

# Preventing the Preventable: Enhancing VTE Prophylaxis in Hospital Settings Through Pharmacy-Driven Intervention

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# Abbreviations

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**BMI:** body mass index

**CDS:** clinical decision support

**CrCl:** creatinine clearance

**DOAC:** direct oral anticoagulant(s)

**DVT:** deep vein thrombosis

**EHR:** electronic health record

**FY:** fiscal year

**ICU:** intensive care unit

**LOS:** length of stay

**MDR:** multidisciplinary rounds

**NPOA:** not present on admission

**PE:** pulmonary embolism

**TBW:** total body weight

**VTE:** venous thromboembolism

Background

# About the Ministry

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**1877**

Founded

**433**

Hospital Beds

**35**

ER Beds

**50**

ICU Beds (4 Units)

## Regional Impact & Quality

- Serves Central & Eastern Kentucky
- Excellence in Patient Care



# About the Ministry

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## Mission

As CommonSpirit Health, we make the healing presence of God known in our world by improving the health of the people we serve, especially those who are vulnerable, while we advance social justice for all.

## Vision

To achieve a healthier future for all – inspired by faith, driven by innovation, and powered by our humanity.

## Our Values

Compassion | Inclusion | Integrity | Excellence | Collaboration

# Why the Focus?

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Venous Thromboembolism (VTE), encompassing Pulmonary Embolism (PE) and Deep Vein Thrombosis (DVT), is a significant health threat in the US, affecting up to 900,000 individuals annually.

## High Incidence

Rates reached 40.8 per 100,000 admissions in 2019.

## Preventable Death

Estimated 60,000-100,000 deaths annually.

## Major Morbidity

1/3 to 1/2 of survivors experience long-term complications.

## Significant Healthcare Burden

Increased hospital readmissions, length of stay, costs, and disability.

## High Risk in ICU

Critically ill face 8-40% incidence due to immobility and age.

Evidence suggests under-prescribing of chemical prophylaxis for high risk patients

# Anticoagulant Mythbusters

**Research Snapshot:** 33 RCTs | >33,000 General Surgery Patients

## Common (Minor) Issues

- Injection Site Bruising (~7%)
- Wound Hematomas (~6%)

## Rare (Major) Bleeds

- GI Tract Bleeding (0.2%)
- Retroperitoneal Bleeding (<0.1%)

## Key Takeaway & Impact

Bleeding complications are generally low and rarely change patient care (<3% of cases). DVT prophylaxis is safe; minor bleeds are common, but serious complications are rare.

**Conclusion: DVT prophylaxis is safe and effective**

# Anticoagulant Mythbusters

**Focus:** Efficacy review of mechanical prophylaxis and early mobilization in VTE reduction.

## Enoxaparin (40 mg/day)

Significantly reduced VTE risk:

- **Mobile Early Group: 3.3%** (vs 10.6% Placebo)
- **Immobile Group: 9.0%** (vs 19.7% Placebo)

## Mechanical Prophylaxis

- Beneficial when chemical prophylaxis is contraindicated
- Morbidity/mortality did not improve with adjunct use of both mechanical and chemical

## Key Takeaway

Patients at moderate to high VTE risk benefit most from chemical prophylaxis when clinically indicated, especially in combination with early mobilization.

**Conclusion: Prioritize chemical prophylaxis + mobilization**

Project

# Chemical VTE Prophylaxis

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## Situation

- SJH was 27th percentile for VTE NPOA for FY25
- New FY26 target goal of 55th percentile

## Background

- Developing a VTE during a hospitalization could increase LOS
- Optimizing and prioritizing pharmacy review for chemical VTE prophylaxis may decrease rate of VTE and LOS

## Assessment

- FY25 DVT NPOA: 2.9 per 1000 acute inpatient encounters
- FY25 PE NPOA: 1.5 per 1000 acute inpatient encounters

## Recommendation

- Implement pharmacy driven focused reviews of inpatients without active orders for chemical VTE prophylaxis to target decreased incidences.

# Chemical VTE Prophylaxis

## PROJECT OBJECTIVES

\* KY Market Data

Metric	Baseline	Goal	Benchmark	Best Possible	Units
Chemical VTE prophylaxis orders	67%	77%	–	100%	Percentage as average
Rate of DVT NPOA	2.86 (FY25)	Less than 3	1.72*	0	Rates per 1000 acute inpatient encounters
Rate of PE NPOA	1.54 (FY25)	Less than 1.4	0.96*	0	
Ranking for VTE NPOA within the South Region for FY26	27th (FY25)	55th	51st*	100th	Percentile

## PROCESS SCOPE

**Process Start:** 6/27/25

**Process End:** 9/12/25

**Included:** acute inpatient encounters at Saint Joseph Hospital, clinical decision support built into Epic for VTE risk stratification, chemical VTE prophylaxis orders/order sets

**Excluded:** other hospitals within the KY Market

# Standard Work/Standard Specifications



## 1. Run Daily Report

Utilize the RX SJH VTE Audit report to identify patients requiring review

RX SJH VTE Audit [50939633] as of Fri 11/14/2025 12:37 PM

Hospital Chart + Add to List ED Chart Team + Patient List Membership Infection Management

Detail List - Original

Detail List Explore

Filter

Re-run Report

Refresh Selected

Select All

Department	Bed	MR	Patient Name	DOB	Admitting Provider	Admit Date/Time	Admit Dx	Code Status	Prophylaxis Intervention	Prophylaxis Devices	VTE Risk Level	Dx/Surgery Excl	Current Anticoag Meds	Anticoag - filter	VTE Medication Action Needed	VTE Mechanical Action Needed
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## 2. Evaluate Patients

Identify patients without anticoagulant orders for opportunities to add chemical VTE prophylaxis



## 3. Provider Outreach

Reach out to physicians/advanced practice providers with evidence-based recommendations

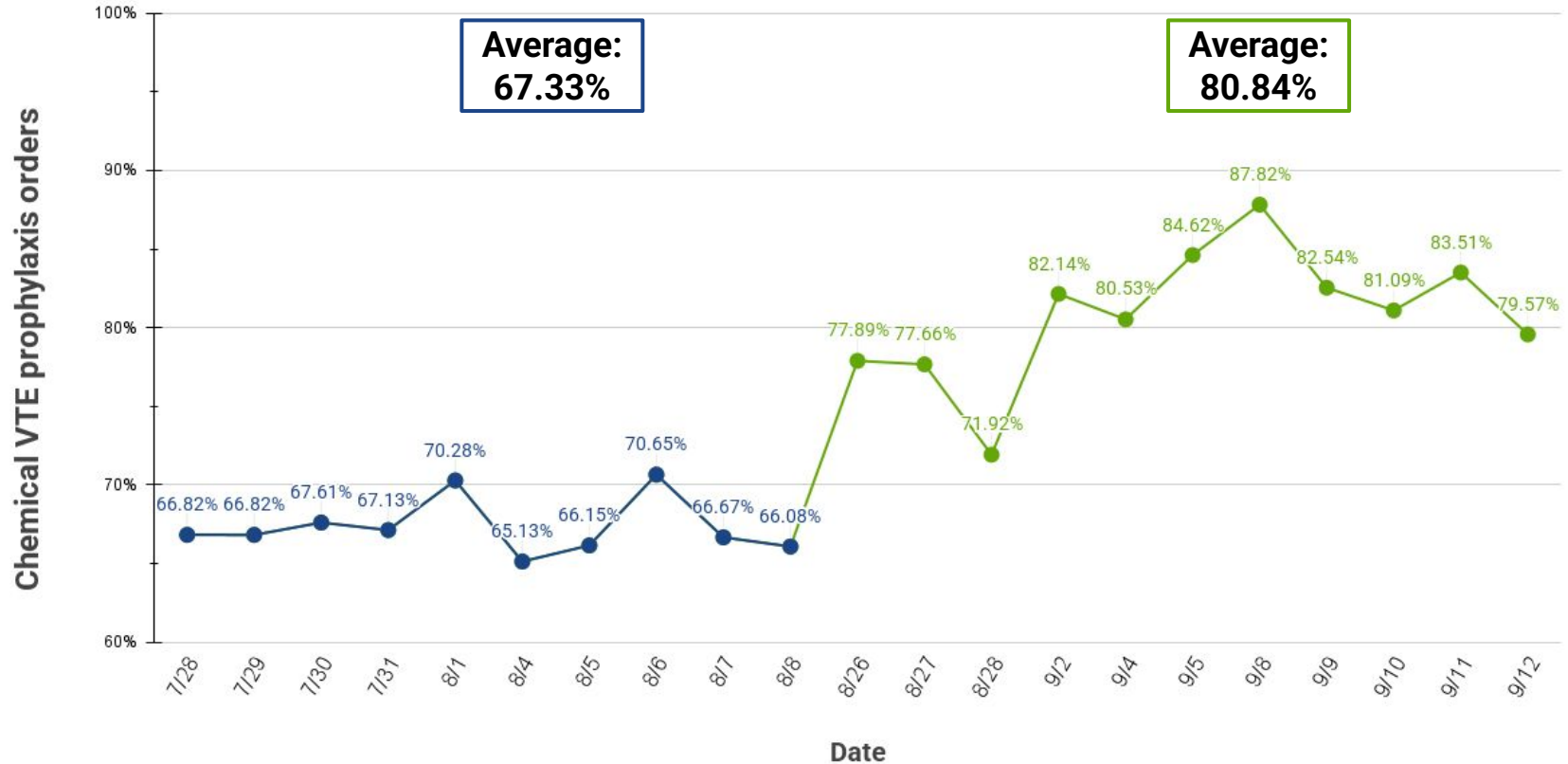


## 4. Document Findings

Accurately document all findings and outcomes in the designated shared spreadsheet

# Chemical VTE Prophylaxis

● Improve/Control Phase ● Baseline Data



# Lessons Learned

## VTE Prophylaxis Orders

Orders increased by **13.5%** through standard work developed in the improve/control phase

## Pharmacy Interventions (i-Vents)

Significant increase in clinical pharmacy interventions for adding anticoagulation:

**Baseline:** 14 interventions

**Improve/Control:** 31 interventions

## Standard Work Updates

Continue current standard work

**Eliminated:** Duplicate spreadsheet documentation

## EHR & Technology

Successful enhancement of CDS tools:

- Improved VTE risk CDS tools
- Optimized chemical VTE prophylaxis order set

Current State

# Departmental Implementation

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## Sustaining Effectiveness

**Optimized EHR Use:** Support personalized utilization of EHR tools by individual pharmacists for VTE assessment.

**Daily Assessment in MDR:** Ensure VTE prevention remains a visible and continually evaluated aspect of patient care.

**New Provider VTE Order Sets:** Rollout of updated order sets with standardized dosing for intuitive integration into workflows.

## Continuing the Journey

- Ongoing technological enhancements, including the EHR auto-refreshing dashboard.
- Embedding interdisciplinary collaboration as a structural, methodological, and technological priority.
- Continuing to advance patient safety and VTE reduction across the broader CommonSpirit Health network

# Pharmacy Workflow

## EHR Options

- Creation of user specific reports
- Utilization of standardized EHR data columns/data
- Use of optional fields
  - History
  - Current diagnosis
  - Allergies

## Multidisciplinary Rounds

- Daily reports
- Active pharmacist participation in both floor and ICU rounds
- Intentional review of patient risk and ordered VTE prophylaxis
  - VTE Risk Score
  - Anticoagulants

Anticoagulant(s)	Anti-Platelets Medications	VTE Medical Action Needed	VTE Risk Score
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# VTE Risk Assessment: Clinical Criteria

## High Risk (Score: 5)

Physical restrictions/non-weight bearing, acute cancer, acute stroke, ICU admission, intubation, major orthopedic or spine surgery, neurosurgery

## Moderate Risk (Score: 3)

Prior VTE history, acute infection, inflammatory disorder, thrombophilia, major surgery, BMI > 50 kg/m<sup>2</sup>, age > 75, decreased mobility PLUS 3 risk factors

## Low Risk (Score: 1)

Fully mobile patients

## N/A (Not Validated)

Pregnant, recently pregnant, or pediatric patients

### EHR VIEWS

Flowsheet view

VTE Risk Score

VTE Risk Score

5 -UE

Sidebar Summary

VTE Risk Score: 5

VTE Risk Score: 5 points (Up 5 points since last review) - [Last updated: 06/10/26 0940]  
0=N/A 1=LOW 3=MODERATE 5=HIGH

Census and Report Listing

VTE Risk Score

Moderate

High

High

Moderate

High

# VTE Risk Assessment Action Guide

## Green 0 (No Action Needed)

Patient meets VTE prophylaxis recommendations

## Yellow 2 (Clinical Review by Pharmacy)

Moderate VTE risk score without any anticoagulation ordered

## Red 3 (Needs Order for Medication)

High VTE risk without any anticoagulation ordered

## Red 4 (Evaluation Needed)

Low risk for VTE or high risk for bleeding AND on current anticoagulation. Evaluation of current order needed

VTE Risk Score	VTE Medication Action Needed
High	0
Moderate	0
Moderate	4
High	0
Moderate	4
Moderate	3
High	4
Moderate	2
High	0
High	4
High	2

# VTE Prophylaxis Orders

Drug	Standard Dose	Weight Based Adjustments	Renal Dosing (CrCl)	Trauma Dosing
			Severe/End-Stage Renal Dysfunction (Heparin Preferred over Enoxaparin)	
Enoxaparin (subq)	40 mg q24h	TBW <ul style="list-style-type: none"> <li>&lt; 50 kg: 30 mg q24h</li> </ul> BMI <ul style="list-style-type: none"> <li>&gt; 40 kg/m<sup>2</sup>: 40 mg q12h</li> <li>&gt; 50 kg/m<sup>2</sup>: 60 mg q12h</li> </ul>	<30 mL/min: 30 mg q24h <30 mL/min & BMI > 40kg/m <sup>2</sup> : 40mg q24h <30 mL/min & BMI > 50 kg/m <sup>2</sup> : 60mg q24h	Standard: 40mg q12h
				High Bleed Risk*: 30mg Q12H
				BMI > 30 kg/m <sup>2</sup> : 0.5 mg/kg q12h**
Heparin (subq)	5000 units q8h	TBW <ul style="list-style-type: none"> <li>&lt; 50 kg: 5000 units q12h</li> </ul> BMI <ul style="list-style-type: none"> <li>&gt; 40 kg/m<sup>2</sup>: 7500 units q8h</li> </ul>	No renal adjustment needed	Standard: 5000 units q8h
				BMI > 30 kg/m <sup>2</sup> : 7500 units q8h

\* High bleed risk: > 65 years old, CrCl < 60 mL/min, TBW <50kg, neurotrauma injury

\*\* Consider monitoring LMWH Anti-Xa

# Current State

DVT NPOA (per 1000)

**2.5** (Goal < 3)

PE NPOA (per 1000)

**0.9** (Goal < 1.4)

## Intervention Documentation

### Anticoagulation - Added Drug Therapy

(3/11/26 - 6/9/26)

**86**

## Anticoagulation Interventions Summary

(3/11/26 - 6/9/26)

Dose Optimization **150**

Added Drug Therapy **86**

Drug Optimization **49**

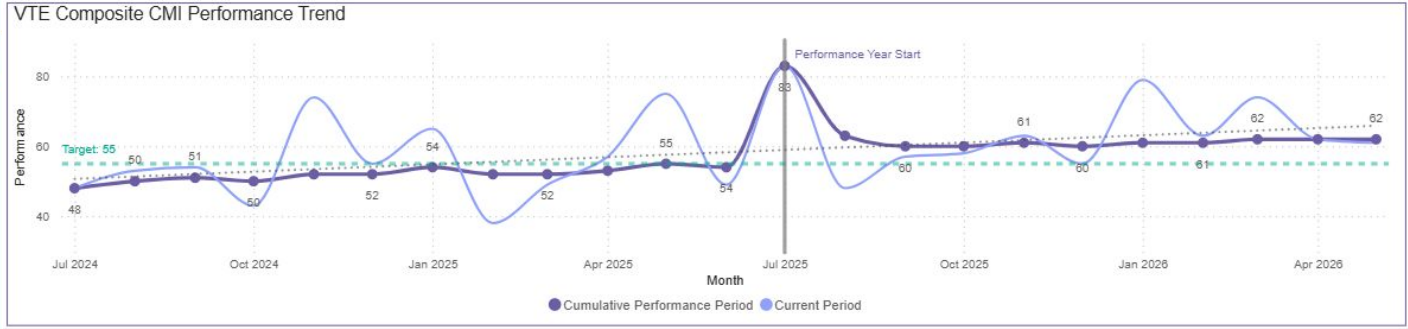
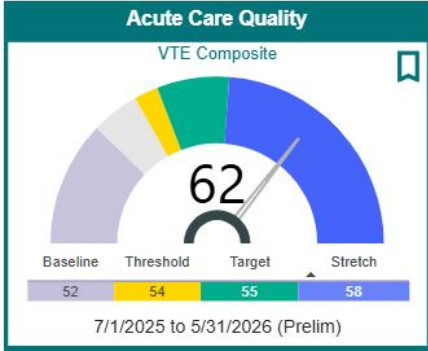
Lab Test Ordered **26**

Monitor Drug Therapy **23**

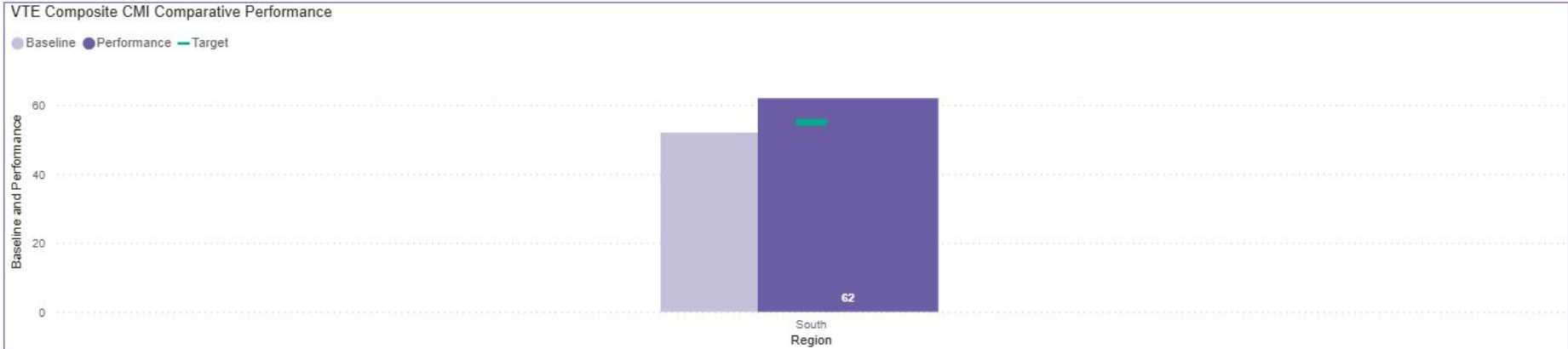
Discontinue Therapy **20**

Patient Education **1**

# CommonSpirit Health Clinical Scorecard



Measure Performance									
62	52	55	52	(Blank)	55	(Blank)	12,346	12,346	Not Focus
Percentile	Baseline Perce...	Target Percentile	Baseline	Rate	Target	Numerator	Denominator	Volume	Focus Facilities



Takeaways

# The Road Ahead: Locking In VTE Prevention Gains



## The Persistent Risk

VTE remains a significant preventable health risk. Hospitalized patients, especially those in the ICU, are at high risk, highlighting the continuous need for robust prophylaxis strategies.



## Pharmacy Impact

Pharmacist-driven interventions are crucial. Our project demonstrates the effectiveness of dedicated pharmacy review in identifying opportunities for appropriate chemical VTE prophylaxis.

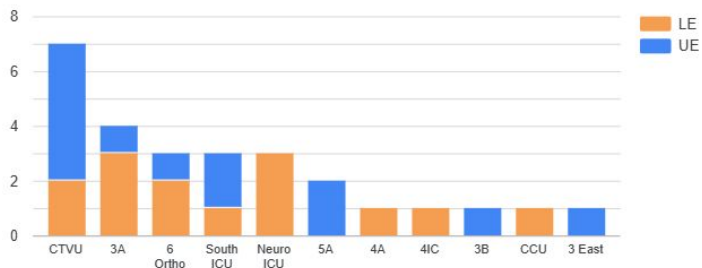


## Interdisciplinary Success

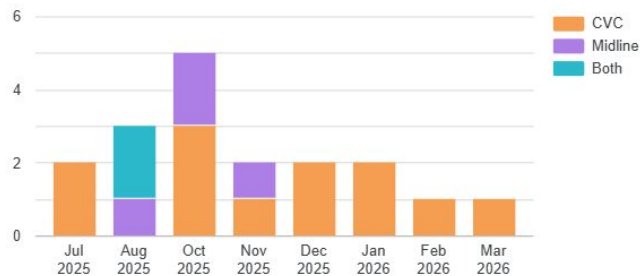
Collaboration was essential to develop standardized workflows. EHR tools, daily reports, and risk scores improved the consistency and appropriateness of VTE management.

# Retrospective Reviews

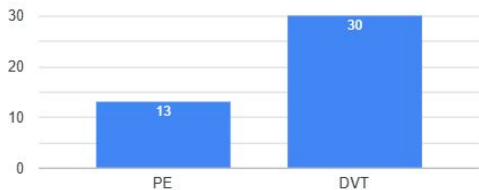
Nursing Unit Broken out by Upper/Lower Extremity



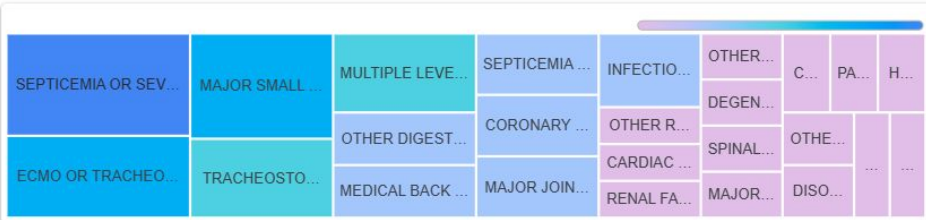
If UE - Line Association



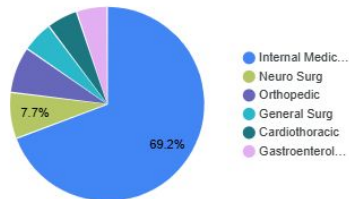
# DVT vs PE



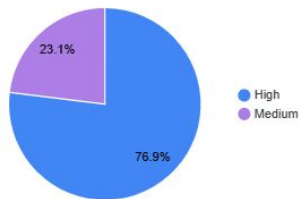
DRG Distribution



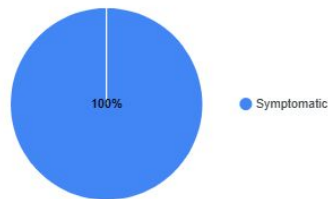
Service Line Where VTE Occurred



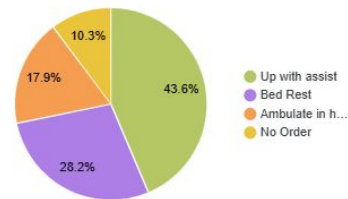
VTE Risk Score at Time of VTE



Symptomatic or Incidental Finding



Ordered Activity Level



# Next Steps

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## Focus on Sepsis Population

- Recovery phase
  - Resolution of lactic acidosis
  - Antibiotic therapy for at least 24 hours
  - No vasopressors within previous 4 hours
- Early progressive mobility
- Central line utilization



## Central Venous Catheters

- Duration
- Necessity
- Consideration of comorbidities
- Catheter to Vessel Ratio

# National Implementation

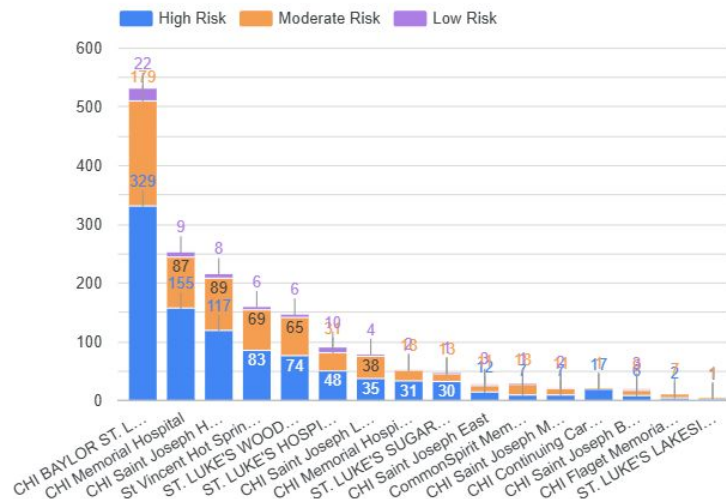
## CommonSpirit Venous Thromboembolism Dashboard

Data Refresh Date  
Jun 4, 2026, 12:55:00 PM

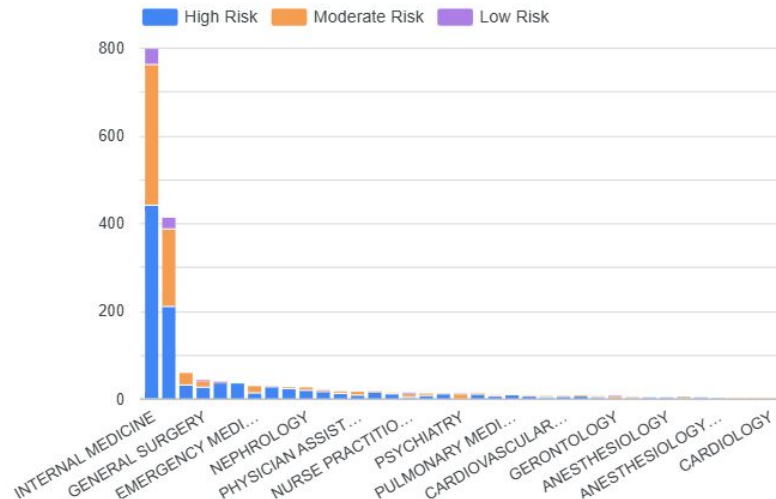
Region <input type="text"/>	Market <input type="text"/>	Facility <input type="text"/>	Department <input type="text"/>	Specialty <input type="text"/>
VTE Risk Level <input type="text"/>	Age Group <input type="text"/>	Gender <input type="text"/>	Prophylaxis Status <input type="text"/>	Prophylaxis Type <input type="text"/>

\*\*Data is limited to the Southern Region \*\*

Facility



Specialty - Provider



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