Importance

- DVT (deep vein thrombosis) is a blood clot in a deep vein.
- DVT is associated with life threatening pulmonary embolism (PE). PE occurs when the blood clot breaks away and travels to the lungs. DVT is also associated with residual venous obstruction and chronic pain and swelling.
- Venous thromboembolism (VTE) includes DVT, PE, and post-thrombotic syndrome (PTS). Per year patient costs are almost $16,000 more for patients with VTE.[1]

VTE and Ambulatory Surgery

- Some procedures most commonly performed in the ambulatory setting have relatively high risks for VTE. Examples of estimated risks include:

For aesthetic procedures:
abdominoplasty - 2%[2]
body contouring - 9.3%[3]
face lifts - 0.49%[4]
high volume liposuction - 1.1%[5]

For orthopaedic procedures:
spine surgery - 1.15%[6]
knee arthroscopy - 0.42%[7]

For otolaryngology procedures the risk is 1.3%.

- For a Caprini score (see Caprini Thrombosis Risk Assessment Tool) over 8, the incidence increases to 18.3%.[8]

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Patient Safety Toolkit: Ambulatory Surgery and VTE

(Venous Thromboembolism)

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Patient Safety Toolkit: Ambulatory Surgery and VTE (Venous Thromboembolism)

PRE-PROCEDURE SCREENING

- Screening for risk of VTE has been shown to have a high positive predictive value.[9]
- There are published recommendations on screening and chemoprophylaxis; however, there are documented gaps in care because of concern with bleeding risk and perceived lack of evidence and lack of awareness of these published recommendations.[3, 10, 11] National health care organizations have issued several guidelines regarding VTE over the last decade.[12, 13, 14, 15, 16, 17, 18]
- It has been demonstrated that a systematic institution-wide assessment of all patients is necessary to accurately identify those patients with significant intrinsic risk factors. One of the most extensively tested assessments of VTE risk factors is the Caprini Thrombosis Risk Factor Assessment. Other patient factors include: co-morbidities (CHF, COPD, etc) and family history/congenital thrombolytic issues, history of DVT and surgical factors (such as arthroscopy or arthroplasty), and family history.[7, 20, 21]
- Common risks identified by another source include: smoking and inflammatory bowel disease.[22]

CAPRINI THROMBOSIS RISK FACTOR ASSESSMENT TOOL*

*For more information or to download scoring sheets, visit www.ISMS.org

Add 1 point for each of the following statements that apply now or within the past month:

____ Age 41– 60 years
____ Minor surgery (less than 45 minutes) is planned
____ Past major surgery (more than 45 minutes) within the last month
____ Visible varicose veins
____ A history of Inflammatory Bowel Disease (IBD) e.g., Crohn's disease or ulcerative colitis
____ Swollen legs (current)
____ Overweight or obese (BMI>25)
____ Heart attack
____ Congestive heart failure
____ Serious infection e.g., pneumonia
____ Lung disease e.g., emphysema or COPD
____ On bed rest or restricted mobility, including a removable leg brace for less than 72 hours
____ Other risk factors (1 point each)*

*Additional risk factors not tested in the validation studies but shown in the literature to be associated with thrombosis include BMI above 40, smoking, diabetes requiring insulin, chemotherapy, blood transfusions, and length of surgery over 2 hours.

Add 2 points for each of the following statements that apply:

____ Age 61–74 years
____ Current or past malignancies (excluding skin cancer, but not melanoma)
____ Planned major surgery lasting longer than 45 minutes (including laparoscopic and arthroscopic)
____ Non-removable plaster cast or mold that has kept you from moving your leg within the last month
____ Tube in blood vessel in neck or chest that delivers blood or medicine directly to heart within the last month (also called central venous access, PICC line, or port)
____ Confined to a bed for 72 hours or more

Add 3 points for each of the following statements that apply:

____ Age 75 or over
____ History of blood clots, either DVT or PE
____ Family history of blood clots (thrombosis)
____ Personal or family history of positive blood test indicating an increased risk of blood clotting

***For women only*: Add 1 point for each of the following statements that apply:**

____ Current use of birth control or Hormone Replacement Therapy (HRT)
____ Pregnant or had a baby within the last month
____ History of unexplained stillborn infant, recurrent spontaneous abortion (more than 3), premature birth with toxemia or growth restricted infant

Add 5 points for each of the following statements that apply now or within the past month:

____ Elective hip or knee joint replacement surgery
____ Broken hip, pelvis or leg
____ Serious trauma e.g.,multiple broken bones due to a fall or car accident
____ Spinal cord injury resulting in paralysis
____ Experienced a stroke

Score Risk Level
0-2 Low
3-8 Increasing
>8 18.3%[8]

PREVENTION

- *Positioning* - Flex the patient's knees to approximately five degrees by placing a pillow underneath them.[2, 11]
- *Compression* - Elastic stockings or intermittent pneumatic compression devices (IPCs). Surgeons should be aware that many offices now have intermittent compression machines, having purchased them new or used, leased them, or rented them on a case-by-case basis.[24] IPCs placed and operational before the induction of anesthesia (especially for lengthy procedures or those performed under general anesthesia) may decrease the DVT risk of procedures performed by 28%.[23]
- Discontinue supplemental hormones one week prior to the procedure.[2]
- *Chemoprophylax*is - Anticoagulants such as low-molecular-weight heparins (LMWH) given two hours before surgery, have been shown to protect patients throughout the peri-operative period. The risks of DVT must always be weighed against the risk of increased bleeding in any given patient. Prophylaxis should be provided for 7-10 days, or at least until resumption of normal ambulation, because the median time-to-event has been reported as 8 days.[19, 25, 26]
- *Anesthesia* - Immobility associated with general anesthesia may be a significant risk factor for VTE. Intravenous sedation including propofol can allow surgeons to perform lengthy surgeries without general anesthesia.
- *Stage multiple procedures* - The length of the procedure itself increases the risk for many complications including VTE.
- *Early ambulation* - This should occur at the facility and be a part of post-discharge instructions.

SIGNS, SYMPTOMS, AND MANAGEMENT

- DVT signs include warmth, tenderness, and swelling. PE is associated with difficulty breathing and chest pain.[27] Physicians should be suspect VTE when patients exhibit these symptoms and have recently had any surgery.
- These can be life threatening situations; rapid diagnosis and treatment is very important.
- Suspicions should lead to immediate testing. The test recommended to confirm DVT is ultrasound with Doppler.[28] Chest x-rays are recommended to confirm PE.[29]
- Treatment: DVT may be treated with thrombolytics in the outpatient; however this requires careful patient selection and there are a number of factors that may lead to inpatient treatment options.[30]

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