

Impact of a Multicomponent Care Transition Intervention on Hospitalizations and Emergency Department Visits in Patients with Venous Thromboembolism

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Conflicts of Interest

- Dr. Kapoor receives sponsored research support from Pfizer Independent Grants for Learning and Change. He is also funded by Bristol Myers Squibb for atrial fibrillation research.
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- All other authors report no conflicts.

Background

- Venous Thromboembolism (VTE) is a significant health problem
 - Annual incidence 900,000
 - Annual treatment cost \$10 B
 - Hospital utilization after VTE diagnosis ~20%
- Preventing hospital utilization after VTE diagnosis complex
 - Initiation/maintenance of anticoagulants
 - Need for more intensive multicomponent intervention

Study Design

- RCT assessing the impact of a multicomponent intervention on hospitalizations in months after VTE diagnosis
- Outcome measures:
 - Hospitalization and Emergency Department (ED) visits
 - Determined by chart review and phone interview

Setting and Population

- Setting
 - UMass Memorial Health Care, a multi-hospital system in central MA
- Inclusion Criteria
 - **VTE episode diagnosed in previous 2 weeks** in hospital or ambulatory setting
 - Prescribed warfarin, direct oral anticoagulant, or low molecular weight heparin
 - Age 18+
 - English-speaking
- Exclusion Criterion
 - Discharge to a nursing home

Methods

- Identification
 - Screened radiology reports and provider referrals for new cases of VTE
- Recruitment
 - In-person (written consent)
 - By phone (verbal consent + written consent via mail)
- Randomization
 - Stratified on type of anticoagulant

Methods

- **Intervention**
 - **Pharmacist home visit** (within 7 days of randomization)
 - Medication reconciliation and simulation*
 - Assessment and education
 - Contact with prescriber (if warranted)
 - Illustrated medication instructions
 - **Anticoagulation expert follow-up consultation** (within 30 days of randomization)
 - Assessment and education
 - Contact with prescriber (if warranted)
 - Illustrated medication instructions












*Kapoor JPS 2018

Illustrated Medication Instructions

THIS IS A DEMO ACCOUNT

Date Printed: Mar. 30, 2018

	Name: 0001 0001	ALLERGIES None	YOUR DOCTOR None	YOUR PHARMACY None
	User: alok.kapoor@umassmemorial.org			

Pill Name	Used for?	Instructions	MORNING	NOON	EVENING	BEDTIME
			7-9am	11-1pm	4-6pm	9-11pm
 Xarelto 15 mg	 Blood Thinner	Take 1 pill in the morning and 1 pill in the evening.	 1 pill		 1 pill	
metoprolol succinate 100 mg	 High Blood Pressure	Take 1 pill in the morning.	 1 pill			
metformin 500 mg	 Diabetes	Take 1 pill in the morning and 1 pill in the evening.	 1 pill		 1 pill	
atorvastatin 40 mg	 Cholesterol	Take 1 pill in the morning.	 1 pill			

Kapoor et al. Supplying Pharmacist Home Visit and Anticoagulation Professional Consultation During Transition of Care for Patients With Venous Thromboembolism. *J Patient Saf.* 2019 Jan 29. [Epub ahead of print] PMID: 30702452

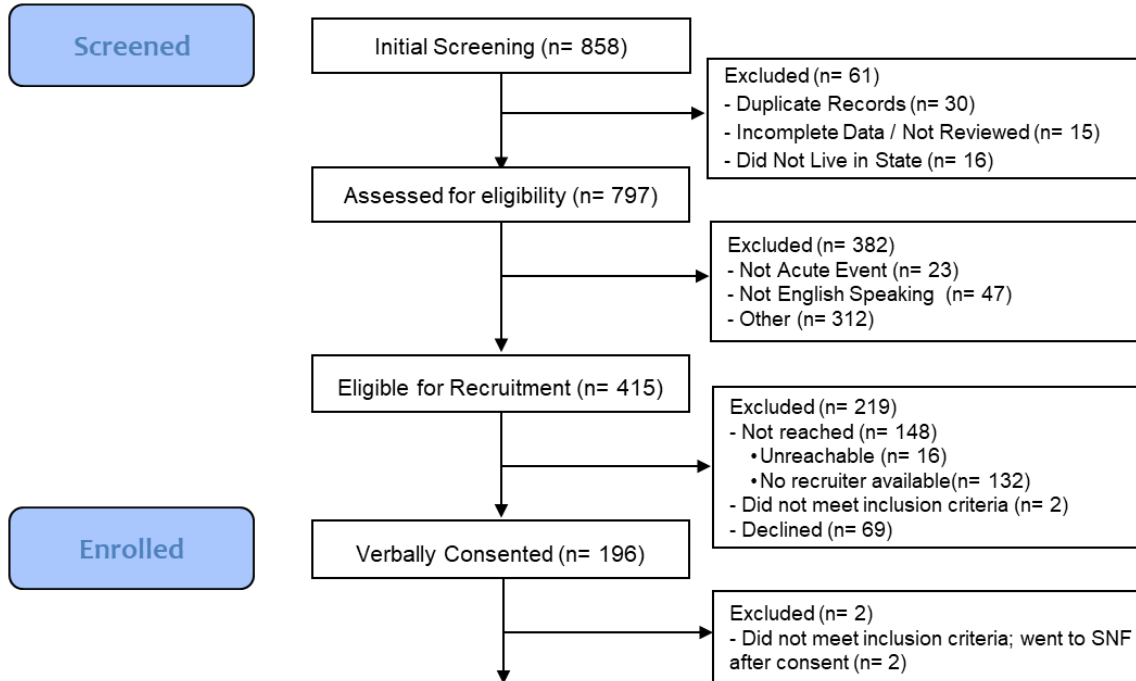
Methods

- Control
 - Standard discharge paperwork
 - » without illustrated medication instructions
 - No contact with pharmacist or anticoagulation expert

Methods

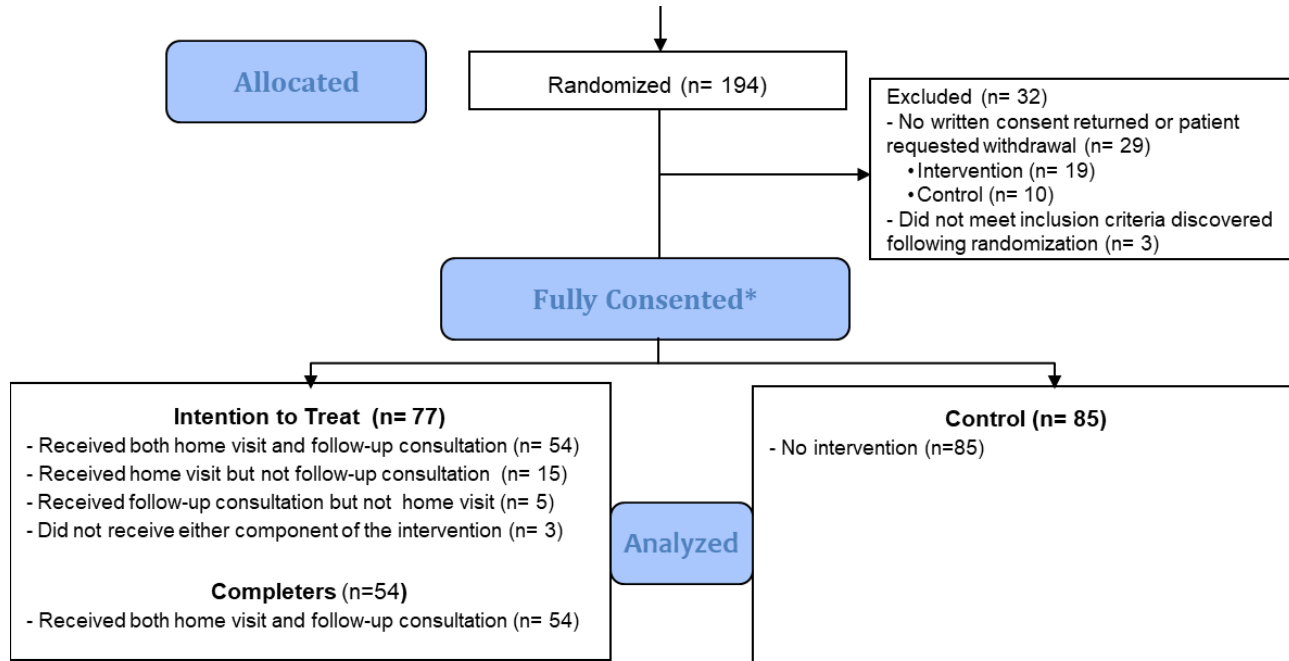
- Physicians: blinded chart review
 - Identify hospitalization or ED visits up to 90 days post-randomization
- Patients: telephone interview
 - 90-120 days post-randomization
 - hospitalized or visited ED outside health system?
 - *When, where, reason*

Study Flow



Kapoor A, Landyn V, Wagner J, Burgwinkle P, Huang W, Gore J, Spencer FA, Goldberg R, McManus DD, Darling C, Boudreaux E, Barton B, **Mazor KM**. Supplying Pharmacist Home Visit and Anticoagulation Professional Consultation During Transition of Care for Patients With Venous Thromboembolism. *J Patient Saf.* 2019.

Study Flow (Cont.)



Kapoor A, Landyn V, Wagner J, Burgwinkle P, Huang W, Gore J, Spencer FA, Goldberg R, McManus DD, Darling C, Boudreaux E, Barton B, **Mazor KM**. Supplying Pharmacist Home Visit and Anticoagulation Professional Consultation During Transition of Care for Patients With Venous Thromboembolism. *J Patient Saf.* 2019.

Analysis

- Compared outcomes (unadjusted and unadjusted)
 - Incidence rate of hospitalization and ED visits for each group
 - Incidence rate = # of events / sum of time observed in each group
- Negative binomial distribution for multivariate regression
 - 70% of patients had no events
- Examined effect of intervention using...
 - Intention to treat (ITT) cohort
 - Completer cohort

Covariates

- Gender
- Race
- Ethnicity
- Income Level
- Health Literacy
- Patient Activation
- Charlson Comorbidity Index
- VTE Type
- Anticoagulant Prescribed
- Care Transition Type

Results: ITT Cohort Characteristics

- Most covariates balanced between intervention (n=77) and control groups (n=85)
 - Gender: more men, but even between groups
 - Race: mostly white, both groups
 - Education: mostly high school educated or higher
 - Income, health literacy, patient activation, VTE type, anticoagulant prescribed, care transition type
 - No between group differences
 - **Charlson Comorbidity Index: lower in the intervention group (p = 0.03)**

Results: ITT Cohort Hospitalizations

	Intervention (n=77)	Control (n=85)
Hospitalizations	11	23
Related to index: Yes	6 (of 11)	3 (of 23)
Reason: Recurrent VTE	0	0
Reason: Major/Clinically Relevant Bleeding	1	2
Reason: Other (SOB, Suspicion VTE, Minor Bleeding)	5	1
Preventable: Yes*	2 (of 11)	2 (of 11)

*Preventable defined as better adherence with medication, better control of anticoagulant, avoidance of another medication that could have interfered with anticoagulant, or better education of the patient about what to expect (minor bleeding while brushing teeth, etc.).

Results: ITT Cohort ED Visits

	Intervention (n=77)	Control (n=85)
ED Visits	14	15
Related to index: Yes	8 (of 14)	4 (of 15)
Reason: Recurrent VTE	0	0
Reason: Major/Clinically Relevant Bleeding	4	0
Reason: Other (SOB, Suspicion VTE, Minor Bleeding)	4	4
Preventable: Yes*	3 (of 14)	0 (of 15)

*Preventable defined as better adherence with medication, better control of anticoagulant, avoidance of another medication that could have interfered with anticoagulant, or better education of the patient about what to expect (minor bleeding while brushing teeth, etc.).

Results: ITT Cohort All Encounters

	Intervention (n=77)	Control (n=85)
Total Number of Encounters (Hospitalizations and ED Visits)	25	38
Observation Days	5,778	6,320
Incidence rate (per 1,000 patient days followed)	4.33	6.01
Incidence rate ratio (unadjusted)	0.71 (95% CI: 0.40 – 1.27)	
Incidence rate ratio (adjusted)*	1.05 (95% CI 0.57-1.91)	

*Covariates: gender, income, race, Hispanic ethnicity, blood clot type, health literacy, patient activation, and Charlson score.

Results: Completer Characteristics

- 54 intervention participants completed all aspects of the intervention; 23 did not
- Compared with controls (n=85), completers (n=54)
 - Had greater percentages of participants who
 - Were white (95.9% vs. 77.9%)
 - Had DVT alone (57.1% vs. 42.9%)
 - Transitioned from ambulatory care to home (22.5% vs. 13.0%)
 - No significant differences on quality of care transition, knowledge, adherence
- Adjusted IRR = 1.05 (no different from ITT result)

Discussion

- Confirmed high utilization of hospital and ED post-VTE diagnosis
- Multicomponent intervention **did not** reduce visits
 - Intervention group had fewer visits, but most of the control group visits were unrelated to VTE, bleeding or anticoagulation
- Future research
 - Testing other interventions for VTE
 - Those that address other comorbidities and conditions of VTE patients (pain related -chest and back pain, cellulitis, dizziness)
 - Testing our multicomponent / pharmacologic based intervention in another group of patients

Limitations

- Small sample size
 - Unable to examine effect of intervention in subgroups (e.g., patients with low health literacy)
- Loss to follow up
 - Two-step process of enrollment
- Fidelity concerns
 - Significant number of patients assigned to intervention did not receive all parts of it

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Thank You!

Results: Completers Cohort Hospitalizations

Outcome: Hospitalizations	Intervention (n=54)	Control (n=85)
Hospitalizations	5	23
Related to index: Yes	4	3
Reason: Recurrent VTE	0	0
Reason: Major/Clinically Relevant Bleeding	1	2
Reason: Other (SOB, Suspicion VTE, Minor Bleeding)	3	1
Preventable: Yes	1	2

Results: Completers Cohort ED Visits

Outcome: ED Visits	Intervention (n=54)	Control (n=85)
ED Visits	12	15
Related to index: Yes	7	4
Reason: Recurrent VTE	0	0
Reason: Major/Clinically Relevant Bleeding	3	0
Reason: Other (SOB, Suspicion VTE, Minor Bleeding)	4	4
Preventable: Yes	3	0

Results: Completers Cohort Incidence Rate

Outcome: All Encounters (Hospitalizations and ED Visits)	Intervention (n=54)	Control (n=85)
Total Number of Encounters	17	38
Days of Observation	4,179	6,320
Incidence rate (per 1,000 patient days followed)	4.07	6.01
Incidence rate ratio unadjusted for covariates	0.71 (95% CI: 0.37 – 1.35)	
Incidence rate ratio adjusted for covariates*	1.05 (95% CI 0.57-1.91)	

*Covariates: gender, income, race, Hispanic ethnicity, blood clot type, health literacy, patient activation, and Charlson score.