

## 2015 CDC HA-VTE PREVENTION CHALLENGE CHAMPION



### ORGANIZATION:

Mayo Clinic

### PATIENT POPULATION:

- Multi-Hospital System with 22 Acute Care facilities
- 121,629 inpatient admissions in 2014; 3971 beds
- 6% belong to a racial or ethnic minority
- 10% are enrolled in Medicaid

### BACKGROUND

Mayo Clinic's first systematic efforts at developing a highly reliable venous thromboembolism prevention (VTE-P) system began with adult patients in 2006. At that time, documented and appropriate VTE-P plans were found in only 79.2% of patient charts. Starting with a project in Rochester to ensure VTE-P plans were in place for >95% of patients, Mayo Clinic used a "Discovery and Diffusion" method to ensure that best practices learned were spread across the health system, so that every Mayo Clinic patient, both young and old, received the best care. The methods used by Mayo Clinic have resulted in a VTE-P core measure reliability of 97% and 0 preventable-type VTEs in the past two quarters, and have been applied across 22 acute care facilities in 5 states.

Using lessons learned from the adult VTE-P projects, Mayo Clinic turned attention to pediatric VTE prevention in the Mayo Eugenio Litta Children's

: Hospital in Rochester, MN, beginning within  
 : the pediatric intensive care unit. At the start of  
 : the project, there was no standardized pediatric  
 : screening tool for VTE upon admission and  
 : further care. A dedicated clinical improvement  
 : team focused first on a "Discovery" project to  
 : develop an appropriate risk screening tool, adopt  
 : accepted consensus VTE-P interventions based  
 : upon risk, and develop a method to ensure that  
 : the program was implemented reliably.

### OBJECTIVES

- To develop reliable VTE-P systems for adult, acute care patients and for pediatric patients.
- To maximize the number of patients reliably receiving indicated and effective VTE-P.
- To enhance safety by appropriate use of VTE-P in a sustained manner with capacity for on-going improvement.

## METHODS

### Adult Acute Care Patients

#### DISCOVERY THROUGH PILOT PROJECTS

Beginning in 2006, two different interdisciplinary teams worked independently in selected medical and surgical practices to improve VTE-P through pilot projects. Each independent team's work resulted in the reduction of defect rates on pilot hospital services to <10%.

Key lessons learned from these early projects are described as follows: (a) 98% of inpatients had at least 1 risk factor for VTE; and (b) when physicians explicitly determined a VTE prophylaxis plan, they made the correct decision 98% of the time.

#### INITIAL DIFFUSION ACROSS MAYO CLINIC ROCHESTER HOSPITALS

Spread Teams were developed that included physician champions, project managers, a pharmacist, and a nurse. To emphasize the engagement of institutional leadership, the project was commissioned by the institution's Clinical Practice Quality Oversight Committee and co-chaired by the Department of Medicine Associate Chair for Quality, and the Chair of the Surgical Quality and Safety Subcommittee. Spread teams focused on implementing VTE-P tools and monitoring them for usability, effectiveness, and unintended consequences or gaps.

### Implementation

#### CREATION OF VTE-PREVENTION PLANS AND A VTE PROPHYLAXIS TOLLGATE

Based on lessons learned from the pilot projects, Spread Teams focused on developing optimal VTE-P plans for individual practices (e.g., preferred VTE-P for a neurosurgery patient is not the same as for a medical patient), and the creation of a "VTE Prophylaxis Tollgate" that required providers to complete a VTE-P plan for every patient. To maximize effectiveness, The Tollgate was integrated into the clinical workflow of all orders sets at admission, transfer, and for selected postoperative settings. The Tollgates were via paper order sets initially and then were converted to electronic format to minimize burden on clinicians. The designs were tested in the "usability" laboratory to ensure that they were as clear and easy to use as software would allow.

#### ALERTS

Based on initial reports and feedback, an electronic VTE- P flag was created to alert the clinician if a) any patient deemed at least "moderate risk" for VTE did not have a valid VTE-P plan in place for any 24 hour period, or b) if any patient had a "low risk" categorization for >3 days (since this length of stay should prompt reconsideration of risk status). The flags were accompanied by user-tested messaging to ensure they were clear and as user-friendly as possible given software constraints.

#### MONITORING

Both process and outcome measures were used to monitor the effectiveness of VTE-P activities. The teams measured and reported the proportion of patients in whom a) VTE risk factors were present (patient is determined to be at least at moderate risk for VTE), and either pharmacologic or mechanical VTE prophylaxis was ordered within 24 hours of admission; or b) VTE risk factors were not present, and VTE-P not indicated was documented within 24 hours of admission. The clinical decision support (CDS) system also provided ongoing monitoring of the frequency of physician alerts (i.e. number of flags).

#### DISSEMINATION TO ALL 22 MAYO CLINIC ACUTE CARE FACILITIES

In order to disseminate the program to the wider Mayo Network, a new multidisciplinary diffusion team was assembled, this time led by the Mayo Clinic Patient Safety Officer (an MD), 3 other physician champions (one from each region of Mayo Clinic), a project manager, a pharmacist, a nurse who creates computerized physician order entry (CPOE) system content, and the institutional quality office personnel who assisted with the measurement, analysis, and display of data at the work-sites. The best practices diffused were 1) all critical access order sets will have a VTE-P Tollgate; 2) all VTE-P tollgates will be a "force function" (i.e., they can't be bypassed); 3) >95% of all eligible patients in the facility at any given moment will have a valid VTE-P plan in place; and 4) monitoring must be available as an automatic feed, rather than by chart review.

## Pediatric ICU Patients

### DEVELOPMENT OF PEDIATRIC VTE SCREENING TOOL

A team consisting of a physician, pharmacist, and nurses developed a standard admission VTE screening tool for all pediatric patients admitted to the pediatric intensive care unit. The components of the tool were chosen based on a review of VTE prevention in the published literature and the current adult VTE and surgical guidelines used by some pediatric surgical specialties.

The screening tool also provided guidance for assessment of bleeding risk and appropriate VTE prevention based on input from subject matter experts and standard prudent interventions.

### MONITORING

To review utilization and accuracy of the pediatric VTE screening tool and its recommended interventions, the following measures were assessed: (a) proportion of patients for whom a VTE-P risk assessment was completed according to the recommended plan, and (b) proportion of patients in whom the appropriate VTE-P plan was put into place based upon risk factors present.

## RESULTS

### Adult Acute Care Patients

Mayo Clinic used CMS Core Measures in all 22 hospitals in the system with the following results.

- Core VTE-1 measure has improved from its values in the mid-80% range to consistently above 95% for the last 6 quarters (most recently, above 97%).
- Core VTE-2 measure has averaged 97.3%, and most recently is at 100%.
- Core VTE-6 has declined from about 12% to 0% in Q2 2015.
- AHRQ, PSI-12 average rate is 5.42/1000 discharges. Mayo-Rochester data reviews indicate that >98% of PSI-12 events received appropriate VTE-P.

These measures represent data from all 22 hospitals, encompassing 3,971 licensed beds, with an average of over 121,000 admissions per year.

### Pediatric Patients

- At baseline there were zero patients with VTE risks documented.
- The risk screening tool was evaluated and piloted with >92% compliance in risk documentation, an accuracy above 64%, and 0 VTE events.
- An improved screening tool was developed showing improvement in accuracy towards 88% over the subsequent 6 months of use and in 9 months 2 VTE were diagnosed.
- Beginning March 17, 2016, prescribers treating pediatric patients started receiving a CDS alert for pediatric patients not having an appropriate VTE-P plan documented in a way analogous to the adult program.

## CONCLUSIONS

Overall, Mayo Clinic's goals to maximize the number of patients reliably receiving indicated and effective VTE-P have been substantially realized. In the past three years, due to the diffusion methodology, Mayo Clinic is able to ensure that VTE-P is used where appropriate in >97% of cases. These methodologies have resulted in a steady decline in at least one measure of potentially preventable VTE, (CMS VTE-6) to 0, a result now sustained over many quarters in most of our hospitals. Keys to success include

- Ensure that a VTE-P plan is declared and executed at the time of admission. The VTE-P should be evidence based, or if lacking strong evidence, should be standard and based upon local expert consensus.
- Have an empowered improvement team for effective initial implementation and a sustained control team for ongoing surveillance and maintenance.
- Use tools to ensure VTE-P, but also ensure that there is minimal cognitive burden on clinical care staff.
- Include mechanisms, such as CDS alerts, to detect drift in best practices as early as possible.
- Provide ongoing review and response to metrics to indicate any unacceptable deterioration in reliability. Such review and response should require minimum resources so that the ongoing improvement effort is sustainable.