LogicStream HEALTH

CASE STUDY

Reduction of Post-Surgical Venous Thromboembolism (VTE)

with Clinical Process Measurement

Summary

Carilion Clinic in Roanoke, VA, knew that venous thromboembolism (VTE), a very treatable and an often-avoidable post-surgical hospital-acquired condition, was causing patient harm and a reduction in reimbursements. They understood that to most reliably prevent VTE across their organization, they needed to not only ensure best practices for post-surgical care are in place, but also that clinicians are following those processes in their workflows. They also recognized that, in order for their VTE prevention program and other initiatives to be effective and sustainable, their clinical leaders needed information about clinician adoption at their fingertips, with easy self-service access that could be trended over time. Carilion used Clinical Process Measurement with help from LogicStream. With the LogicStream solution, Carilion is able to identify unnecessary care variation, target interventions for improvement and, ultimately, realize significant improvement in their VTE rate.

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CarilionClinic.org

Clinical Process Measurement Background

Venous thromboembolism, along with several other hospital acquired conditions (HAC) such as catheter associated urinary tract infections (CAUTI), central line associated bloodstream infection (CLABSI) and surgical site infections (SSI), to name a few, are costly. They cause harm to patients and

impact the health system's bottom line. Current reimbursement models and the shift to pay for performance are making these HACs even more costly. The good news is that with standardized processes, measurement of adoption to reduce unnecessary care variation, and an understanding of how the care delivered is impacting patient outcomes, care around HACs can be greatly improved.

With the proper IT solutions in place, all the clinical content used to prevent Hospital Acquired Conditions, including VTE, can be evaluated and managed. While developing this content, it is important to be mindful to avoid unnecessary interruptive alerts and hard stops which can lead to alert fatigue and clinician distrust and dissatisfaction with the system. Standardizing this process ensures the right information is presented to the right person in the right intervention format, through the right channel at the right time in workflow.[i] Many organizations find they have multiple order sets and other orderables in place for a given initiative which can lead to unnecessary variation in care. Clinician custom orders, modification of order sets and following historical patterns of care causes additional variation. IT teams need the ability to monitor and manage this content. But the work doesn't end simply after the content is implemented and managed.

Beyond implementation of a standardized care process, it is crucial to understand how clinicians are interacting with the process. The next step is to determine adoption by measuring the usage of identified best practices within a patient population. In this case, post-surgical patients with risks of developing blood clots. Through the measurement and monitoring process, clinicians who are following the practices can be identified and more importantly, those who are not using the accepted best practice can also be identified. Once identified, data-driven discussions can happen to standardize care delivery.

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The key to preventing VTE is ensuring pre- and post-care for surgical procedures was appropriately delivered by all clinicians involved in the patient's care. While deploying the best practices is a good first step, if no one is following those best practices, patient care will not improve. The only way to do that is to track, monitor and measure the usage of the content, something very difficult to accomplish with the electronic health record (EHR) alone. The current state for most healthcare organizations is a long and laborious process between clinical teams and analytics

teams to develop reports that will give the clinical leaders the information they need to target interventions. This process is simply too long to drive effective, targeted interventions that are delivered in a timely fashion. It is certainly not scalable across the multiple initiatives most healthcare organizations are working on at any given time. The clinical leaders need access to this information in an easy, self-service format, across many initiatives over time. The electronic health record alone cannot deliver what these clinical leaders need.

With self service access… leadership can determine who hasn't instituted best practice workflows and have targeted conversations with those clinicians.

The ability to drill down to hospital, department and individual physician can provide visibility to where interventions and intelligent conversations are required to improve compliance with the desired workflow. This information is available for any level of clinical operations. With self-service access, medical leadership can know at any given time who has adopted and instituted the agreed-upon clinical process. More importantly, leadership can determine who hasn't instituted best practice workflows and have targeted conversations with those clinicians. Once standardized processes are being applied to patients, outcomes benchmarking can happen to determine if those processes are impacting outcomes as desired. If not, because clinicians are following the desired workflow, tweaks can be made in one place and deployed throughout a health system to improve patient outcomes.

The Challenge

- Clinical teams have little or no insight into current workflows and clinical content influencing VTE prophylaxis
- Clinical leadership has no access to who is and is not following the desired VTE protocol, so they can't focus their attention on only those who need it
- Lack of clarity defining the costs associated with VTE and the work required to reduce those costs
- Difficulty modifying provider workflows to maximize adherence to VTE prophylaxis guidelines while also avoiding unnecessary hard stops or alert fatigue
- Ensuring pre- and post-care for surgical procedures were appropriately delivered

- Measurement and management of clinical alerts and other clinical decision support tools is resource intensive and difficult for a healthcare organization to deliver at scale
- Most healthcare organizations find they have:
    - Minimal ongoing evaluation of the effectiveness of standardized processes post-deployment.
    - No way to measure clinician response to workflow modifications or interruptions and how that reflects their overall adoption of standardized care processes.
    - No self-service tools for clinical operations to ensure high adoption of VTE protocols.
    - An inability to understand the impact clinical workflows have on delivery of care quality and clinical outcomes.
    - Historically utilized lagging outcomes to measure clinical process, resulting in an inability to prompt targeted interventions that guide quality improvement efforts.

CASE STUDY

Carilion Clinic, a non-profit health system with 685 employed physicians and 1,026 licensed beds, recently implemented LogicStream to improve their VTE rates and standardize their processes to understand their impact on clinical outcomes. The early findings are included below:

Problem: The health system had 79 order sets with variation of VTE prophylaxis built into the EHR.

Solution: Created three order sets (Ortho, Trauma and all others) and have updated all order sets with the standard panels.

Problem: VTE prophylaxis medications were ordered but not always administered and they had no way to measure compliance and performance.

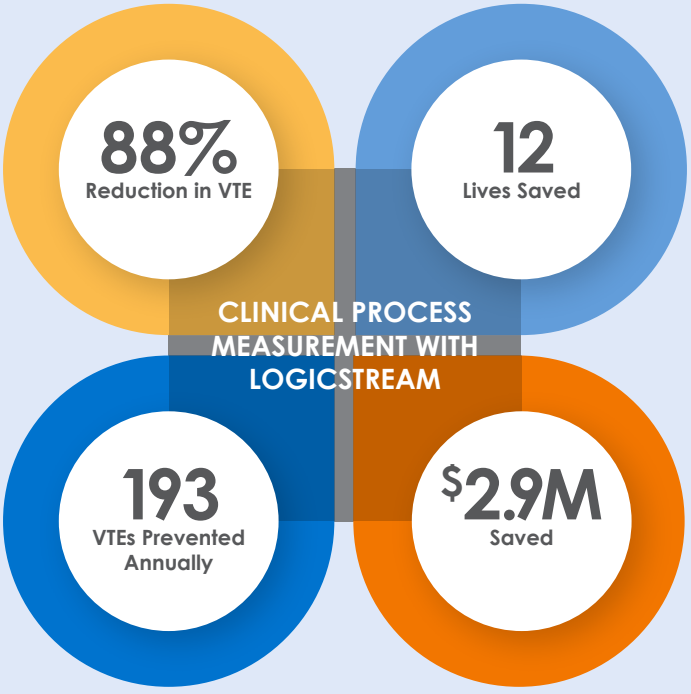
Solution: Create an initiative within LogicStream to monitor and measure compliance and performance with VTE prophylaxis best practices allowing for clear insight into clinician variance and taking appropriate targeted and corrective action.

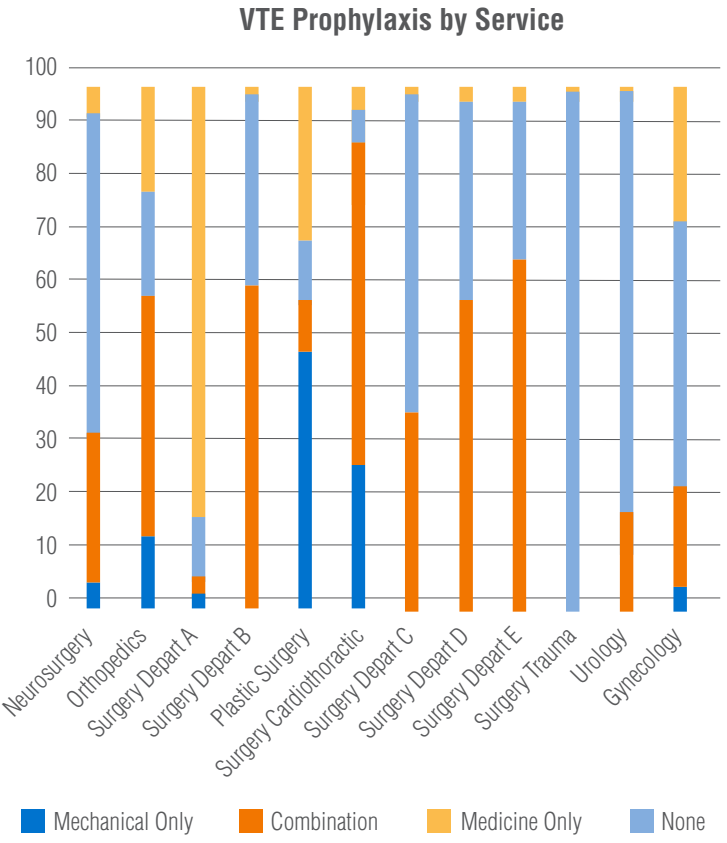
Problem: A VTE clinical alert in place with no measurement of alert firing or adherence to the desired action.

Solution: Measured the VTE clinical alert and determined clinicians' compliance with the desired workflow action was only 6% in the previous 12 months. Targeted interventions with non-compliant clinicians at the individual, department and hospital level now take place using the measured outcomes data to demonstrate and emphasize the importance of following the standardized processes.

Results:
The following are clinical results achieved by one of our LogicStream customers, leveraging this approach to Clinical Process Measurement.

- The incidence of VTE across a surgical patient population went from 1.5% to 0.5% which represents an 88% reduction in VTE.
- According to the Agency for Healthcare Research and Quality (AHRQ), VTE represents 6.1% excess mortality, 4.5-5.5 days of excess hospitalization, and up to $15,000 in excess hospital costs.
- The following data details cost savings and lives saved with the addition of Clinical Process Measurement with LogicStream.





This graph demonstrates significant variance in VTE-related care as measured with LogicStream.

Measurement of ordering patterns and their relation to protocol use and effectiveness is critical to care standardization. In the graph above, we can see that Surgery Department A has significant variation in VTE care provided, which after further analysis with LogicStream the client was able to document that poor adherence with the standard protocol was the cause of the variation. Once this variation was reduced with LogicStream and improvements to the standard protocol were made, VTE rates dropped by nearly 90%. By adding the ability to measure how the protocol is used with LogicStream, health systems are able to quickly identify the source of variation and correct it.

The LogicStream Solution

LogicStream gives health systems the capability to apply Clinical Process Measurement to critical problems they are struggling to solve. The comprehensive solutions set allows health systems of any size to:

- Provide clinical teams responsible for current VTE outcomes with self-service access to critical workflow and process information
- Facilitate the organization of all clinical content in the EHR impacting the decisions physicians make in relation to VTE
- Track and identify precisely where accepted best practice protocols are adopted
- Reduce the burden of technical teams to run reports based on generic requests from clinical teams
- Understand exactly what tools in their EHR have the highest impact on VTE reduction
- Apply learnings to other quality improvement efforts or requirements
- Identify and eliminate unnecessary care variation around VTE
- Gain a high level of physician adoption around VTE Protocols
- Ensure the right drug goes to the right patient every time
- Eliminate $2.9 million in non-reimbursable costs annually
- Measure the direct impact their EHR has on key HACs such as VTE
- Document an 80+% reduction in the incidence of VTE

[i] Osheroff, J.A., Teich, J.A., D. Levick et al. *Improving Outcomes with Clinical Decision Support: An Implementer's Guide*. 2nd Edition. Chicago, IL: HIMSS, 2012: p. 15.

About LogicStream Health

LogicStream Health software is trusted by high-performing healthcare systems across the United States. Our clinical process improvement and control software platform is the first and only technology capable of helping clinicians gain highly actionable, instant insights into improving vital clinical processes, and automating and achieving better control over the care they deliver to patients. Customers save millions of dollars with our software, for example, by reducing high-cost medications; reducing catheter-associated urinary tract infections (CAUTI); and, reaching nearly 100% compliance with venous thromboembolism (VTE) protocols. Our software is rapidly implemented and easily adopted by clinicians, informaticists, and executives striving to improve, automate and better control vital clinical processes. Our mission is clear—*Helping clinicians improve and better control the care they deliver to every patient, every day.*

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