

Immediate Postpartum VTE Risk Stratification

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Abstract

Women who are pregnant or are postpartum are at increased risk for developing venous thromboembolism, which includes deep vein thrombosis (DVT) and pulmonary embolism (PE).

The Obstetrics and Gynecology governing body currently recommends that the decision to administer VTE prophylaxis to postpartum women is largely up to physician discretion. Currently at Erlanger, there is no protocol in place to screen women that are at an increased risk from the baseline postpartum physiology.

Body mass indices (BMIs) were collected from patients who have had a vaginal delivery, operative vaginal delivery or cesarean section between 01/01/2021 and 01/01/2022. To balance health care costs, the top 10% of BMIs were identified as a high-risk factor. We plan to administered pharmaceutical anticoagulation to this population of women during their postpartum inpatient admission.

Education was provided to staff members to increase the awareness of this serious postpartum complication. Participants were asked to complete a questionnaire to gauge effectiveness of educational materials

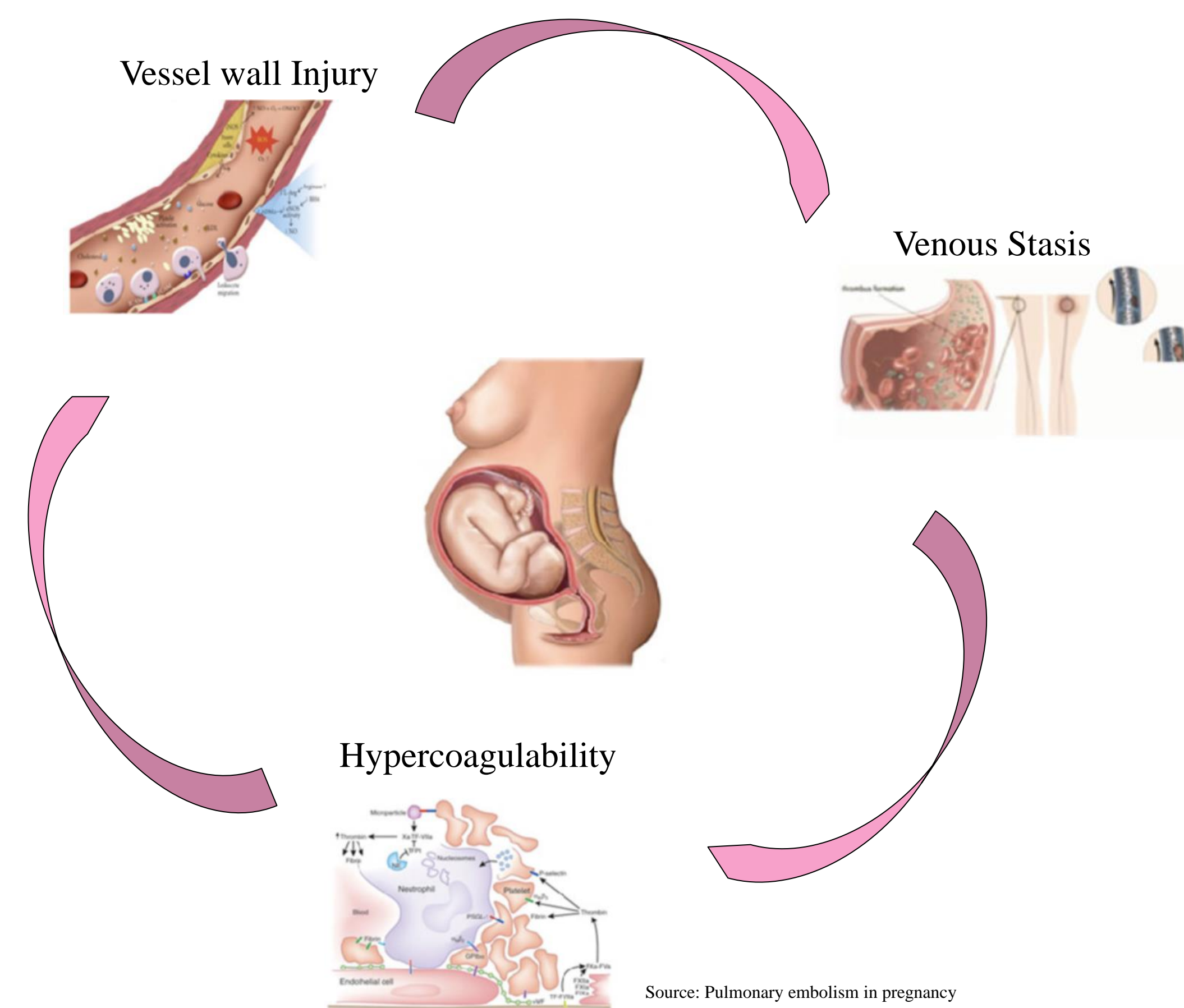
Introduction

- Venous thromboembolism (VTE) includes deep vein thrombosis and pulmonary embolism
- Postpartum women are approximately fourfold to fivefold increased risk of developing a VTE
- There are many factors that increase a woman's chance of VTE including obesity, tobacco abuse, undergoing a cesarean section, delivering multiples, diagnosis of thrombophilia, and a history of COVID
- According to the CDC, 31.2% of adults are obese in the state of Tennessee.
- Based off risk factors and obesity rates within the state of Tennessee, we propose using BMI as a qualifier for women to receive postpartum pharmaceutical prophylaxis, such as heparin or Lovenox, during their postpartum admission.
- In addition to providing pharmaceutical anticoagulation, staff education will be provided in hopes of raising awareness and identification of VTE at Erlanger.

Table 1. Changes in the Normal Functioning of the Coagulation System During Pregnancy

Coagulant Factors	Change in Pregnancy
Procoagulants	
Fibrinogen	Increased
Factor VII	Increased
Factor VIII	Increased
Factor X	Increased
Von Willebrand factor	Increased
Plasminogen activator inhibitor-1	Increased
Plasminogen activator inhibitor-2	Increased
Factor II	No change
Factor V	No change
Factor IX	No change
Anticoagulants	
Free Protein S	Decreased
Protein C	No change
Antithrombin	No change

Data from Bremme KA. Haemostatic changes in pregnancy. *Best Pract Res Clin Haematol* 2003;16:153-68 and Medcalf RL, Stasinopoulos SJ. The undecided serpin. *The ins and outs of plasminogen activator inhibitor type 2.* *Febs J* 2005;272:4858-67.
Source: American College of Obstetricians and Gynecologists



Age Group, y	Deep Venous Thrombosis						Pulmonary Embolism			
	Pregnancy		Postpartum		Total		Pregnancy		Postpartum	
	Women, n	Rate (95% CI)*	Women, n	Rate (95% CI)*	Women, n	Rate (95% CI)*	Women, n	Rate (95% CI)*	Women, n	Rate (95% CI)*
15-19	5	200.6	2	240.7	7	210.6	1	40.1	0	0.0
20-24	7	71.5	11	337.0	18	137.8	0	0.0	5	153.2
25-29	8	26.2	19	400.6	27	142.3	0	0.0	7	147.6
30-34	8	95.5	10	358.2	18	161.2	3	35.8	2	71.6
≥35	4	149.8	2	224.7	6	168.5	0	0.0	6	674.2
All ages†	32	85.2 (58.3-120.3)	44	351.4 (255.4-471.8)	76	151.8 (119.6-190.0)	4	10.6 (2.9-27.3)	20	159.7 (97.6-246.7)

* Incidence per 100 000 woman-years. † Table 1. Incidence of Deep Venous Thrombosis and Pulmonary Embolism among Pregnant, Postpartum, and Nonpregnant Women in Olmsted County, Minnesota, 1966-1995
Source: Trends in the incidence of venous thromboembolism during pregnancy or postpartum: a 30-year population-based study.

Conclusion

- Top 10% of BMIs from women who delivered via vaginal or cesarean section at Erlanger between 01/2021-01/2022 will be identified
- Women who are admitted and have a BMI that fall within the top 10% of BMIs will receive pharmaceutical anticoagulation during their postpartum inpatient status
- Plan to conduct chart review after 1 year of VTE prophylaxis to determine number of VTE and any adverse outcomes
- Continue to educate medical students, UT Obstetrics & Gynecology residents and faculty
- Preliminary data from educational experiences show there is an increase in knowledge amongst Women Services staff members

Sources

- American College of Obstetricians and Gynecologists. "ACOG practice bulletin No. 196: thromboembolism in pregnancy." *Obstetrics and gynecology* 132.1 (2018): e1-e17.
- Conti, E., et al. "Pulmonary embolism in pregnancy." *Journal of thrombosis and thrombolysis* 37.3 (2014): 251-270.
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Acknowledgements

- We thank Women's Services Staff members for participating in our educational lectures, Brooke Fuchcar and Sandra Condroski for their Epic expertise and Dr. Angela Yates for her guidance

