Venous Thromboembolism Prevention

Donna Boruchov, MD
Joanna Young, PharmD, BCPS
Jessica Winters, MD
Katherine Baldwin, MD

Connecticut Children's

MAGNET RECOGNIZED

BEST CHILDREN'S HOSPITAL

What is a Clinical Pathway?

An evidence-based guideline that decreases unnecessary variation and helps promote safe, effective, and consistent patient care.

Objectives of Pathway

- To identify inpatients at risk for VTE
- To reduce VTE events without increase in adverse events
- To ensure appropriate VTE prevention based on risk level

Why is Pathway Necessary?

- Hospital-acquired venous thromboembolism (HA VTE) is a significant morbidity and mortality risk for our pediatric patients
- HA VTE may be prevented using mechanical and pharmacologic prophylaxis in patients at risk. By providing a standardized approach, we may decrease the overall VTE events in our patients
- Solutions for Patient Safety, a network of 150+ pediatric hospitals working together to help each individual hospital make progress on a journey to zero harm, recommends development of a screening process and pathway for HA VTE prophylaxis, making this the gold standard for children's hospitals

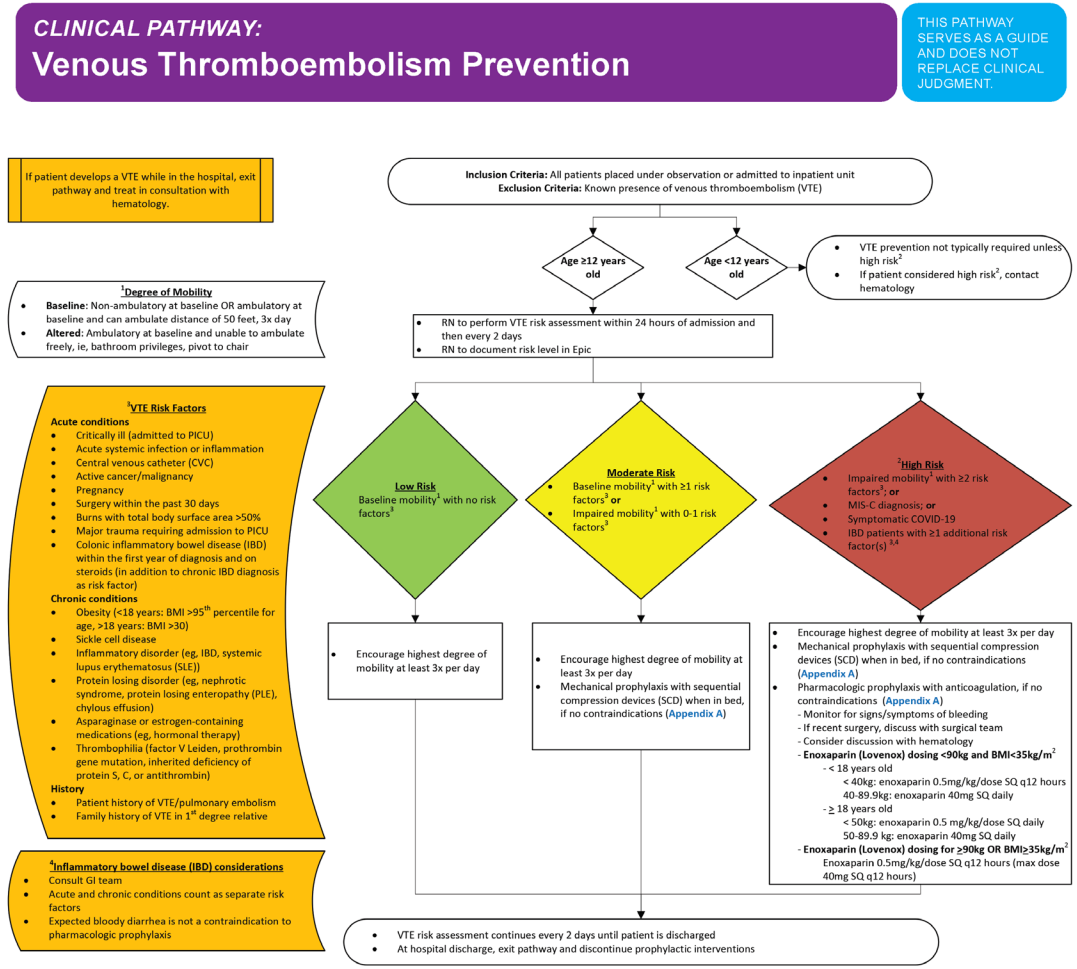
Background

- Hospital-acquired venous thromboembolism (VTE) is a life-threatening condition that includes deep vein thrombosis (DVT) and pulmonary embolism (PE), and it is the most common preventable cause of hospital death in adults (*ISTH Steering Committee 2014, Lozano 2012*)
- Thromboprophylaxis is highly effective at preventing VTE, and the Agency for Healthcare Research and Quality identified thromboprophylaxis as the “number one patient safety practice”
- In the early 2000's, it was found that there was a significant increased in VTE in children admitted to children's hospitals (70% increase using PHIS database 2001-2007) *(Raffini 2009)*
- Pediatric studies have identified risk factors associated with the development of in-hospital VTE including ICU stay, central venous catheter presence, mechanical ventilation, and systemic infection *(Mahajerin 2015, Jaffray 2022)*

Pathway Review

This is the VTE Prevention Clinical Pathway.

Each component will be reviewed in the following slides.



CLINICAL PATHWAY:

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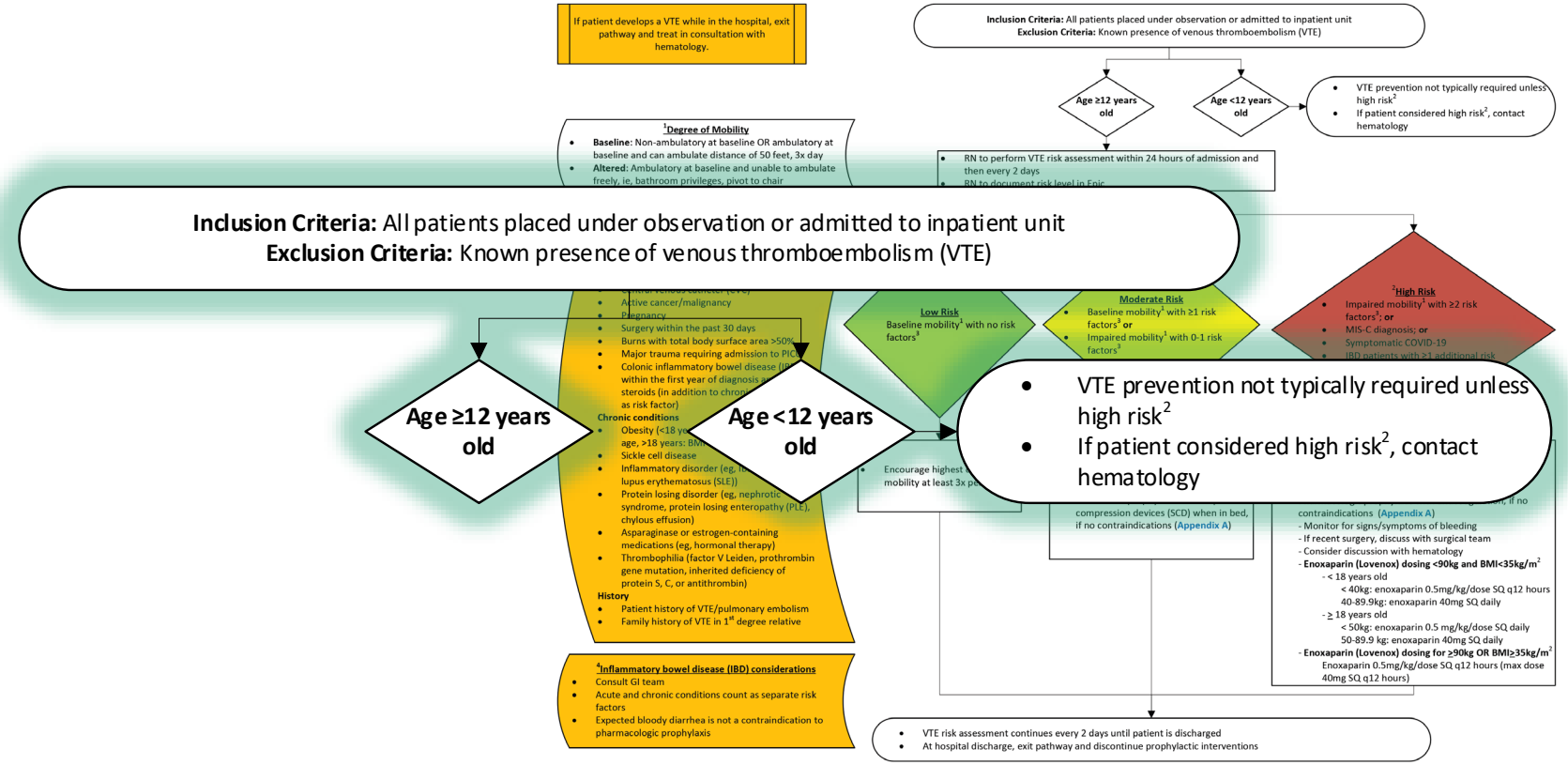
THIS PATHWAY SERVES AS A GUIDE AND DOES NOT REPLACE CLINICAL JUDGMENT.

- All patients ≥12 years should be assessed for VTE risk
- Patients <12 years old that are high risk can be considered for VTE prevention, and if meets criteria, hematology should be consulted (outside of scope of this pathway)



Inclusion Criteria: All patients placed under observation or admitted to inpatient unit
Exclusion Criteria: Known presence of venous thromboembolism (VTE)

Age ≥12 years old

Age <12 years old

- VTE prevention not typically required unless high risk[2]
- If patient considered high risk[2], contact hematology

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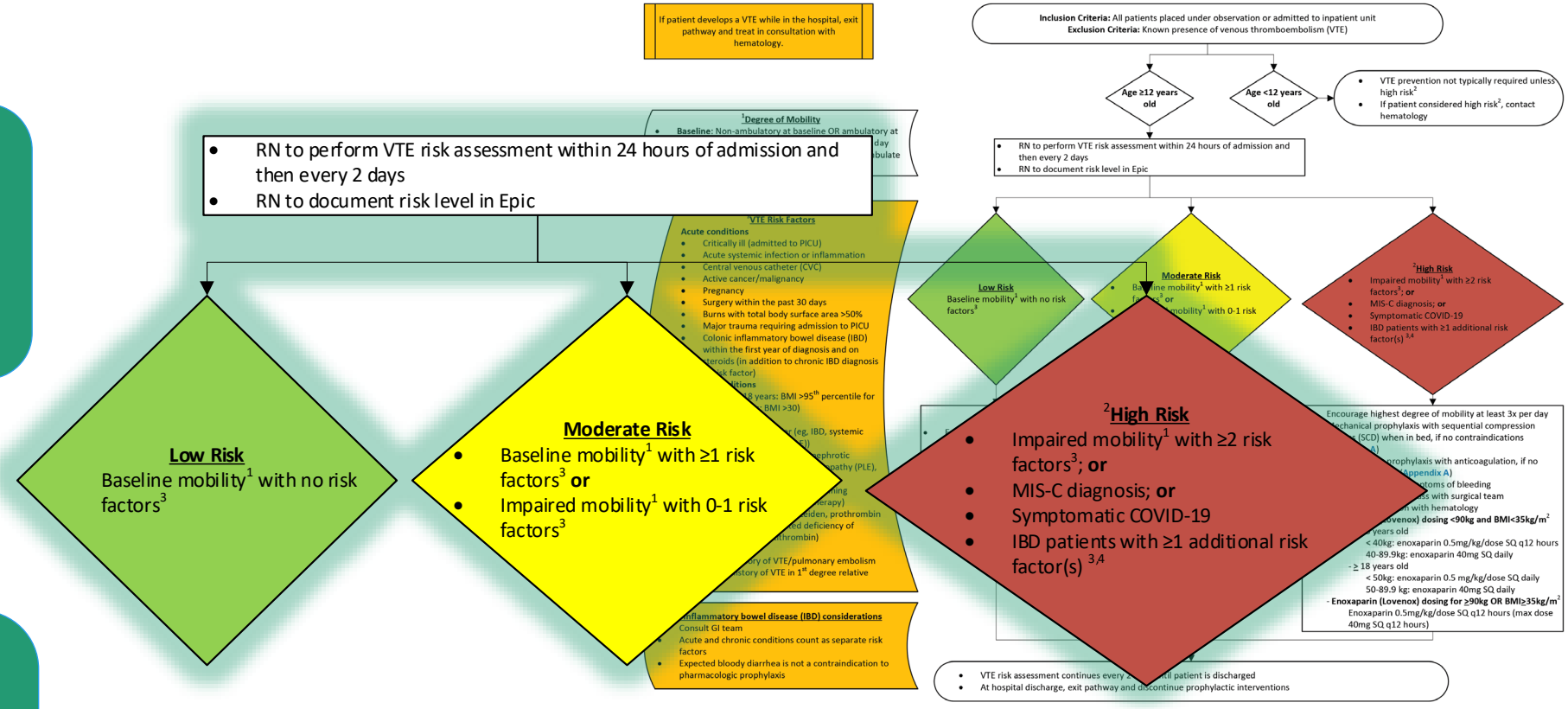
Bedside RN performs VTE screen in EPIC

- See EPIC tutorial slides

VTE screen completion will trigger an OPA (Our Practice Advisory) to prompt provider to address VTE risk

- See EPIC tutorial slides



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Risk level is determined by:

- Level of mobility
- Other VTE risk factors, including known acute conditions, chronic conditions, and patient/family history factors associated with VTE

Low Risk
Baseline mobility[1] with no risk factors[3]

Moderate Risk
- Baseline mobility[1] with ≥1 risk factors[3] **or**
- Impaired mobility[1] with 0-1 risk factors[3]

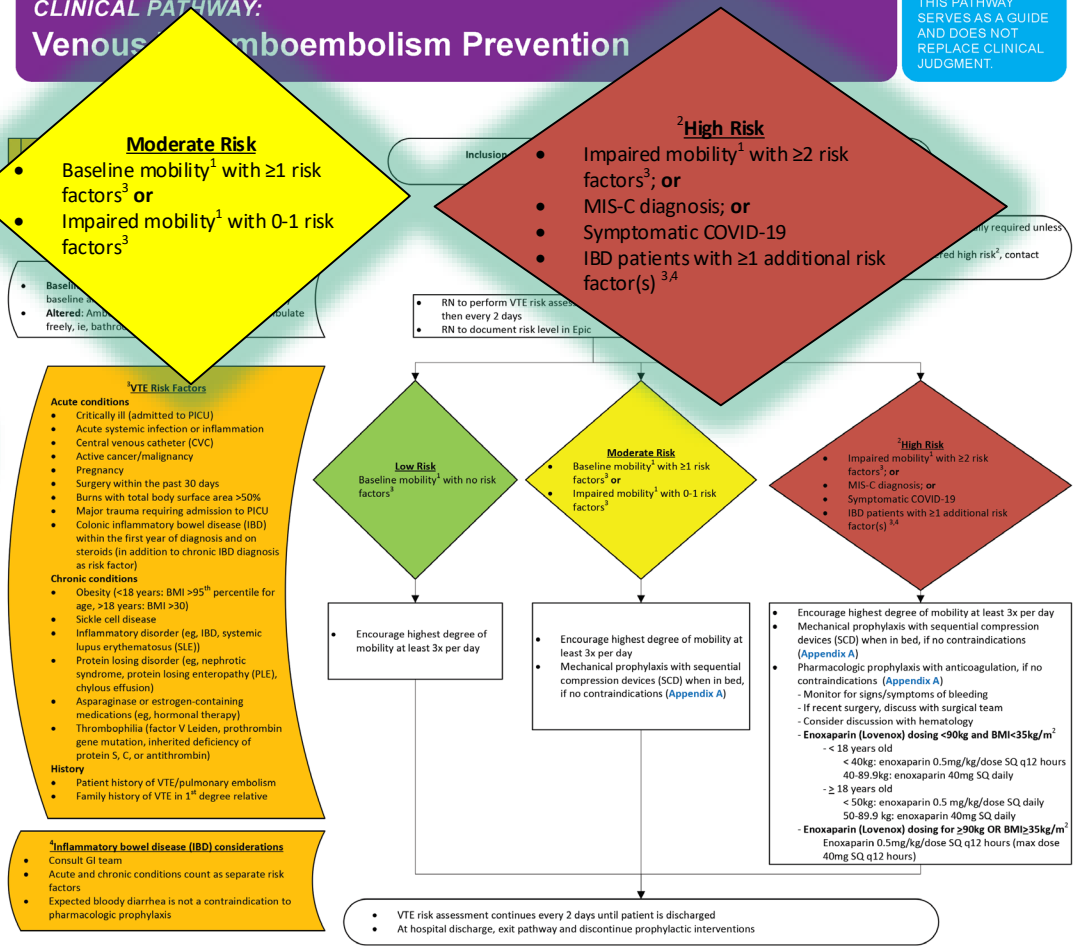
[2]High Risk
- Impaired mobility[1] with ≥2 risk factors[3]; **or**
- MIS-C diagnosis; **or**
- Symptomatic COVID-19
- IBD patients with ≥1 additional risk factor(s) [3,4]

[3]VTE Risk Factors

Acute conditions
- Critically ill (admitted to PICU)
- Acute systemic infection or inflammation
- Central venous catheter (CVC)
- Active cancer/malignancy
- Pregnancy
- Surgery within the past 30 days
- Burns with total body surface area >50%
- Major trauma requiring admission to PICU
- Colonic inflammatory bowel disease (IBD) within the first year of diagnosis and on steroids (in addition to chronic IBD diagnosis as risk factor)

Chronic conditions
- Obesity (<18 years: BMI >95th percentile for age, >18 years: BMI >30)
- Sickle cell disease
- Inflammatory disorder (eg, IBD, systemic lupus erythematosus (SLE))
- Protein losing disorder (eg, nephrotic syndrome, protein losing enteropathy (PLE), chylous effusion)
- Asparaginase or estrogen-containing medications (eg, hormonal therapy)
- Thrombophilia (factor V Leiden, prothrombin gene mutation, inherited deficiency of protein S, C, or antithrombin)

History
- Patient history of VTE/pulmonary embolism
- Family history of VTE in 1st degree relative



[1]Degree of Mobility

- **Baseline**: Non-ambulatory at baseline OR ambulatory at baseline and can ambulate distance of 50 feet, 3x day
- **Altered**: Ambulatory at baseline and unable to ambulate freely, ie, bathroom privileges, pivot to chair

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Of note, patients with **Inflammatory Bowel Disease (IBD)** are specifically called out in this pathway

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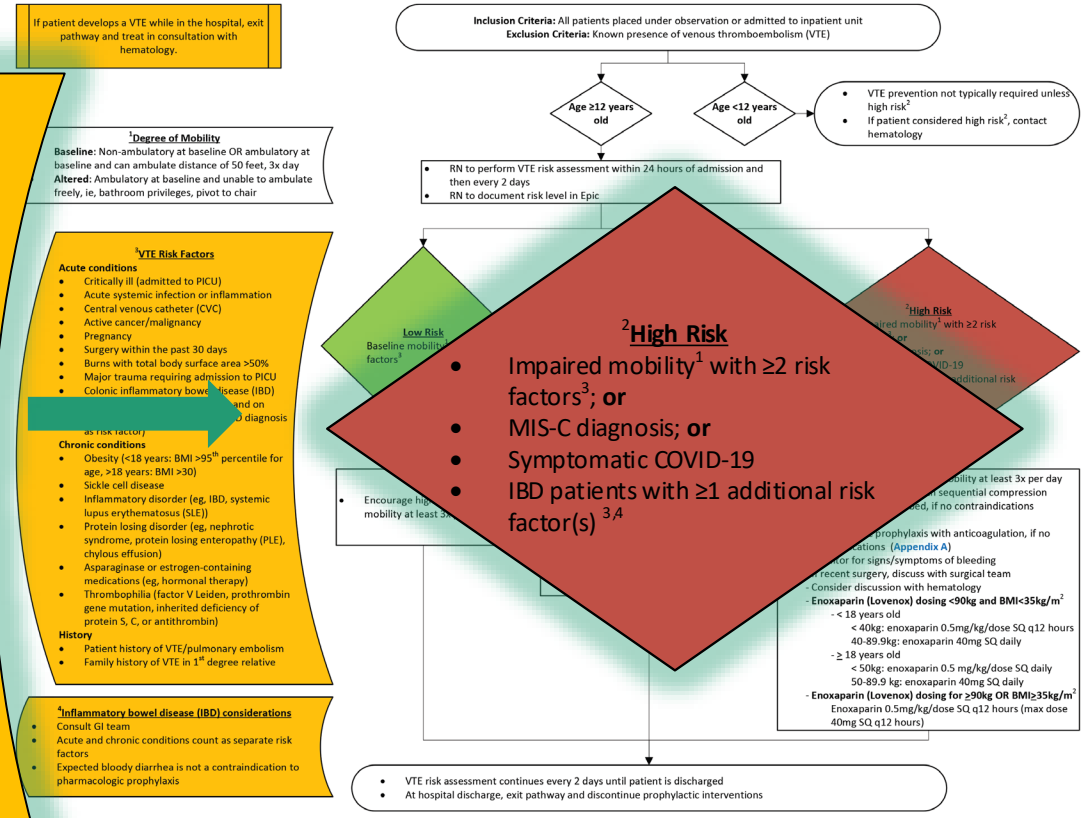
[4]Inflammatory bowel disease (IBD) considerations

- Consult GI team
- Acute and chronic conditions count as separate risk factors
- Expected bloody diarrhea is not a contraindication to pharmacologic prophylaxis



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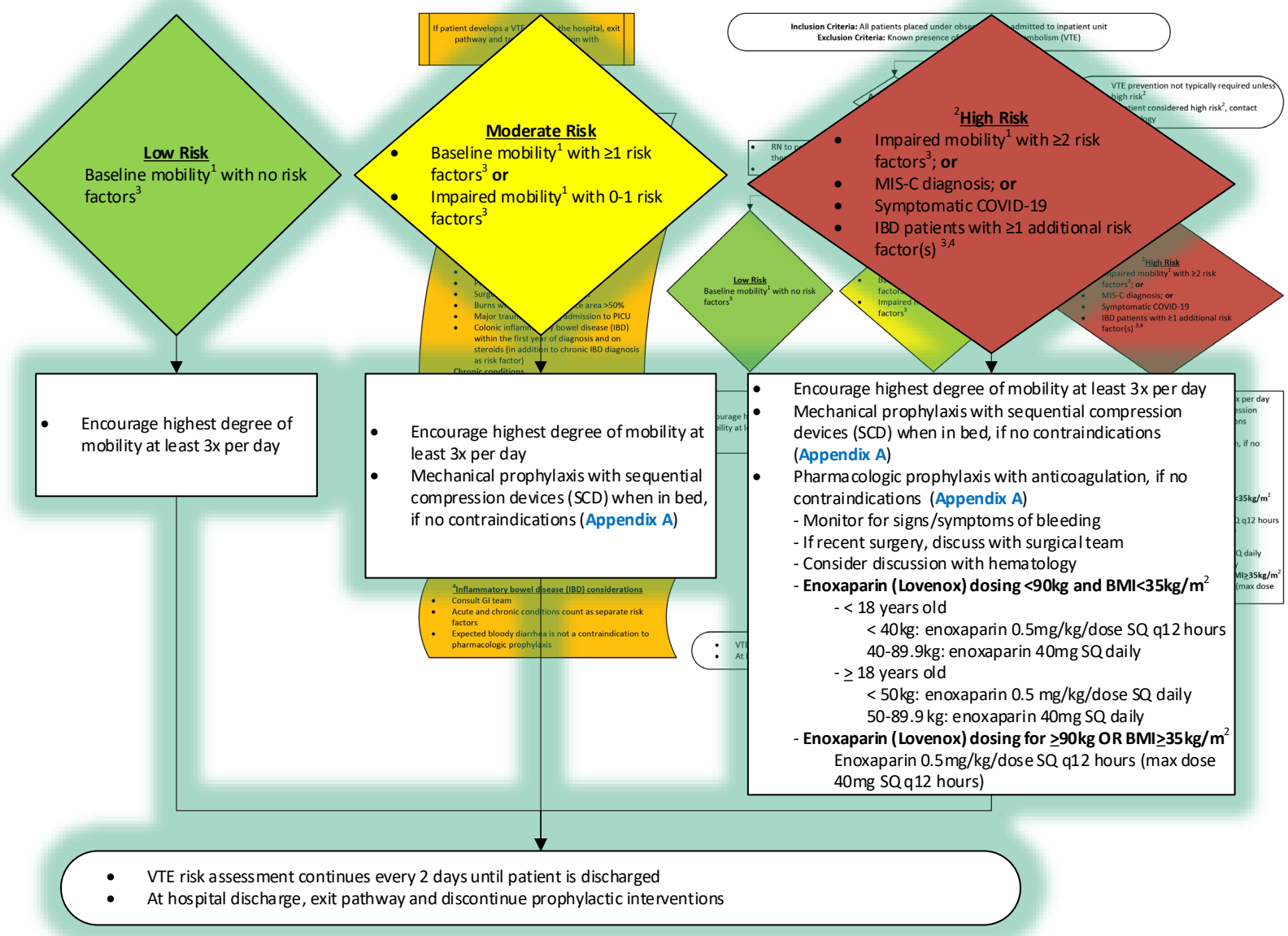
VTE prophylaxis interventions are determined by level of risk



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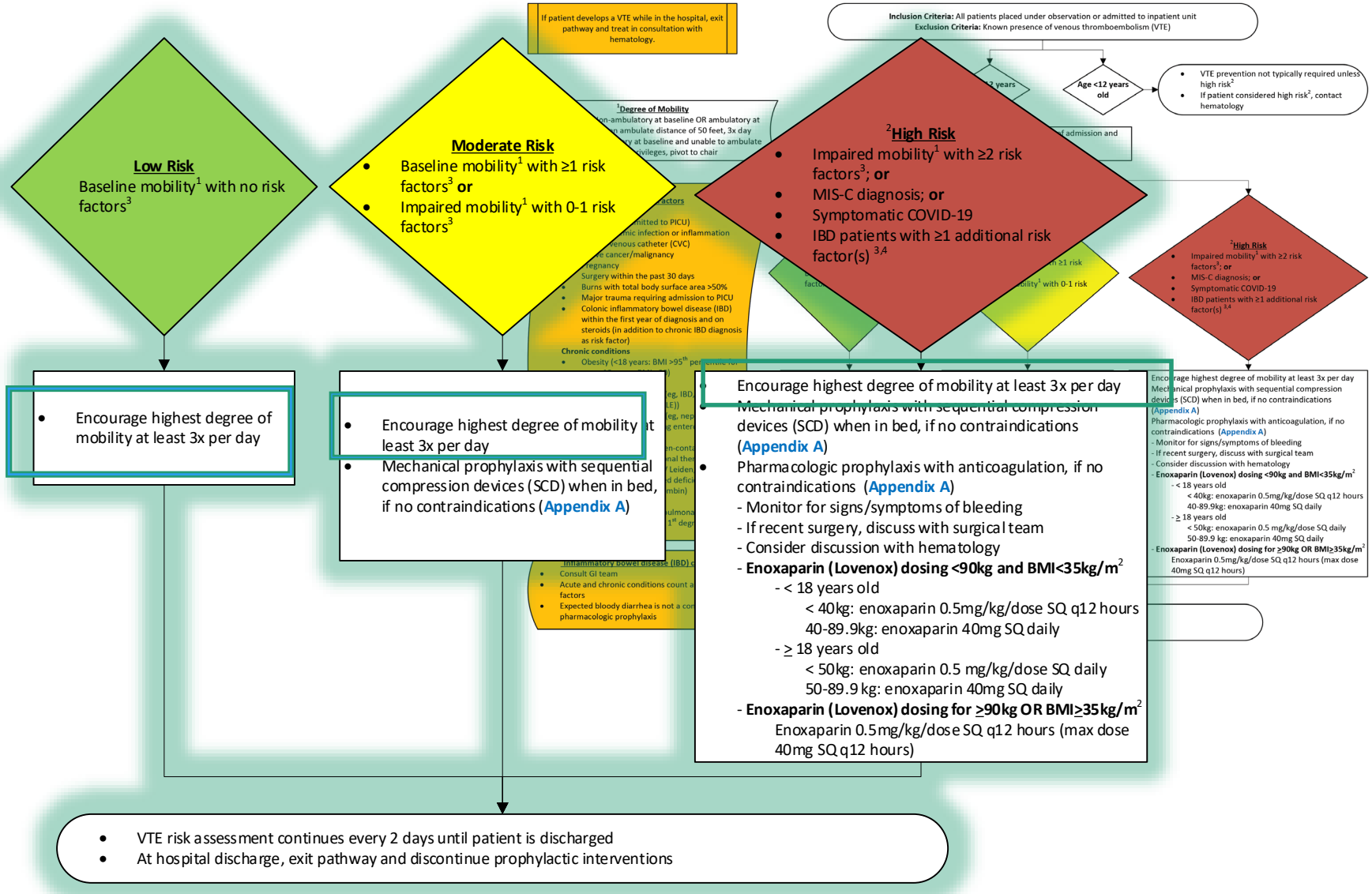
At **ALL** levels of risk, patients should ambulate at least 3 times per day as able



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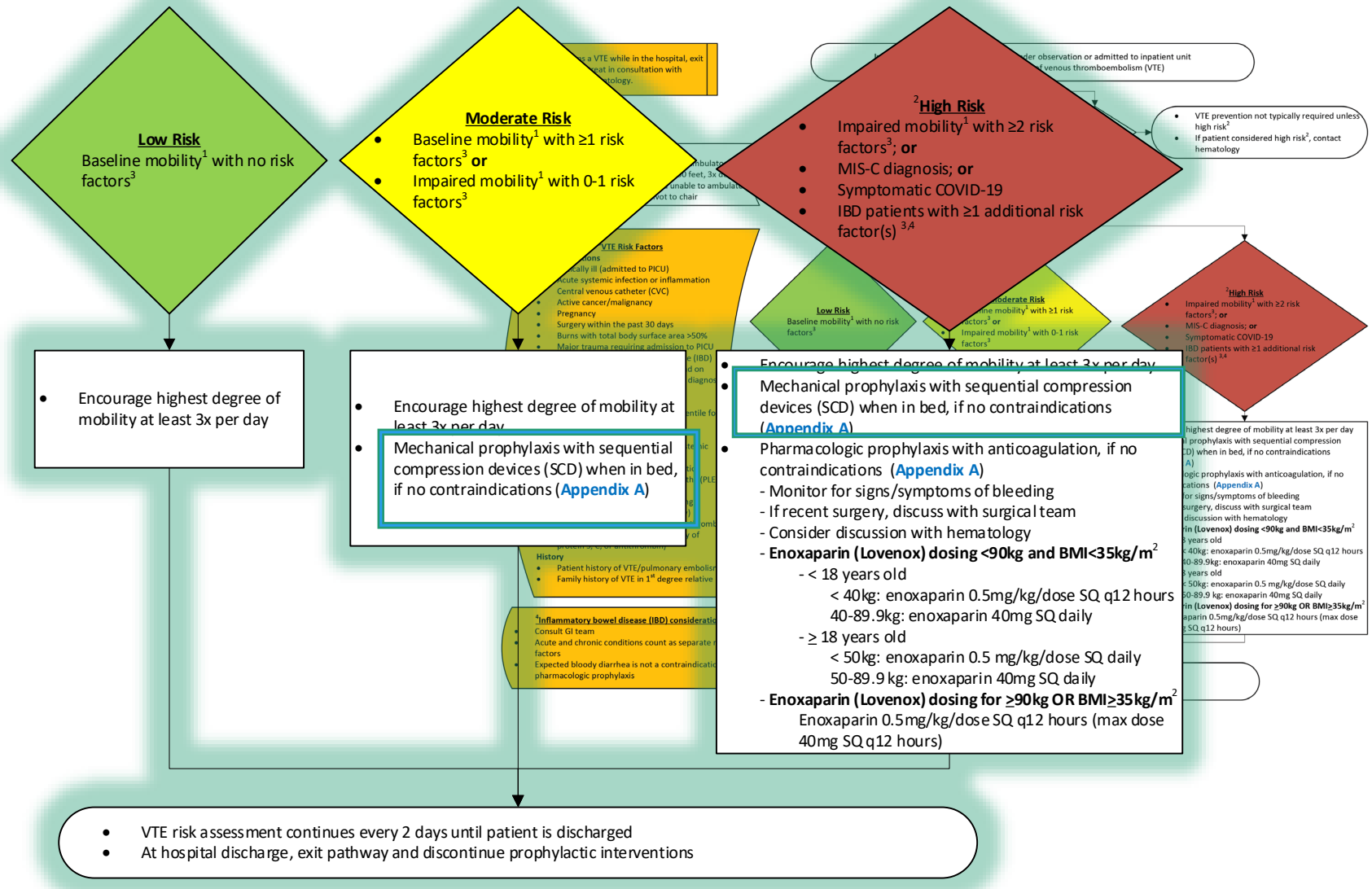
For **moderate and high** risk, order mechanical prophylaxis with sequential compression devices as long as there are no contraindications



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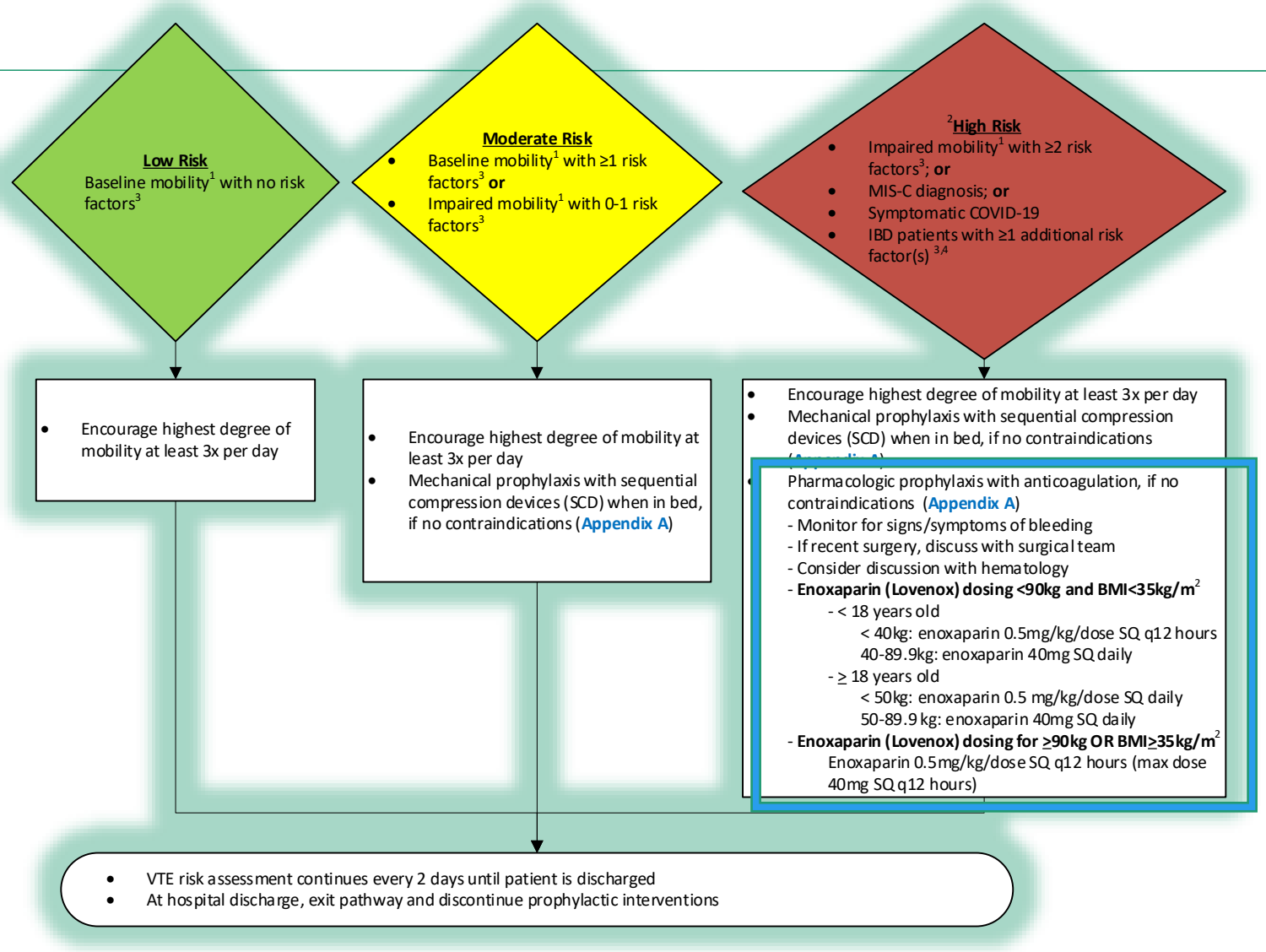
For **high** risk, consider pharmacologic prophylaxis with enoxaparin (Lovenox) as long as there are no contraindications

Please note that monitoring of anti Xa levels is **NOT** necessary when administering enoxaparin as prophylaxis



Appendix A lists contraindications to both mechanical and pharmacologic VTE prophylaxis

Contraindications to sequential compression device (SCD):

- Suspected or existing VTE (use graded compression stockings)
- Acute fracture of extremity (use device on unaffected extremity)
- Skin conditions affecting extremity (e.g., dermatitis, burn)
- PIV in extremity (use device on unaffected extremity)
- Lower extremity conditions that result in significant pain with compression (e.g., solid tumor, vaso-occlusive episode in sickle cell disease)
- Unable to achieve correct fit due to patient size

Contraindications to pharmacologic prophylaxis:

ABSOLUTE

- Intracranial hemorrhage
- Congenital or acquired bleeding disorder
- Platelet count unable to be sustained >50,000m3
- Uncorrected coagulopathy
- Acute stroke or brain ischemia
- Allergy to heparin or enoxaparin [e.g., hx of heparin induced thrombocytopenia (HIT)]
- Ongoing and uncontrolled bleeding (exceptions include bloody diarrhea in inflammatory bowel disease flare; discuss with GI team)

RELATIVE

- Intracranial mass
- Lumbar puncture or epidural catheter placement within last 4 hours or removal in prior 12 hours
- Uncontrolled severe hypertension
- Anticipated invasive procedure in next 24 hours
- Spine surgery or injury
- Suspected or known paraspinal hematoma

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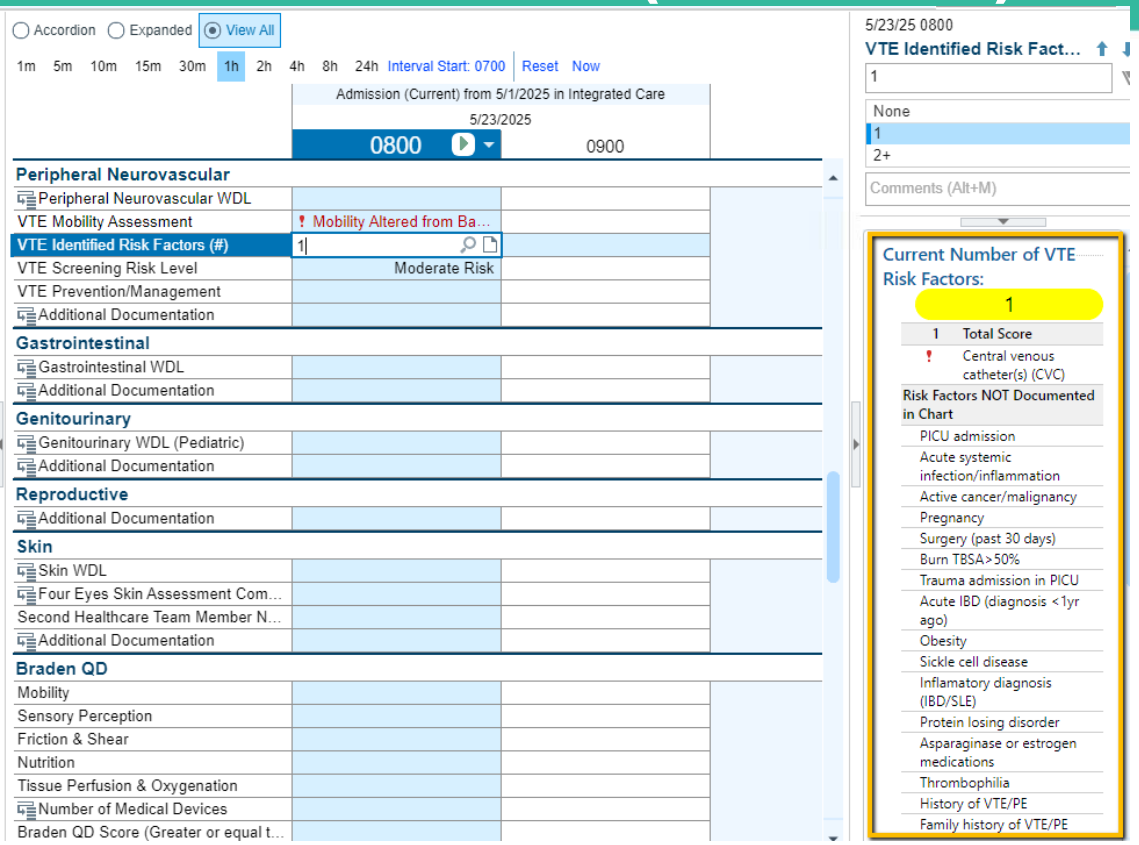
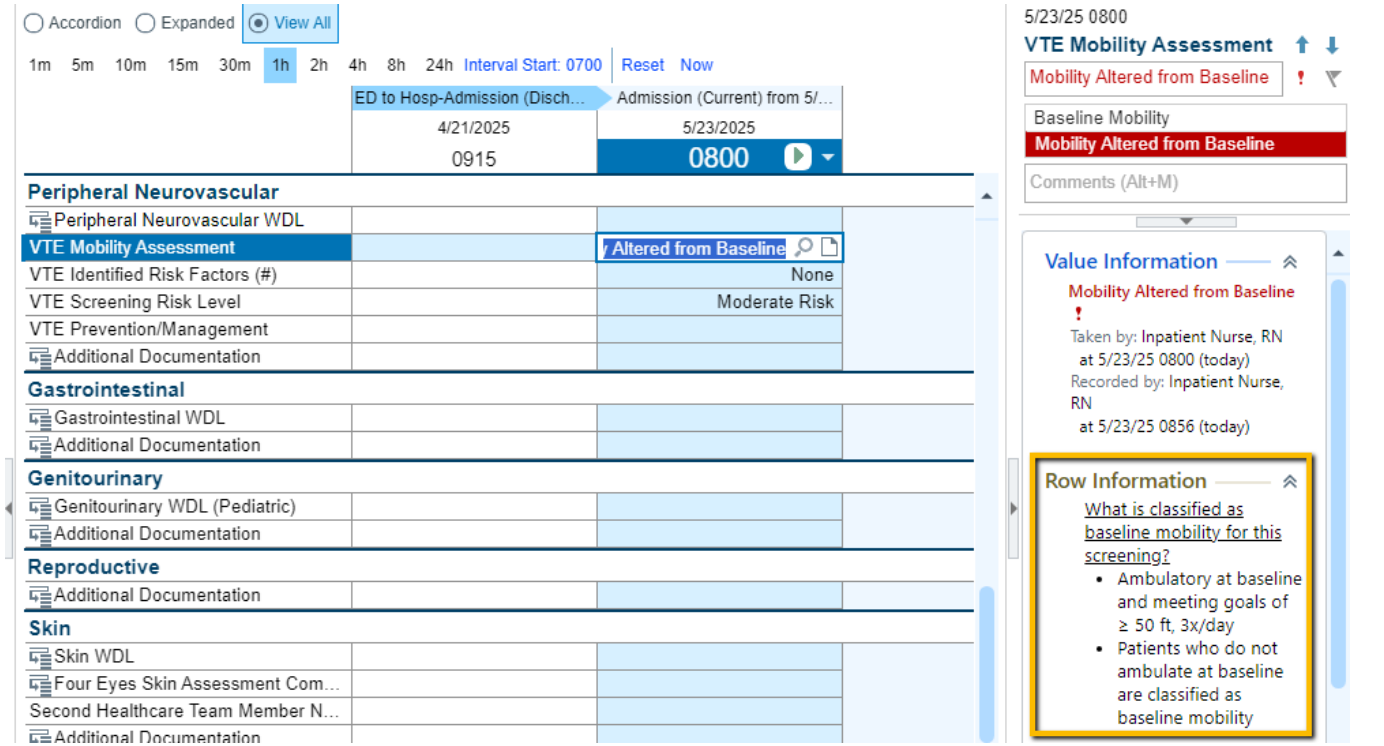
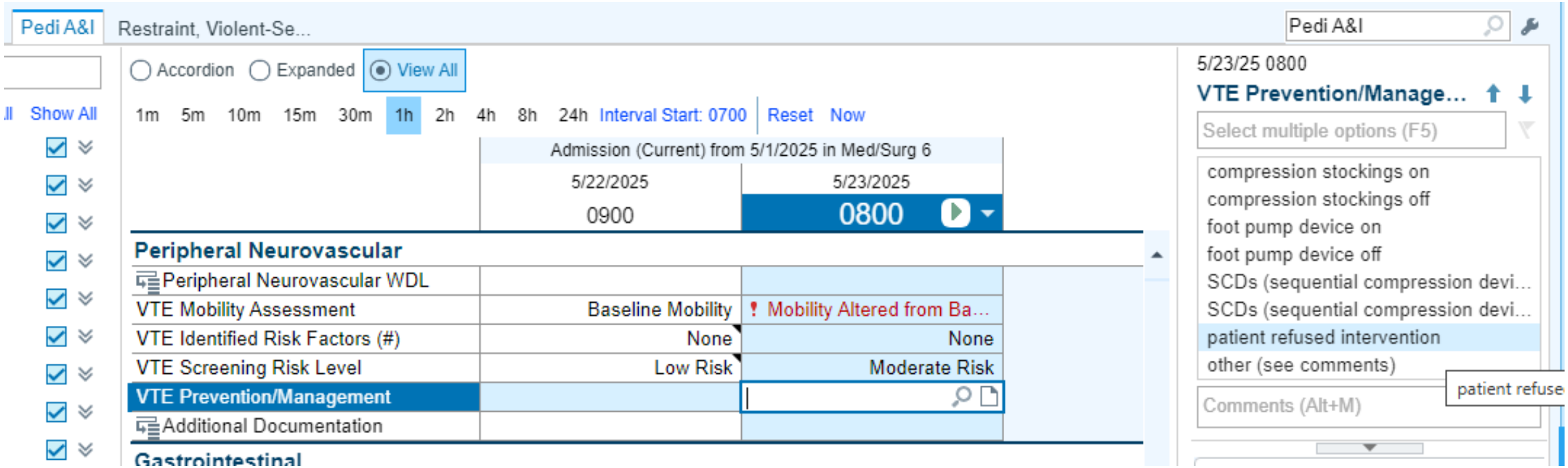
EPIC Tutorial (RN Role)



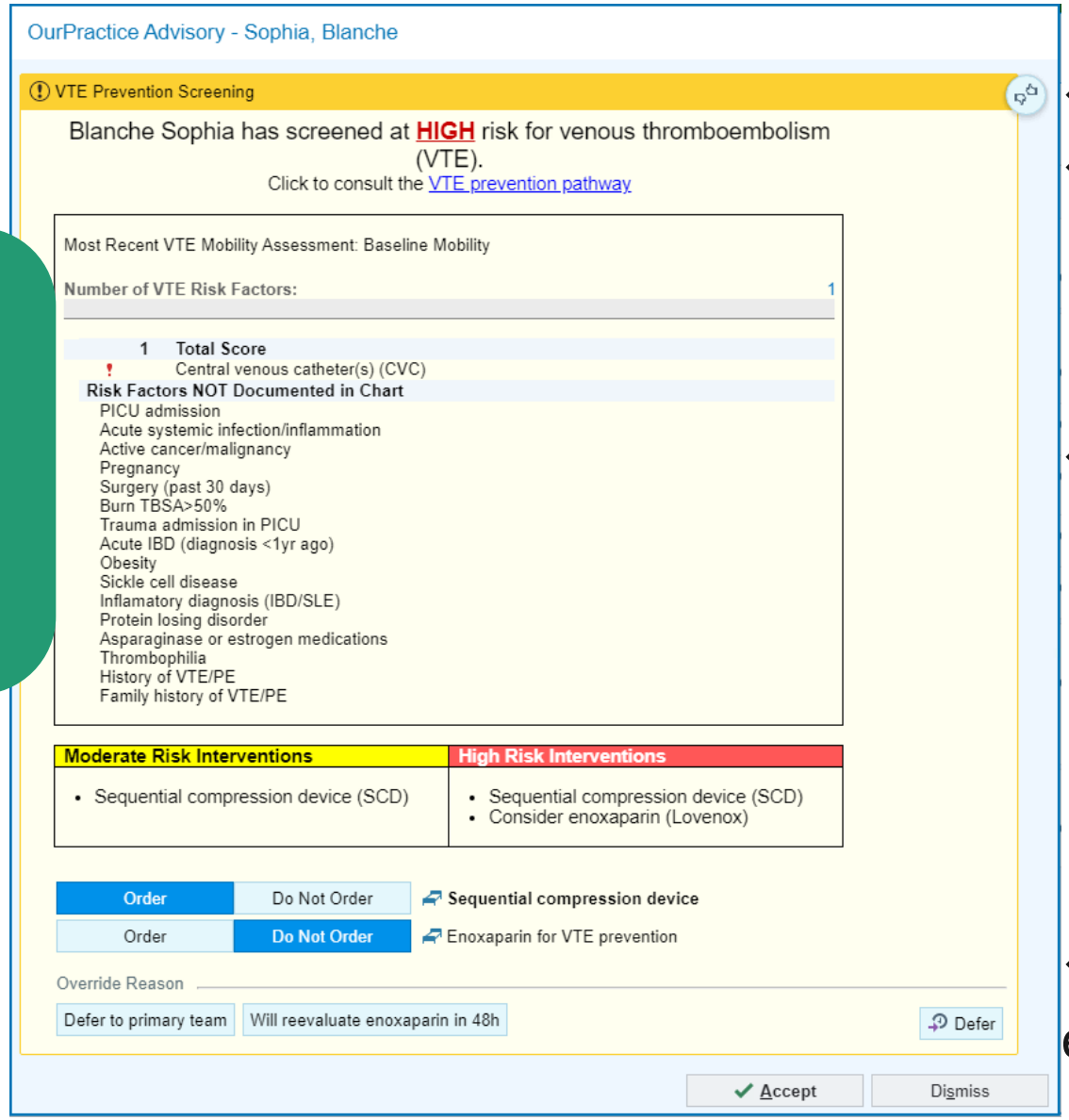


EPIC Tutorial (RN Role)



EPIC Tutorial (Provider Role)

When RN completes VTE screen an OPA (Our Practice Advisory) will fire to providers when they access ”manage orders”



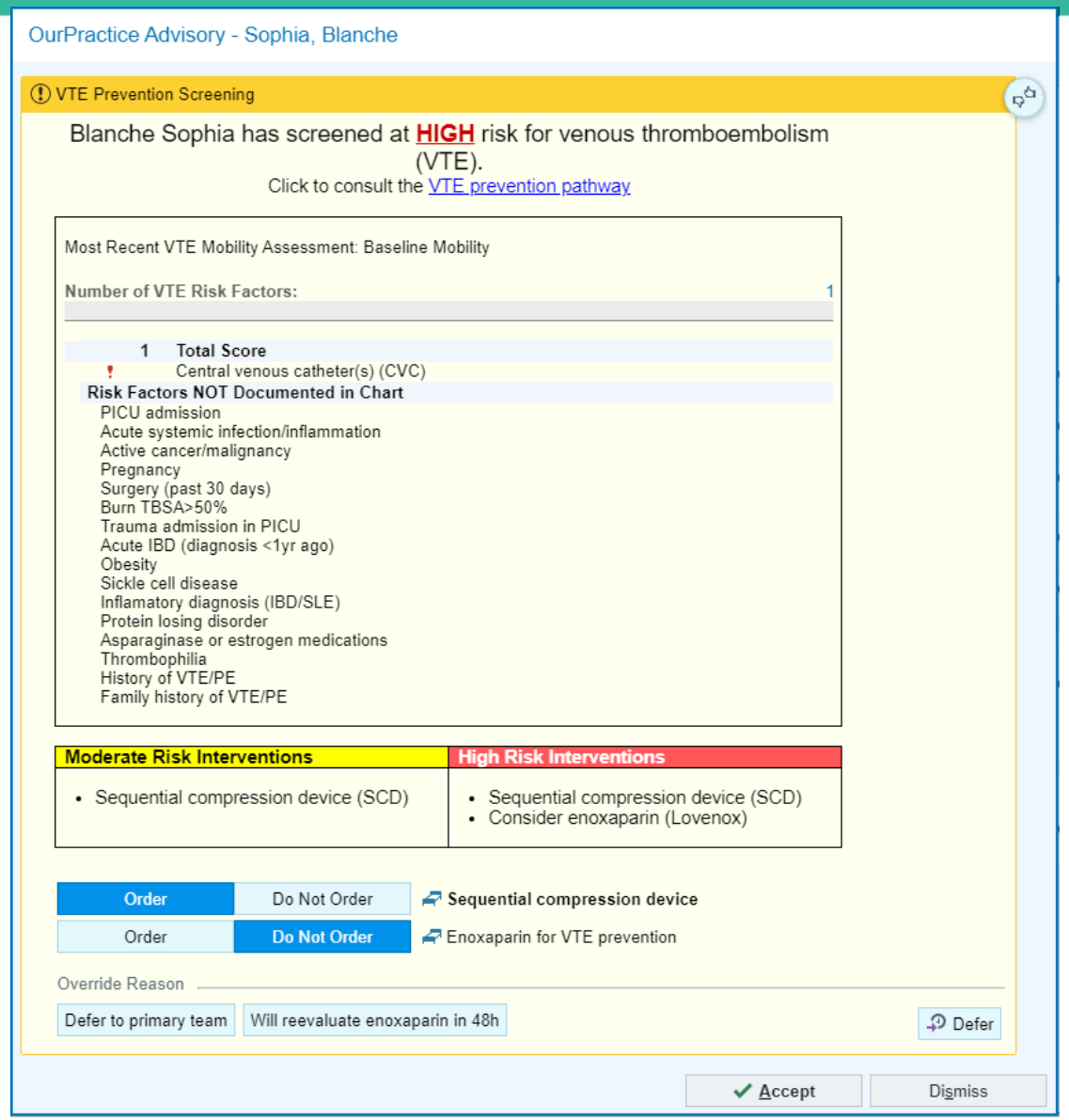
← Patients risk level

← Link to clinical pathway

← Risk factors the patient may have based on what’s documented in EPIC

← Orderable SCDs and enoxaparin (Lovenox)

EPIC Tutorial (Provider Role)

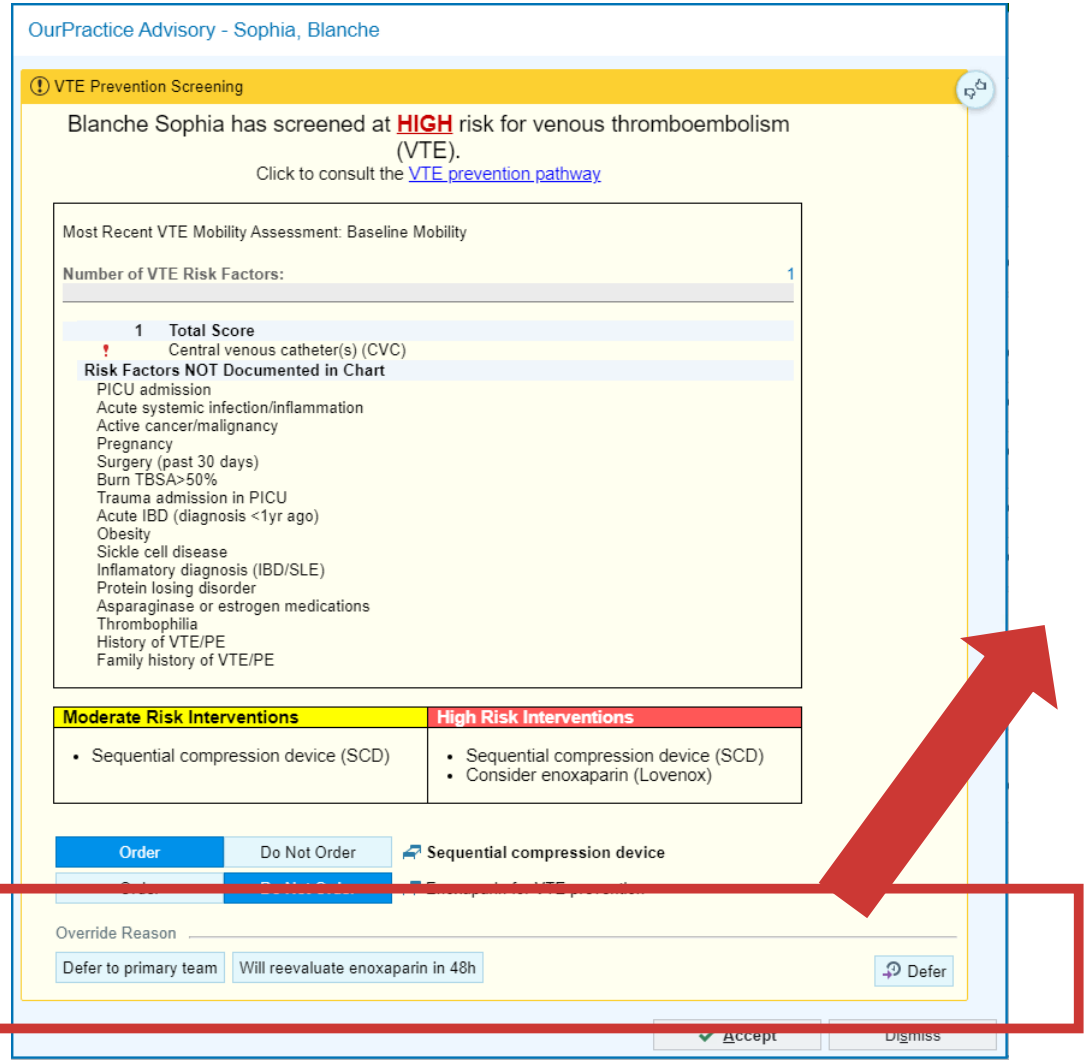


If the patient is **MODERATE** risk, an order related to mechanical prophylaxis will silence the OPA

- Orders for mechanical prophylaxis:
  SCD (sequential compression device)
- GCS (graded compression stockings)
- Order that states there is a contraindication to mechanical prophylaxis *(found in VTE prevention order set)*

If the patient is **HIGH** risk, the patient must have mechanical prophylaxis (above) *and* pharmacologic prophylaxis to silence the OPA. This is typically enoxaparin (Lovenox) but includes any type of anticoagulation.

EPIC Tutorial (Provider Role)

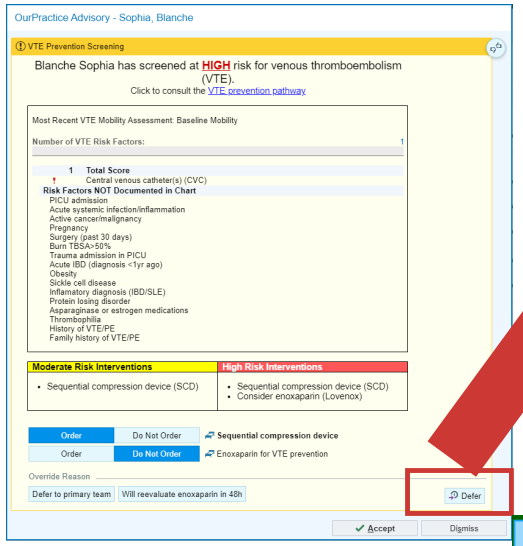


Override reasons function as follows:

- *Defer to primary team* - defers for current provider for 4 hours
- *Will reevaluate enoxaparin in 48h* - defers for 48 hours for all users
- *Defer* - is a *NEW* functionality, and makes the OPA a banner for 24 hours

If a team decides enoxaparin is not appropriate for the patient, click this option

EPIC Tutorial (Provider Role)



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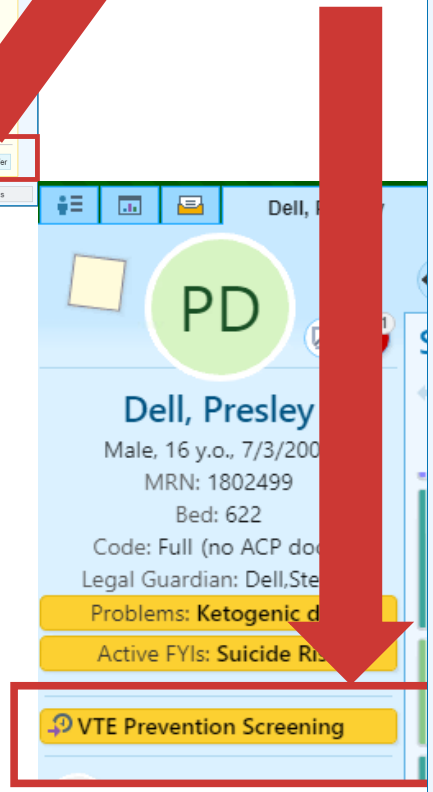
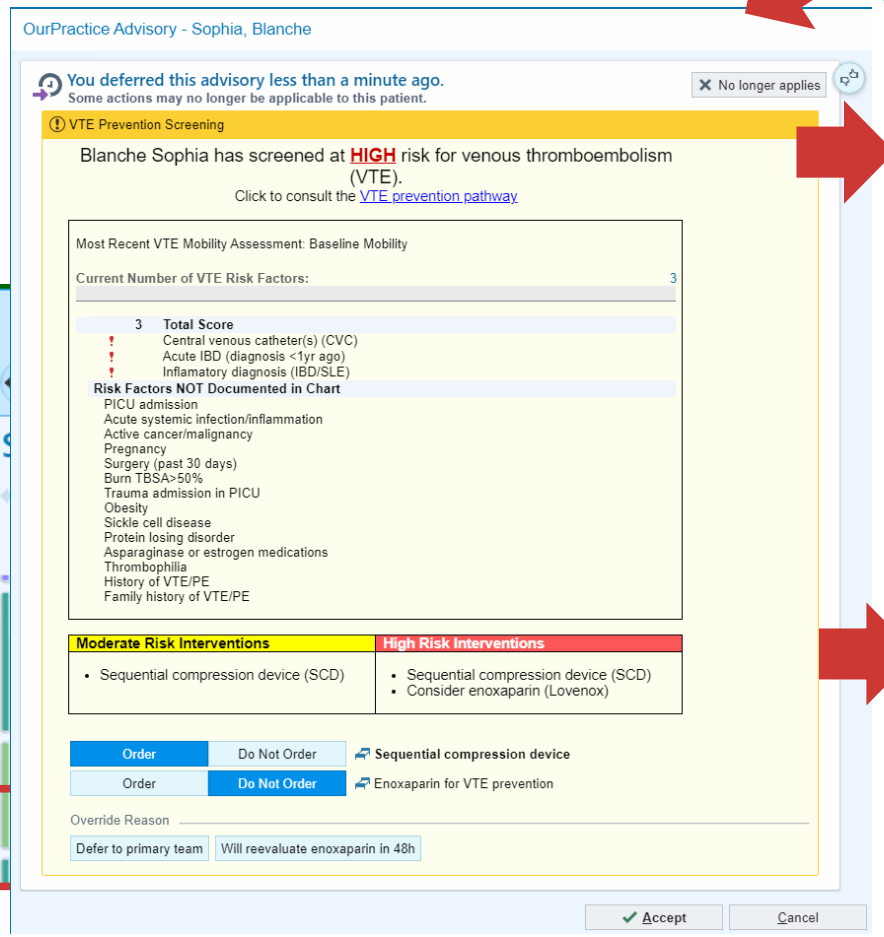


You can hover over banner to view OPA
You can click on banner to get OPA pop up



”No longer applicable” silences the OPA until a new VTE screen is completed

Cancel (at bottom) sends OPA back to the banner

Review of Key Points

- VTE screening should be completed by nursing within 24 hours of admission and every 2 days thereafter
- Providers should use the order panel to order appropriate VTE prophylaxis based on patient's risk level

Quality Metrics

- Percentage of patients with VTE risk assessment completed within 24 hours of admission to hospital unit
- Counts of patients who are low, moderate and high risk
- Percentage of patients with appropriate VTE prevention based on risk level
- Percentage of patients screened as high risk who receive anticoagulation medication
- Number of VTE events

Pathway Contacts

- Donna Boruchov, MD – Hematology/Oncology
- Joanna Young, PharmD, BCPS – Pharmacy
- Jessica Winters, MD – Critical Care
- Katherine Baldwin, MD – Gastroenterology

References

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Thank You!

About Connecticut Children's Pathways Program

Clinical pathways guide the management of patients to optimize consistent use of evidence-based practice. Clinical pathways have been shown to improve guideline adherence and quality outcomes, while decreasing length of stay and cost. Here at Connecticut Children's, our Clinical Pathways Program aims to deliver evidence-based, high value care to the greatest number of children in a diversity of patient settings. These pathways serve as a guide for providers and do not replace clinical judgment