

## **Perioperative DVT Prophylaxis and Anticoagulation**

### Reading:

- 1) Pannucci C et al. A validated risk model to predict 90-day VTE events in postsurgical patients. *Chest* 2014; 145: 567-573.
- 2) Yngve F et al. Prevention of VTE in orthopedic surgical patients. *Chest* 2012;141 (2 Suppl): e278S-e325S.
- 3) Gould MK et al. Prevention of VTE in nonorthopedic surgical patients. *Chest* 2012; 141 (2 Suppl): e227S-e277S.
- 4) Baron TH et al. Management of antithrombotic therapy in patients undergoing invasive procedures. *NEJM* 2013; 368: 2113-2124.
- 5) Douketis J et al. Perioperative bridging anticoagulation in patients with atrial fibrillation. *NEJM* 2015; 373: 823-833.
- 6) Van Veen J, Makris M. Management of perioperative antithrombotic therapy. *Anaesthesia* 2015;70 (Suppl1): 58-67.
- 7) Rogers SO Jr, Kilaru RK, Hosokawa P, Henderson WG, Zinner MJ, Khuri SF. Multivariable predictors of postoperative venous thromboembolic events after general and vascular surgery: results from the patient safety in surgery study. *J Am Coll Surg.* 2007 Jun;204(6):1211-21. PubMed PMID: 17544079.

### **Patient 1**

A 43-year-old male with a history of a mechanical mitral valve replacement is planned for anterior cruciate ligament reconstruction. He is on warfarin with an INR (international normalized ratio) goal of 2.5-3.5. You are consulted to help manage his anticoagulation perioperatively.

**When should he stop his warfarin?**

**Should he receive heparin, low molecular weight heparin (LMWH), or neither prior to surgery?**

**When should his anticoagulation resume postoperatively and how?**

### **Patient 2**

A 37-year-old male is admitted for injuries sustained in a motor vehicle accident. He has fractured two ribs and has a displaced fracture of his right olecranon. He is diagnosed with a pulmonary embolism on hospital day #2. Lower extremity venous duplex ultrasound reveals a right lower extremity deep venous thrombosis extending above the knee. He is on full anticoagulation. The orthopaedic surgeon wants to operate on the olecranon fracture. He explains that operating now will provide a much better chance for a fully functional elbow. The surgeon states that waiting more than one week to operate will dramatically increase the risk that his elbow will be nonfunctional.

**Should surgery be postponed? When is it safe for a patient who has suffered a pulmonary embolism to undergo surgery?**

**If the patient goes for surgery, how will we manage his anticoagulation perioperatively?**

**What else can we do to prevent further pulmonary embolism?**

### **Patient 3**

A 74-year-old male is planned to undergo hemicolectomy for a localized adenocarcinoma of the colon. He was diagnosed with a deep venous thrombosis (DVT) 4 months ago and has been on warfarin. His INRs have been therapeutic and the lower extremity swelling that prompted the diagnosis of DVT has abated. The surgeons request help in managing his anticoagulation perioperatively.

**When should he stop warfarin?**

**Should he receive “bridging therapy”?**

**When and how should his anticoagulation be restarted postoperatively?**

### **Patient 4**

A 70-year-old male with a history of hypertension and atrial fibrillation is planned to undergo a tooth extraction. He has no history of valvular abnormalities, congestive heart failure, diabetes, or prior strokes.

**Should his warfarin be stopped prior to this procedure?**

**Patient 5**

A 44-year-old female has a history of obesity, congestive heart failure and a DVT 8 years ago. The DVT occurred after a car accident. She is planned for total hysterectomy for treatment of uterine fibroids.

**What are this patient's risk factors for venous thromboembolism (VTE)?**

**How could you lower her risk for perioperative VTE?**

**Patient 6**

A 38-year-old male with a history of hypertension is scheduled for an inguinal hernia repair. He has no other medical problems.

**Should this patient get VTE prophylaxis and if so, with what?**

**Patient 7**

A 64-year-old female with a history of osteoarthritis is planned for total hip arthroplasty.

**Is this patient at risk for VTE?**

**What method or medication should we use to decrease her risk? When should we start it?**

**Does the choice of her anesthesia change her risk for DVT and how you would manage her prophylaxis?**

**What should be the duration of her prophylaxis?**