VTE as Hospital Quality Indicator

VTE Consensus Conference

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VTE Facts

• VTE (DVT and PE) in the US: ~600,000 events/year
  – >100,000 dying annually
  – ~30% DVT develop post-phlebitic syndrome
  – ~5% PE develop chronic pulmonary HTN
• ~50% VTE: ~ 90 days of hospitalization/surgery
• Majority preventable with appropriate prophylaxis

Can VTE prophylaxis and/or event rates serve as a hospital quality metric
Ideal Quality Metric – *characteristics*

- Meaningful measure
- Directly impacts outcomes
- Minimal potential for unintended consequences
- Not ‘gamable’
- Objective
- Consistently collected or easily collectable
- Risk adjusted – on patient and acuity

*Schold et al, CJASN, 2017*
VTE as Quality Metric – *widely used*

- Care quality commission (UK)
- Australian commission on safety... (Australia)
- Agency for healthcare research and quality (USA)
- Joint commission (USA)
- Center for Medicare and Medicaid services (USA)
- American College of Surgeons (USA)
- And many more

*VTE related quality metrics are often utilized in pay for performance programs*
Academic Medical Centers.

Pulmonary Embolism Benchmarking Project, 33 United States hospitals.

The National Quality Forum have prioritized VTE prevention as a major patient safety initiative. Many national organizations, including all patients receive VTE prophylaxis unless they have contraindications. Numerous studies suggest that all hospitals should institute formal VTE prophylaxis programs.

Periodic audit with feedback, computerized decision support, and provider reminders are important strategies to improve guideline adherence. Effective methods to improve guideline adherence must be an opportunity for practice and quality improvement.

VTE guideline adherence in this AMC subset. This appears to be an opportunity for practice and quality improvement. However, there is still a low adherence in each group separately or overall. Informatics and possibly targeted quality improvement and educational efforts are needed.

Greater severity of illness seemed related to whether surgical patients received guideline-adherent prophylaxis. Among medical patients, statistically significant determinants included patient-specific factors such as VTE history. Medical patients with Medicaid insurance and private or commercial insurance were less likely to receive appropriate prophylaxis. Perhaps, there are educational implications of these findings.

Among medical patients, Greater severity of illness seemed related to whether surgical patients received guideline-adherent prophylaxis. Among more than 1500 medical and surgical, acute and critical care settings, we found lower-than-expected VTE prophylaxis use. Despite evidence for VTE prophylaxis for at-risk hospitalization and possible intensive care patients at US AMCs.

Conclusions

Prophylaxis rates are highly variable across UHC study of 33 US academic medical centers. Medical: 59%; Surgical: 39% [26-100]. Medical patients % adherence to VTE prophylaxis guidelines by site. Surgical patients % adherence to VTE prophylaxis guidelines by site. Medical: 59%; Surgical: 39% [16-67].

Acknowledgments

The authors wish to thank the UHC 2007 DVT/PE Benchmarking Project Team for allowing us to make use of these data. A special thanks to Joanne Cuny, RN, MBA, and Pradeep Sama, MBA, for their time and assistance.
VTE Prophylaxis – elements

Effective VTE prophylaxis: a multi-step process

1. Individualized VTE risk assessment
2. Prophylaxis prescription based on risk
3. Administration of the prescribed prescription
4. Patient acceptance of the administration
VTE Prophylaxis – *effectiveness*

- Which element(s) should be considered as metric?
  - All have to work for *effective* prophylaxis

- Wide variation among agencies

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*Lau et al, Circulation, 2018*
Process vs Outcome

• VTE prophylaxis rates measure process
  – Assumption: Improved process = Improved outcomes

• Quality (value) = Outcomes/Cost

Why not measure outcome – VTE rate – as quality metric?
Devil (very often) is in the Detail

• Unintended consequences
  – VTE: ‘the more you look, the more you find’
  – Dis-incentivizes hospitals to find and treat VTE

• Surveillance
To surveil or not to surveil?


CDC Consensus Conference – surveillance

- Improved utilization...,(of) proven-effective preventive measures is critical to reducing VTE disease burden
- Systematic surveillance is critical...to provide...data on the prevalence and annual incidence of VTE in the U.S.
- ...systematic surveillance will be important to enhance prevention efforts
- The CDC should convene a second group of experts to advise the agency in detail on the strengths, weaknesses, and feasibility of possible approaches to systematic surveillance for DVT and PE

Surveillance vs No Surveillance

DVT/PE: Impact of surveillance

- Lung transplantation [33]
- Implantable defibrillator [34]
- Auto airbags [35]
- APC [36]
- tPA for AMI [37]
- CABG [38]
- NICU care [39]
- Statins [40]
- Warfarin for stroke prophylaxis [41]

DVT Sur. 25,000 50,000 75,000 100,000 150,000 100,000

US Dollar cost per QALY saved from best case scenario to worst case scenario

[0.26-0.90]

0 1 2 3 4 5

Malhotra et al, PLOS, 2014
Surveillance Bias – *impact*

- Systemic review of ten VTE studies:
  - 9/10: positive correlation of VTE with imaging intensity

Hospitals with higher quality scores had higher VTE prophylaxis rates but worse risk-adjusted VTE rates. Increased hospital VTE rates were associated with increasing imaging rates. Surveillance bias limits the usefulness of the VTE quality measure for hospitals working to improve quality and patients seeking to identify a high-quality hospital.

*Bilimoria et al, JAMA, 2013*

*Chen et al, Am J Med Qual, 2017*
Surveillance Bias – impact

• Patient Safety Indicator (PSI) 90
  – Hospital VTE rate a component of PSI 90
  – Widely used in federal ‘pay for performance’ programs

• 3,203 hospitals: PSI with and without VTE
  – 17% improved; 21% worse; 62% unchanged

• Hospitals that improved
  – Larger; Academic; More technology; Sicker patients

VTE rate as quality metric penalizes larger, academic centers with more sick patients

Blay Jr et al, Jt Comm J Qual Patient Saf, 2019
Summary

• VTE has a high societal burden
• Most VTE during/post hospitalization/surgery
• Majority of peri-hospitalization VTE preventable
• VTE prophylaxis is highly variable
• VTE prophylaxis and VTE event rates can serve as important hospital quality metrics with caveats
  – Role of surveillance is unclear
  – Utilizing VTE event rates as metric unfairly penalizes large academic centers treating the sicker patients
• Improving VTE prophylaxis may have a halo effect
Thank you