24 hours of surgery. • For management of patients currently on prophylaxis, see institutional algorithm³ 	Prophylaxis should be continued for at least 7-10 days. Extended VTE prophylaxis can be considered for high risk patients on a case by case basis ⁴ .
Patients with open or laparoscopic abdominal or pelvic surgery	<ul style="list-style-type: none"> • Enoxaparin 40 mg SQ every 24 hours or • Heparin 5000 units SQ every 8 hours • Add SCDs during hospital stay 		<ul style="list-style-type: none"> • Extended to total of 28 days⁴ • Extended to 14 days⁴ for minimally invasive abdominal surgeries. This excludes minimally invasive surgeries for gynecology oncology.
Moderate risk - Major surgery for cancer with no additional VTE risk factors ²	<ul style="list-style-type: none"> • Enoxaparin 40 mg SQ every 24 hours or • Heparin 5000 units SQ every 8 hours • SCDs are optional 		None
Orthopedic Surgery			
High risk orthopedic surgeries	<ul style="list-style-type: none"> • Enoxaparin 30 mg SQ every 12 hours or • Heparin 5000 units SQ every 8 hours • Add SCDs during hospital stay 	<ul style="list-style-type: none"> • Start 12 hours or more preoperatively or 12 hours or more postoperatively³ • For management of patients currently on prophylaxis, see institutional algorithm³ 	<ul style="list-style-type: none"> • Minimum 10-14 days; extended to 30 days recommended⁴ • Alternative option at discharge: Aspirin 81-325 mg PO every 12-24 hours
Neurosurgery or Spinal Surgery			
Moderate risk - No additional VTE risk factors ²	<ul style="list-style-type: none"> • SCDs alone for at least 24-48 hours • Once adequate hemostasis is established and the risk of bleeding decreases then transition to enoxaparin 40 mg SQ every 24 hours or heparin 5000 units SQ every 8 hours 	For management of patients currently on prophylaxis, see institutional algorithm ³	None
High risk - One or more VTE risk factors ² other than active cancer			See Ambulatory Cancer Patients on Page 4

¹ This section includes first line options. Additional pharmacologic prophylaxis options and dosing for renal dysfunction can be seen in [Appendix E](#).

² See [Appendix A](#) for VTE Risk Factors

³ For more information on peri-procedure management of anticoagulants, see [Peri-Procedure Management of Anticoagulants algorithm](#)

⁴ Enoxaparin or apixaban may be utilized for extended duration prophylaxis at hospital discharge. For concerns regarding affordability, consider submitting a test claim 48 hours prior to discharge via Pecon (for internal use only).

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APPENDIX D: Pharmacological Options for VTE Prophylaxis - continued

Patient group	Medication Regimen ¹	Peri-operative Considerations	Extended Prophylaxis
Non-Surgical Hospitalized Patients			
Moderate risk	<ul style="list-style-type: none"> • Enoxaparin 40 mg SQ every 24 hours or • Heparin 5000 units SQ every 8 hours 	See institutional algorithm ²	See Ambulatory Cancer Patients on Page 4
Patients intolerant to heparin products or those who prefer to avoid pork products	<ul style="list-style-type: none"> • Fondaparinux 2.5 mg SQ every 24 hours³ or • Rivaroxaban 10 mg every 24 hours⁴ or • Apixaban 2.5 mg PO every 12 hours⁴ 	See institutional algorithm ²	See Ambulatory Cancer Patients on Page 4
Ambulatory Cancer Patients⁵			
Multiple Myeloma patients receiving IMiD (<i>i.e.</i> , thalidomide or lenalidomide)	High Risk: <ul style="list-style-type: none"> • Enoxaparin 40 mg SQ every 24 hours or • Rivaroxaban 10 mg every 24 hours⁴ or • Apixaban 2.5 mg PO every 12 hours⁴ or • Fondaparinux 2.5 mg SQ every 24 hours³ Low Risk: <ul style="list-style-type: none"> • No prophylaxis or • Aspirin 81-325 mg PO every 24 hours 	See institutional algorithm ²	Continue while on immunomodulatory drugs
<ul style="list-style-type: none"> • Khorana score ≥ 2 prior to starting a new chemotherapy regimen or • High risk outpatients 	<ul style="list-style-type: none"> • Enoxaparin 40 mg SQ every 24 hours or • Rivaroxaban 10 mg PO every 24 hours⁴ or • Apixaban 2.5 mg PO every 12 hours⁴ 	See institutional algorithm ²	Continue for 6 months or longer, if risk persists then reassess

IMiD = immunomodulatory drug

¹ This section includes first line options. Additional pharmacologic prophylaxis and dosing for renal dysfunction can be seen in [Appendix E](#)

² For more information on peri-procedure management of anticoagulants see [Peri-Procedure Management of Anticoagulants](#) algorithm

³ Contraindicated if total body weight < 50 kg

⁴ Check for drug interactions prior to use

⁵ Prior to discharge, ensure patient can afford their medication. For concerns regarding affordability, consider submitting a test claim 48 hours prior to discharge via Pecon (for internal use only)

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APPENDIX E: Dosing Recommendations for Renal Impairment, Obesity, and Underweight Patients

Patient Population	Creatinine Clearance		
	CrCl > 30 ml/min	CrCl 20-30 ml/min	CrCl < 20 ml/min / dialysis
BMI < 40 and weight ≥ 55 kg	<ul style="list-style-type: none"> • Enoxaparin 40 mg SQ every 24 hours or • Enoxaparin 30 mg SQ every 12 hours or • Dalteparin 5,000 units SQ every 24 hours or • Heparin 5,000 units SQ every 8 hours or • Fondaparinux 2.5 mg SQ every 24 hours¹ or • Rivaroxaban 10 mg PO every 24 hours^{2,3} or • Apixaban 2.5 mg PO every 12 hours^{2,3} 	<ul style="list-style-type: none"> • Enoxaparin 30 mg SQ every 24 hours or • Heparin 5,000 units SQ every 8 hours or • Rivaroxaban 10 mg PO every 24 hours^{2,3} or • Apixaban 2.5 mg PO every 12 hours^{2,3} 	<ul style="list-style-type: none"> • Heparin 5,000 units SQ every 8 hours or • Apixaban 2.5 mg PO every 12 hours^{2,3}
Patient with BMI ≥ 40 kg/m ²	<ul style="list-style-type: none"> • Enoxaparin 40 mg SQ every 12 hours or • Heparin 7,500 units SQ every 8 hours 	Heparin 7,500 units SQ every 8 hours	
Patient with weight < 55 kg	<ul style="list-style-type: none"> • Enoxaparin 30 mg SQ every 24 hours or • Heparin 5,000 units SQ every 8-12 hours 	Heparin 5,000 units SQ every 8-12 hours	

¹ Contraindicated if total body weight < 50 kg and/or CrCl < 30 mL/minute

² Check for drug interactions prior to use

³ Both apixaban and rivaroxaban should be avoided in patient with severe liver dysfunction (Child Pugh score C). Rivaroxaban is contraindicated with Child Pugh score B and apixaban should be used with caution.

Note: Currently apixaban and rivaroxaban are indicated for VTE prophylaxis in patients undergoing knee or hip replacement surgery. Rivaroxaban is also indicated in medical patients who are not at high risk of bleeding. There is limited data to support apixaban or rivaroxaban use if patients with CrCl <30 mL/min as these patients were excluded from the trials for VTE prophylaxis. Both apixaban and rivaroxaban appear to be safe and effective compared to warfarin in patients being treated for non-valvular atrial fibrillation with end stage renal disease and can be considered for VTE prophylaxis in this population.

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APPENDIX F: Risk Factors for Major Bleeding Complications in Surgical Patients

General Risk Factors

- Active bleeding
- Previous major bleeding
- Known, untreated bleeding disorder
- Severe renal or hepatic failure
- Thrombocytopenia
- Acute stroke
- Uncontrolled systemic hypertension
- Lumbar puncture, epidural, or spinal anesthesia within previous 4 hours or next 12 hours
- Concomitant use of anticoagulants, antiplatelet therapy, or thrombolytic drugs

Procedure-specific risk factors

- Abdominal surgery
 - Male sex, preoperative hemoglobin level < 13 g/dL, malignancy, and complex surgery defined as two or more procedures, difficult dissection, or more than one anastomosis
- Pancreaticoduodenectomy
 - Sepsis, pancreatic leak, sentinel bleed
- Hepatic resection
 - Number of segments, concomitant extrahepatic organ resection, primary liver malignancy, lower preoperative level, and platelet counts
- Cardiac surgery
 - Use of aspirin
 - Use of clopidogrel within 3 days before surgery
 - BMI > 25 kg/m², nonelective surgery, placement of five or more grafts, older age
 - Older age, renal insufficiency, operation other than CABG, longer bypass time
- Thoracic surgery
 - Pneumonectomy or extended resection

Procedures in which bleeding complications may have especially severe consequences

- Craniotomy
- Spinal surgery
- Spinal trauma
- Reconstructive procedures involving free flap

CABG = coronary artery bypass graft

APPENDIX G: IMPEDE VTE Score

Variable	Point Score
IMiD therapy	+ 4
BMI ≥ 25 kg/m ²	+ 1
Pelvic, hip, or femur fracture	+ 4
Erythropoiesis-stimulating agent	+ 1
Dexamethasone (regimen dose)	
Low dose (≤ 160 mg/month)	+ 2
High dose (>160 mg/month)	+ 4
Doxorubicin	+ 3
Ethnicity/Race = Asian/Pacific Islander	- 3
History of VTE before multiple myeloma diagnosis	+ 5
Tunneled line of central venous catheter	+ 2
Existing thromboprophylaxis: Therapeutic LMWH or warfarin	- 4
Existing thromboprophylaxis: prophylactic LMWH or aspirin	- 3

IMiD = immunomodulatory drug

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SUGGESTED READINGS

- Aloia, T. A., Geerts, W. H., Clary, B. M., Day, R. W., Hemming, A. W., D'Albuquerque, L. C., ... Toogood, G. J. (2016). Venous thromboembolism prophylaxis in liver surgery. *Journal of Gastrointestinal Surgery*, 20(1), 221-229. doi:10.1007/s11605-015-2902-4
- Azboy, I., Groff, H., Goswami, K., Vahedian, M., & Parvizi, J. (2020). Low-Dose Aspirin Is Adequate for Venous Thromboembolism Prevention Following Total Joint Arthroplasty: A Systematic Review. *The Journal of Arthroplasty*, 35(2020) 886-892. doi:10.1016/j.arth.2019.09.043
- CLOTS (2013). Effectiveness of intermittent pneumatic compression in reduction of risk of deep vein thrombosis in patients who have had a stroke (CLOTS 3): A multicentre randomised controlled trial. *Lancet*, 382, 516-24. doi:10.1016/S0140-6736(13)61050-8
- Falck-Ytter, Y., Francis, C. W., Johanson, N. A., Curley, C., Dahl, O. E., Schulman, S., ... Colwell Jr, C. W. (2012). Prevention of VTE in orthopedic surgery patients: antithrombotic therapy and prevention of thrombosis: American College of Chest Physicians evidence-based clinical practice guidelines. *Chest*, 141(2), e278S-e325S. doi:10.1378/chest.11-2404
- Farge, D., Frere, C., Connors, J. M., Khorana, A. A., Kakkar, A., Ay, C., Muñoz, A., ... Yasuda, C. (2022). 2022 International Clinical Practice Guidelines for the treatment and prophylaxis of venous thromboembolism in patients with cancer, including patients with covid-19. *The Lancet Oncology*, 23(7), E334–E347. doi:10.1016/s1470-2045(22)00160-7
- Geerts, W. H., Bergqvist, D., Pineo, G. F., Heit, J. A., Samama, C. M., Lassen, M. R., & Colwell, C. W. (2008). Prevention of venous thromboembolism: American College of Chest Physicians evidence-based clinical practice guidelines. *Chest Journal*, 133(6_suppl), 381S-453S. doi:10.1378/chest.08-0656
- Gould, M. K., Garcia, D. A., Wren, S. M., Karanicolas, P. J., Arcelus, J. I., Heit, J. A., & Samama, C. M. (2012). Prevention of VTE in nonorthopedic surgical patients: antithrombotic therapy and prevention of thrombosis: American College of Chest Physicians evidence-based clinical practice guidelines. *CHEST Journal*, 141(2_suppl), e227S-e277S. doi:10.1378/chest.11-2297
- Horlocker, T. T., Vandermeulen, E., Kopp, S. L., Gogarten, W., Leffert, L. R., & Benzon, H. T. (2018). Regional Anesthesia in the Patient Receiving Antithrombotic or Thrombolytic Therapy: American Society of Regional Anesthesia and Pain Medicine Evidence-Based Guidelines (Fourth Edition). *Regional anesthesia and pain medicine*, 43(3), 263–309. doi:10.1097/AAP.0000000000000763
- Kahn, S. R., Lim, W., Dunn, A. S., Cushman, M., Dentali, F., Akl, E. A., ... Schulman, S. (2012). Prevention of VTE in nonsurgical patients: Antithrombotic therapy and prevention of thrombosis: American College of Chest Physicians evidence-based clinical practice guidelines. *Chest*, 141(2), e195S-e226S. doi:10.1378/chest.11-2296
- Key, N. S., Khorana, A. A., Kuderer, N. M., Bohlke, K., Lee, A. Y., Arcelus, J. I., ... Falanga, A. (2020). Venous thromboembolism prophylaxis and treatment in patients with cancer: ASCO clinical practice guideline update. *Journal of Clinical Oncology*, 38(5), 496-520. doi:10.1200/JCO.19.01461

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SUGGESTED READINGS - continued

- Leonardi, M. J., McGory, M. L., & Ko, C. Y. (2006). The rate of bleeding complications after pharmacologic deep venous thrombosis prophylaxis: A systematic review of 33 randomized controlled trials. *Archives of Surgery, 141*(8), 790-799. doi:10.1001/archsurg.141.8.790
- National Comprehensive Cancer Network. (2022). *Cancer-Associated Venous Thromboembolic Disease*. (NCCN Guideline - Version 1.2022). Retrieved from: http://www.nccn.org/professionals/physician_gls/pdf/vte.pdf
- O'Toole, R. V., Stein, D. M., O'Hara, N. N., Frey, K. P., Taylor, T. J., Scharfstein, D. O., ... Castillo, R. C. (2023). Aspirin or low-molecular-weight heparin for thromboprophylaxis after a fracture. *The New England Journal of Medicine, 388*(3), 203–213. doi:10.1056/NEJMoa2205973
- Scholten, D. J., Hoedema, R. M., & Scholten, S. E. (2002). A comparison of two different prophylactic dose regimens of low molecular weight heparin in bariatric surgery. *Obesity Surgery, 12*(1), 19-24. doi:10.1381/096089202321144522
- Sanfilippo, K. M., Luo, S., Wang, T. F., Fiala, M., Schoen, M., Wildes, T. M., ... Gage, B. F. (2019). Predicting venous thromboembolism in multiple myeloma: development and validation of the IMPEDE VTE score. *American Journal of Hematology, 94*(11), 1176–1184. doi:10.1002/ajh.25603
- Sebaaly, J., & Covert, K. (2018). Enoxaparin dosing at extremes of weight: Literature review and dosing recommendations. *Annals of Pharmacotherapy, 52*(9), 898-909. doi:10.1177/1060028018768449
- Yam, L., Bahjri, K., Geslani, V., Cotton, A., & Hong, L. (2019). Enoxaparin Thromboprophylaxis Dosing and Anti-Factor Xa Levels in Low-Weight Patients. *Pharmacotherapy: The Journal of Human Pharmacology and Drug Therapy, 39*(7), 749-755. doi:10.1002/phar.2295

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DEVELOPMENT CREDITS

This practice consensus algorithm is based on majority expert opinion of the VTE workgroup at the University of Texas MD Anderson Cancer Center for the patient population. These experts included:

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