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ACFAS Clinical Consensus Statement

American College of Foot and Ankle Surgeons' Clinical Consensus Statement: Risk, Prevention, and Diagnosis of Venous Thromboembolism Disease in Foot and Ankle Surgery and Injuries Requiring Immobilization



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Venous Thromboembolism Prophylaxis Clinical Consensus Statement Panel of the American College of Foot and Ankle Surgeons, Chicago, IL

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ABSTRACT

The purpose of this document is to provide guidance for physicians regarding the risk, prevention, and diagnosis of venous thromboembolism disease after foot and ankle surgery and while caring for lower extremity injuries that require ankle immobilization. A panel composed of all authors of this document reviewed the published evidence and, through a series of meetings, reached consensus regarding the viewpoints contained herein. We conclude that routine chemical prophylaxis is not warranted; rather, patients should be stratified and have a prevention plan tailored to their individual risk level. An effective venous thromboembolism prevention program is typically multimodal and focuses on addressing any modifiable risk factors, use of mechanical prophylaxis, early mobilization, and careful consideration of the use of chemical prophylaxis. The final decision regarding use and method(s) of prophylaxis adopted should be agreed upon by both the clinician and patient after a discussion of the potential benefits and harms as they relate to the individual. This should take place preferably during the preoperative visit or in the immediate post-injury setting, and it may need to be revisited during the course of care if the patient's risk level changes. Prompt recognition of the signs and symptoms of deep venous thrombosis following surgery or injury is important. Patients suspected of deep venous thrombosis should receive further work-up with either a D-dimer test or duplex venous ultrasound of the symptomatic leg, depending on their pretest probability for the disease. The latter can be determined using a validated clinical decision-making tool (e.g., Well's criteria).

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This document was created to serve as a clinical consensus statement (CCS) of the American College of Foot and Ankle Surgeons (ACFAS). It is important to appreciate that consensus statements do not represent *clinical practice guidelines*, *formal evidence reviews*, *recommendations*, or *evidence-based guidelines*. Rather, a CCS reflects information synthesized by an organized group of experts based on the best available evidence, and it may also contain opinions, uncertainties, and minority viewpoints. A CCS should open the door to discussion on a topic, as opposed to attempting to provide definitive answers. Adherence to consensus statements will not ensure successful treatment in every clinical situation, and the physician should make the ultimate decision based on all available clinical information and circumstances

with respect to the appropriate treatment of an individual patient. Given the inevitable changes in the state of scientific information and technology, periodic review and revision will be necessary.

Definition of Venous Thromboembolism Disease

For the purposes of this document, *venous thromboembolism disease* (VTED) is defined as a clinical spectrum of pathologic clotting that encompasses both deep venous thrombosis (DVT) and pulmonary embolism (PE). DVT is the formation of a thrombus in one of the deep veins of the body. PE is a blockage of one or more of the pulmonary arteries by a thrombus that has travelled from another part of the body via the deep venous system.

Background Rate of Venous Thromboembolism Disease

VTED affects 300,000 to 600,000 people and is the proximate cause of more than 60,000 deaths each year in the United States (1).

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There is potentially increased risk of VTED following foot/ankle surgery and lower limb injury; however, the incidence of VTED in these instances is poorly understood. This is at least partly due to the wide range of procedures/injuries encountered in this area of the body, their varying levels of complexity, and the varying aftercare protocols (e.g., immediate weightbearing versus strict non-weightbearing). In addition, thrombotic endpoints have not been consistently reported in the literature from study to study, and they vary from strictly clinical (i.e., symptomatic DVT) to sonographic and phlebographic, and they also vary in terms of reported location (e.g., distal versus proximal lower extremity DVT).

In a large administrative database study with nearly 90,000 patients, Jameson et al (2) found that the rate of symptomatic VTED after ankle fracture surgery, total ankle replacement surgery, hindfoot arthrodesis, or first metatarsal surgery was less than 0.3% for each type of surgery. Similarly, following 2,733 patients for an average of 90 days after foot or ankle surgery, Mizel et al (3) found that the prevalence of symptomatic DVT and non-fatal PE was only 0.22% and 0.15%, respectively. In contrast, Solis and Saxby (4) found a 3.5% incidence of post-operative DVT among 201 patients who underwent foot ankle surgery that involved use of venous sonography for surveillance. However, all of these DVT cases were clinically asymptomatic. Still other studies found alarmingly high rates of VTED following foot/ankle surgery. In particular, 2 reports of studies using phlebographic endpoints observed DVT rates among patients who had not received chemical prophylaxis to be as high as 28% and 36% following ankle fracture surgery (5) and Achilles tendon rupture surgery (6), respectively.

Shortcomings of Current Guidance

The American College of Chest Physicians (ACCP) (7) recommends use of chemical prophylaxis or an intermittent pneumatic compression device for patients undergoing major orthopedic surgery in their latest 2012 guidelines. The same guidelines suggest that no chemical prophylaxis is needed for patients with a lower extremity injury that requires immobilization (7). These guidelines, however, do not attempt to differentiate among the numerous foot and ankle conditions encountered in clinical practice and, instead, treat all isolated injuries distal to the knee in the same manner. Furthermore, ACCP panel members were asked only to consider the use of prophylaxis to reduce fatal and symptomatic PE and symptomatic DVT when developing their recommendations; the panel did not take into account the possible adverse outcomes associated with the development of postthrombotic syndrome (PTS). PTS is characterized by leg pain and swelling and occurs when venous valvular reflux and outflow obstruction develop after DVT (8). It is estimated that PTS may affect 20% to 50% of patients diagnosed with DVT, and most symptoms of PTS become apparent within 2 years of the diagnosis of DVT (9). PTS can lead to diminished quality of life and reduced productivity (10), and 5% to 10% of patients with PTS develop a severe form of illness, which may include venous leg ulcers (8,9). Recent work suggests that PTS avoidance can significantly reduce overall health care costs (11). Although we agree that avoiding symptomatic VTED and avoiding mortality in the short term remain the primary outcomes of interest when considering the use of chemical prophylaxis, our panel felt that PTS avoidance was also an important endpoint worthy of consideration when developing the viewpoints contained herein.

The purpose of this CCS is to address the topics of risk, prevention, and diagnosis of VTED following foot and ankle surgery or injury. More specifically, our aim is to provide insight into 4 questions:

1. Is routine chemical prophylaxis warranted after foot/ankle surgery or injury requiring immobilization?

2. If routine prophylaxis is not warranted, which patients should receive chemical prophylaxis?
3. Which method(s) of VTED prophylaxis is/are preferred?
4. Which diagnostic tests should be used for an individual suspected of DVT?

Materials and Methods

Creation of Panel

Members of ACFAS have suggested that CCSs would be useful; therefore, ACFAS enacted an initiative to create such documents for foot and ankle surgeons. This initiative was originally conceived to report on a variety of topics and take the place of previous clinical practice guidelines (CPGs). To move forward with this initiative, a formal consensus method process was undertaken. On April 18, 2014, experts in the field of foot and ankle surgery were sent an invitation by ACFAS to participate on a panel tasked with developing a CCS on VTED prophylaxis. The 6-member panel completed disclosures and was led by a chairperson and assisted by ACFAS staff. Over several months, panel members participated in e-mail dialogue, several conference calls, and a face-to-face meeting. The panel's stated goal was to examine the current literature regarding the use of VTED prophylaxis and DVT diagnosis after foot and ankle surgery or injury, and to compile this information to provide direction in risk assessment, use of prophylaxis, and diagnosis of VTED in postoperative and post-injury settings. A literature search was undertaken to identify published studies on these topics. In addition, the panel reached consensus on a series of questions relating to VTED prophylaxis and diagnosis.

Literature Review

Search terms were identified for the 3 principal CCS areas of interest (i.e., VTED risk, VTED prevention, and diagnosis of DVT) and were searched within the Cochrane Database of Systematic Reviews, Cochrane Controlled Trials, PubMed, OVID, EMBASE, Cumulative Index of Nursing and Allied Health Literature (CINAHL), and Google Scholar. The search terms and Boolean operators utilized to identify articles relating to VTED risk were as follows: ("risk" OR "risk assessment" OR "incidence" OR "prevalence") AND ("venous thromboembolism" OR "deep vein thrombosis" OR "pulmonary embolism" OR "postthrombotic syndrome") AND ("foot" OR "ankle"). Studies involving elective surgery and trauma patients were included. Studies dealing primarily with multitrauma patients were excluded. The search strategy used to identify articles relating to VTED prevention was as follows: ("foot" OR "ankle") AND ("immobilization" OR "cast" OR "orthosis" OR "surgery" OR "surgical" OR "trauma") AND ("venous thromboembolism" OR "deep vein thrombosis" OR "pulmonary embolism" OR "postthrombotic syndrome") AND ("prophylaxis" OR "thromboprophylaxis" OR "low molecular weight heparin" OR "LWMH" OR "aspirin" OR "mechanical" OR "inferior vena cava filter" OR "IVC filter"). Again, studies involving elective surgery and trauma were included, whereas studies dealing primarily with multitrauma patients were excluded. The search terms and Boolean operators used to identify articles relating to DVT diagnosis were as follows: ("diagnosis" OR "algorithms" OR "predictive value" OR "tests" OR "D-dimer" OR "Hohman's test" OR "Hohman's sign" OR "duplex venous ultrasound" OR "phlebography") AND ("venous thromboembolism" OR "deep vein thrombosis"). Studies involving primarily emergency room or inpatient populations were excluded because the panel was interested in determining the most appropriate methods for diagnosing DVT in the outpatient setting.

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