Implementing AORN Recommended Practices for Prevention of Deep Vein Thrombosis

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ABSTRACT

One to two people per 1,000 are affected by deep vein thrombosis (DVT) or pulmonary embolism in the United States each year. AORN published its new “Recommended practices for prevention of deep vein thrombosis” to guide perioperative RNs in establishing organization-wide protocols for DVT prevention. Strategies for successful implementation of the recommended practices include taking a multidisciplinary approach to protocol development, providing education and guidance for performing preoperative patient assessments and administering DVT prophylaxis, and having appropriate resources and the facility’s policy and procedure for DVT prevention readily available in the practice setting. Hospital and ambulatory patient scenarios have been included as examples of appropriate execution of the recommended practices. AORN J 94 (November 2011) 443-451, © AORN, Inc, 2011. doi: 10.1016/j.aorn.2011.07.018

Key words: AORN recommended practices, deep vein thrombosis, pulmonary embolism, DVT prophylaxis, graduated compression stockings, intermittent pneumatic compression devices.

The purpose of the new recommended practices (RP) document is to “guide perioperative RNs by providing a framework that can be used for developing a protocol for deep vein thrombosis (DVT) prevention” and to provide guidance for administering mechanical and pharmacologic prophylaxis. There are nine recommendations that will help perioperative RNs identify and minimize the risks for DVT while developing an optimal level of practice.
WHAT'S NEW?
The new RP document supersedes the 2007 AORN “Guideline for prevention of venous stasis.” A number of significant changes were made to the guideline during its development into an RP document. The most notable changes include the incorporation of more actionable steps and the elimination of material considered to be purely educational and therefore not germane to implementation of the practice recommendations.

RATIONALE
According to the Centers for Disease Control and Prevention (CDC), DVT and pulmonary embolism (PE) are a significant concern in the United States:

- As many as 60,000 to 100,000 Americans die each year because of DVT or PE.  
- Estimates of the annual number of individuals affected by DVT or PE in the United States range from 300,000 to 600,000, or one to two per 1,000 people; this is possibly as high as one in 100 people in those older than 80 years.  
- One-third of persons who develop a DVT will have long-term complications, and one-third will have a recurrence within 10 years.  
- Approximately 5% to 8% of the US population has inherited thrombophilias that increase the risk for thrombosis.

Although the prevention of DVT and PE should be a priority of the entire health care system, the particular risks facing perioperative patients makes it imperative that perioperative RNs take an active role in DVT prevention.

Venous thromboembolism (VTE) prophylaxis is one of the Surgical Care Improvement Project (SCIP) measures that are reported to health care accreditation agencies (eg, the Joint Commission), the Centers for Medicare & Medicaid Services (CMS), and other insurance payers. The SCIP measures for perioperative VTE prophylaxis will be included in the Clinical Process of Care Measures for the CMS Hospital Value-Based Purchasing (VBP) program. Beginning in fiscal year 2013, for discharges occurring on or after October 1, 2012, this program will implement a pay-for-performance system based on how well a facility performs on each measure or how much performance is improved on a specific measure during a stated performance period.

DISCUSSION
A discussion of the key points of the RP for prevention of DVT in combination with various strategies for successful implementation of the practice recommendations follows. As applicable to each recommendation, explanation of the perioperative nurse’s role as patient advocate is incorporated. Hospital and ambulatory patient scenarios representing examples of implementation also are provided.

Recommendation I
A key element to successful execution of the practice recommendations for prevention of DVT in an organization is the development and implementation of an organization-wide protocol that includes care of the perioperative patient. The protocol should

- include perioperative-specific DVT prevention measures,  
- be evidence based and applicable to all patients in the facility population,  
- include the use of a computer-generated alert that identifies the patient at risk for developing a DVT,  
- link each level of risk to evidence-based prophylaxis options, and  
- list contraindications to prophylaxis and provide recommendations for alternative modalities.

When computerized documentation is not available, the patient assessment form should highlight those items, or groups of items, that indicate increased risk for developing a DVT and a consistent order set should be used.
The health care organization-wide DVT protocol should be developed by a multidisciplinary team that includes RNs; physicians; anesthesia professionals; pharmacists; personnel from quality/risk management, information technology, and administration; and other key stakeholders. Acceptance of the protocol and ease of implementation will be greatly improved if the individuals who will actually be using the protocol are involved in the development and decision-making process from the beginning.

The support and sponsorship of the health care organization, and, more importantly, the support and sponsorship of key leaders in the organization, will be essential for successful development of the protocol and implementation of the recommended practices. Choosing a physician team leader who will champion the cause and encourage other physicians to embrace the protocol and adhere to the recommended interventions will be particularly advantageous. A physician hospitalist, pulmonologist, hematologist, critical care physician, anesthesiologist, or surgeon is likely to be the best choice for this key position.

Starting the development process will be for the protocol team to thoroughly review the literature and identify best practices for DVT prophylaxis. Identifying and incorporating best practices into the protocol and having a solid literature base to support the recommendations will be of the essence in resolving disputes that may arise or in addressing resistance to specific elements of the protocol. Many health care organizations are willing to share the documents they have developed and are currently using. Teaching universities (even if not close by) are excellent resources; however, it may take a bit of investigative work to reach the individuals who created the documents or have the authority to release them to an outside facility or organization.

Developing the protocol will take time and effort. Excellent leadership and organizational skills will be necessary with regard to management of time, resources, and people. A highly visible and enthusiastic presence coupled with patience and humor and a persistent focus on the final goal is likely to be the best approach for all members of the protocol development team. Developing a protocol for prevention of DVT provides an outstanding opportunity to enhance collaboration and collegial relationships between all involved parties. These individuals include both internal facility personnel (eg, nurses, hospitalists, administrators) and external parties (eg, surgeons, anesthesia professionals, individuals providing resources). The end result should be a reliable, evidence-based protocol for prevention of venous thrombosis that is
easy to follow and also fulfills regulatory and accreditation requirements.

**Recommendation II**
The perioperative RN should conduct a thorough and careful preoperative patient assessment to determine the individual patient’s risk factors for DVT. The assessment should include, but not be limited to, the risk factor groups associated with Virchow’s triad (ie, venous stasis, vessel wall injury, hypercoagulability) because patients with these risk factors have a greater potential for DVT formation. Based on the individual patient’s DVT risk factor assessment, the perioperative RN should consult and collaborate with surgical team members and members of other disciplines as appropriate regarding the need for and selection of prophylaxis in the organizational protocol.

An important step when implementing this practice recommendation will be to provide education and guidance for nurses who will be conducting preoperative assessments. A well-respected advanced practice nurse or nurse educator in the facility may prove to be an excellent resource for patient assessment education and hands-on demonstrations. An experienced nursing instructor who teaches assessment courses may be willing to come to the facility to provide education and to recommend specific nursing assessment texts that could be used as facility resources.

As patient advocates, nurses must be conscientious to ensure that questions that arise during the preoperative assessment are fully addressed and the information required for accurate decision-making is communicated to the appropriate parties. Establishing a collegial atmosphere in which nurses feel empowered to advocate for patients through collaboration with physicians and other health care providers will be essential to successful implementation of this recommendation. Initiating team-building exercises for all members of the team, including physicians, may be helpful in promoting and nurturing a climate that encourages cohesiveness, community spirit, and a commitment to patient safety.

**Recommendation III**
Perioperative RNs will need to apply specific interventions to decrease the potential for complications when the patient is receiving mechanical prophylaxis, including graduated compression stockings (GCS) and intermittent pneumatic compression (IPC) devices (Figures 1 and 2). Contacting the vendor representative and scheduling product-specific education and inservice programs along with hands-on practice can be very effective in promoting proper use of mechanical prophylaxis devices and products. It is vitally impor-

![Figure 1. (A) Knee-high graduated compression stockings. (B) Thigh-high graduated compression stockings.](446 | AORN Journal)
tant that the perioperative RNs who will be using these products understand the significance of ensuring proper size, fit, and application when using mechanical modalities for prevention of DVT. It is also crucial that these nurses be cognizant of the contraindications to mechanical prophylaxis measures (eg, dermatitis, arteriosclerosis)\(^\text{15-18}\) and the complications that can occur as a result (eg, skin injury, nerve palsy)\(^\text{17-19}\).

Implementing this recommendation will be much easier if there are sufficient sizes and quantities of devices, measuring tools, and any other supplies that may be required. These items must be conveniently located to allow for ease of application and use. In addition, product literature and facility policies and procedures regarding mechanical prophylaxis interventions should be readily available for reference.

**Recommendation IV**

As patient advocates accountable for their own actions, RNs who administer pharmacologic DVT prophylaxis must be familiar with the scope and standards of nursing practice as well as the health care organization’s policies and procedures for medication administration and documentation. It is fundamentally important that these nurses be completely cognizant of the contraindications to pharmacologic prophylaxis (eg, ocular surgery, pregnancy)\(^\text{5,20,21}\) as well as the complications that might occur as a result of the administration of anticoagulant medications (eg, bleeding, compartment syndrome)\(^\text{6,22}\).

Implementation of pharmacologic prophylaxis will be easier if medication administration protocols and other resources, such as paper or electronic drug references, pertaining to anticoagulants and other medications are readily available. Inservice programs and education presented by, or better yet in combination with, anesthesia professionals and members of other facility departments (eg, the critical care unit) who are involved in the administration of pharmacologic prophylaxis may be helpful and will also provide an excellent opportunity for collaboration and partnership in this important aspect of patient care.

**Recommendation V**

“The perioperative RN should provide the patient and his or her designated caregiver(s) instructions regarding prevention of DVT and the prescribed prophylactic measures.”\(^\text{1(e7)}\) The patient has a right to be informed about his or her medical condition and the surgical procedure and treatment plan. Patient education and discharge planning for surgical procedures begins in the preoperative phase of care with the initial visit to the physician’s office and continues throughout the scheduling procedure, diagnostic testing, the preadmission interview, and the preanesthesia assessment.

Nurses who have been fully educated regarding DVT and PE, the associated risk factors,
and the mechanical and pharmacologic prophylaxis measures should have few, if any, problems providing the necessary patient education. Providing opportunities for role-playing exercises may be helpful for nurses who lack confidence in their communication skills or teaching abilities. Allowing these nurses to proctor with nurses who are especially skilled in teaching should be helpful and may prove to be a wise investment of time for the nurses that will benefit both nurses and patients.

A good place to begin patient and family member education is with an examination of the organization’s current educational methods and materials used for patient education. Devoting time, energy, and resources to verifying that patient education needs are being addressed and to filling in any gaps found should provide a solid return in the area of patient compliance and customer satisfaction. The facility’s current educational materials should be examined and new tools created or current tools revised as needed.

**The Final Four**

The final four recommendations in each AORN RP document discuss education/competency, documentation, policies and procedures, and quality assurance/performance improvement. These four topics are integral to the implementation of AORN practice recommendations. Personnel should receive initial and ongoing education and competency validation as applicable to their roles. Implementing new and updated practice recommendations affords an excellent opportunity to create or update competency materials and validation tools. AORN’s perioperative competencies team has developed the AORN *Perioperative Job Descriptions and Evaluation Tools* to assist perioperative personnel in developing competency evaluation tools and job descriptions.

Documentation of nursing care should include patient assessment, plan of care, nursing diagnosis, and identification of desired outcomes and interventions, as well as an evaluation of the patient’s response to care. Implementing new or updated practice recommendations may warrant a review or revision of the relevant documentation being used in the facility.

Policies and procedures should be developed, reviewed periodically, revised as necessary, and readily available in the practice setting. New or updated practice recommendations may present an opportunity for collaborative efforts with nurses and personnel from other departments in the facility to develop organization-wide policies and procedures that support the recommended practices. The AORN Policy and Procedure Tem-

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**Educational Resources**

AORN provides a number of excellent educational resources on the topic of deep vein thrombosis (DVT) and prophylaxis modalities:

- *AORN Journal* articles on DVT and pulmonary embolism
  
  www.aorn.org/AORNJournal

- Confidence-Based Learning module
  
  http://www.aorn.org/Education/ConfidenceBasedLearning

  A DVT-related module is scheduled for release toward the end of 2011

- Periop 101: A Core Curriculum™
  
  http://www.aorn.org/Education/Periop101/

- Recommended practices for prevention of deep vein thrombosis [webinar]
  
  http://www.aorn.org/Education/Webinars/PreviouslyRecordedWebinars

  Contact hours for this webinar expire February 22, 2012.

*Web site access verified July 12, 2011.*
plates, 2nd edition,\textsuperscript{24} provides a collection of 15 sample policies and customizable templates based on AORN’s Perioperative Standards and Recommended Practices. Regular quality improvement projects are necessary to improve patient safety and to ensure safe, quality care. For details on the final four practice recommendations that are specific to the RP document discussed in this article, please refer to the full text of the RP document.

**AMBULATORY PATIENT SCENARIO**

Nurse C works in the preoperative holding area at the Riverside Ambulatory Surgery Center. Her patient, Ms E, is a 42-year-old woman with a body mass index of 37.5 kg/m\(^2\) who is scheduled for a laparoscopic right ovarian cystectomy by Dr Q at 9:30 AM. While conducting the preoperative assessment, Nurse C notes that Ms E had an episode of DVT approximately six months previously and is currently taking estradiol 1 mg daily. There are no medical orders for DVT prophylaxis. Dr Q is not always receptive to interdisciplinary collaboration. What actions should Nurse C take?

As an advocate for her patient, the most appropriate action for Nurse C would be to speak with Dr Q as soon as possible. Nurse C should relate to Dr Q that there are no orders for DVT prophylaxis and specify her concerns regarding the patient’s unique risk factors for DVT (ie, age greater than 40 years, obesity, potential for surgery to last longer than 30 minutes, hormone replacement therapy, history of DVT). Nurse C should document her conversation with Dr Q in the medical record and implement the orders for DVT prophylaxis that occur as a result. In the

![Figure 3](image-url)

Figure 3. (A) Measuring for proper fit of knee-high graduated compression stockings. (B) Measuring for proper fit of thigh-high graduated compression stockings.
event that Dr Q chooses not to provide orders for DVT prophylaxis measures, Nurse C should report her concerns to the nurse manager.

HOSPITAL PATIENT SCENARIO
Nurse D works on the postoperative surgical unit at Urban Hospital. Her patient, Mr P, is a 62-year-old man recovering from a laparoscopic-assisted sigmoid colon resection the day before. As she enters the room to conduct a routine head-to-toe assessment, Nurse D notices that the IPC devices have been turned off and the wraps and GCS have been removed. When questioned about this, the patient’s wife states that she removed them because her husband was complaining that the pumps and stockings were itchy and uncomfortable. What actions should Nurse D take?

Nurse D should first consider the situation and ensure there are no physical or mechanical reasons for Mr P’s discomfort. His skin integrity should be carefully assessed. Mr P’s GCS should be checked for proper size (Figure 3) and fit. Likewise, his IPC wraps should be checked for proper size, fit, and placement. The IPC device should additionally be checked for proper function and settings. If Mr P’s skin is in good condition and there are no mechanical or functionality issues, Nurse D should carefully reapply the mechanical devices and take a few minutes to provide some patient and family member education. The teaching should be directed to Mr P but should also include Mrs P. Nurse D should avoid using medical jargon and provide the educational information in short, simple sentences. She should emphasize the importance of complying with treatment to prevent the development of blood clots after surgery. Mr P’s specific concerns (eg, the stockings are itchy) should be addressed, and he and Mrs P should be given the opportunity to ask questions and to repeat back what they have learned. Mr and Mrs P also should be provided with educational materials regarding DVT prophylaxis. Nurse D should document the education session and demonstration of understanding by Mr and Mrs P in the medical record.

CONCLUSION
Implementing the AORN recommended practices for prevention of DVT presents a unique opportunity to build collaboration within and beyond the facility setting and to make certain that evidence-based practices are understood and followed by all clinical practitioners. Perioperative RNs can take an active role in DVT and PE prevention by providing a careful and thorough preoperative assessment, advocating for patients through collaboration with professional colleagues, and educating patients as to the necessity of compliance with prophylactic treatments.

References

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This RP Implementation Guide is intended to be an adjunct to the complete recommended practices document upon which it is based and is not intended to be a replacement for that document. Individuals who are developing and updating organizational policies and procedures should review and reference the full recommended practices document.
Implementing AORN Recommended Practices for Prevention of Deep Vein Thrombosis

PURPOSE/GOAL

To educate perioperative nurses about how to implement the AORN “Recommended practices for prevention of deep vein thrombosis (DVT)” in inpatient and ambulatory settings.

OBJECTIVES

1. Identify the purpose of AORN’s “Recommended practices for prevention of DVT.”
2. Discuss the prevalence of DVT and pulmonary embolism in the United States.
3. Identify the regulatory and accrediting bodies that measure DVT prevention in health care facilities.
4. Discuss AORN’s practice recommendations for prevention of DVT.
5. Identify methods for implementing AORN’s practice recommendations for prevention of DVT.

The Examination and Learner Evaluation are printed here for your convenience. To receive continuing education credit, you must complete the Examination and Learner Evaluation online at http://www.aorn.org/CE.

QUESTIONS

1. The purpose of AORN’s “Recommended practices for prevention of deep vein thrombosis” is to provide perioperative RNs with
   1. a framework that can be used for developing a protocol for DVT prevention.
   2. a framework for inservice education programs on DVT prevention.
   3. guidance for administering mechanical prophylaxis.
   4. guidance for administering pharmacologic prophylaxis.
   a. 1 and 2
   b. 3 and 4
   c. 1, 3, and 4
   d. 1, 2, 3, and 4

2. According to the Centers for Disease Control and Prevention, as many as 60,000 to 100,000 Americans die each year because of DVT or pulmonary embolism.
   a. true
   b. false

3. Measures taken at health care facilities for venous thromboembolism prophylaxis are currently or are expected to be required to be reported to
   1. the Centers for Medicare & Medicaid Services (CMS).
   2. insurance payers.
3. the Joint Commission.
4. the US Food and Drug Administration.
   a. 1 and 2     b. 3 and 4
   c. 1, 2, and 3     d. 1, 2, 3, and 4

4. An organization-wide protocol for prevention of DVT should
   1. be developed by a multidisciplinary team.
   2. be evidence based and applicable to all patients in the facility population.
   3. include the use of a computer-generated alert that identifies the patient at risk for developing a DVT.
   4. list contraindications to prophylaxis and provide recommendations for alternative modalities.
      a. 2 and 4     b. 1 and 3
      c. 1, 3, and 4     d. 1, 2, 3, and 4

5. The first step in developing an organization-wide protocol for prevention of DVT is to thoroughly review the literature and identify best practices for DVT prophylaxis.
   a. true     b. false

6. _______________________ can be an excellent resource in providing education and guidance for nurses who will be conducting preoperative patient assessments for DVT risk factors.
   1. An advanced practice nurse
   2. A nurse educator
   3. A nursing instructor who teaches assessment courses
   4. A nursing assessment text
      a. 1 and 2     b. 2 and 3
      c. 1, 2, and 4     d. 1, 2, 3, and 4

7. Implementing the recommendation that perioperative nurses apply specific interventions to decrease the potential for complications when the patient is receiving mechanical prophylaxis will be easier if
   a. one perioperative nurse is dedicated to stocking related supplies and materials.
   2. product literature and facility policies and procedures are readily available.
   3. there are sufficient sizes and quantities of devices and measuring tools.
   4. supplies are conveniently located to allow for ease of application and use.
      a. 1 and 3     b. 2 and 4
      c. 2, 3, and 4     d. 1, 2, 3, and 4

8. Implementation of pharmacologic prophylaxis for DVT will be easier if
   1. inservice education programs are presented by nursing staff members only.
   2. medication administration protocols are readily available.
   3. paper or electronic drug references are readily available.
   4. separate inservice education programs are presented for nursing staff members and anesthesia professionals.
      a. 1 and 2     b. 2 and 3
      c. 1, 2, and 3     d. 1, 2, 3, and 4

9. Patient education and discharge planning for surgical procedures takes place during
   1. the preoperative phase of care.
   2. diagnostic testing.
   3. the preadmission interview.
   4. the preanesthesia assessment.
      a. 1 and 3     b. 2 and 4
      c. 1, 2, and 4     d. 1, 2, 3, and 4

10. A good place to begin patient and family member education is with an examination of the organization’s current educational methods and materials used for patient education.
    a. true     b. false

The behavioral objectives and examination for this program were prepared by Kimberly Retzlaff, editor, with consultation from Rebecca Holm, MSN, RN, CNOR, clinical editor, and Susan Bakewell, MS, RN-BC, director, Center for Perioperative Education. Ms Retzlaff, Ms Holm, and Ms Bakewell have no declared affiliations that could be perceived as potential conflicts of interest in the publication of this article.
Implementing AORN Recommended Practices for Prevention of Deep Vein Thrombosis

This evaluation is used to determine the extent to which this continuing education program met your learning needs. Rate the items as described below.

**OBJECTIVES**

To what extent were the following objectives of this continuing education program achieved?

1. Identify the purpose of AORN’s “Recommended practices for prevention of DVT.”
   *Low 1. 2. 3. 4. 5. High*

2. Discuss the prevalence of DVT and pulmonary embolism in the United States.
   *Low 1. 2. 3. 4. 5. High*

3. Identify the regulatory and accrediting bodies that measure DVT prevention in health care facilities.
   *Low 1. 2. 3. 4. 5. High*

4. Discuss AORN’s practice recommendations for prevention of DVT.
   *Low 1. 2. 3. 4. 5. High*

5. Identify methods for implementing AORN’s practice recommendations for prevention of DVT.
   *Low 1. 2. 3. 4. 5. High*

**CONTENT**

6. To what extent did this article increase your knowledge of the subject matter?
   *Low 1. 2. 3. 4. 5. High*

7. To what extent were your individual objectives met? *Low 1. 2. 3. 4. 5. High*

8. Will you be able to use the information from this article in your work setting? *1. Yes 2. No*

9. Will you change your practice as a result of reading this article? (If yes, answer question #9A. If no, answer question #9B.)

9A. How will you change your practice? *(Select all that apply)*

1. I will provide education to my team regarding why change is needed.
2. I will work with management to change/implement a policy and procedure.
3. I will plan an informational meeting with physicians to seek their input and acceptance of the need for change.
4. I will implement change and evaluate the effect of the change at regular intervals until the change is incorporated as best practice.
5. Other: ________________________________

9B. If you will not change your practice as a result of reading this article, why? *(Select all that apply)*

1. The content of the article is not relevant to my practice.
2. I do not have enough time to teach others about the purpose of the needed change.
3. I do not have management support to make a change.
4. Other: ________________________________

10. Our accrediting body requires that we verify the time you needed to complete the 2.0 continuing education contact hour (120-minute) program: ___