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## Screening for Venous Thromboembolism in Asymptomatic Trauma Patients: Effective in High Risk Patients

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## Introduction

- Screening for venous thromboembolism (VTE) in the asymptomatic trauma patient remains controversial
- While some institutions screen high risk patients, others rely on clinical judgment or endorse no screening
- Thomas Jefferson University endorses screening, but lacks a standard protocol
- This study aims to investigate the relationship between screening and rates of pulmonary embolism in the setting of non-protocolized screening
- Early detection and treatment may be linked to lower rates of pulmonary embolism

## Hypothesis

Through data analysis of a large cohort of trauma patients, a clinically applicable protocol can be developed based on various predisposing factors for VTE in asymptomatic patients. By isolating the factors that make these patients high risk for VTE, we can effectively lower the incidence of PE in hospitalized trauma patients.

## Methods

- Pennsylvania Trauma Outcome Study (PTOS) queried
- Inclusion criteria:
  - Admitted to urban level one trauma center from 2005-2015
- Screened Group: Patients who underwent one or more asymptomatic lower extremity ultrasound for deep venous thrombosis (DVT) prior to diagnosed pulmonary embolism (PE)
- Control Group: Patients with PE who were not screened for DVT
- Univariable chi-squared analysis comparing association of PE and asymptomatic screening in patients stratified by:
  - Demographics
  - Comorbidities
  - Injury (TBI, Spinal cord injury, Extremity fracture, ect.)
  - Procedure (Spine, Orthopedic, ect.)
  - Incidence of DVT

## Results

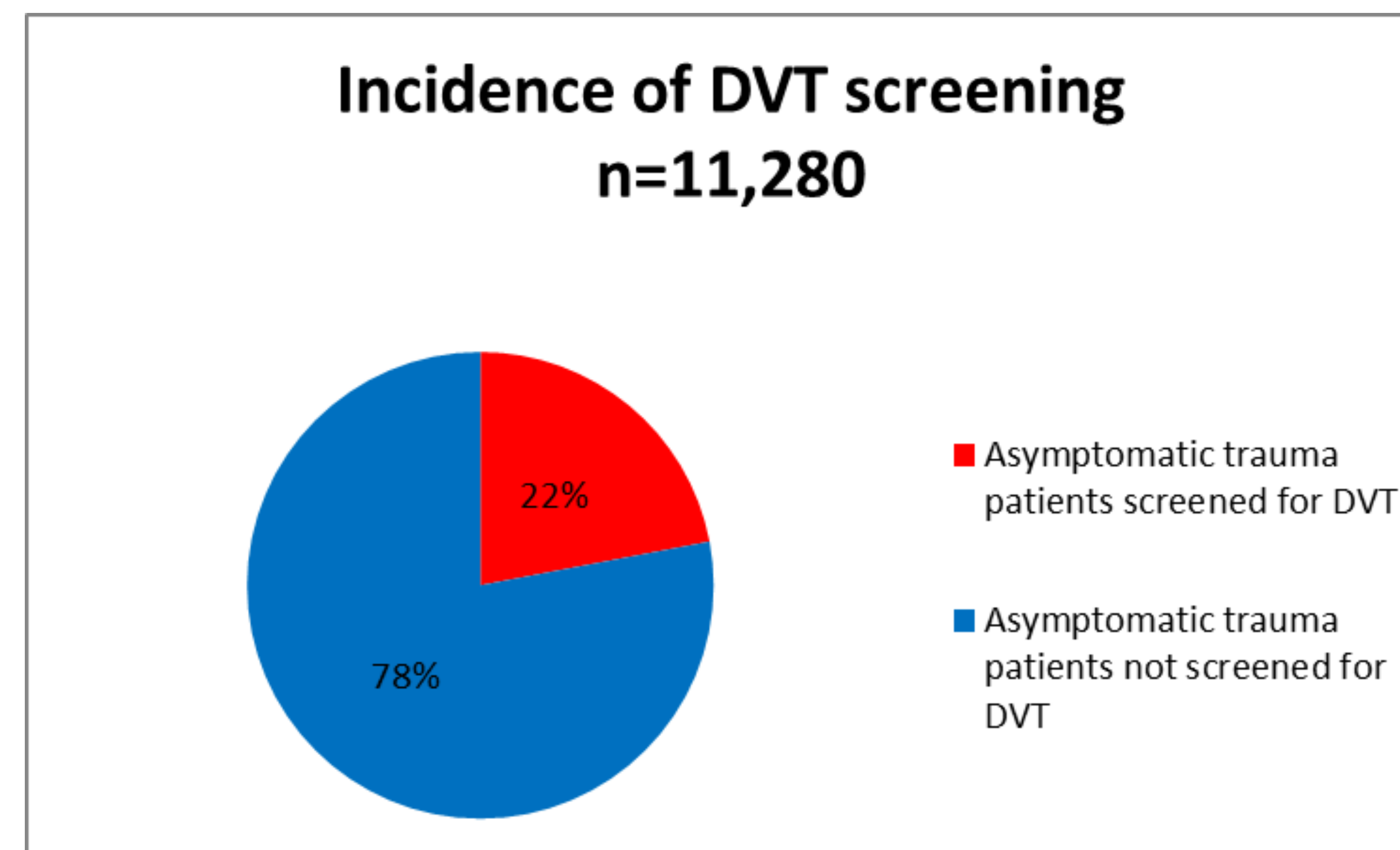


Fig. 1: Incidence of DVT Screening

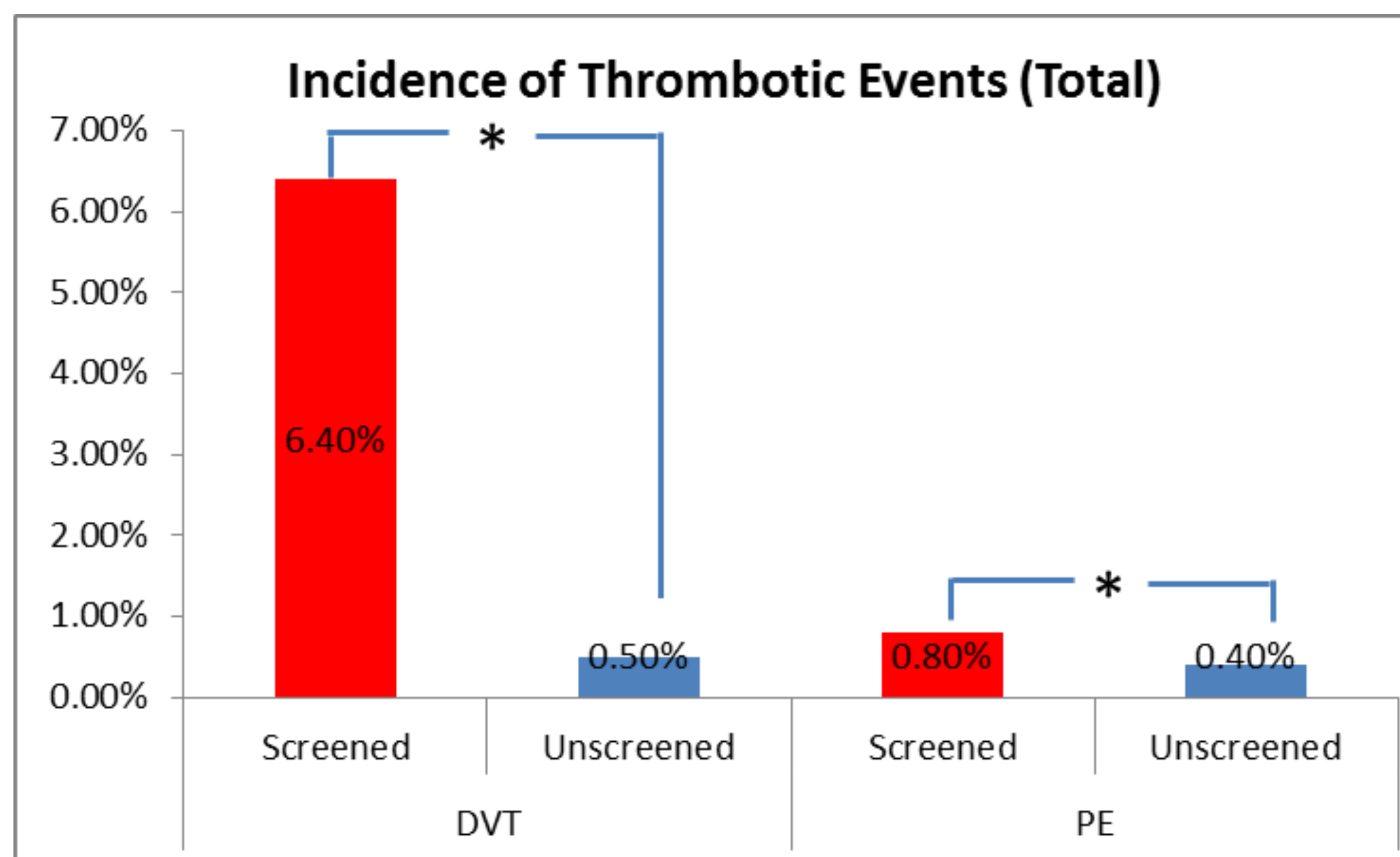


Fig. 2: Incidence of Thrombotic Events (Total)  
\* = Statistically significant (p <0.05)

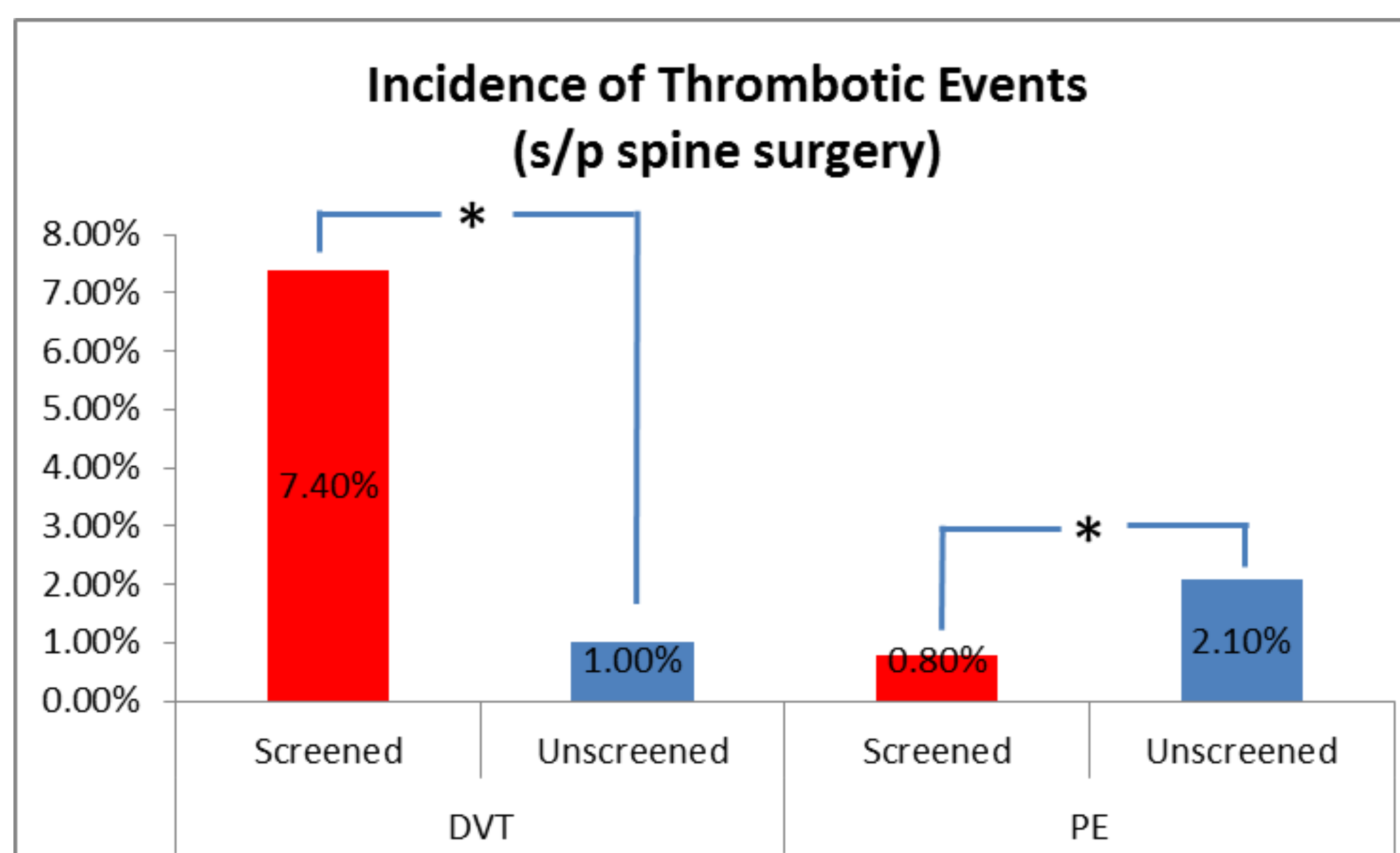


Fig. 3: Incidence of Thrombotic Events (s/p spine surgery)  
\* = Statistically significant (p <0.05)

## Results

- 11,280 patients submitted to PTOS between 2005 and 2015
- 2,491 (22%) underwent asymptomatic lower extremity ultrasound screening
- Incidence of DVT and PE in the screened patients was significantly higher compared with unscreened patients [6.4% (n=159) vs. 0.5% (n=40), p<0.001 and 0.8% (n=19) vs. 0.4% (n=37), p=0.032]
- In trauma patients who underwent a spine procedure, incidence of DVT remained higher [7.4% (63/850) vs. 1.0% (6/580), p<0.001], but incidence of PE was lower in screened patients [0.8% (7/850) vs. 2.1% (12/580), p=0.043]

## Conclusion

Without a protocol, lower extremity ultrasound screening of asymptomatic trauma patients may not be effective in eliminating the overall incidence of PE. However, certain high risk patients may still demonstrate reductions in pulmonary embolism suggesting value in targeted, protocol driven screening of high risk patients.

## References

1. Haut E, Lau B, Kraus P et al. Preventability of Hospital-Acquired Venous Thromboembolism. *JAMA Surgery*. 2015;150(9):912. doi:10.1001/jamasurg.2015.1340.
2. Allen C, Murray C, Meizoso J et al. Surveillance and Early Management of Deep Vein Thrombosis Decreases Rate of Pulmonary Embolism in High-Risk Trauma Patients. *Journal of the American College of Surgeons*. 2016;222(1):65-72. doi: 10.1016/j.jamcollsurg.2015.10.014.
3. Toker S, Hak D, Morgan S. Deep Vein Thrombosis Prophylaxis in Trauma Patients. *Thrombosis*. 2011;2011:1-11. doi:10.1155/2011/505373.
4. Schoenfeld A, Herzog J, Dunn J, Bader J, Belmont P. Patient-Based and Surgical Characteristics Associated With the Acute Development of Deep Venous Thrombosis and Pulmonary Embolism After Spine Surgery. *Spine*. 2013;38(21):1892-1898. doi:10.1097/brs.0b013e31829fc3a0.