Position Statement on
Venous Thromboembolism Prophylaxis
for Patients Undergoing Breast Operations

1. The risk of venous thromboembolism (VTE) associated with breast surgery is extremely low.

2. VTE prophylaxis guidelines and compliance measures relevant to patients undergoing major abdominal, pelvic, and orthopedic operations should not be uniformly applied to breast surgery patients.

3. Decisions regarding VTE prophylaxis in breast surgery patients should be individualized, taking into consideration the risk of VTE and the risk of bleeding complications. The type of procedure and the type of anesthesia should also be considered. Early ambulation should be encouraged and is sufficient prophylaxis in the majority of breast surgery patients. Mechanical VTE prophylaxis is appropriate in patients at increased risk. Chemical prophylaxis may be considered in highly selected patients.

4. Except for other medical co-morbid conditions and long reconstructive procedures, most breast surgery patients do not need VTE prophylaxis.

According to NCCN Categories of Consensus, these recommendations are Category 2A: Based upon lower-level evidence, there is uniform American Society of Breast Surgeons consensus that the recommendations are appropriate.

VTE is a serious and potentially fatal consequence of certain disease states and medical interventions, including hospitalization and surgery. The Institute of Medicine estimates that 200,000 to 500,000 patients are affected by VTE and that 40,000 to 80,000 deaths related to VTE occur annually in the United States. It is believed that this is a largely preventable condition with appropriate prophylaxis.\(^1\),\(^2\)

Various organizations have made recommendations regarding VTE prophylaxis in medical and surgical patients.\(^3\),\(^4\) Other groups have established measures by which organizations, primarily hospitals, can be judged regarding their compliance with these recommendations. For example, the Centers for Medicare & Medicaid Services (CMS) Physician Quality Reporting System (PQRS) perioperative measures set includes VTE prophylaxis.\(^5\)

Prevention of VTE and associated complications is clearly an important goal. The majority of VTE prevention guidelines were established using evidence-based medicine based on valid high-quality data. However, the generalizability of these guidelines to breast surgery and breast cancer patients has not been established. Presently, there are no established guidelines for the use of VTE prophylaxis in breast surgery patients.
This is an important issue because in the absence of guidelines breast surgeons could be subject to criticism for not following guidelines that were established for a very different surgical patient population. Furthermore, arbitrary application of guidelines not appropriate to breast surgery patients may lead to an increase in complications and cost of health care. Specifically, if there is uncertain or no associated benefit with chemoprophylaxis, then routine application of such guidelines could lead to increased risk of bleeding complications in breast surgery patients.

Contemporary studies demonstrate a very low rate of clinically significant VTE-related complications in ambulatory breast surgery patients.\(^6,7\) Patiar et al recently concluded, “All patients undergoing surgery for breast cancer should receive both intermittent pneumatic compression (IPC) and graduated compression (GC) stockings, with heparin reserved for those at very high risk.”\(^8\)

In a study from the MD Anderson Cancer Center, 3898 patients were treated on clinical pathways with mechanical anti-embolism devices and early ambulation.\(^9\) Seven patients with postoperative VTE within 60 days were identified, for a rate of 0.16% per procedure. Six patients presented with only a deep venous thrombosis (DVT) or a pulmonary embolism (PE); 1 patient had both. The median time from surgery to diagnosis of VTE was 14 days (range, 2–60 days; mean, 22 days). No relationship was identified between stage of breast cancer or type of breast surgery and development of VTE. Two (29%) of the 7 patients with VTE had received neoadjuvant chemotherapy. VTE treatment consisted of subcutaneous low-molecular-weight heparin (n = 5) or intravenous heparin (n = 2) followed by warfarin. There were no deaths. The authors concluded, “VTE following breast cancer surgery is rare in patients who are treated on clinical pathways with mechanical anti-embolism devices and early ambulation in the postoperative period. We conclude that systemic VTE prophylaxis is not indicated in this group of patients.”

Two studies used National Surgical Quality Improvement Program (NSQIP) methodology to study the incidence of VTE in breast cancer patients undergoing surgery.\(^6,7\) One study compared VTE incidence in the U.S. Department of Veterans Affairs patients to private sector patients and the other study compared mastectomy to breast-conserving therapy patients. Deep venous thrombosis and pulmonary embolism occurred in less than 0.4% and 0.2% of patients, respectively.\(^6,7\) Collectively, more than 6,900 patients were included in these two studies.

The use of chemical VTE prophylaxis in breast surgery patients is not without potential for serious harm. A literature review of hemorrhagic complications after breast cancer surgery concluded that chemical prophylaxis was associated with increased bleeding complications, with up to an 11% incidence of significant bleeding after breast excision with heparin prophylaxis.\(^8\) In a retrospective institutional review, Friis et al reported a statistically significant three-fold increase in bleeding complications in comparison of low-molecular-weight heparin to compression stockings as follows: “Of the 310 patients in the heparin group 58 (18.7%) developed a hematoma: 29 (9.4%) were reoperated, and 29 (9.4%) were managed by aspiration. Among the 102 patients in the TED stockings group, 7 (6.8%) developed a hematoma: 3 (2.9%) were reoperated, and 4 (3.9%) were managed by aspiration.”\(^10\)
The most widely applied criteria by which organizations are judged regarding VTE prophylaxis, as well as other measures of the quality of surgical care, are the Surgical Care Improvement Project (SCIP) measures.11 (SCIP is sponsored by the CMS.) Many organizations, including CMS in the PQRS, apply these measures to breast surgery, although breast surgery does not meet the SCIP definition of moderate- or high-risk surgery (open surgical procedure >30 minutes requiring in hospital stay >24 hours post-op).

Furthermore, the Caprini scoring system,12,13 the SCIP manual,11 the American College of Chest Physicians guidelines,2 and the Cochrane review3 do not list breast surgery or breast reconstruction as “major” surgery.

The Cochrane Systematic Review on VTE states, “The type of surgery is the primary determinant of the risk of deep venous thrombosis (DVT). Most individuals undergoing outpatient surgery have low rates of DVT. For example, only 1 symptomatic VTE occurred in the first month following 2,281 day-case hernia repairs (0.04%).”3

Because most patients undergoing breast surgery are ambulatory, and many are discharged within 24 hours of the surgery, it may be that the following Cochrane recommendations made for low-risk patients are most appropriate: “2.1.1. For low-risk general surgery patients who are undergoing minor procedures and have no additional thromboembolic risk factors, we recommend against the use of specific thromboprophylaxis other than early and frequent ambulation (Grade 1A).”3

A diagnosis of cancer has been included among factors that predispose to VTE-related complications. However, the National Comprehensive Cancer Network (NCCN) guidelines4 and other references do not list breast cancer as one of the malignancies predisposing to VTE. Breast cancer is not in the NCCN list as a “cancer type at high risk for VTE.”

Some breast surgery patients have multiple predisposing factors for VTE for whom chemical prophylaxis could be considered in addition to mechanical VTE prophylaxis and early ambulation. Predisposing VTE risk factors include both host and operative factors. Host factors may include a personal history of DVT/PE, known or suspected inherited or acquired hypercoagulability disorders, limitations in ambulation, a history of a recent major surgical procedure that predisposes to VTE, older age, heart failure, advanced disease, estrogen therapy, morbid obesity, or an indwelling central venous catheter. Khorana has recently reviewed these risk factors.14

Operative factors predisposing to VTE include type of anesthesia (local/regional vs general), length of general anesthesia, blood transfusions, and type of reconstruction (expander/implant vs myocutaneous flap). In patients undergoing immediate reconstruction, the Caprini score may aid in VTE risk stratification.12,13 Chemical prophylaxis should be considered in patients undergoing major myocutaneous flap procedures or lengthy reconstructive surgery. Pannucci et al reviewed VTE risk in the 5 centers comprising the Plastic Surgery VTE Prevention Study Network (VTEPSN).13 More than 3000 patients underwent breast reconstruction without chemical prophylaxis in this review. Approximately 1 in 9 (11.3%) patients with a Caprini score greater than 8 had a VTE event and the 60-day hazard ratio was 49 for this group compared to patients
with a lower Caprini score. The VTEPSN concluded that chemical prophylaxis is underutilized in this patient population. Kim et al reported a 16.7% chance of pulmonary embolism in an institutional review of patients undergoing TRAM breast reconstruction without chemical prophylaxis compared to 0% in patients receiving enoxaparin.15

These factors, as well as the risk and possible consequences of bleeding complications, should all be considered when making a decision regarding the use of chemical VTE prophylaxis in breast surgery patients.

References


Approved September 29, 2011
Board of Directors
The American Society of Breast Surgeons