The Military Health System's

PARTNERSHIP FOR PATIENTS CAMPAIGN

SAFE CARE SAVES LIVES

Implementation Guide for Venous Thromboembolism

February 14, 2013

U.S. DEPARTMENT OF HEALTH & HUMAN SERVICES

PARTNERSHIP FOR PATIENTS

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Contents

1. Introduction

This implementation guide was created to support the Partnership for Patients, a national initiative sponsored by the Department of Health and Human Services to reduce harm in health care facilities. Military Health System leadership has pledged its support to the PfP, and has made a commitment to specific, identified aims. Improving the quality and safety of health care in all Department of Defense facilities will only be possible with universal support at *every* level in the MHS.

This guide is one of 10 harm-specific guides designed to assist you as you implement identified evidence-based practices to improve patient care. Common to all guides are resources that support efforts to educate the health care team by providing MHS-selected EBPs and quality improvement strategies.

In addition, implementation strategies and tools relevant to all harm categories are included in a guide titled "Practical Applications for Process Improvement and Change Management." This guide supports efforts to equip the health care team with rapid-cycle process improvement methods and engage the health care team through the use of change management strategies.

2. Venous Thromboembolism Prevention Evidence-Based Practices for Surgical Patients

2.1 Background Information

Venous thromboembolism refers to pathologic thrombosis occurring on the venous side of the circulation. The most common manifestation is deep vein thrombosis, which is the presence of a thrombus in one of the deep veins, usually in the lower extremities. A life-threatening manifestation of VTE results from embolization of venous thrombi to the pulmonary circulation, known as pulmonary embolism. According to the Surgeon General, venous thromboembolism is a major source of inpatient morbidity and mortality. Despite evidence that VTE is a common hospital-acquired condition, prophylactic strategies to reduce morbidity and mortality are often underutilized. [1] Therefore, opportunity exists to ensure evidence-based practices are fully implemented and monitored in order to reduce the incidence of VTE.

[1] Tapson VF, Hyers T.M., Waldo A.L., et al. Antithrombotic therapy practices in US hospitals in an era of practice guidelines, *Arch Intern Med,* 2005;165:1458-1464.

VTE Burden of Illness

- VTE occurs in approximately 1 out of every 1000 adults per year.
- Venous thrombosis is responsible for 10 percent of U.S. hospital deaths each year.
- The average incidence of deep vein thrombosis (DVT) is 50 out of every 100,000 adults per year.
- The average incidence of pulmonary embolus (PE) is 70 out of every 100,000 adults per year.
- PE and DVT are the most common causes of preventable death.
- Without prophylaxis, DVT risk ranges between 25 to 42 percent in medical intensive care patients.

Sources:

1. Tapson VF, Hyers T.M., Waldo A.L., et al. Antithrombotic therapy practices in US hospitals in an era of practice guidelines, Arch Intern Med, 2005;165:1458-1464.
2. White, R. (2003). The Epidemiology of Venous Thromboembolism. Circulation, 107, I-4-I-8.
3. Surgeon General's Call to Action to Prevent DVT and PE 2003 DHHS. http://www.surgeongeneral.gov/library/conference/deepvein/agenda.html.Accessed 6/13/12.
4. Agency for Healthcare Research and Quality, Evidence Report / Technology Assessment Number 68. "Diagnosis and Treatment of Deep Venous Thrombosis and Pulmonary Embolism.
5. Heit J.A., O'Fallon W.M., Petterson TM, et al. Relative impact of risk factors for deep vein thrombosis and pulmonary embolism, Arch Intern Med, 2002; 162:1245-1248.

2.2 Risk Factors

The following risk factors have been found to put a patient at risk for PE or DVT[1,2]:

- Age greater than 50
- Prior history of VTE
- Obesity and overweight
- Cancer and cancer therapy
- Prolonged immobility
- Previous DVT or PE or family history
- Supplemental estrogen
- Recent major surgery or trauma
- Inherited blood disorders
- Pregnancy and childbirth
- Cardiovascular disease
- Smoking
- Ethnicity of African American or White

[1] White, R. (2003). The Epidemiology of Venous Thromboembolism. *Circulation*, 107, I-4-I-8.
[2] Mayo Clinic. (September 2011) Pulmonary Embolism Risk Factors. http://www.mayoclinic.com/health/pulmonary-embolism/ds00429/dsection=risk-factors Accessed 6/13/12.

2.3 Evidence-Based Practice Guidelines

In an effort to prevent VTE, care management bundles have been created. ***A care bundle is a set of evidence-based interventions*** that, when used together, significantly improve patient outcomes. To reduce the prevalence of VTE, the American College of Chest Physicians has developed a synthesis of evidence-based prevention guidelines. The ACCP guidelines recommend that every acute care facility have a comprehensive, systematic strategy related to the assessment of VTE risk, prophylaxis, diagnosis, treatment, monitoring and patient education. By incorporating the latest guidelines on VTE prevention, we can improve patient outcomes and reduce costs. A summary of the ACCP recommendations is outlined below.

Summary of ACCP VTE Prevention Guidelines for Surgical Patients

- All patients should undergo a VTE risk assessment to identify low, moderate and high risk patients
- Thromboprophylaxis recommendations are graded as strong (Grade 1) or weak (Grade 2) with quality of the evidence graded as high (A), moderate (B), or low (C):

Indication	Recommendation
Surgical patients at increased risk of thrombosis who are bleeding or are at high risk for major bleeding:	• Employ mechanical prophylaxis with graduated compression stockings or intermittent pneumatic compression (IPC) at least until the risk of bleeding decreases
General and abdominal-pelvic surgery patients at very low risk for VTE:	• Encourage early ambulation • Do not use pharmacologic (Grade 1B) or mechanical prophylaxis (Grade 2C)
General and abdominal-pelvic surgery patients at moderate risk for VTE who are not at high risk for major bleeding:	• Low Molecular Weight Heparin (LMWH) (Grade 2B), • Low Dose Unfractionated Heparin (LDUH) (Grade 2B) or • mechanical prophylaxis, preferably with IPC (Grade 2C)
General and abdominal-pelvic surgery patients at high risk for VTE who are NOT at high risk for major bleeding:	• LMWH (Grade 1B) or LDUH (Grade 1B). • Add mechanical prophylaxis with elastic stockings or IPC to pharmacologic prophylaxis (Grade 2C)
High-VTE-risk patients undergoing abdominal or pelvic surgery for cancer who are NOT otherwise at high risk for major bleeding complications:	• Extended-duration prophylactic treatment with LMWH for 4 weeks (Grade 1B)
Thoracic surgery patients at moderate risk for VTE who are NOT at high risk for perioperative bleeding:	• LDUH (Grade 2B), LMWH (Grade 2B), or • mechanical prophylaxis with IPC (Grade 2C) over no prophylaxis
Thoracic surgery patients at high risk for VTE who are NOT at high risk for perioperative bleeding:	• LDUH (Grade 1B) or LMWH (Grade 1B) over no prophylaxis, in addition, to mechanical prophylaxis (Grade 2C)

Craniotomy patients:	• Employ mechanical prophylaxis, preferably with IPC, over no prophylaxis (Grade 2C) or pharmacologic prophylaxis (Grade 2C)
Craniotomy patients at very high risk for VTE (e.g., those undergoing craniotomy for malignant disease):	• Add pharmacologic prophylaxis to mechanical prophylaxis once adequate hemostasis is established and the risk of bleeding decreases (Grade 2C)
Total hip arthroplasty or total knee arthroplasty surgeries:	• Use of one of the following for a minimum of 10 to 14 days: LMWH, fondaparinux, apixaban, dabigatran, rivaroxaban, LDUH, adjusted-dose vitamin K antagonist (VKA), aspirin (all Grade 1B) or intermittent pneumatic compression device (IPCD) (Grade 1C)
Hip fracture surgery:	• Use of one of the following rather than no antithrombotic prophylaxis for a minimum of 10 to 14 days: LMWH, fondaparinux, LDUH, adjusted-dose VKA, aspirin (all Grade 1B), or an IPCD (Grade 1C)
Conclusion: Decision regarding prophylaxis should be made after consideration of risk factors for both thrombosis and bleeding, clinical context, and patients' values and preferences. Source: Guyatt, G.H., Akl, E.A., Crowther M., Gutterman, D.D., Schünemann, H.J., (2012). Executive Summary: Antithrombotic Therapy and Prevention of Thrombosis, 9th ed: American College of Chest Physicians Evidence-Based Clinical Practice.	

2.4 MHS VTE Performance Measures

The Joint Commission and the Centers for Medicare and Medicaid Services have developed process VTE quality measures for surgical patients. The Agency for Healthcare Research and Quality has developed an outcome patient safety indicator identifying post-operative DVT and PE. The MHS has selected the following process and outcomes indicators to measure performance:

Description	Data Source	Metric
SCIP-VTE-2: Surgery Patients Who Received Appropriate Venous Thromboembolism Prophylaxis Within 24 Hours Prior to Surgery to 24 Hours After Surgery **Numerator:** Number of surgery patients who received appropriate VTE prophylaxis within 24 hours prior to anesthesia start time to 24 hours after surgery for all selected surgery patients. **Denominator:** All selected surgery patients	TJC ORYX	Process Measure
Numerator: Discharges among cases meeting the inclusion and exclusion rules for the denominator with ICD-9-CM codes for deep vein thrombosis or pulmonary embolism in any secondary diagnosis field. **Denominator:** All surgical discharges age 18 and older defined by specific DRGs or MS-DRGs and an ICD-9-CM code for an operating room procedure.	MHS PSP PSI -12	Outcome Measure

3. References

AHRQ, (2008) Preventing Hospital Acquired Venous Thromboembolism, AHRQ.

Agency for Healthcare Research and Quality, Evidence Report / Technology Assessment Number 68. "Diagnosis and Treatment of Deep Venous Thrombosis and Pulmonary Embolism.

Guyatt, G.H., Akl, E.A., Crowther M., Gutterman, D.D., Schünemann,H.J., *(2012)*. Executive Summary: Antithrombotic Therapy and Prevention of Thrombosis, 9th ed: American College of Chest Physicians Evidence-Based Clinical Practice Guidelines. *Chest,* 141(2)(Suppl): 7S-47S.

Heit J.A., O'Fallon W.M., Petterson TM, et al. Relative impact of risk factors for deep vein thrombosis and pulmonary embolism, *Arch Intern Med*, 2002; 162:1245-1248.

Surgeon General's Call to Action to Prevent DVT and PE 2003 DHHS. http://www.surgeongeneral.gov/library/conference/deepvein/agenda.html. Accessed 7/11/12.

Tapson VF, Hyers T.M., Waldo A.L., et al. Antithrombotic therapy practices in US hospitals in an era of practice guidelines, *Arch Intern Med*, 2005;165:1458-1464.

White, R. (2003). The Epidemeniology of Venous Thromboembolism. Circulation, 107, 1-4-1-8.