Venous Thromboembolism
The Need for Transitions of Care

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KEYWORDS

• Venous thromboembolism • Inferior vena cava filters • SHM FAST

KEY POINTS

- Patients transitioning from the hospital setting with VTE are vulnerable due to multiple factors inherent in current care models.
- The concern over adverse drug events associated with anticoagulation potentially leading to re-hospitalization and harm deserves special attention.
- There are new and innovative programs, such as SHM FAST, that specifically target this patient population.

INTRODUCTION

The Centers for Disease Control and Prevention estimates that approximately 900,000 patients are diagnosed with venous thromboembolism (VTE) annually in the United States leading to approximately 548,000 hospitalizations and 100,000 deaths.[1] Approximately 274 people die daily in the United States from VTE. The numbers are staggering with 1 person dying every 5 minutes! There are more deaths annually in the United States from VTE than breast cancer (41,000), AIDS (16,000), and motor vehicle accidents (32,000) combined![1] VTE is recognized as a leading cause of preventable hospital deaths and a leading cause of maternal deaths. The health care costs associated with VTE in the United States are estimated at $7-10 billion.[2] What is most notable is that VTE is preventable. Additionally, the harm associated with the treatment of VTE is preventable. However, problems surface when patients with VTE transition from one level of care to another. For instance, the patient discharged from the hospital is at risk of potential harm from discontinuity of care. This problem can also be seen with transitions in patients with other diagnoses, but patients with VTE are at increased risk for adverse drug events and re-admissions.

FACTORS IMPACTING TRANSITIONS OF CARE

When patients transition from the hospital to other settings, several challenges arise. There is a potential risk of losing important information regarding patient care. Harm

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can arise as the patient leaves the hospital setting without appropriate handoff of key elements such as hospital course, medication changes, and aftercare plan. Many current hospital systems create a discontinuity of care between sending and receiving providers with a potential for harm. In some hospital settings, primary care providers have limited involvement in the care of their patients with whom they have developed long-term relationships. Often hospital care is provided by the hospital-based team led by a Hospitalist, an ED Provider, and or an Intensivist. The primary care provider may not be involved at all during the hospitalization other than through telephone communications with the hospital treatment team. Handoffs between sending and receiving providers should occur at key transition points, such as admission or discharge from a facility or unit, and this creates a potential for significant communication breakdown. Sometimes, there is no handoff, potentially worsening the situation.[3] Also, within health care settings such as hospitals, communication can be fragmented among providers as a patient transition from one unit to another, commonly having a new set of providers.

This transition of care at discharge is further complicated by the vulnerable patient who may not fully understand everything explained and is presented with an overwhelming amount of information at discharge. The volume of information presented can be staggering for a patient. The patient discharge instructions packet includes a large volume of information that is aimed at providing comprehensive directions, but it often fails at effectively communicating key elements such as aftercare plans and medication changes. The discharge instructions may not have been written in simple-to-understand language. Often instructions contain medical jargon that may be difficult for a non-medical person to understand. The discharge instructions may not be in the spoken language of the patient. Moreover, it is common for a patient to hear only part of the information during an overwhelming time, such as discharge from the hospital. Even highly functioning patients may not understand everything in their after-care plan. However, there are strategies to help bridge this problem. The term health literacy is used to assess a patient's understanding of key elements such as diagnosis, aftercare plan, and medication changes. Having the patient repeat back these key elements to better assess their level of understanding and make necessary adjustments can be an effective approach. This approach is called "Teach Back."[4,5] When patients have difficulty with "Teach Back," using a family member or proxy may help ensure a seamless transition.

The discontinuity between the hospital-based care team and the primary care team may lead to failed handoffs with potential adverse consequences. Patients often have test results pending at the time of discharge that require follow-up. The receiving providers may be unaware that there are results that require further action.[6] Discharge summaries afford a method of redundancy that allows receiving providers an overview of their patient's hospitalization, but often these summaries are missing key information that may adversely impact patient care.[7,8] Of course, provider-to-provider direct communication is optimal, allowing the receiving provider the opportunity to ask questions. Unfortunately, this type of communication is highly variable and often does not occur.

Another key element to a safe transition is the follow up of the patient with the aftercare provider. Often patients are lost to follow up, or they follow up outside of a window of time for safe care. In some cases, patients are discharged to another care facility such as acute rehabilitation, skilled nursing facility, long-term acute care hospital (LTACH) or long-term care facility. When this type of transition occurs an additional care team may become involved with the potential loss of information and loss of continuity. At every step of the transition there is a risk for error, and the

more steps, the greater risk. This problem can also be seen with medications leading to potential harm.

Medication reconciliation is an important process during transitions verifying patient's medications and noting medications that have been started or discontinued. The performance of medication reconciliation is an ongoing process at key points of transition. The complexity of medication treatments has grown and there are medications, such as anticoagulants that can have dire consequences if taken incorrectly. Additionally, it is a time for the clinician to review how patients take their medications. Confusion about dosing schedules and self-administration can be detected by the clinician during this evaluation. Unfortunately, if an appropriate medication reconciliation does not occur and unnecessary redundancies, expired or incorrect dosages, or the wrong medications are not corrected, then the patient is at risk for harm.

Complicating the issue of safe transitions is the reduction in the length of stay of a patient during hospitalization. Some patients are discharged with VTE from the emergency department. In some instances, patients with VTE are treated completely in the outpatient setting.

RISK WITH ANTICOAGULANTS AND VENOUS THROMBOEMBOLISM

In 2012 Budnitz and colleagues[9] estimated that the rates of emergency hospitalizations for adverse drug events in older adults from 2007 to 2009 were highest for warfarin, accounting for 20 hospitalizations per 10,000 outpatient visits. It should be noted that warfarin was the only anticoagulant studied. Antiplatelet medications were also associated with adverse drug events leading to re-hospitalization in this study. Since this study, we have seen the emergence of direct oral anticoagulants (DOACs) with indications for VTE and atrial fibrillation. There are currently 4 FDA-approved DOACs in the US for the treatment of VTE: Apixaban, Dabigatran, Edoxaban, and Rivaroxaban (**Table 1**). Due to the efficacy and safety of these agents, the current guidelines recommend the use of apixaban, dabigatran, edoxaban or rivaroxaban in the treatment of VTE over vitamin K antagonists such as warfarin.[10,11] In patients with cancer-associated VTE, apixaban, edoxaban, or rivaroxaban are recommended over low molecular weight heparin.[10] However, if a patient has confirmed antiphospholipid syndrome, a vitamin K antagonist is recommended over the DOACs.[10] Additionally, patients with low-risk DVT and PE are recommended to have outpatient treatment rather than inpatient treatment for VTE.[10,11] So how is the risk for patients with VTE assessed?

Patients at risk for mortality from PE can be assessed using prognostic models such as the Pulmonary Embolism Severity Index (PESI)[12] or a simplified PESI (sPESI),[13] HESTIA, or BOVA scores. The PESI and sPESI score have been validated with the best results for patients at low risk for 30-day mortality.[11] The PESI score assigns points and evaluates variables such as age, male gender, history of cancer, heart failure, chronic lung disease, pulse $\geq$ 110/min, systolic blood pressure <100 mm Hg, respiratory rate $\geq$ 30/min, temperature < 36∘ Celsius, altered mental status, and arterial oxygen < 90%. Class I (<66 points) and Class II (66 to 85 points) are low risk for 30-day mortality. Class III (86 to 105 points), Class IV (106 to 125 points), and Class V (>125 points) are high risk. But the calculation can be cumbersome. Therefore, the sPESI was developed to facilitate clinicians making calculations for the risk of death from PE. The sPESI score assigns 1 point for age > 80 years, history of cancer, chronic cardiopulmonary disease, pulse $\geq$ 110/min, systolic blood pressure < 100 mm Hg, and arterial oxygen saturation < 90%. Low-risk patients have an sPESI score of 0; high-risk patients have an sPESI score $\geq$ 1.

The Hestia Score also evaluates patients at low risk who may be eligible for outpatient management.[14] This score evaluates hemodynamic instability, thrombolysis or

Table 1
Direct oral anticoagulants used in the treatment of acute VTE

DOAC	Mechanism	Half-Life	Peak Onset	Parenteral Lead in Required?	Dosing
Apixaban	Factor Xa inhibitor	11.5 h	1.5–3.3 h	No	10 mg twice daily for 7 days, then 5 mg twice daily
Dabigatran	Direct thrombin inhibitor	12–14 h	2 h	Yes[a]	150 mg twice daily
Edoxaban	Factor Xa inhibitor	10–14 h	1.5 h	Yes[a]	60 mg daily
Rivaroxaban	Factor Xa inhibitor	5–9 h	2–4 h	No	15 mg twice daily for 21 days then 20 mg daily

[a] After 5 days can transition to oral.

Modified from Merli G, Hiestand B, Amin A, et al. Balancing Anti-thrombotic Efficacy and Bleeding Risk in the Contemporary Management of Venous Thromboembolism. Curr Emerg Hosp Med Rep; 07 April 2015: 3 89-99.

embolectomy needed, active bleeding or high risk for bleeding, >24 hours on supplemental oxygen to maintain a SaO2 > 90%, PE diagnosed on anticoagulation, severe pain needing intravenous pain medication required > 24 hours, medical or social reason for admission, creatinine clearance < 30 mL/min by Cockcroft-Gault formula, severe liver impairment, pregnant, or history of heparin-induced thrombocytopenia. If 1 or more is present, the patient is not recommended for outpatient management (**Table 2**).

Finally, the BOVA score aims to identify patients with intermediate-risk PE.[15] This score assigns 2 points each for SBP 90-100 mm Hg, elevated cardiac troponin, and RV dysfunction on echocardiogram or CT scan. It assigns 1 point for a heart rate > 110 beats per minute. A score of 0-2 is Stage I and considered low risk with PE-related complications at 4.4% and PE-related mortality at 3.1%. A score of 3-4 is Stage II and is intermediate risk, with PE complications at 18% and PE-related mortality at 6.8%. A score >4 is Stage III and high risk with PE complications at 42% and PE-related mortality at 10% (**Fig. 1**).

The use of these scores can help guide clinicians caring for patients with PE with risk stratification and site of care. The scores also highlight the vulnerability of patients with VTE and the risk of mortality associated with PE.

CENTER FOR MEDICARE AND MEDICAID SERVICES MEASURES TO PREVENT READMISSIONS FOCUS ON CREATING SAFE TRANSITIONS

The Joint Commission recognized the vulnerability of patients receiving anticoagulation and developed the National Patient Safety Goal for anticoagulant therapy.[16] The aim of this effort is stated later in discussion:

Table 2
The hestia score

Is the patient hemodynamically unstable?[a]	Yes	No
Is thrombolysis or embolectomy necessary?	Yes	No
Active bleeding or hign risk of bleeding[b]	Yes	No
More than 24 h of oxygen supply to maintain oxygen saturation > 90%?	Yes	No
Is pulmonary embolism diagnosed during anticoagulant treatment?	Yes	No
Severa pain needing intravenous pain medication for mote than 24 h	Yes	No
Medical or social reason for treatment in the hospital for more than 24 h (infection, malignancy, no support system)?	Yes	No
Does the ptient ghave a creatinine clearance of < 30 mL min^{-1}?[c]	Yes	No
Does the patient have severe liver impairment?[d]	Yes	No
Is the patient pregnant	Yes	No
Does the patient have a documented history of heparin-induced thrombocytoprnia?	Yes	No
If the answer to one of the questions is 'yes', the patient cannot be teeated at home in the Hestia Study		

[a] Include the following criteria, but leave these to the discretion of the investigator: systolic blood pressure < 100 mm Hg with heart rate > 100 beats min^{-1}; condition requiring admission to an intensive care unit.
[b] Gastrointestinal bledding in the preceding 14 days, recent stroke (< 4 weeks ago), recent operation (< 2 weeks ago), bleeding disorder or thrombocytopenia (platelet count < 75 × 109 L^{-1}), uncontrolled hypertension (systolic blood pressure > 180 mm Hg or diastolic blood pressure > 110 mm Hg).
[c] Calculated creatinine clearance according to the Cockroft-Gaukt formula.
[d] Left to the discretion of the physican.
Taken from Zondag W, Mos ICM, Creemers-Schild D, et al. Outpatient treatment in patients with acute pulmonary embolism: the Hestia study. J Thromb Haemost. 2011; 9(8):1500-1507.

The 8P Screening Tool
Identifying Your Patient's Risk for Adverse Events After Discharge

The 8Ps (Check all that apply.)	Risk Specific Intervention	Signature of individual responsible for insuring intervention administered
Problems with medications (polypharmacy – i.e. ≥10 routine meds – or high risk medication including: insulin, anticoagulants, oral hypoglycemic agents, dual antiplatelet therapy, digoxin, or narcotics) ☐	☐ Medication specific education using Teach Back provided to patient and caregiver ☐ Monitoring plan developed and communicated to patient and aftercare providers, where relevant (e.g. warfarin, digoxin and insulin) ☐ Specific strategies for managing adverse drug events reviewed with patient/caregiver ☐ Elimination of unnecessary medications ☐ Simplification of medication scheduling to improve adherence ☐ Follow-up phone call at 72 h to assess adherence and complications	
Psychological (depression screen positive or history of depression diagnosis) ☐	☐ Assessment of need for psychiatric care if not in place ☐ Communication with primary care provider, highlighting this issue if new ☐ Involvement/awareness of support network insured	
Principal diagnosis (cancer, stroke, DM, COPD, heart failure) ☐	☐ Review of national discharge guidelines, where available ☐ Disease specific education using Teach Back with patient/caregiver ☐ Action plan reviewed with patient/caregivers regarding what to do and who to contact in the event of worsening or new symptoms ☐ Discuss goals of care and chronic illness model discussed with patient/caregiver	
Physical limitations (deconditioning, frailty, malnutrition or other physical limitations that impair their ability to participate in their care) ☐	☐ Engage family/caregivers to ensure ability to assist with post-discharge care assistance ☐ Assessment of home services to address limitations and care needs ☐ Follow-up phone call at 72 h to assess ability to adhere to the care plan with services and support in place.	
Poor health literacy (inability to do Teach Back) ☐	☐ Committed caregiver involved in planning/administration of all discharge planning and general and risk specific interventions ☐ Post-hospital care plan education using Teach Back provided to patient and caregiver ☐ Link to community resources for additional patient/caregiver support ☐ Follow-up phone call at 72 h to assess adherence and complications	
Patient support (social isolation, absence of support to assist with care, as well as insufficient or absent connection with primary care) ☐	☐ Follow-up phone call at 72 h to assess condition, adherence and complications ☐ Follow-up appointment with appropriate medical provider within 7 d after hospitalization ☐ Involvement of home care providers of services with clear communications of discharge plan to those providers ☐ Engage a transition coach	
Prior hospitalization (non-elective; in last 6 months) ☐	☐ Review reasons for re-hospitalization in context of prior hospitalization ☐ Follow-up phone call at 72 h to assess condition, adherence and complications ☐ Follow-up appointment with medical provider within 7 d of hospital discharge ☐ Engage a transition coach	
Palliative care (Would you be surprised if this patient died in the next year? Does this patient have an advanced or progressive serious illness? "No" to 1st or "Yes" to 2nd = positive screen) ☐	☐ Assess need for palliative care services ☐ Identify goals of care and therapeutic options ☐ Communicate prognosis with patient/family/caregiver ☐ Assess and address concerning symptoms ☐ Identify services or benefits available to patients based on advanced disease status ☐ Discuss with patient/caregiver role of palliative care services and the benefits and services available to the patient	

Fig. 1. The BOOST 8Ps. (*Taken from* Coffey C, Greenwald J, Budnitz T, et al. Project BOOST Implementation Guide, second edition. 2013; Appendix K p.136.)

"NPSG.03.05.01: Reduce the likelihood of patient harm associated with the use of anticoagulant therapy."

The focus of this safety goal is to minimize the risk to the patient taking anticoagulants by ensuring appropriate evidence-based protocols are implemented, including the monitoring of drug-to-drug interactions, drug to food interactions, INR, renal and/or liver function when appropriate. Additionally, monitoring and reporting of adverse drug events, strategies for patient education, and strategies for managing the bleeding patient are discussed.[16]

READMISSION RISK STRATIFICATION AT TRANSITION

Risk assessment evaluation using screening tools has been used to identify patients during transitions of care who are at high risk for readmissions. The Society of Hospital Medicine developed a program called Project BOOST (Better Outcomes by Optimizing Safe Transitions) to address this challenge. BOOST identifies 8 problem areas and provides key interventions to avoid adverse events for patients discharged from the hospital. They are known as the "8Ps" (see **Fig. 1**). "Problems with Medications" is one of the 8Ps that identifies two areas: (1) polypharmacy with patients receiving 10 or more routine medications and (2) High-risk medications such as anticoagulants, dual antiplatelet therapy, diabetic medications, and narcotics as a potential risk for adverse events.[5] Specific interventions include medication education using "Teach Back," a monitoring plan developed and communicated to the patient and aftercare providers, strategies to manage adverse drug events, elimination of unnecessary

medications, simplified scheduling and follow up phone call at 72 hours to better assess adherence and complications.[5] A limitation of the 8Ps for patients with VTE can be seen in the category "Principle Diagnosis." This category includes cancer, stroke, diabetes, COPD, and heart failure, but does not specifically address VTE.[5] This risk assessment model does consider other areas such as "Poor Health Literacy," defined as inability to do teach back, and "Physical Limitations" as key problems at transition. There is no score in this model since its focus addresses specific vulnerabilities during transition and places action steps to create better outcomes.

Other readmission risk assessment strategies can be found in the HOSPITAL score and the LACE index. The HOSPITAL score (**Table 3**) is a validated score and considers the variables hemoglobin, discharge from the oncology service, sodium, procedure during the hospitalization, index type admission as elective or non-elective and hospital length of stay $\geq$ 5 days. Patients with a HOSPITAL score of 7 or greater are at risk for readmission to the hospital.[17] However, this score does not specifically address anticoagulation or VTE.

Finally, the LACE index[18] considers the length of stay, patient acuity on admission, and comorbid illness as measured using the Charlson index and Emergency Department utilization in the last 6 months. The Charlson index does mention peripheral vascular disease but does not specifically mention VTE.[19]

With the challenges and limitations of risk stratification, identifying patients at risk during transitions with venous thromboembolism and the vulnerability of patients with VTE, a different strategy must be undertaken for this disease-specific transition need. Other solutions have surfaced to reduce harm.

Harm Reduction Strategies

With more complex management and a growing number of anticoagulants and indications, the role of the Pharmacist in transitions has had a positive impact on

Table 3
The HOSPITAL score

Attribute	Points
Low hemoglobin level at discharge (<12 g/dL)	1
Discharge from an oncology service	2
Low sodium level at discharge (<135 mEq/L)	1
Procedure during hospital stay (any ICD-9-CM coded procedure)	1
Index admission type: nonelective	1
Number of hospital admissions during the previous year	
0	0
1–5	2
>5	5
Length of stay $\geq$ 5 days	2
Readmission Risk	**Score**
Low	0–4
Intermediate	5–6
High	$\geq$ 7

Modified from Donzé J, Aujesky D, Williams D, Schnipper JL. Potentially Avoidable 30-Day Hospital Readmissions in Medical Patients: Derivation and Validation of a Prediction Model. JAMA Intern Med. 2013; 173(8):632–638.

bridging the care gap by improving patient understanding and appropriate use of anticoagulants but has not significantly reduced bleeding or 30 -readmissions.[20,21] One possible explanation surfaced from a study of patients from Project RED (Re-Engineered Discharge),[22] where 401 patients were identified, 277 received a pharmacist call and 124 could not be contacted. Patients who could not be contacted were more likely to be readmitted or visit the emergency department. The importance of the connection with the patient at transition or discharge and the connection between the sending provider team and the receiving team is paramount to a safe transition. However, despite all efforts for appropriate management, it can be expected that a subset of patients will fail in transitions and require more frequent health care contact than others. For instance, reconciliation with insurers for approval for a specific medication may not occur correctly or timely at discharge. Patients may present to the pharmacy and receive a bill for hundreds of dollars because the insurer did not approve the medication or has another medication on the formulary. Additionally, the patient who is discharged after normal business hours or on weekends may require special arrangements. One countermeasure includes delivering the medication to the patient's bed prior to discharge. The strategy ensures that the patient has the medications in hand when they are discharged from the hospital. It eliminates a potential extra step when treatment delays could occur and potentially contribute to harm. Pharmaceutical companies have simplified the process with payment vouchers and samples. Another innovation from pharmaceutical companies is a blister pack for the first 30 days of treatment for newly diagnosed venous thromboembolism. This pack helps bridge a medication error that may occur as the patient transitions from the hospital or the Emergency Department. DOACs such as edoxaban and dabigatran require a parenteral lead in therapy for approximately 5 days prior to starting the DOAC. This additional step requires parenteral administration with a medication such as heparin infusion targeting a therapeutic aPTT or a low molecular weight heparin administered subcutaneously. An advantage of low molecular weight heparin is that it may be administered in the outpatient setting and potentially shortens hospital length of stay. The disadvantage is the required training of the patient or a proxy on the injection of the low molecular weight heparin. It is usually easier to take a pill than to self-inject for patients. The situation is more complicated if the patient is managed with warfarin, usually requiring the titration of an INR to a therapeutic level of 2 – 3. This approach may require bridging with a parenteral anticoagulant such as heparin or a low molecular weight heparin. The additional blood draws required during titration and subsequent periodic monitoring complicate the management strategy and create opportunities for treatment failure. Close monitoring by a care team such as an anticoagulation clinic can reduce harm in this situation. The time in therapeutic range of INR for warfarin monitoring is a significant metric for high-quality anticoagulation management. Dedicated teams, such as anticoagulation clinics, may be more successful than traditional office-based monitoring since care is focused on the complexity of anticoagulation management. Nevertheless, even in the best-controlled anticoagulation studies with DOACs, the time in the therapeutic range falls short of perfect. In some of the best-controlled studies, the time in the therapeutic range was at best 63.5%.[23] This implies that the patient was either under-anticoagulated and at risk of clotting or over-anticoagulated and at greater risk of bleeding. The DOACs have stopped the complexity of monitoring INRs, but renal function, liver function, blood count, and drug-to-drug interaction still require evaluation. Patients taking CYP3A4 Inducers and Inhibitors, and P-glycoprotein Inducers and Inhibitors may have strong interactions with the DOACs and may need to be avoided or closely monitored. Similarly, these drugs should not be used

during pregnancy or during breastfeeding. Patients using nonsteroidal anti-inflammatory drugs (NSAIDS) are at increased risk for bleeding while taking anticoagulants and require education on alternate or safer therapies. These issues could be monitored in high-quality anticoagulation clinics.

Venous Thromboembolism and the Inferior Vena Cava Filters

Some patients diagnosed with VTE require the placement of an IVC filter. In most instances, the filter is only temporary and should be removed as early as possible. When patients are transitioning from the hospital setting after the placement of an IVC filter, the follow-up for removal of the filter should be communicated and, if possible, scheduled. Indwelling retrievable filters that are not removed increases the risk of harm.

SPECIFIC PROGRAMS AIMED AT CREATING SAFE TRANSITIONS: SOCIETY OF HOSPITAL MEDICINE FACILITATION OF ANTICOAGULATION FOR SAFER TRANSITIONS

Programs such as Project BOOST offer a powerful approach to creating a model for safe transitions, but a greater focus on patients transitioning from hospitals with VTE is necessary to address the complexities associated with this disease state and its treatment. A novel program that specifically addresses transitions of care for patients with VTE is the Society of Hospital Medicine Facilitation of Anticoagulation for Safer Transitions (SHM FAST) program.[24] This program originated as a quality improvement effort directed to help patients safely transition from the hospital with VTE. It is a mentored program that started at multiple sites across a mix of academic and community hospitals of varying sizes. The sites met monthly with mentors and assembled interdisciplinary teams consisting of a Lead Hospitalist, Lead Pharmacist, Lead Nurse, Lead Primary Care Provider, and Lead Information Technology Specialist. Additional members were added based on individual site needs. The goal of this quality improvement program was for sites to address the needs of patients diagnosed with VTE transitioning from the hospital setting by creating a seamless process leveraging the assets within each institution. The targets were both process and outcome measures facilitating safe transitions. Patients were included in the program if there was a primary ICD-10 code for acute DVT or PE. Patients were excluded if they were not discharged on full anticoagulation, had chronic VTE or acute VTE that is not their primary diagnosis during hospitalization, refused treatment or follow-up care, or could not be transitioned to an ambulatory setting for safety reasons or social situations in which would prevent communication with the patient for follow up care (such as homeless with no phone or means to contact). The sites used evidence-based transition protocols incorporating either a standard or a comprehensive bundle. The standard bundle was used by most of the sites in this program. The components of the standard bundle are listed later in discussion.

- Perform a 2-day follow-up call.
- Perform enhanced medication reconciliation.
- Utilize the VTE order set.
- Employ a checklist for oral anticoagulation readiness.
- Utilize the checklist for DOAC appropriateness.
- Use a standardized discharge readiness checklist.
- Utilize standardized transition record.
- Hospitalist will directly communicate the plan of care to the next provider using a standardized script

The Comprehensive Bundle included all components of the standard bundle plus the following.

- Perform a face-to-face visit within 7 days post-discharge.
- Oversee patient care for 30 days post-discharge.
- Perform 30-day phone calls.

There were 3 phases to this process. The first phase was a baseline assessment and goal setting over a 3-month period to evaluate institutional assets and gaps in the transition process for patients with VTE. Process mapping was initiated during this phase aimed at understanding current processes at each institution. The focus was to develop attainable goals that were specific, measurable, achievable, relevant, and time-bound (SMART goals). Efforts were then mobilized to achieve those goals. Evaluating change that occurred throughout the process used the Plan-Do-Study-Act (PDSA) cycle. The second phase was an implementation phase over a 12-month period during which the plan was executed with adjustments made as needed. The final phase was a 3-month sustainability phase looking at the success of the efforts the team accomplished in the prior phases in creating the transitions and ensuring it was hard wired into the fabric of the institution.[24]

In this program, 1,995 patients were screened for eligibility and 1,322 were enrolled in the program. Results provide a signal in the right direction for creating safe transitions for patients with VTE. Process metrics such as patient and/or family education occurred successfully in 1,013 cases, follow-up phone calls occurred in 810 cases, and medication reconciliation occurred in 1,182 patients across all cohorts. Outcome metrics such as readmission rate were 3.8% across the cohorts and were attributed to the development of major bleeding or recurrent VTE. Emergency Department utilization was 4.8%. Finally, access to medications was not a cause for readmissions or recurrent VTE.[25] It should be noted that this program was started and implemented during the COVID-19 pandemic, which greatly impacted available resources and support. Programs such as SHM FAST offer a focused transition plan for patients with VTE.

SUMMARY

In conclusion, patients transitioning from the hospital setting with VTE are vulnerable due to multiple factors inherent in current care models. The concern over adverse drug events associated with anticoagulation potentially leading to re-hospitalization and harm deserves special attention. Nonetheless, many models provide only limited attention to the VTE patient. There are new and innovative programs, such as SHM FAST, that specifically target this patient population. Further investigation and widespread implementation strategies are needed to improve this process and create a safe transition for patients with VTE.

CLINICS CARE POINTS

- Patients transitioning from the hospital setting are vulnerable to harm.
- There are new and innovative strategies designed to create safe transitions.

DISCLOSURE

AJM was a mentor for the Society of Hospital Medicine.

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