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2020

Acute Pulmonary Embolism

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Recommended Citation

Haydar, Samir, "Acute Pulmonary Embolism" (2020). *MaineHealth Performance Improvement*. 47.
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Problem/Impact Statement

Acute Pulmonary Embolism (PE), a form of venous thromboembolism (VTE), is a potentially life threatening diagnosis where there is significant heterogeneity in presentation in the Emergency Department and lack of standardization regarding subsequent inpatient management.

Goal/Objective

To standardize approaches for the evaluation and treatment of newly diagnosed PE beginning in the Emergency Department and extending through hospitalized care. To develop standardized risk stratification of PE patients (i.e. Low, Intermediate, High) to facilitate appropriate management and guide disposition decisions (discharge, ED Obs, Hospital Obs, Hospital Inpatient) to improve patient experience, outcomes, and efficiency. To develop performance metrics for assessing standardized care delivery implementation.

Baseline Metrics/Current State

- Prior to this project, we did not have the ability to report data based on PE risk stratification levels.
- We are now tracking PE encounter volumes by risk-stratification in our monthly and quarterly scorecards.
- PE order set utilization increased from 33.3% in FY20 Q1 to 63.2% in FY20 Q4 TD (data as of 8/10/20).

Order Set Utilization						
VTE Order Set Utilization (encounter count)	63	14	15	23	12	64
VTE Order Set Utilization (rate)	36.0%	33.3%	50.0%	60.5%	63.2%	49.6%

PE Order Set Development

Epic now calculates the sPESI Score:
The revised order set uses data previously entered into the patient's Epic chart to calculate the sPESI score.¹ Because this score is calculated using data in Epic, it will only be accurate if vital sign and problem list data are accurate. Therefore, the calculated score should be reviewed and used or modified per the best professional judgment of providers. The sPESI score can be pulled into the provider note with a new ".sPESI" smart phrase where it can then be accepted or modified.

sPESI Score	
1	Total Score
1	Has Heart Failure or Chronic Lung Disease Diagnosis (1 point)
Criteria that do not apply:	
	Age greater than 90 (1 point)
	Has Cancer Diagnosis (1 point)
	Heart Rate greater than 110 (1 point)
	Systolic blood pressure less than 100 mmHg (1 point)
	Pulse Oximetry less than 90% (1 point)
{sPESI Score Reviewed:33246}	

Refinement of Risk Assessment Categories:
This new order set uses the most recent evidence, based partly on the European Society of Cardiology/European Respiratory Society Pulmonary Hypertension Guidelines,² and establishes the following risk categories:

- High risk PE
- Intermediate-High Risk PE
- Intermediate-Low Risk PE
- Low Risk PE

These are based off of clot burden, hemodynamic stability and the sPESI score.

Risk Level	sPESI Score	RV Dysfunction on Imaging or Elevated Cardiac Biomarkers
Intermediate-High	1 or higher	Both
Intermediate-Low	1 or higher	One or Neither
Low	Zero	Neither

You can review the associated pathways on the EM Guidelines website:
<https://mainehealth.org/healthcare-professionals/clinical-resources-guidelines-protocols>

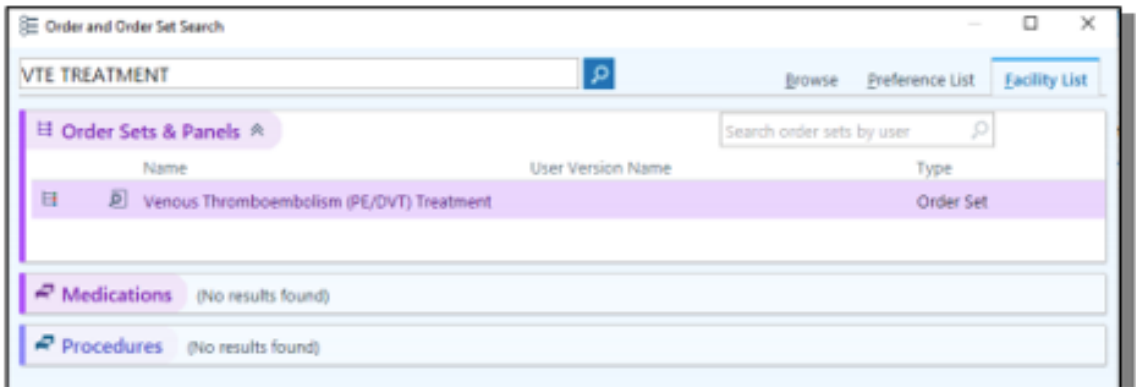
PE Order Set and Clinical Pathway

PE Order Set Go-Live and Clinical Pathway

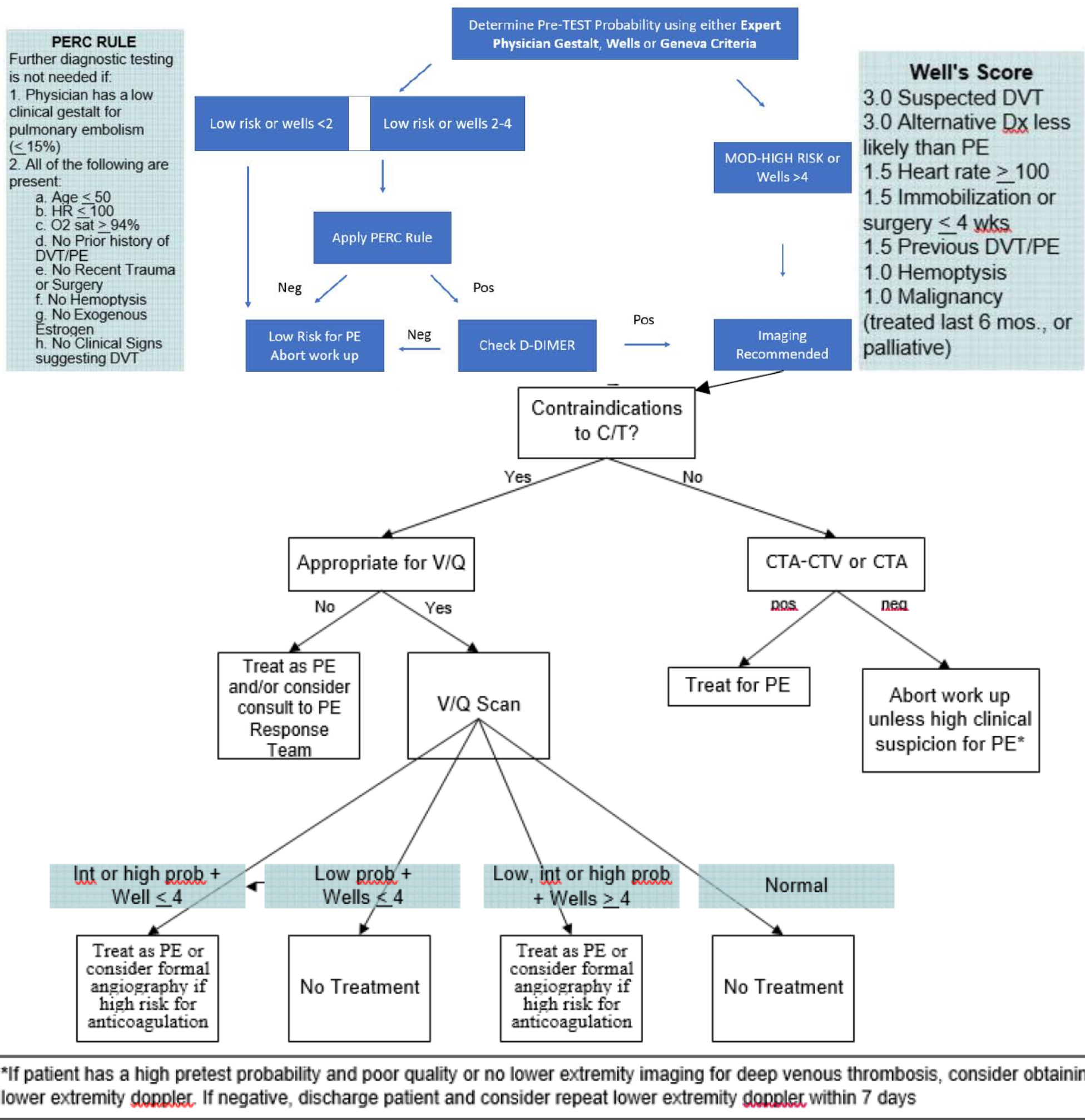
Updated Venous Thromboembolism (DVT/PE) Treatment Order Set and Associated Workflows

The Venous Thromboembolism (VTE) Treatment Order Set has been updated to provide easy access to risk assessment tools. The target population for this order set is **newly diagnosed VTE patients (Pulmonary embolism or Deep vein Thrombosis)**. The new design of this set enables prescribers to make informed decisions about risk stratification and management of VTE patients.

Find the updated set in order search:



Clinical Guideline for Work Up of Pulmonary Embolism (PE)



This guideline was ratified by the emergency department faculty at Maine Medical Center in July 2020. It reflects our expert opinion and is not necessarily applicable to all institutions. It is intended to be a reference for clinicians caring for patients and is not intended to replace providers' clinical judgement.

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Countermeasures

By When & Status*	Who	Deliverable
End Q1	Dr. Samir Haydar Karla Hyde Team	<ul style="list-style-type: none">Define patient cohorts, finalize metric definitions based on cohort definitions
End Q2	Dr. Liz Herrle Dr. Samir Haydar Team	<ul style="list-style-type: none">Develop and submit Order set for Epic ASAP build, determine baseline/benchmark of outcome metrics, develop tracking tool
End Q3	Dr. Christine Hein Faye Collins	<ul style="list-style-type: none">Educate staff on pathway and goals of project, Implement Order set
End Q4	Dr. Samir Haydar Karla Hyde Team	<ul style="list-style-type: none">Show improvement in Order set/pathway utilization, monitor and establish baseline for Readmission rate and LOS for admitted/discharged/CDU ED PE patients

Outcomes

- Dr. Hein created an educational PowerPoint for providers on the new PE order set and clinical pathway.
- Wes Zemrak, Pharmacy Supervisor, created a Scope article summarizing PE project achievements. This article will be published in September.
- PE AVS SmartText was implemented. This provides PE educational materials in the patient's AVS.

Next Steps

- Increase PE order set utilization.
- Dr. Samir Haydar will continue to send email reminders to ED providers regarding the PE order set and sustainability.