

Venous Thromboembolism Disease Prophylaxis in Foot and Ankle Surgery

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KEYWORDS

• VTED prophylaxis • Foot and ankle • Mechanical • Chemical prophylaxis

KEY POINTS

- Indications for venous thromboembolism disease (VTED) prophylaxis in foot and ankle surgery remain unclear, with available evidence frequently of low quality and often contradictory in its conclusions.
- Consider all potential individual risk factors for VTED when making any decision to pursue chemical prophylaxis after foot and ankle surgery.
- The need for perioperative chemical prophylaxis in foot and ankle surgery is most clear for patients who have a known history of VTED, hereditary predisposition, or a positive family history.
- Certain subpopulations of patients may be at higher risk, such as ankle fracture in those older than 50, acute Achilles tendon injury, or preexisting inflammatory connective tissue disorders. The need for VTED prophylaxis, the type of prophylaxis recommended, as well as its efficacy in preventing VTED remains controversial.
- Higher-powered level I data will be necessary to definitively answer these VTED questions and develop consensus for the foot and ankle population.

INTRODUCTION

The fundamental reason for preventing postoperative deep vein thrombosis (DVT) is to avoid clinically significant chronic venous stasis, phlebitis, and, most importantly, potentially fatal pulmonary embolism (PE). Accordingly, numerous specialty society guidelines underscore the importance of postoperative venous thromboembolism disease (VTED) prophylaxis after hip or knee arthroplasty or in the setting of hip fracture, for which there is robust literature supporting the use of such preventive measures. In contrast, few data exist to guide patients or providers alike regarding the use of VTED

prophylaxis after foot and ankle surgery. Current recommendations are often inconsistent and are generally based on weak or insufficient evidence (Table 1). Therefore, the recommendations currently in use after hip and knee arthroplasty may not be safely extrapolated to foot and ankle surgery patients, especially in light of the wide variability in procedure type and severity, as well as differences in postoperative immobilization protocols. These shortcomings continue to render safe and effective VTED care of the foot and ankle patient somewhat challenging.

Published surveys of foot and ankle surgeons have repeatedly demonstrated that providers use a wide variety of prophylactic regimens

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Table 1
Recommendations for venous thromboembolism disease prophylaxis from different committees

Committee	Recommendation
American College of Chest Physicians (ACCP) 2012 ¹	Use chemical prophylaxis or an intermittent pneumatic compression device for patients undergoing major orthopedic surgery (total hip arthroplasty, total knee arthroplasty, or hip fracture surgery). <i>No chemical prophylaxis is needed for patients with a lower extremity (distal to knee) injury that requires immobilization-weak recommendation based on low quality evidence</i>
American Academy of Orthopedic Surgeons (AAOS) 2012 ²	Use pharmacologic or mechanical prophylaxis for venous thromboembolism disease in patients undergoing elective hip or knee arthroplasty without risk factors. <i>No specific recommendation regarding foot and ankle surgery</i>
American Orthopedic Foot & Ankle Society (AOFAS) 2013 ³	<i>Insufficient evidence to make recommendation for or against use of venous thromboembolism disease prophylaxis</i>

without clear patterns of use, including aspirin, low molecular weight heparin (LMWH), sequential compression devices, and other forms of prophylaxis. This ongoing confusion is highlighted by the inconsistent guidelines published to date, and demonstrates the lack of consensus necessary to properly care for this patient population. One survey found that even though fewer than 50% of surgeons used prophylaxis, 70% believed it was sometimes necessary, with great variation in use.^{4–6} Although some surgeons have argued that prophylaxis is not uniformly necessary for the foot and ankle population based on an overall lower incidence of VTED as compared with the hip and knee population, most acknowledge that not all the foot and ankle population is risk free. Unfortunately, an assumption that VTED prophylaxis is unnecessary at the population level does not predicate an ability to perform a risk-benefit analysis at the individual patient level.

INCIDENCE

Foot and ankle surgery encompasses a disparate array of procedures, making it challenging to project heterogeneous procedure data at the population level onto a single individual. The incidence of VTED events in foot and ankle surgery as described in the literature is therefore often marked by enormous variability. Many of the largest studies to date depend on large-scale state or national databases, and thereby insert their own confounders. A large-scale study that retrospectively examined a California state-wide database found a very low incidence of DVT, and recommended no need for prophylaxis.⁷ This study, however, relied on hospital

readmissions to capture DVTs, likely underestimating the incidence of such events. Another retrospective population study conducted within a single, large-scale California health system also found a low rate of DVT, but the overwhelming majority of these procedures were located in the forefoot, which may also underestimate VTED rates by virtue of being low-risk procedures.⁸ Meanwhile, another prospective study exploring VTED after acute Achilles injuries found DVTs in more than a third of patients, suggesting a markedly high risk.⁹ This study, however, performed routine ultrasound screening of all patients, including asymptomatic ones, arguably overestimating the incidence of clinically significant events. Meanwhile, there are studies published in well-regarded journals concluding that the simple act of below-knee cast immobilization requires DVT prophylaxis, colored by other studies that suggest DVT prophylaxis may not work in preventing VTED events.^{10–12} Ultimately, providers and patients alike find themselves mired in uncertainty.

At the population level, the overall risk of VTED for patients without risk factors undergoing foot and ankle surgery is approximately 3:1000, compared with the overall population rate of 1:1000.¹³ The risk of VTED increases to more than 4% in the presence of previous VTED history and 2 or more of the following risk factors: obesity with a body mass index (BMI) greater than 30 kg/m², age older than 40, medical comorbidities, use of a contraceptive pill, and immobilization.¹⁴ Felcher and colleagues¹⁵ found that history of VTED conferred a 23 times greater risk (multivariate odds ratio 23, 95% confidence interval 9–58) of subsequent VTED event among 7264 patients who

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