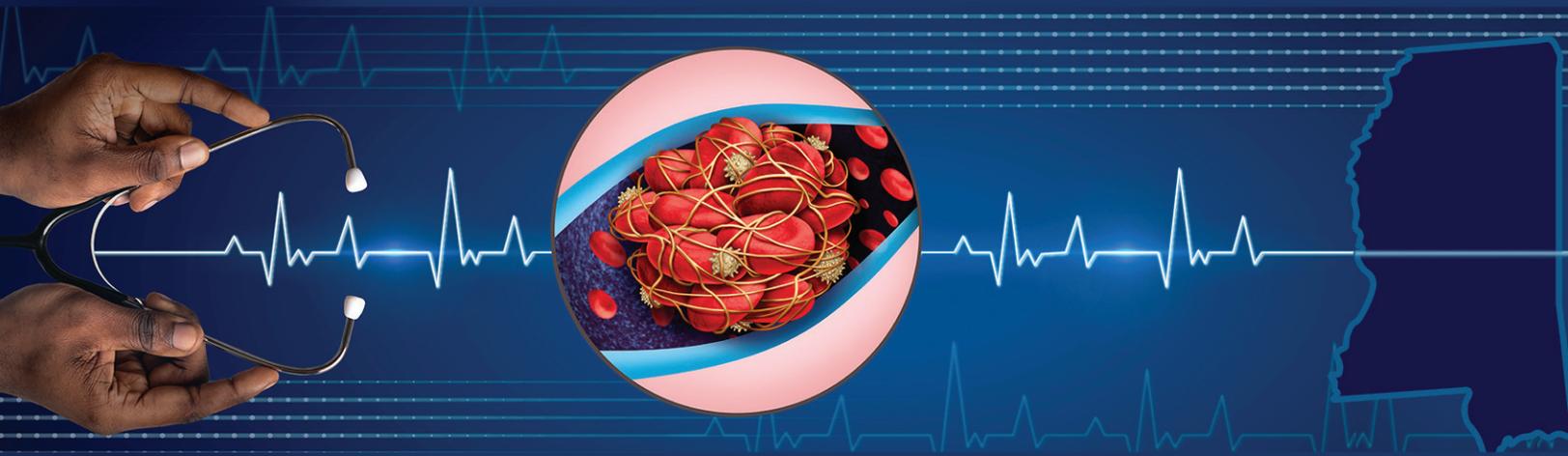


Improving Care Disparities for Black Americans in Mississippi with Venous Thromboembolism:

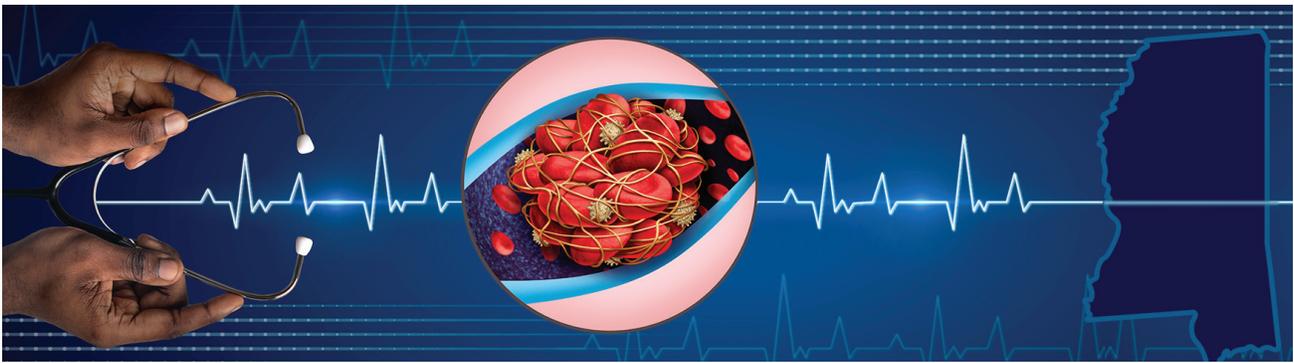


The Role of Care Transitions in Critical Access Hospitals

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Improving Care Disparities for Black Americans in Rural Mississippi with Venous Thromboembolism: The Role of Care Transitions in Critical Access Hospitals

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ABSTRACT

Purpose: This study addressed how Care Transition Intervention (CTI) from a VTE coach over 6 weeks may reduce readmission rates and improve qualitative outcomes in a cohort of rural, Black Mississippian participants who experienced VTE, compared with a control group of Black VTE patients who had not received CTI.

Methods: This study is a longitudinal, qualitative research design.¹ A prospective cohort of 10 Black participants living with VTE were compared to 10 Black VTE patients identified from a retrospective chart review. Data was garnered from CTI interviews (n = 44), utilizing a standardized VTE checklist, over 6 weeks. These interviews were transcribed verbatim and analyzed.

Findings: Absolute risk of readmission was 10% for the CTI-intervention group, and 50% for the control group. Quantifying the above results revealed the relative risk reduction of readmission was 80% (confidence interval [CI]; 0-1.2). Further, the number-needed-to-treat (NNT) was 2.5, reflecting 2.5 patients would need to receive VTE CTI, to prevent 1 readmission for VTE.

Conclusions: The incorporation of the VTE CTI coach reduced the absolute and relative number of readmissions when compared to a similar control group but did not rise to the level of statistical significance. Qualitative outcomes in the CTI group were improved including assessing medication adherence and educating patients to recognize recurrent VTE. Based on these results, we recommend a national quality incentive to assess CTI for rural patients living with VTE with attention to disparities in Black rural populations.

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Keywords: rural, health, health services research, healthcare disparities.



INTRODUCTION

Venous thromboembolism (VTE) is estimated to affect over 900,000 Americans per year, with more than 60-100,000 individuals subsequently dying from VTE.² Black Americans are disproportionately affected by VTE, with incidence rates estimated at 30-100% higher than White Americans.³ Additionally, Black Americans are 3 times more likely to die from VTE; and have a 30% higher 30-day mortality rate from VTE than White people.⁴ Further, analysis of Medicare data spanning 1999 until 2010 revealed that Black Americans are more likely to be hospitalized for VTE—and their rate of hospitalization increased over that decade by 20.8%—compared with a decrease in hospitalization of all other patient subgroups including age, sex, and other race.⁵

Beyond ethnic disparities, regionality differentiates the risk of experiencing VTE, with the highest VTE event rates occurring in the Southeastern United States compared to the rest of the nation. For the last decade, the most persistently elevated VTE rates were observed in Medicare patients that live in Mississippi, Louisiana, and Florida, while all other regions of the United States experienced a decline in VTE occurrence, except for Michigan.⁵⁻⁷ Acknowledging this increased risk of VTE occurrence for Black Americans, 1 in 5 of all VTE patients experience hospital readmission. Breaking down the causes of readmission, socioeconomic status constituted an important risk factor.⁸

Rehospitalization within 30 days of discharge in both medical and surgical admissions is a common and costly occurrence across multiple diagnoses: In a retrospective analysis of 11,855,702 Medicare beneficiaries, 19.6% of patients with any diagnosis were re-hospitalized within 30 days, and 34.0% within 90 days.⁹ Quality of healthcare analyses hypothesize that care transitions (CT) from hospital to home are of tantamount importance in ensuring patient safety and preventing readmission—and the lack thereof engenders 15 billion dollars in surplus healthcare costs.¹⁰

Care Transitions Intervention (CTI) is a nonclinical coaching strategy that occurs in the hospital, home, and via telephone or virtual visits for 28 days post-discharge. While one large study of a multi-racial, Veterans Administration-based patient population demonstrated no difference in readmission rates when comparing CTI to intra-provider health information exchange alone¹¹, alternative studies have identified CTI benefits chronically-ill older adults.¹² In a recent randomized control trial (N=1679) conducted by an accountable care organization in urban Boston, they analyzed outcomes for patients receiving CTI, revealing meaningful reductions in adverse events posthospitalization but no reduction in readmission rates in a predominantly white, urban population.¹³

Recent research supports that Black and White Americans receive different levels of post-hospitalization CT. In a Michigan retrospective survey of 1257 participants, inconsistencies were identified in how Black people

experience care transition compared to their non-Hispanic White counterparts. Upon discharge, Black patients had fewer follow-up visits scheduled or completed within two weeks of discharge. Additionally, Black patients received fewer follow-up phone calls and were less likely to receive prescribed equipment, even when adjusted for other demographic variables.¹⁴ This corroborates earlier work asserting that improving CTI for geriatric, Black, and Latino people is an unmet need.¹⁵

Disparities in CT are accentuated in rural beneficiaries regardless of race: In South Carolina, rural patients living with diabetes were less likely to have physician follow-up within thirty days of a hospital stay compared with urban patients.¹⁶ Beyond this work, increasing dialogue supports an unmet need to address health inequities even within this cohort of rural Americans: Health inequities exist between how rural Black people experience CT compared to rural non-Hispanic Whites.¹⁷ While these disparities in CTI have been identified among rural and Black patients, it remains unknown whether CTI is proven effective in real-world settings for rural racial and ethnic minorities.¹⁸

Moving from theory to concrete strategies, this study endeavored to document readmission outcomes and real-world patient experience in a cohort of rural, Black Mississippian participants who experienced VTE and then received Care Transition Intervention (CTI) from a VTE coach for 6 weeks after their discharge from primary VTE care in an emergency room, hospital, or subacute rehabilitation center. Comparing outcomes from this CTI group with a retrospective cohort of rural Black patients from the same region—who had previously received standard-of-care (SoC) discharge planning and follow-up—we hoped to gain insight into whether intensive post-discharge CT coaching can reduce readmission rates and improve qualitative clinical outcomes in rural Black Americans who have experienced VTE.

OBJECTIVE

The goal of this study was to implement and evaluate a VTE Care Transitions program in one rural Critical Access Hospital (CAH) catchment region in Mississippi to:

- Reduce VTE readmission to both emergency room (ER) and inpatient settings in the critical 30-day post-discharge period
- Increase VTE medication adherence
- Improve continuity of care with primary care providers
- Improve patient activation and health outcome measures for Black American patients with a VTE diagnosis discharged on a direct oral anticoagulant (DOAC)

The study was performed with participants from 2 rural counties in Mississippi that met the Health Resources and Services Administration and United States Department of Agriculture's definition of 'rural' areas.^{19,20}



METHODS

This study is a longitudinal qualitative research design.¹ Assessing how VTE patients respond to CTI from an engaged VTE coach and supervising physician is uniquely suited to the benefits of qualitative analysis because it is based on the “emotions, perceptions, and actions of people who suffer from a medical condition...uncovered through observing the interactions of professionals with clients and interviewing about their experience.”²¹

Transitioning The Original Research Paradigm

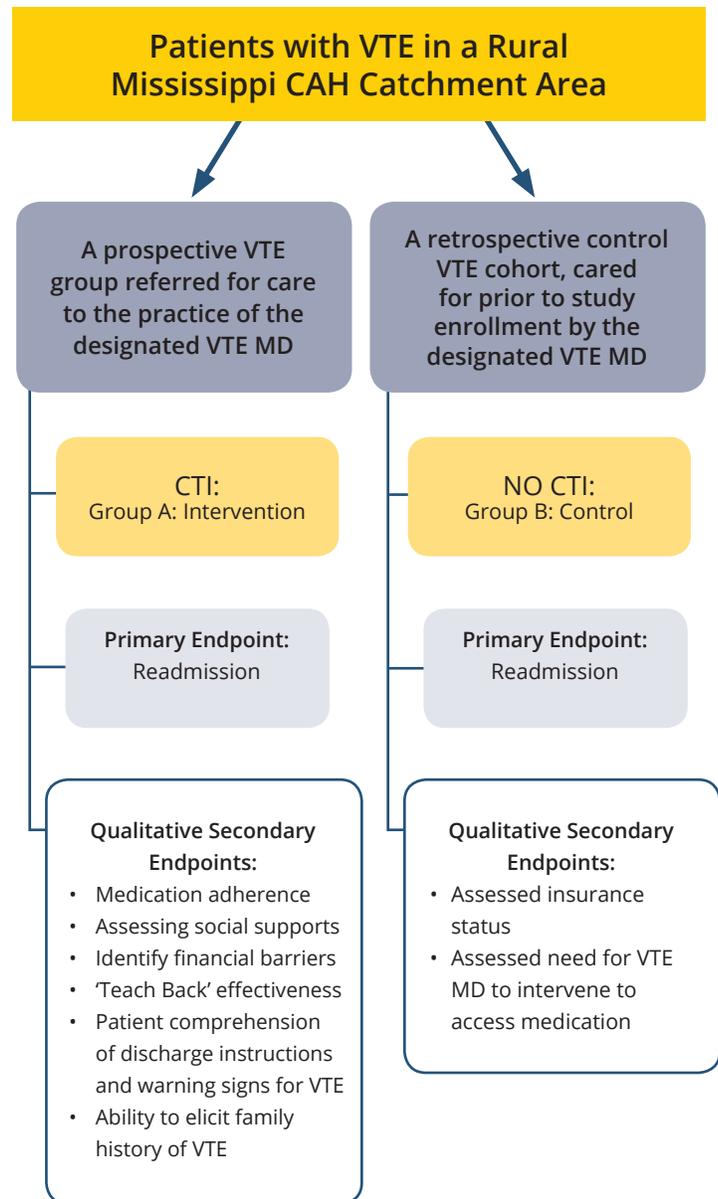
The initial research design anticipated all 10 patients would be recruited directly from the Critical Access Hospital (CAH) serving a catchment region in rural Mississippi. Challenges during the stakeholder engagement process were related to the number of patients available for enrollment directly from the CAH. After thorough review of medical records, the CAH concluded that most patients meeting the study criteria had been triaged to other hospitals better equipped to handle these cases, thus reducing the potential pool of study enrollees. Once the study moved from a hospital- to community-based study, internal review board (IRB) approval of the study was no longer available. However, given that the study premise offered non-clinical verbal coaching as CTI, with no identifiable risk to human subjects, the study team determined IRB approval was not required in this instance.

Participants: A Prospective Cohort and Retrospective Control Group Obtained by Chart Review

Because of these unanticipated limitations for enrollment, the research team recruited first-time VTE participants who were referred to a well-known resource clinician for VTE patients in the CAH catchment area. (Figure 1) The final study and control groups reflected patients under the care of the study’s resource physician, after being referred to him from various hospitals, CAHs, and clinics. Then, enrolled patients were followed by the NP VTE coach for at least 6 weeks.

These participants were compared to a control group identified via retrospective chart review in the resource physicians’ practice: 10 patients who had already experienced VTE prior to the CTI study’s enrollment period. Because of the physicians’ privileges to admit to the CAH, the study and control groups were highly-representative of the larger patient population in the CAH-outreach area, revealing information on complex issues and challenges among this community.

Figure 1. Participant Enrollment, Quantitative and Qualitative Endpoints.



CAH: Critical Access Hospital; VTE: venous thromboembolism; CTI: care transitions intervention

Study Size

The study size was predetermined to meet a practical sample size for the VTE coach to reach participants weekly, based on the large, rural area of coverage. This prospective cohort of 10 Black patients, presenting with confirmed VTE to the community resource MD during the enrollment period (Group A), agreed to enrollment after giving verbal consent to the VTE coach, participants received CTI via phone and in-person coaching visits.



A version of CTI was implemented via in-person home visits, virtual, or phone-based clinical coaching with a Black nurse practitioner (NP) with considerable care-management experience in the CAH-catchment area. Stakeholder engagement for study enrollment was sought within the referral region of a CAH in rural Mississippi, ultimately resting with one CAH-privileged and community-based physician who was a resource for referrals from multiple settings including the CAH. The prospective CTI cohorts' enrollment period was from October 2021 to April 2022.

Then, ten control patients were obtained via a chart review of the study physicians' prior VTE patients in his practice. In a cohort that extended from May 2020 until July 2021, the study team assessed the first ten patients who retrospectively met inclusion criteria of:

- Black race
- Diagnosis of VTE
- And had received care in the study physicians' clinic prior to the CTI cohorts' enrollment period

Data was obtained via interviews in-person, virtual visits, and phone calls when in-person participant visits were not practical or possible with the designated VTE coach over six weeks. This transition between in-person, virtual, or phone visits was based on patient needs, VTE coach accessibility to the large, rural catchment area, and constraints added by the co-existing SARS-CoV-2 pandemic.

Our purpose was to identify the effects of CTI on VTE patients discharged from the CAH in rural Mississippi, observing a quantitative endpoint of 30-day readmission rates. Through interviewing, qualitative endpoints including changes in DOACs, medication adherence, assessing social supports and financial barriers, and the effectiveness of the 'teach back' method with participants were gathered.^{22,23} With verbal participant consent, the VTE coach recorded all in-person and telephone assessment visits with the intervention group participants. Interviews were conducted with a standardized VTE management checklist (**Appendix A, see page 9**), augmented with open-ended questions (**Appendix B, see page 12**). Interviews between the participants, the VTE coach, and the study teams' perceptions of the study's benefits were transcribed by the medical writer. These interviews (n = 44) were transcribed verbatim and analyzed using an iterative, open-ended process of coding and comparison to contextualize outcome parameters, including the following:

- Patient and provider perceptions of care transitions and the VTE journey
- Patient experiences of communication concerning VTE prophylaxis
- Provider perspectives on their role in the prevention of hospital readmission

Illustrative vignettes of these interviews demonstrate data gathering techniques including (**Appendix C: Tables 4,5,6 and 7, see page 13**):

- Implementing the 'teach back' method to assess participant comprehension of signs and symptoms of recurrent VTE
- Assessing participants' medication comprehension at discharge
- Oral Anticoagulant (OAC) medication adherence
- Whether patients were adding self-care to their regimen after coaching intervention

Closing interviews with both the VTE coach and the study physician provided additional context for the intervention experience and clinical outcomes.

Potential Bias: The Observer as Participant

Because of the small size of the study, selection bias is likely the most potent limitation of this study's results. Also, as the study physician was recognized as a resource for VTE patients in the area, it is possible that more clinically complex patients may have been preferentially referred to his practice. And the participants chosen for the retrospective control cohort may also have been a source of information bias, as the study team may have recalled, and therefore chosen, more clinically complex VTE patients.

Other potential sources of bias include observer-participant bias.²⁴ The VTE coach, as observer, was also critical of medical needs such as participants' missing medication, psychological decompensation, and a life-threatening medical complication (**Appendix C, Table 8, see page 15**). The VTE coach transitioned to participant, initiating strategies to obtain medication, facilitate psychological evaluation and support, and immediate hospitalization for the respective participants.

Benefits of the Observer-Participant Role

Regarding potential advantages of the observer-participant role in qualitative studies, similar to prior researchers' experience²⁵, concordance in race between the participants and the VTE coach—a Black nurse practitioner with extensive experience caring for people living in the Mississippi Delta—may have enhanced study data's quality due to the VTE coach's ability to identify barriers to learning, facilitate patients' comprehension, and reduce study participants' fear of judgment by medical professionals when knowledge deficits were uncovered.²⁶⁻³⁰ These benefits may have been further augmented by the study leaders' status as a Black physician deeply engaged as a resource to medical care in the CAH-catchment area.³¹

Statistical methods in this qualitative analysis were limited because the small study size rendered quantitative results that were not statistically significant. All other study results were qualitative, based on interviews garnering patient perspectives and the observations of the VTE coach and study physician.



Regarding missing data, when participants were unable to be reached via phone or in-person, the study physician intervened at the participants' next clinic visit, requesting the participant reach the VTE coach, and contact was re-established for CTI. These remediations reflect the flexibility and consideration of the participants' challenges and needs, often required by observers in a qualitative analysis.²¹

RESULTS

Primary and Secondary Endpoints

Qualitative analysis was formative and summative. Formative qualitative analysis—constant and ongoing assessment of results—of the prospective cohort was revealed through the interview process by the VTE coach including medication adherence, change in DOACs, assessing social support systems and financial barriers, acquiring participants' family history of VTE, and effectiveness of the 'teach back' method in improving participants knowledge and understanding of their illness (Figure 1, see page 4). Summative analysis—tallying up the primary endpoint for comparison—was used to assess readmission rates. (Tables 1 and 2)

Table 1. Readmission in the Clinical Transitions Intervention (CTI) [Group A]. Additionally, demographic data including gender, age, and social support constructs.

Participant No.	Gender	Age	Support Status	30-Day Readmission
01	Female	75-79	Lives with extended family	N
02	Female	70-79	Lives with extended family	N
03	Male	60-69	Lives alone	N
04	Female	30-39	Lives with SO	Y
05	Male	70-79	Lives with SO	N
06	Female	≥ 80	Lives alone	N
07	Female	70-79	Lives with SO	N
08	Male	60-69	Lives with extended family	N
09	Female	70-79	Lives alone	N
10	Female	40-49	Lives alone	N

Table 2. Readmission in the non-CTI Group (Control) [Group B]. Additionally, demographic data including gender, age, and insurance status as a barrier to treatment.

Participant No.	Gender	Age	Insurance Status	30-Day Readmission
01	Female	70-79		Y
02	Female	60-69	No insurance coverage	N
03	Male	70-79		N
04	Female	≥ 80		N
05	Male	70-79		Y
06	Male	70-79	No insurance coverage	N
07	Female	50-59		Y
08	Female	50-59		N
09	Female	50-59	No insurance coverage	Y
10	Female	50-59		Y

When comparing the CTI group (Group A) with the non-CTI control group (Group B), participants and control persons demonstrated the following readmission rates, death, DOAC changes, and variances in insurance coverage. (Table 3)

Table 3. Post-VTE 30-Day Readmission Rate

	CTI Group	Control Group (No CTI)
Readmission	1	5
Death	None	1
DOAC changes	None	3
No insurance coverage	1	3

Absolute risk of readmission was 10% and 50% for Group A (intervention) and B (controls), respectively. Quantifying the above results revealed the relative risk reduction of readmission was 80% (Confidence Interval [CI]; 0-1.2). And the number-needed-to-treat (NNT) was 2.5, reflecting 2.5 patients would need to receive VTE CTI, to prevent 1 readmission for VTE. However, as the calculated CI includes the null value 1, these quantitative results are rendered statistically insignificant.³² This lack of statistical significance is likely a result of the small sample size.^{33,34}

As our study was predominantly qualitative, our observations were codified via multiple individual patient interviews, allowing the study team to formulate conclusions about how 10 VTE patients responded to CTI from the VTE coach. Utilizing a rigorous checklist (Appendix A, see page 9), the VTE coach collected qualitative observations through in-person, virtual, and phone interviews (n = 44) with participants. The study team then garnered the following qualitative observations regarding the effect of CTI on VTE patients in rural Mississippi.



Key qualitative results include:

- The VTE coach was able to identify and address barriers to care
- Follow-up visits were critical to intervention group wellbeing and effective care transition
- Frequency of interactions supported by a rigorous checklist enabled the VTE coach to emphasize and reinforce key information points at each visit, including the importance of medication adherence
- Asking patients to ‘teach back’ enabled the VTE coach to gauge patient understanding, reinforced symptom recognition, and when to contact HCPs in an emergency
- Using familiar terms and plain language in the follow-up protocol and VTE coach visits enabled participants to:
 - Better understand their own medical history (and potential risk)
 - Share information with their HCPs and establish an effective communication feedback loop
- The VTE coach was able to provide support for managing medications associated with comorbid conditions—to avoid the potential for drug-drug interactions with polypharmacy
- The post-discharge checklist was a valuable tool to record social status
- In-person or virtual follow-up visits by a VTE coach provide windows to assess social support in an ongoing fashion and identify patients with suboptimal social support
- Intervention group participant sentiment about the program was overwhelmingly positive at the beginning and at the end of the program

DISCUSSION

Hospital readmissions can be a de facto ‘barometer’ of the efficacy of care transitions and how patients experience the healthcare system. Quality assurance agencies have proposed diverse strategies to reduce patient risk via CT programs from hospital to home.^{35,36} Rural areas may be the least studied regions for how lapses in care transition affect patient outcomes, morbidity, and mortality. A recent survey of nurses who control care transitions (CT) for rural patients identified core issues in CT, citing stressed discharge systems and theorized an increased need for guideline-directed care, improved communications, and sufficient staffing.^{37,38} These results are mirrored in a large multi-racial cohort demonstrating that Black Americans were less likely to report completing a post discharge follow-up visit (OR, 0.49; 95% CI, 0.36-0.67; $P < .001$) or to receiving prescribed medical equipment (OR, 4.23; 95% CI, 1.30-13.83; $P = .02$).¹⁴ For these reasons, we endeavored to gauge the effectiveness of CTI in reducing readmissions and enhancing qualitative clinical outcomes for rural Black Americans who had been diagnosed with VTE. Barriers to care, as identified by an expert consortium include:³⁹

- Intra-provider communication between hospital and discharge

- Poor patient comprehension of their diagnosis, treatment plan, and a point person for patient outreach
- Social support deficits
- Patient insecurity about insurance coverage regarding medication could offer a significant obstacle to receiving medication
- Barriers in anticoagulation therapy due to lack of insurance coverage, unaffordability, risk of polypharmacy, and patient comprehension of dosing and administration

Regarding patients’ perceptions of barriers, in a recent online survey of 971 participants, 1 in 3 patients reported barriers to care, with 1 in 5 recounting cost of medication and 13% identifying lack of social support as main obstacles to their VTE care.⁴⁰ Our study addressed these recognized barriers by designing a VTE CTI program that encompassed recurrent visits and rigorous adherence to checklists and follow-up open-ended questions. From these interviews, the study team garnered valuable insights into how CTI can qualitatively improve clinical outcomes.

What Went Right? The Value of In-Person Patient Communication

The most recurrent positive qualitative results were how participants and the VTE coach endorsed the benefits of ‘in-person’ visits. Firstly, she frequently identified inadequate comprehension of discharge instructions, as exemplified by the following quote:

“[The Discharge Instructions] were all folded up in their bag, but nobody has taken time to follow up or reread it or go back through it with them.”

The VTE coach surmised that the in-person visit was tantamount in discovering inadequate or strained social supports, allowing her to increase vigilance on participants at increased risk, like alcohol overuse, severe psychological stressors, inability to obtain their medication, or incorrect administration of medication (**Appendix C, Table 5, see page 13**). She shared these observations with the study physician, initiating timely and appropriate intervention and follow-up:

[Participant 5] “Dr. got him to fill out some paperwork to get help on that...[We] got a three-month supply from [the pharmacy chain], and I think we got it for \$19, so that was a big help.”

The Importance of the ‘Teach Back’ Method and the Use of Plain Language with Participants

Further, the VTE coach underscored the importance of the ‘teach back’ method and using plain language when communicating with patients, and identifying patient’s miscomprehension of their diagnosis, revealed in this ‘debriefing’ interview with the VTE coach:

“The language is a barrier. We’re probably using medical terms. Nobody’s really explaining it to them. They’ve had a blood clot, they know their arm was sore or was swollen, or they had a blood clot in their lungs. [I Ask] Do you understand that? And,



without this medication: If you're not taking it correctly, what could possibly happen? They know that, but they don't retain the information given at discharge. So, [you need] somebody to follow up, even if it's a call after discharge, to say We're just following up with you, can you basically give me back the information that we gave you at discharge?"

These observations underscore the need for plain-language communication and how repetitive follow-up questions can uncover important gaps in patient comprehension of their VTE diagnosis and the risk it poses to the participant. These plain-language communications, checklists, and open-ended questions also allowed participants to 'connect-the-dots' to their own family histories of VTE, recognized as an important factor in initial VTE diagnosis and VTE readmission, as reflected to the VTE coach:^{41,42}

"...That's what they said my mom had! So, am I going [to get] that? Am I gonna die from this? Because my mom was taking a bath when this happened to her. And she fell in a tub. I tried to help her. I call[ed] 911. But it was too late!"

This participant-reflected insight demonstrates that increasing health literacy, facilitated by multiple interactions with the VTE coach, allows the participant to communicate effectively regarding their perceptions and fears about the risk of VTE, the risk of recurrence, and the increased risk of VTE to other family members.

CTI Can Establish Rapport and a Communication Channel with Healthcare Providers

Consistent follow-up and establishing rapport were key to assessing the primary endpoint of readmission at 30 days, and further qualitative assessments. The VTE coach was able to identify nonadherence to DOAC treatment and the financial and social challenges that provoked this lapse. (Appendix C, Table 6, see page 14) Additionally, the VTE coach uncovered one patient within the 30-day readmission period who was symptomatic, and referred them to the emergency room, resulting in readmission. Later in the study period, a participant texted the VTE coach, recognizing her as a point-of-contact person, with significant signs and symptoms of pulmonary and systemic illness. The VTE coach then transitioned from observer-to-participant, intervening in the participants' care. She recommended and ensured the participant reported to the hospital and notified the study physician, resulting in the participants' four-week hospitalization for a pulmonary fungal infection.

These results elucidate the benefits of having a well-trained, medically astute VTE CTI coach who can gain trust, reinforce self-care, help patients identify clinical signs and symptoms related to their diagnosis, and leverage their strong rapport with the participant to facilitate better clinical outcomes. (Appendix C, Tables 7 and 8, see pages 14-15)

VTE CTI Reinforces Learning and Enhances Health Behaviors

The frequency of interactions emphasized key information points and reinforced the importance of this information for participants. As a result, by the study end, more study

participants were able to provide more specific information about their self-care behaviors. The study physician emphasized how repeated interaction with the VTE coach reinforced behavioral modification, as he recounted:

"The more you have interaction with a trained medical professional, the more time that you have to talk and educate [the participants] about [their] chronic illness that they [have] and let them know, these are some things you need to be concerned about, that you really need to watch out for. These are some things that will help improve the outcome of your illness and help [prevent] you being in a hospital, [and] just improve your overall health...[the ultimate evaluation] will be to see how these people fare several weeks or months after the study ends. Do they continue with this lifestyle modification or did they [just] go by the wayside? That'd be interesting to find out."

Finally, two-thirds of the participants were queried and reflected their perception of VTE CTI's value to them, one reflected below and further excerpts (Appendix C, Table 9, see page 15):

[Participant 7] "I believe y'all have done a good job in doing something worthwhile for Black people. Because, we don't get that often, and I [have never known] anything like this. I just thank God for the program, and thank God for you that are doing it, and I get excited by [this] stuff. I think this it's a good program."

Limitations of the Study

The 2 quantitative endpoints: the absolute risk of readmission for the CTI and non-CTI group, and the relative risk reduction (80%) were not able to be ascertained as statistically significant, likely due to the small sample size. And we acknowledge that the VTE CTI study design is susceptible to selection bias due to challenges in enrollment both prospectively and retrospectively attained control group via chart review. However, qualitative observations were methodically collated, garnering insights into how VTE CTI can enhance clinical outcomes for rural Black patients.

CONCLUSIONS

The incorporation of a VTE CTI coach reduced the absolute and relative number of readmissions when compared to a similar control group but did not rise to the level of statistical significance, likely due to the small study size. This study is unique in its focus on rural Mississippian Black people living with VTE, mirroring other cohorts who have historically suffered from disparate care transitions. Qualitative outcomes in the CTI group were enhanced, including reinforcement of the importance of medication adherence, vigilance for medication access, improvement in patient comprehension of their illness, and assessing gaps in social support. We hope this small study can initiate dialogue among medical professionals to promote a national quality incentive to improve CTI in all patients following VTE, with attention to the disparities experienced by rural Black Americans in care transitions.



Appendix A

Mississippi VTE Care Transitions Coordinator Checklist

Contact Date _____

Patient Information

Patient Name and Age _____

Gender

- Male
- Female
- Other _____

Patient Education Level

- High School
- College
- Other _____

Patient Support Status

- Lives alone
- Lives with spouse or significant other
- Lives with extended family
- Other _____

Family History and Risk Factors for Recurring VTE

- Patient and Family History _____
- Initial location of VTE
 - Proximal
 - Distal
- D-dimer Test performed?
 - Elevated
 - Non-elevated
- Residual Thrombosis
 - Yes
 - No
- Screening for antiphospholipid syndrome and/or malignancy in patients presenting with arterial thrombosis, unusual site of thrombosis, or recurrent pregnancy loss
 - Yes
 - No

Physicians

- Discharging physician name/contact _____
- Current physicians' names/contacts _____
- Date of next physician visit _____

Diagnosis

- Cause of VTE _____

Hospital _____

Discharging Hospital _____

Admission

- Emergency Department _____
 - Date of discharge _____
- Inpatient _____
 - Date of discharge _____



Patient/Family Education

- Educated patient and family about condition
 - Discussed progress towards patient, family, and healthcare providers' goals
 - Involved patient and family in care practices (eg. Assisting with rehabilitation)
 - Discussed patient and family questions
 - Reviewed discharge instructions as needed
 - Asked patient and family to restate provided information to ensure understanding ('teach back' method)
-
-

Notes added individually on each category above.

Barriers to Optimal Care

- Patients' health insurance status and ability to access post discharge treatments
 - Patient needs help locating and completing patient cost assistance programs for prescribed DOAC
 - Patient needs psychosocial support
 - Patient needs emotional support
 - Patient needs transportation support to physician and pharmacy visits
 - Other barriers _____
-
-

Notes added individually to each category above.

Care Plan

- Asked patient and family to restate provided information to ensure understanding (via the teach back method)
 - Gave the patient and family a copy of the care plan
-
-

Notes added individually to each category above.

Recurring VTE and PE Risk Assessment and Screening Post Discharge

- Recurring VTE Signs/Symptoms
 - Leg pain or tenderness of the thigh or calf
 - Leg swelling (edema)
 - Skin that feels warm to the touch
 - Reddish discoloration or red streaks
- Pulmonary Embolus Signs/Symptoms
 - Rapid or irregular heartbeat
 - Lightheadedness or dizziness
 - Excessive sweating
 - Fever
 - Leg pain or swelling, or both, usually in the calf, caused by deep vein thrombosis
 - Clammy or discolored skin (cyanosis)



- Triage to Physician
 - Yes
 - No
- Name of physician _____
- Appointment date _____
- Follow-up date _____

Medication

- Direct oral anticoagulant
 - Yes
 - No
- Pharmacy where prescriptions are filled _____
- Other current medications _____
- Medication list reviewed with patient and family
 - Yes
 - No
- Explained medications to patient and family, including dosing and regimen:
 - Morning
 - Noon
 - Evening
 - Bedtime
 - Other
- Reviewed medication rationale, potential side effects, and storage instructions with patient and family?
 - Yes
 - No
- Information provided on medication assistance programs?
 - Yes
 - No
- Offered to assist patient with medication assistance program initial applications?
 - Yes
 - No
- Asked patient and family to restate provided information to ensure understanding via the 'teach back' method?
 - Yes
 - No



APPENDIX B
Open-Ended Follow-Up Questions for Participants in
CTI-guided VTE Care Management

1. Since you've been home, what are you doing to take care of yourself?
- Diet
 - Compression stockings
 - Day-to-day help in the home
 - Who is there to help you if you can't take care of yourself to get to the doctor/or medication?

2. How do you make sure you take your 'blood thinner' medicine?

- Do you have any problems with taking or getting the medicine?

- Do you have any problems with paying for the medicine?

3. Do you feel like you know who to call, and when, if you run out of medication or feel unwell?
- Yes
 - No

4. Is there anything that would make it easier for you to take care of yourself or to help you take your 'blood thinning' medicine?



APPENDIX C

Interview Vignettes Illustrating Formative Assessments During CTI with Group A Participants

Table 4. Group A Examples of Symptom Recognition Through the 'Teach Back' Method

<p>VTE Coach: What's the biggest thing you think of looking for if we may suspect you may have another blood clot? Tell me what you were feeling.</p> <p>Participant 5: Shortness of breath.</p> <p>VTE Coach: The chest pain?</p> <p>Participant 5: Chest pain. The swelling. Yes.</p> <p>VTE Coach: Okay, those are the things that we want you to watch because I know you're a busy man.</p>
<p>VTE Coach: Before we end our conversation, I want you to tell me those signs and symptoms that I told you to look for in the event you start to have problems again.</p> <p>Participant 6: Okay.</p> <p>VTE Coach: What did I tell you to look for that I want you to call 911 for or go to the emergency room? What symptoms did I tell you to look for?</p> <p>Participant 6: Short of breath.</p> <p>VTE Coach: Short of breath. What else?</p> <p>Participant 6: I can't think of the rest of it.</p> <p>VTE Coach: Chest pain.</p> <p>Participant 6: Yes, chest pain.</p> <p>VTE Coach: Legs swelling.</p> <p>Participant 6: Legs swelling.</p> <p>VTE Coach: Discoloration of the skin. Whether or not your legs are warm to the touch. Shortness of breath that does not go away once you sit down and rest.</p> <p>Participant 6: Okay.</p>
<p>VTE Coach: You remember the side effects or the side symptoms to look for in event that you're not feeling well?</p> <p>Participant 10: Oh, I do. Shortness of breath, sweating, swelling, and chest pain.</p>

Table 5. Examples of OAC Medication Recall at Discharge

<p>VTE Coach: Are you taking the blood thinner twice a day as [per] the order?</p> <p>Participant 2: I'm not sure. I think it's maybe once a day.</p> <p>VTE Coach: The Eliquis you're on should be twice a day.</p> <p>Participant 2: I think, in my understanding, that it's once a day. Now the doctor or either nurse would know.</p>
<p>VTE Coach: Did he tell you how long you will probably be on the blood thinner?</p> <p>Participant 5: No.</p>
<p>VTE Coach: Did they put you on a blood thinner?</p> <p>Participant 6: Yes.</p> <p>VTE Coach: Do you know the name of your blood thinner?</p> <p>Participant 6: No, I don't.</p>



Table 6. Group A Oral Anticoagulant (OAC) Education

<p>Participant 3: I'm off the blood thinner.</p> <p>VTE Coach: He [the study physician] took you off the blood thinner?</p> <p>Participant 3: No, he just said I had to take them till June. I'm off now.</p> <p>VTE Coach: You just went ahead and stopped it since he told you what to do? Okay.</p> <p>Participant 3: When they ran out, they ran out the other day, so...</p> <p>VTE Coach: Okay, so since you ran out, now what I want you to do is to look for those things we talked about, those signs [and] symptoms, like that arm pain, because that's where your blood clot was. Any chest pains, any shortness of breath, any lower extremity leg pain, redness, and discoloration? We just [have] to watch you closely since you're off and you just ran out. When? What day?</p> <p>Participant 3: I think it was just a day or two ago.</p>
<p>Participant 7: If I miss a dose, I just take it the next day.</p> <p>VTE Coach: The next day. We want you to look for any bruising or bleeding, if you have any, just make sure you let us know, you have our contact information.</p>
<p>Participant 5: If I miss in the morning, I take it about eight o'clock at night.</p> <p>VTE Coach: But you know you take two doses, so we don't want you to overdo it.</p> <p>Participant 5: Right, I know.</p> <p>VTE Coach: Our biggest thing is just to watch for bleeding or bruising.</p> <p>Participant 5: No, I don't have [any] bleeding.</p> <p>VTE Coach: Good, no bleeding? No bruising?</p> <p>Caretaker: I check him out thoroughly, honey. He [is] on my watch.</p>

Table 7. Group A Examples of Self-care across the Study Period

Initial Visits (T1-T3)
"I've been walking. Sometimes I get short of breath, not all the time, but sometimes I do."
"I get tired out so quickly when I go to a grocery store, 30 minutes is enough for me. Sometime[s] I use the little cart. The scooter."
"I walk around the house as much as I can."
"[I don't exercise] too much. I exercised yesterday, though."

Later Visits (T4-T10)

"I do this for my legs, move my foot up and down."
"Exercise is an everyday thing."
"We go for a good walk twice a day."
"I've been fishing, I've been riding a bike."
"I'm exercising daily."
"I get up and walk around."
"I try to reach over and touch my arm out and bring it back to my chest."
"I'm walking my dog, I'm taking my medication as prescribed, and I am eating different. I'm trying to cut out some of my sodium and stuff, so, yes, I have changed my way of eating."



Table 8. VTE Coach Transitioned from Observer to Participant in the Study.
Extracts of Communication by then VTE coach, when contact was initiated by an acutely ill study participant in Group A.

A participant texted the VTE coach because of symptoms of increasing shortness of breath.

Extract:

VTE Coach: You sound a little out of breath. Why don't you go to the emergency room?

Participant 4: The kids are here.

VTE Coach: You need to go to the emergency room and text me when you get there. I'm going to text Dr. H and let him know I sent you to the emergency room. Does your chest, or anything, hurt?

Participant 4: It does and for some reason, I'm sweating a lot. I'm sweating so much that I have to change my sheets in the middle of the night!

VTE Coach: Any chest pain?

Participant 4: Yes.

VTE Coach: Okay, I want you to hang up with me. Do you have somebody that can take you to the emergency room?

Participant 4: Yes.

VTE Coach: You got my cell number. This is my cell number. Text me and let me know you made it there. I'm going to text Dr. H and let him know that I sent you with chest pain, shortness of breath.

Clinical Follow-up:

The VTE coach called the participant back in ten minutes to check her status. The participant, who's initial VTE was precipitated after a COVID-19 infection, was subsequently hospitalized for nearly four weeks and treated for a fungal infection in her lungs.

Table 9. Participants Perceptions of the VTE CTI Study and Termination of the Coaching Relationship

Participant 5:

"I feel that it's a good thing to do, that's what I feel. I feel it's good to have somebody that care[s] and [tries] to do something for me and to be around when ain't nobody doing nothing for me. I love how you come in and you do something for me!"

Participant 9:

"I think it's great and it's very much needed because I feel more comfortable and secure knowing that its' hard to get to a doctor. Sometimes, I can call you or text you, or whatever, and you'll give me an answer, what to do, or you'll come, or whatever, so that's a blessing!"

Participant 1:

They're closing it down? They take everything away, they take it away, huh?

Participant 10:

I thought you said it was lasting for—Has it been over a year already? Everything been going quite well. I thank you. I do. I enjoyed our less-than-a-year time, you was calling to check on me, so I appreciate that.

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