Guideline

1.0 SCOPE

1.1 Care of the Trauma Services Patient at CCHMC.
1.2 This guideline provides the minimum standard of care for any patient with suspected or confirmed injury and those at risk for deep vein thrombosis.

2.0 DEFINITIONS

2.1. **Altered mobility:** A permanent or temporary state in which the child has a limitation in independent, purposeful physical movement of the body or of one or more extremities.
2.2. **Deep Vein Thrombosis (DVT):** A blood clot (thrombus) that was initially formed in a deep (non-peripheral) vein.
2.3. **Graduated Compression Stocking (GCS):** Elastic stockings, either knee- or thigh-high, also known as TED hose.
2.4. **Risk category: Refer to VTE Risk Factors algorithm**
  2.4.1. **Low risk:** No VTE risk factors
  2.4.2. **Moderate risk**: Multiple risk factors for VTE in the absence of altered mobility or has altered mobility with one or fewer additional risk factors.
  2.4.3. **High risk**: Altered mobility plus two or more additional risk factors
2.5. **Sequential Compression Device (SCD):** A device designed to intermittently squeeze blood from underlying deep veins in the leg upon compression of an inflatable sleeve, and to allow the blood to flow again when it decompresses.
2.6. **Venous Thromboembolism (VTE):** A blood clot (thrombus) in a vein or one that has broken free and is carried in the bloodstream (embolus).

3.0 GUIDELINE

3.1. It is recommended that patients age 10 – 17 years be assessed for VTE risk factors, and based on that assessment, assigned to a risk category (low, moderate, high).
  3.1.1. At the time of inpatient admission; and
  3.1.2. Reassessed at 48 – 72 hours of hospitalization.
  3.1.3. This should be documented in the patient's medical record.
3.2. It is recommended that VTE prophylaxis be administered based on risk category as soon as feasible, but within 24 hours of assessment, unless there are contraindications (See algorithm).
3.3. If planning to initiate pharmacologic prophylaxis it is recommended:
  3.3.1. In surgical patients to seek surgical input regarding bleeding risk prior to initiation
  3.3.2. See **BESt #049** for management of LMWH prophylaxis
  3.3.3. Obtain Hematology consultation when considering alternative pharmacologic agents.
3.4. Refer to **BESt 181** algorithm below for Risk Category Assessment and Prophylaxis for VTE.

Risk Assessment for Thrombosis for Non-Bariatric Surgery Patients ≥ 10 years old

RN or MD/APN to Complete:

Risk factors?	History □ Personal history of blood clot □ Family history of clotting disorder or clots High-risk Medical conditions □ Known clotting disorder □ Blood stream infection (currently on antibiotics for positive blood culture) □ Cancer □ Chronic inflammatory condition (i.e. Crohn's, Ulcerative Colitis, Lupus) □ Nephrotic syndrome □ Trauma patient if > 1 lower extremity (LE) fracture, pelvic fracture, or spinal cord injury Medications □ Estrogen (i.e. birth control) in past 2 months (Depo shots don't contain estrogen) Physical Exam □ Obesity (BMI > 95th percentile, see growth chart in Epic) □ PICC or central line	Total number of risk factors: _____
Contraindications to SCD (sequential compression device)?	□ Current DVT □ Fracture of lower extremity (LE) □ Skin conditions affecting LE (burn, dermatitis, wound, epidermolysis bullosa)	□ Yes (if any checked) □ No
Contraindications to Lovenox?	□ Active bleeding □ Known bleeding disorder □ Epidural or lumbar puncture in the last 12 hours □ Platelets <50,000/mm or heparin-induced thrombocytopenia □ Brain tumor □ Pelvic fracture in last 48 hours □ Recent or scheduled neurosurgical procedure within 48 hours □ Uncontrolled hypertension	□ Yes (if any checked) □ No

- See next page for page 2 of risk assessment

For MD/APN to complete:

≥2 Risk Factors	Anticipated altered mobility > 48 hours? □ Bedrest or significant activity restriction □ Any line or tube that restricts mobility (i.e. epidural, foley, NG to continuous suction, chest tube, EVD, mechanical ventilation)	□ Yes = **High** Risk □ No = **Moderate** Risk
0-1 Risk Factor	Anticipated altered mobility > 48 hours? □ Bedrest or significant activity restriction □ Any line or tube that restricts mobility (i.e. epidural, foley, NG to continuous suction, chest tube, EVD, mechanical ventilation)	□ Yes = **Moderate** Risk □ No = **Low** Risk

If NO contraindications (see page 1), the following interventions (and orders) are indicated:

Pre-op Orders	
	Recommended Intervention/Order
ALL patients with surgery scheduled for > 60 minutes	□ Intra-op SCD (sequential compression device) – apply in pre-op/holding area

Post-op or Admission Orders	
Risk Category	**Recommended Interventions/Orders**
Low Risk	None – encourage early ambulation
Moderate Risk	☐ SCD (sequential compression device), aim at 18 hours of use
High Risk	☐ SCD (sequential compression device), aim at 18 hours of use **AND** ☐ Lovenox * (first dose 12 hours after surgery and hold 12h prior to surgical procedure) ○ < 50 kg = 0.5 mg/kg/dose subQ BID ○ 50-125 kg = 30 mg subQ BID or 40mg subQ daily ○ > 125 kg = 40 mg subQ BID * If renal dysfunction, consider decreasing dose and checking LMWH level 4 hours after 2nd or 3rd dose (goal 0.1-0.3 unit/mL, see BESt statement for management of LMWH for more details) ** If considering other options, consult hematology.

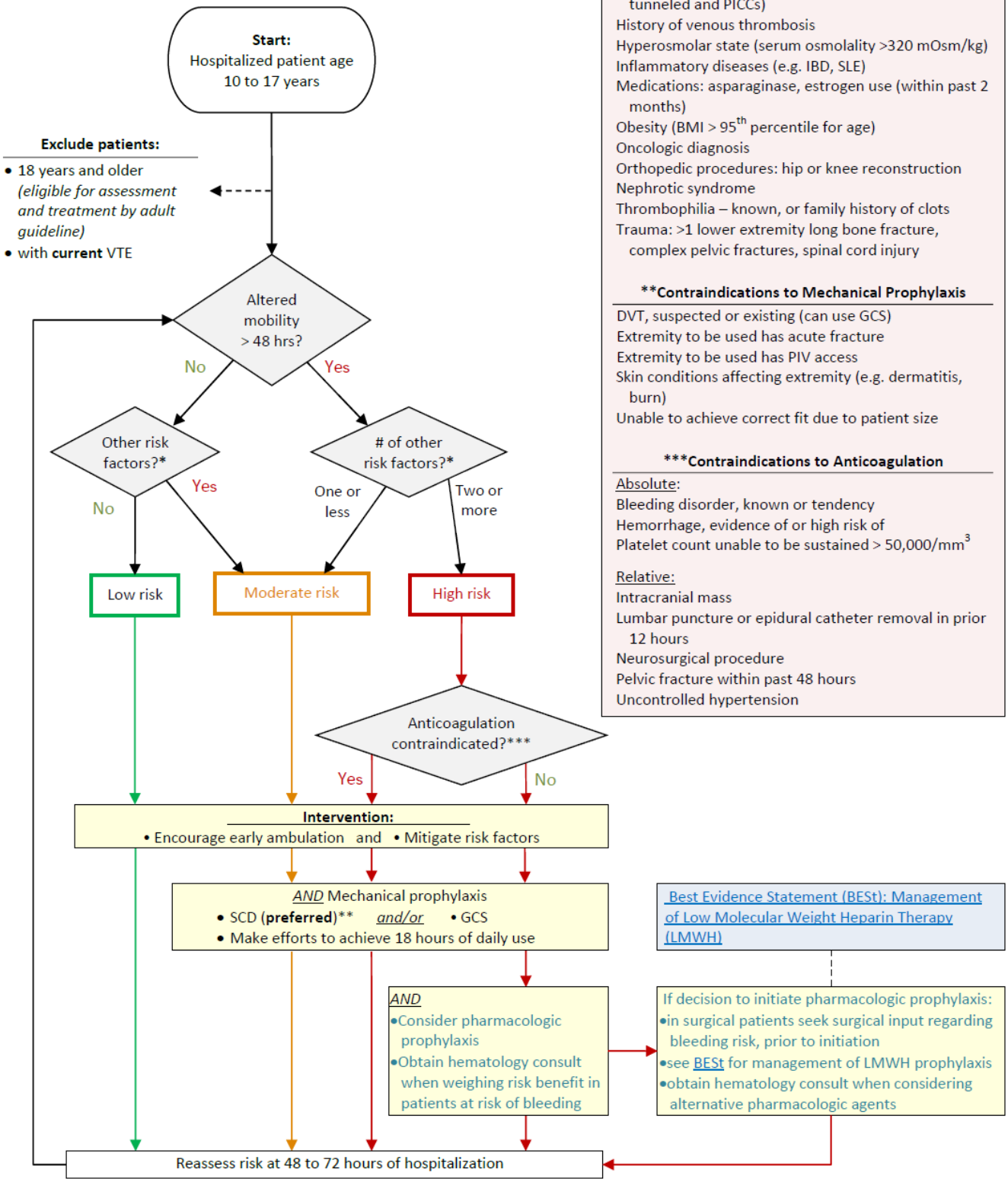
Cincinnati Children's

Hospital Medicine/Prophylaxis/Venous Thromboembolism/BESt 181

Best Evidence Statement (BESt)

Algorithm: Risk Category Assessment and Prophylaxis for Venous Thromboembolism

Definitions, abbreviations and development credit for the algorithm – See next page



***VTE Risk Factors**

Blood stream infection
Central Venous Catheter (including non-tunneled, tunneled and PICCs)
History of venous thrombosis
Hyperosmolar state (serum osmolality >320 mOsm/kg)
Inflammatory diseases (e.g. IBD, SLE)
Medications: asparaginase, estrogen use (within past 2 months)
Obesity (BMI > 95th percentile for age)
Oncologic diagnosis
Orthopedic procedures: hip or knee reconstruction
Nephrotic syndrome
Thrombophilia – known, or family history of clots
Trauma: >1 lower extremity long bone fracture, complex pelvic fractures, spinal cord injury

****Contraindications to Mechanical Prophylaxis**

DVT, suspected or existing (can use GCS)
Extremity to be used has acute fracture
Extremity to be used has PIV access
Skin conditions affecting extremity (e.g. dermatitis, burn)
Unable to achieve correct fit due to patient size

*****Contraindications to Anticoagulation**

Absolute:
Bleeding disorder, known or tendency
Hemorrhage, evidence of or high risk of
Platelet count unable to be sustained > 50,000/mm^3

Relative:
Intracranial mass
Lumbar puncture or epidural catheter removal in prior 12 hours
Neurosurgical procedure
Pelvic fracture within past 48 hours
Uncontrolled hypertension

4.0 REFERENCES

4.1 Multidisciplinary VTE Prophylaxis BESt Team, Cincinnati Children's Hospital Medical Center: Best Evidence Statement Venous Thromboembolism (VTE) Prophylaxis in Children and Adolescents, http://www.cincinnatichildrens.org/service/j/anderson-center/evidence-based-care/bests/, BESt 181, pages 1-14, Date 2/18/14.

5.0 APPROVALS

All revisions of this guideline are approved by the Trauma Service Department. This guideline is reviewed every three years or sooner if deemed necessary. Policy authority for this document resides with the Trauma Service Department. This guideline is approved by the Trauma Services Manager and the Director of Trauma Services.

HISTORY
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06/2004
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05/15
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