

Field Guide: *Venous Thromboembolism (VTE)*

Definition and Harm Impact



Deep vein thrombosis (the formation of a blood clot in a deep vein) and pulmonary embolism (a blood clot that travels to the lungs) are known collectively as venous thromboembolism, or VTE. VTE is one of the most common forms of preventable death in hospitals. It is estimated that approximately 350,000 to 900,000 patients develop VTE each year in hospitals, and approximately 100,000 of the patients who develop VTE die from it each year.¹ Aside from the mortality risk, VTE is responsible for causing long-term, chronic conditions. Even seemingly healthy patients who are admitted to the hospital for minor surgical procedures or routine childbirth find themselves at greater risk once hospitalized if progressive ambulation is not encouraged. This means that the vast majority of hospitalized patients are at some level of risk for developing VTE,² as risk factors include:

- Multiple comorbidities
- Recent surgery
- Immobility or inadequate mobility
- Lack of individualized, risk-based prophylaxis treatment
- Lack of patient education and engagement in prevention

Many VTE cases that develop in the hospital can be prevented with the use of prophylaxis treatments like anticoagulant medication and compression devices. It is common, though, for clinicians to underestimate the risk of harm from a clot while overestimating the risk of bleeding from preventative prophylaxis. While a large percentage of VTE cases can be preventable, clinicians do not always prescribe the appropriate risk-based prophylaxis treatment.³

Engaging Patients and Families



It is essential that patients and family members be engaged and included in care decisions about VTE prevention. When patients and family members understand the reasons for preventative measures, such as sequential compression devices, frequent ambulation, or anticoagulant medication that requires frequent blood draws, they are more likely to adhere to treatment recommendations. Engaged patients and family members may be able to identify early signs and symptoms of blood clot formation and alert the treatment team. A few methods to engage patients and families in VTE prevention include:

- Provide education about VTE risks and methods to prevent VTE.
- Provide education about signs and symptoms of early blood clot formation and encourage patients and families to speak up if they suspect changes in the patient's condition.
- Provide written materials in plain language that include information about VTE prevention.
- Use Teach-Back when providing education to patients to validate understanding.
- Engage the organization's Patient and Family Advisory Council (PFAC) in the design of patient education related to VTE prevention to improve the value to patients.
- Encourage patients and family members to be proactive in asking healthcare providers about ambulation and include family members in any education.



Hospital Improvement Strategies

Improvement efforts aimed at increasing patient mobility and the number of patients receiving appropriate prophylaxis interventions have the greatest success in reducing hospital-acquired VTEs.^{4,5} Successful strategies in the work toward reducing VTE rates include:

- Early ambulation for post-operative patients
 - This includes an emphasis on preoperative conditioning education and preoperative mobility education when possible. For example, implementation of an Early Recovery After Surgery (ERAS) program includes standardized emphasis on conditioning and early mobility.
- Use of standardized risk assessments for every hospitalized patient
 - Use one process for assessing all patients at admission and at standardized times throughout their inpatient stay (e.g., change in status, following surgery, change in level of care).
- Risk-based prophylaxis
 - Use standardized order sets that allow for risk-based prescribing of mechanical and chemoprophylaxis, when indicated.
 - In collaboration with medical staff members, develop standardized order sets that are specific to individual specialties, such as trauma, cardiology, surgery, and medicine.
- Use clinical decision support and build reliability into ordering systems and processes
 - Use decision support built into electronic ordering systems that includes risk-based standardized protocols.
 - Include pharmacists in hospital rounds, or in review of medication orders.
- Use of concurrent data to inform practices and allow for real-time improvement
 - Develop a process for concurrent surveillance of risk factors and concomitant prophylaxis for patients in the hospital.
- Implement a real-time check of all or certain population groups within the hospital (e.g., those without ambulation orders, intensive care unit only, those identified as high-risk for VTE) to cross check the accuracy of the VTE risk assessment versus the appropriateness of the ordered intervention, also known as “measure-vention.”



Measurement

The Hospital Improvement Innovation Network (HIIN) goal for reduction in VTE rates is a 20 percent reduction from 2015–2016 baseline rates. VTE is measured as a rate of surgical patients who develop either deep vein thrombosis (DVT) or pulmonary embolism (PE) following a surgical procedure within the same hospitalization. It is based on the national metric from the Agency for Healthcare Research and Quality (AHRQ) Patient Safety Indicator #12 and is measured as the total number of surgical patients who develop DVT or PE divided by the total number of surgical patients multiplied by 1,000. While VTE can affect any patient type, the measurement is focused solely on surgical patients for the purposes of the HIIN.

Resources and Guides for Hospitals



- Health Research & Educational Trust (HRET) (June 2017)—Venous Thromboembolism (VTE) Change Package: 2017 Update. Chicago, IL: Health Research & Educational Trust. Available at: <http://www.hret-hiin.org/Resources/vte/17/venous-thromboembolism-change-package.pdf>.
- Johns Hopkins Medicine. Armstrong Institute for Patient Safety and Quality—Preventing Venous Thromboembolism. Available at: https://www.hopkinsmedicine.org/armstrong_institute/improvement_projects/infections_complications/VTE/index.html.
- Agency for Healthcare Research and Quality (AHRQ)—Preventing Hospital-Associated Venous Thromboembolism. AHRQ. Available at: <http://www.ahrq.gov/professionals/quality-patient-safety/patient-safety-resources/resources/vtguide/index.html>.
- Society for Hospital Medicine—The VTE Toolkit, Society for Hospital Medicine. Available at: http://www.hospitalmedicine.org/Web/Quality_Innovation/Implementation_Toolkits/Venous_Thromboembolism/Web/Quality_Innovation/Implementation_Toolkit/Venous/Overview.aspx.
- HRET—VTE Process Discovery Tool. HRET. Available at: <http://www.hret-hiin.org/resources/display/vte-process-discovery-tool>.

¹ Rathbun, S. (2009). The surgeon general's call to action to prevent deep vein thrombosis and pulmonary embolism. *Circulation*, 119(15), 480–482.

² Heit, JA; Melton, LJ; Lohse, CM, et al. (2001) Incidence of venous thromboembolism in hospitalized patients versus community resident. *Mayo Clinic Proceedings*, 76(11):1102–1110.

³ Tapson, VF, Hyers, TM, Waldo, AL. (2005) Antithrombotic therapy practices in US hospitals in an era of practice guidelines. *Archives of Internal Medicine*, 165(13):1458–1464.

⁴ Agency for Healthcare Research and Quality. Preventing Hospital-Associated Venous Thromboembolism. AHRQ, Rockville, MD. Available at: <http://www.ahrq.gov/professionals/quality-patient-safety/patient-safety-resources/resources/vtguide/index.html>. Accessed on: May 16, 2019.

⁵ Maynard, G. (2010). Designing and implementing effective VTE prevention protocols: lessons from collaboratives. *Journal of Thrombosis and Thrombolysis*, 29(2), 159–166.