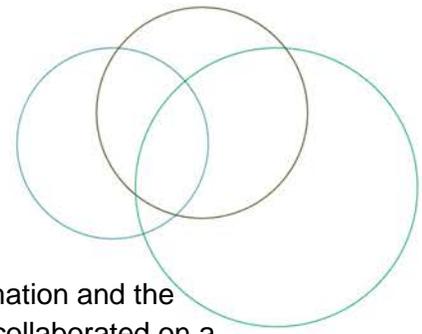


HOSPITAL HARM IMPROVEMENT RESOURCE

Venous Thromboembolism



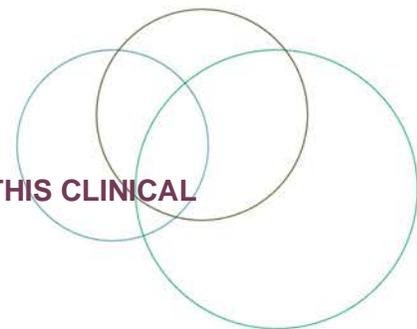
ACKNOWLEDGEMENTS



The Canadian Institute for Health Information and the Canadian Patient Safety Institute have collaborated on a body of work to address gaps in measuring harm and to support patient safety improvement efforts in Canadian hospitals.

The Hospital Harm Improvement Resource was developed by the Canadian Patient Safety Institute to complement the Hospital Harm measure developed by the Canadian Institute for Health Information. It links measurement and improvement by providing resources that will support patient safety improvement efforts.



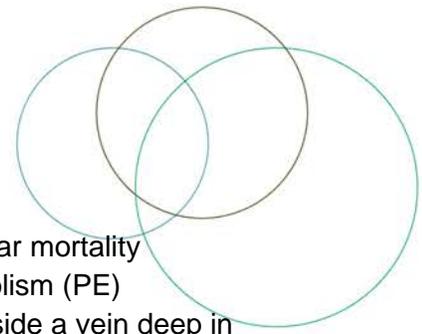


DISCHARGE ABSTRACT DATABASE (DAD) CODES INCLUDED IN THIS CLINICAL CATEGORY:

A06: Venous Thromboembolism

Concept	Embolism, thrombosis, phlebitis or thrombophlebitis of the pulmonary vein or other veins (excluding superficial veins) identified during a hospital stay.
Selection criteria	
I80.1	Identified as diagnosis type (2)
I80.2	OR
I82.2	Identified as diagnosis type (3) AND T80.1, T81.7, T82.8, T83.8, T84.8 or T85.8
I82.8	as diagnosis type (2) AND Y60–Y84 in the same diagnosis cluster
I82.9	
O87.102	Identified as diagnosis type (M), (1), (2), (W), (X) or (Y)
O87.902	
Codes	Code descriptions
I26.–	Pulmonary Embolism
I80.1	Phlebitis and thrombophlebitis of femoral vein
I80.2	Phlebitis and thrombophlebitis of other deep vessels of lower extremities
I82.2	Embolism and thrombosis of vena cava
I82.8	Embolism and thrombosis of other specified veins
I82.9	Embolism and thrombosis of unspecified vein
O87.102	Deep phlebothrombosis in the puerperium; delivered with mention of postpartum complication
O87.902	Venous complication in the puerperium, unspecified; delivered with mention of postpartum complication
Additional codes	Inclusions
T80.1	Vascular complications following infusion, transfusion, and therapeutic injection
T81.7	Vascular complications following a procedure, not elsewhere classified
T82.8	Other specified complications of cardiac and vascular prosthetic devices, implants, and grafts
T83.8	Other complications of genitourinary prosthetic devices, implants, and grafts
T84.8	Other complications of internal orthopaedic prosthetic devices, implants, and grafts
T85.8	Other complications of internal prosthetic devices, implants, and grafts, not elsewhere classified
Y60–Y84	Complications of medical and surgical care (refer to Appendix A) of the Hospital Harm Indicator General Methodology Notes





OVERVIEW AND IMPLICATIONS

Venous Thromboembolism (VTE) is the third most common cause of vascular mortality worldwide and comprises deep-vein thrombosis (DVT) and pulmonary embolism (PE) (Nicholson, et al., 2020). DVT occurs when an abnormal blood clot forms inside a vein deep in the leg. DVT may cause leg pain and/or swelling but is often clinically silent. PE occurs when all or part of a DVT breaks away from its site in a vein and travels through the venous system to lodge in the lungs. PE may cause chest pain, shortness of breath, tachycardia, hemoptysis, or pre-syncope but is often clinically silent. In clinical practice, about two-thirds of VTE episodes manifest as DVT and one-third as PE with or without DVT (Nicholson, et al., 2020).

About 50 per cent of all VTE events occur because of a current or recent hospital admission for surgery or acute medical illness. Hospital-acquired VTE is preventable, with interventions including anticoagulants and mechanical measures, including compression stockings and intermittent pneumatic compression (Schünemann et al., 2018). In addition, VTE remains an important cause of maternal morbidity and mortality in Canada with an overall incidence of DVT and PE of 12.1 per 10,000 and 5.4 per 10,000 pregnancies, respectively. VTE occurs at a rate of 4.3 per 10,000 pregnancies postpartum (Chan et al., 2014).

RISK FACTORS

Risk factors for VTE can be subdivided into factors that promote venous stasis, factors that promote blood hypercoagulability, and factors causing endothelial injury or inflammation. A clear understanding of the risk factors for VTE is vital to identify patients at risk of VTE who would benefit from thromboprophylaxis. An individual patient's risk of VTE depends on intrinsic, patient-specific factors (such as genetic risk factors, age, or body mass index) and acquired risk due to the unique context or situation (such as hospitalization, surgery, cancer, or pregnancy). Risk factors are also frequently categorized by “transient vs. persistent” and “major vs. minor” (Nicholson et al., 2020; Chan et al., 2014).

GOAL

To prevent VTE in hospitalized adult and obstetrical patients by implementing strategies which increase the use of evidence-based thromboprophylaxis.

IMPORTANCE TO PATIENTS AND FAMILIES

Hospital-acquired VTE (blood clots) is preventable (Schünemann et al., 2018).

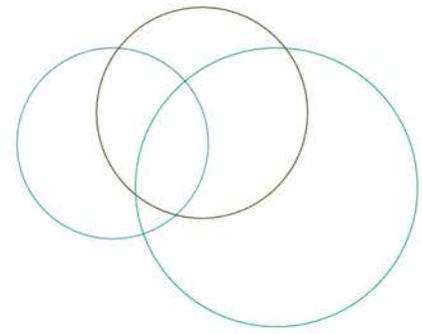
One of the most important things you can do to prevent blood clots is to know if you are at risk. Some risk factors are hospitalization, surgery, pregnancy, or cancer. Other things you can do to reduce your risks and protect yourself from life-threatening blood clots include:

- Recognize the signs and symptoms of blood clots (DVT: swelling, pain, skin warm to the touch, redness; PE: difficulty breathing, chest pain, coughing, blood in sputum, rapid or irregular pulse).
- Tell your doctor if you have risk factors for blood clots.



HOSPITAL HARM IMPROVEMENT RESOURCE

Venous Thromboembolism



- Before any surgery, talk with your doctor about blood clots.
- Tell your doctor or nurse if you have any symptoms of a blood clot.
- Mobilize as recommended by your health care provider.
- Don't smoke or quit smoking
-

Patient Story

How a Drawing Saved My Life: Lori's Story

In August 2014, I was overwhelmed with joy after delivering my baby boy, Jack. He was perfect, the delivery was pretty easy, and I was ready to go home. During a brief moment of quiet during his nap, I perused through the endless literature provided by the hospital. A hand drawing of a leg, with a red mark and arrow pointing to the calf describing deep vein thrombosis (DVT) struck me. I had a weird Charley horse in my leg, right in the same spot, but I thought it was no big deal. I mentioned it to the nurse, and we decided it was harmless. I went home with my bundle of joy. (Stop the Clot, nd).

Maury Lieberman's story

Maury Lieberman, National Blood Clot Alliance (NBCA) Board member, discusses his experience with cancer and blood clots: (Stop the Clot, 2015) Video

CLINICAL AND SYSTEM REVIEWS, INCIDENT ANALYSES

Given the broad range of potential causes of hospital associated VTE, clinical and system reviews should be conducted to identify latent causes and determine appropriate recommendations.

Occurrences of harm are complex with many contributing factors. Organizations need to:

1. Measure and monitor the types and frequency of these occurrences.
2. Use appropriate analytical methods to understand the contributing factors.
3. Identify and implement solutions or interventions that are designed to prevent recurrence and reduce risk of harm.
4. Have mechanisms in place to mitigate consequences of harm when it occurs.

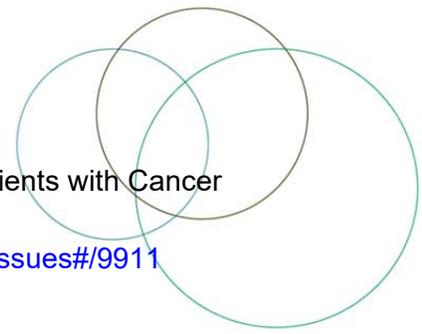
To develop a more in-depth understanding of the care delivered to patients, chart audits, incident analyses and prospective analyses can be helpful in identifying quality improvement opportunities. Links to key resources for [conducting chart audits](#) and [analysis methods](#) are included in the [Hospital Harm Improvement Resources Introduction](#).

If your review reveals that your cases of VTE are linked to specific processes or procedures, you may find these resources helpful:

- American Society of Clinical Oncology www.asco.org

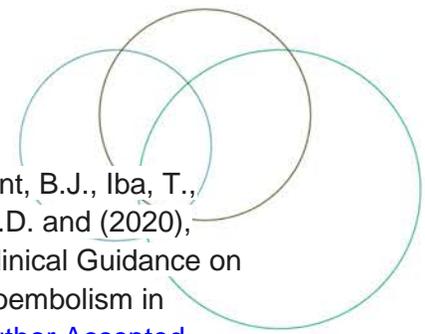


HOSPITAL HARM IMPROVEMENT RESOURCE
Venous Thromboembolism



- Venous Thromboembolism Prophylaxis and Treatment in Patients with Cancer Update <https://www.asco.org/research-guidelines/quality-guidelines/guidelines/supportive-care-and-treatment-related-issues#/9911>
- American Society of Hematology <https://www.hematology.org/>
 - 2019 Guidelines for management of venous thromboembolism: prevention of venous thromboembolism in surgical hospitalized patients <https://ashpublications.org/bloodadvances/article/3/23/3898/429211/American-Society-of-Hematology-2019-guidelines-for>
 - 2018 Guidelines for management of venous thromboembolism: prophylaxis for hospitalized and nonhospitalized medical patients (Schünemann) <https://ashpublications.org/bloodadvances/article/2/22/3198/16115/American-Society-of-Hematology-2018-guidelines-for>
 - 2018 guidelines for management of venous thromboembolism: venous thromboembolism in the context of pregnancy (Bates) <https://ashpublications.org/bloodadvances/article/2/22/3317/16094/American-Society-of-Hematology-2018-guidelines-for?searchresult=1>
- CHEST – American College of Chest Physicians www.chestnet.org
 - Antithrombotic Therapy and Prevention of Thrombosis (9th Edition), Published: February 2012 Prevention of VTE in Nonsurgical Patients [https://journal.chestnet.org/article/S0012-3692\(12\)60124-X/fulltext?_ga=2.21455602.810240998.1611603389-2133843351.1611603389](https://journal.chestnet.org/article/S0012-3692(12)60124-X/fulltext?_ga=2.21455602.810240998.1611603389-2133843351.1611603389)
 - Prevention of VTE in Nonsurgical Patients [https://journal.chestnet.org/article/S0012-3692\(12\)60124-X/fulltext?_ga=2.21455602.810240998.1611603389-2133843351.1611603389](https://journal.chestnet.org/article/S0012-3692(12)60124-X/fulltext?_ga=2.21455602.810240998.1611603389-2133843351.1611603389)
 - Prevention of VTE in Nonorthopedic Surgical Patients [https://journal.chestnet.org/article/S0012-3692\(12\)60125-1/fulltext?_ga=2.34014952.810240998.1611603389-2133843351.1611603389](https://journal.chestnet.org/article/S0012-3692(12)60125-1/fulltext?_ga=2.34014952.810240998.1611603389-2133843351.1611603389)
 - Prevention of VTE in Orthopedic Surgery Patients [https://journal.chestnet.org/article/S0012-3692\(12\)60126-3/fulltext?_ga=2.191914723.810240998.1611603389-2133843351.1611603389](https://journal.chestnet.org/article/S0012-3692(12)60126-3/fulltext?_ga=2.191914723.810240998.1611603389-2133843351.1611603389)
 - Prevention, Diagnosis, and Treatment of VTE in Patients with Coronavirus Disease 2019
CHEST (chestnet.org)
- International Society on Thrombosis and Haemostasis
[International Society on Thrombosis and Haemostasis, Inc. \(isth.org\)](http://International Society on Thrombosis and Haemostasis, Inc. (isth.org))
 - Full list of [Published Guidance - International Society on Thrombosis and Haemostasis, Inc. \(isth.org\)](http://Published Guidance - International Society on Thrombosis and Haemostasis, Inc. (isth.org))





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- Journal of Clinical Medicine <https://www.mdpi.com/journal/jcm>
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- Plos One <https://journals.plos.org/plosone/>
 - A systematic review of clinical practice guidelines on the use of low molecular weight heparin and fondaparinux for the treatment and prevention of venous thromboembolism: Implications for research and policy decision-making - <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0207410>
- Society of Obstetricians and Gynaecologists of Canada www.sogc.org
 - Clinical Practice Guidelines: Venous thromboembolism and antithrombotic therapy in pregnancy. *J Obstet Gynaecol Can.* 2014; 36 (6): 527–553. [https://www.jogc.com/article/S1701-2163\(15\)30569-7/fulltext](https://www.jogc.com/article/S1701-2163(15)30569-7/fulltext)
- Stop the Clot. <https://www.stoptheclot.org/>
- The Lancet Oncology <https://www.thelancet.com/journals/lanonc/home>
 - 2019 international clinical practice guidelines for the treatment and prophylaxis of venous thromboembolism in patients with cancer https://www.sciencedirect.com/science/article/pii/S1470204519303365?casa_token=wR071dAWhkAAAAA:lbnuYnSXaD97RZBGMYSFzAJK90a0I9H5EPGD4mwzgakl1qcvD4ali4tXgdHPr0bkc3jRFbxkZD4
- Thrombosis Canada. <http://thrombosiscanada.ca/>
- World Thrombosis Day. <http://www.worldthrombosisday.org/>

MEASURES

Vital to quality improvement is measurement, and this applies specifically to implementation of interventions. The chosen measures will help to determine whether an impact is being made (primary outcome), whether the intervention is being carried out (process measures), and whether any unintended consequences ensue (balancing measures).

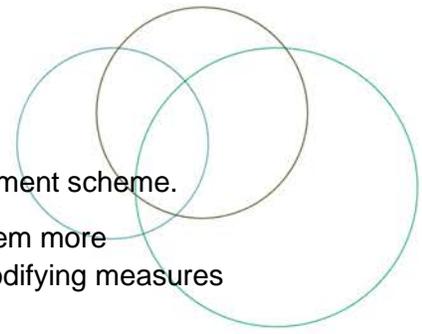
In selecting your measures, consider the following:

- Whenever possible, use measures you are already collecting for other programs.
- Evaluate your choice of measures in terms of the usefulness of the results and the resources required to obtain them; try to maximize the former while minimizing the latter.



HOSPITAL HARM IMPROVEMENT RESOURCE

Venous Thromboembolism



- Try to include both process and outcome measures in your measurement scheme.
- You may use different measures or modify the measures to make them more appropriate and/or useful to your setting. However, be aware that modifying measures may limit the comparability of your results to others.
- Posting your measure results within your hospital is a great way to keep your teams motivated and aware of progress. Try to include measures that your team will find meaningful and exciting (IHI, 2012).

GLOBAL PATIENT SAFETY ALERTS

[Global Patient Safety Alerts](#) provides access and the opportunity to learn from other organizations about specific patient safety incidents including alerts, advisories, recommendations, and solutions for improving care and preventing incidents. Learning from the experience of other organizations can accelerate improvement.

Recommended search terms:

- Deep vein thrombosis (DVT)
- Pulmonary embolism (PE)
- Venous thromboembolism (VTE)
- Venous thrombosis

VTE PREVENTION SUCCESS STORIES

[Getting patients on board with VTE prophylaxis](#)

A bundle to educate patients about venous thromboembolism (VTE) included a 10-minute video of patients' stories and in-person support from a nurse educator.

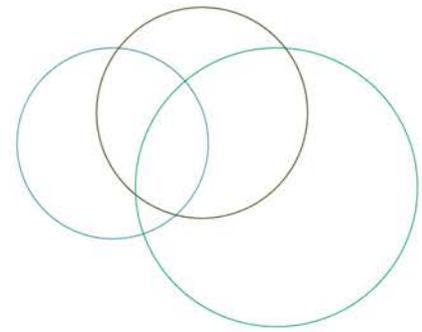
Where: The Johns Hopkins Hospital, a 1,000-bed academic medical center in Baltimore.

The issue: Administering venous thromboembolism (VTE) prophylaxis as prescribed.

Background: Hospitalists know the importance of medications for VTE prophylaxis, but 12.7 per cent of prescribed doses were not administered in a study of 75 patients at Johns Hopkins Hospital, published in March 2018 by the American Journal of Health-System Pharmacy. Because the most commonly cited reason for non-administration was patient refusal, the Johns Hopkins VTE Collaborative decided to tackle the problem with patient education.

“Our first step was to ask patients what they wanted to learn,” said Elliott R. Haut, MD, PhD, vice chair of quality, safety, and service in the department of surgery at Johns Hopkins Medicine. After collecting patient input, the research group developed a patient education bundle composed of a two-page form about blood-clot prevention, a 10-minute video of patients' stories (shown on a hospital tablet, the TV, or a patient's personal device), and in-person support from a nurse educator... (Frost, 2019)





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Stop the clot – Prevent Blood Clots. (retrieved January 2021) <https://www.stoptheclot.org/>

