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***ORH Enterprise-Wide Initiative
Transitions Nurse Program End-of-Year Evaluation
October 1, 2017 – September 30, 2018***

EXECUTIVE SUMMARY

The rural Transitions Nurse Program (TNP) is an intensive care coordination program designed to enhance the transitions of care for Veterans from a tertiary VA facility back to their VA primary care provider. The program is led by a Transitions Nurse based at an urban VA medical center who identifies, enrolls, and coordinates the care needs of vulnerable Veterans. In its second year as an ORH EWI, TNP is actively enrolling Veterans at 11 VA medical centers: Denver, Iowa City, Pittsburgh, Salt Lake City, Seattle, Gainesville (Fiscal Year (FY) 17 sites) and Reno, San Francisco, Durham, Portland and Minneapolis (FY 18 sites). Between October 1, 2016 and September 30, 2018, TNP has addressed the transitional needs of 2,156 Veterans.

FY 18 TNP sites were recruited through the ORH EWI call. We received 12 applications. Site selection was based on the number of rural Veterans discharged annually, site requests for staffing, alignment with the TNP intervention, and leadership engagement. Ultimately five sites were enrolled in the program. Of the 7 sites not selected, exclusion was based on the following reasons: they wanted to use medical assistants instead of a nurse, they requested more than one nurse FTE, or they were planning to enroll patients going to community care, long-term care, or skilled nursing facilities.

Transitions Nurse training occurs annually for all sites. The FY 18 training occurred in May at the Denver VA medical center (VAMC) and University of Colorado, Center of Advanced Professional Education (CAPE). Twelve Transitions Nurses and 10 site champions attended the three-day TNP intervention, communication, and problem-solving sessions. Evaluation of TNP indicates that Transitions Nurses are implementing the TNP intervention with fidelity and are consistently using the communication and problem-solving skills learned at the annual training. Veteran and provider interviews indicate that TNP is viewed as an impactful program. High Veteran satisfaction is reported, and providers have voiced gratitude that TNP Transitions Nurses are part of the care team. Preliminary analyses of TNP outcome data suggest that patients enrolled in TNP were significantly more likely to see their PCP within 14 days of discharge ($p = <0.001$) and had a reduced risk of death within 30 days of hospitalization ($p = 0.013$) compared with matched patients not enrolled in TNP. No difference in 30-day readmission or emergency/urgent care rates were noted. These preliminary results are promising; however, further analyses are needed to understand and validate these findings.

TNP has maintained a consistent implementation and evaluation team, based at the Denver Center of Innovation. The implementation team consists of Lynette Kelley, RN, MSN, Ashlea Mayberry RN., and Heather Gilmartin, PhD, NP. The evaluation team consists of Chelsea Leonard, PhD, Marina McCreight, MPH, Anne Hines, PhD, David Gaskin, BS, Brigid Connelly, BS, and Ted Warsavage, MS. In April 2018 TNP leadership transitioned from Dr. Robert Burke, who took a position at the University of Pennsylvania, to Dr. Heather Gilmartin.



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TNP Program Updates/Adaptations

Pre-implementation Assessment

In the second year of TNP expansion, adaptations were made to the TNP implementation strategies based on evaluation of the first year (FY 17) program results. In year 1 of TNP, the Denver-based implementation and evaluation team collected pre-implementation site specific data pertaining to current processes and potential barriers and facilitators to implementation. Four team members traveled to sites for 3-day visits. Site specific data were collected using key informant interviews, process mapping, observations, and brainwriting premortem sessions. To enhance the sustainability of TNP, in year 2 we created a training program and educational toolkit to train Transitions Nurses to collect pre-implementation data at their own sites.

The goals of the new program are to empower Transitions Nurses to learn about the culture and potential barriers and facilitators to implementing TNP at their own site and to provide them opportunities to engage with local partners and site leadership. The Denver team provided mentoring and coaching, data analysis, and feedback reports. Surveys and interviews with FY 18 nurses indicated high satisfaction with the training and toolkit. In interviews conducted six months after TNP implementation, one nurse noted that *"finding out the barriers [helped inform] where I needed to start... Knowing the process and where I needed to interject [helped prepare for the program roll-out]."* The Transitions Nurse pre-implementation assessments led to locally identified solutions, increasing the chance for sustainable adoption, implementation, and maintenance of TNP at each site.

Hiring and Turnover

All 11 TNP sites have presented unique challenges. However, hiring and turnover have been the most notable. To date, TNP has had 3 of 11 (27%) Transitions Nurses leave TNP for other positions within the VA. There has been no turnover in site champions. Reasons for Transitions Nurse turnover included opportunities for leadership positions within their organization and moving away from the area. All positions were successfully filled before the original Transitions Nurse left, allowing the new nurses to observe and learn from their predecessors.

Transitions Nurse Annual and New Hire Training

In March 2018, we offered annual and new hire training to Transitions Nurses and site champions. The 3-day course hosted at CAPE covers care coordination, effective communication, relational skills, and the four core components of TNP (i.e., assess Veteran and family discharge readiness, follow-up appointment with PACT, post-discharge phone call to Veteran, post-discharge communication with PACT). Participants work with standardized patient actors to acquire skills in care coordination, effective communication, and motivational interviewing. The in-person training provides opportunities for real-time feedback from peers and begins the TNP learning collaborative. During this time, site champions receive training in quality improvement and implementation science principles to help them engage stakeholders and successfully implement TNP. The FY 17 Transitions Nurses shared their first-year experiences through "Lessons Learned" presentations. Two FY 18 Transitions Nurses were not able to attend the May training due to hiring delays. Due to this, CAPE adapted the 3-day training to a virtual platform to



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allow for these nurses to receive the same training without travel. Feedback on the virtual training was very positive. In FY19, the Denver-based team will create a toolkit to standardize the virtual training for use in a Pathway to Partnership application to spread and scale up TNP and the Transitions Nurse training across the VA. The Transitions Nurse Training program is evaluated using Kirkpatrick's 4 Level Model to assess satisfaction with training, whether Transitions Nurses learn key concepts, and how they apply those concepts in their role.

Evaluation Results

We report on progress for all RE-AIM domains and program adaptations. Noted additions to this second-year report are the effectiveness analyses, maintenance, and sustainment efforts.

REACH

We used administrative data to estimate the pool of potentially eligible Veterans for TNP. This number is used as the denominator for the reach calculation. However, this data does not factor in certain aspects of TNP. For example, Transitions Nurses do not enroll Veterans on weekends, nor engage with Veterans who are in the hospital less than 24 hours. Due to this, the reach calculation does not fully capture the absolute number, proportion, and representativeness of individuals who are willing to participate in a given intervention. We report reach data to sites to help them evaluate and modify their processes as needed. Our preliminary data estimate that across sites, 14% (2191/15702) of eligible Veterans were enrolled in TNP during FY 18. Reach varied across the 11 sites, from 6% (99/1793) to 46% (79/172). For intensive care coordination programs like TNP, we anticipate a low reach (**Appendix: Table 1**).

In FY 18 we added a second reach measure at the request of site champions. Facility leadership were asking how far TNP reached into VAMC catchment areas. We employed Geographical Information System (GIS) mapping to provide a visual representation of the reach of TNP. Sites were provided with national and site-specific maps (**Appendix: Figures 1 & 2**). Transitions Nurses and site champions reported the maps were easy to understand, were easy to share, and were a great advertisement for TNP. We asked Transitions Nurses and champions to rate the acceptability and appropriateness of the GIS maps as an implementation strategy for TNP. Our stakeholders responded they overwhelmingly agreed that the GIS maps were an acceptable (4.6; 1-5 Likert scale) and appropriate (4.8; 1-5 Likert scale) approach to reporting the reach of TNP.

EFFECTIVENESS

Veteran Satisfaction

In August of FY 18, we began to capture Veteran satisfaction using Interactive Voice Response (IVR) surveys. Each Veteran enrolled in TNP receives an automated call from a VA telephone number that asks questions about their experience in the program. IVR survey questions are modeled after the VA Survey of Hospital Experiences of Patients (SHEP). Transitions Nurses are supplied with a standardized TNP IVR script to educate their patients on what to expect from the phone call. To date, Veterans across all sites rate TNP as highly satisfactory (8.5: 1–10 Likert scale). The current response rate for IVR calls is 39%. A snapshot of the IVR results available to sites via the TNP real-time dashboard is included as **Appendix: Figure 3**. Veteran feedback is also received by mail (e.g. feedback forms). We received feedback from 17 Veterans in FY 18. Quotes are presented in **Appendix: Table 2**.



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TNP Outcomes: Preliminary Analyses

TNP is hypothesized to positively impact 14-day post-hospitalization visits with VA primary care, and decrease rehospitalization, emergency department visits, and death post-discharge. We assessed outcomes for patients enrolled in TNP compared to propensity matched controls (2:1).

Outcomes of interest include: (1) PCP visit within 14 days of discharge (binary); (2) Death within 30, 60, and 90 days of discharge (survival); (3) Rehospitalization within 30, 60, and 90 days of discharge (survival); (4) Emergency Department/Urgent Care visit within 30, 60, and 90 days of discharge (survival). We added Index Length of Stay at the request of site champions. A full description of analytic methods is provided in **Appendix: Table 3**.

Preliminary analyses suggest that patients enrolled in TNP were significantly more likely to see their PCP within 14 days of discharge ($p < 0.001$) and have a reduced risk of death within 30 days of hospitalization ($p = 0.013$) than matched patients. TNP did not have a significant impact on death within 60 or 90 days ($p = 0.112$; $p = 0.863$ respectively), or 30, 60, 90-day rehospitalization, emergency/urgent care rates, or length of stay (**Appendix: Tables 4 – 7; Figures 4,5**).

The TNP outcomes are promising, yet preliminary. We offer initial evaluation and considerations. First, the lack of impact on readmissions was surprising, however, the data suggest a very low readmission rate for TNP enrollees (12%) and controls (13.4%). We are unsure if TNP can impact such a low readmission rate in this population. Second, the analysis surrounding death was challenging given the sparse occurrence. It is possible that PCP visits have a mediating effect, as could ED visits and readmissions. To help us understand these findings we will be conducting additional analyses and chart reviews to determine the causes and preventability of readmissions and death. Third, we acknowledge that these results may change as the Transitions Nurses continue to enroll Veterans and we investigate other methods to understand these findings. Due to this, we request these results to be viewed as preliminary and not shared widely.

ADOPTION

All sites have successfully adopted the core components of TNP. All sites are currently enrolling Veterans, engaging in the TNP learning collaborative, and receiving referrals from various providers. **Appendix: Table 8** presents total enrollment at each site.

TNP Learning Collaborative

All site champions participate in monthly calls with Dr. Gilmartin to review TNP progress. FY 18 Transitions Nurses participated in weekly calls hosted by Lynette Kelley and Ashlea Mayberry. Calls were titrated to biweekly as the nurses became more comfortable in their roles. FY 17 Transitions Nurses participate in monthly calls. Once each quarter, the two cohorts participate in a joint call. These calls provide an opportunity for site champions and Transitions Nurses to build a community of practice and to troubleshoot intervention and adoption issues. The learning collaborative also fosters ongoing learning through journal club activities, opportunities to practice presentations, review of TNP results, opportunities for improvement and to support career



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development. In interviews with FY 17 sites, one nurse stated the calls were “just like a support system.” Other nurses discussed the value of sharing experiences from colleagues.

Referrals to TNP and Transitions Nurse Strategies to Promote Adoption

Across the 11 TNP sites, Transitions Nurses reported that 18 unique roles refer Veterans to the program. This indicates broad knowledge of TNP across roles. **Appendix: Table 9** lists the sources of referrals to TNP. The Transitions Nurses and site champions educate peers about TNP through in-services, flyers, posters, color pamphlets, and a short informational video. In-services occur frequently due to changes in the staffing of rounding teams. **Appendix: Table 10** lists examples of audiences that Transitions Nurses have presented.

IMPLEMENTATION

The Denver team employs multiple, evidence-based implementation strategies to support TNP. These include assessing for readiness and identifying barriers and facilitators through pre-implementation local needs assessments, audit and providing feedback, a Lean Six Sigma process improvement approach, the development, implementation and organization of tools for quality monitoring (e.g. interviews, data dashboard), and obtaining and using Veteran and family feedback. In addition, we provide centralized technical assistance, partner with data experts who access VA data warehouse sources, offer internal and external facilitation, and monitor for program adaptations. We built a learning collaborative to capture and share local knowledge across sites. We identified and continue to support site champions and prepare materials for champions and Transitions Nurses to inform local opinion leaders and facility leadership about TNP processes and outcomes. Through our annual training we conduct ongoing education using a dynamic and interactive framework to reinforce communication and leadership skills and review the TNP core components. The goal is to ensure standardization of TNP delivery. Using a train-the-trainer approach, we have provided forums for Transitions Nurses to present their experiences within and outside TNP and have supported new Transition Nurses to travel to other sites to shadow expert Transition Nurses. In this report, we report on fidelity tracking and pre-implementation assessment. In the next fiscal year, we will report on stakeholder perceptions of the impact of the various implementation strategies on TNP implementation and maintenance.

The Denver team tracks fidelity and adaptations using qualitative observations and interviews and an audit trail. We conduct assessments throughout the year at each site to track fidelity to the program components, the Transitions Nurses’ competency in delivering the program components, and modifications and adaptations to TNP care coordination processes. We encourage sites to adapt TNP to their local context, in consultation with the Denver team, while retaining fidelity to the TNP four core components. The goal is to improve adoption by increasing fit with local context. **Appendix: Table 11** shows the number of Veteran enrollments where all four TNP core components were completed. We conducted site visits at FY18 sites 9 months after Transitions Nurses began enrolling Veterans. Observations and interviews indicated that TNP is being delivered with high fidelity.



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Pre-Implementation Assessment Results

Barriers to TNP implementation were identified during pre-implementation assessments conducted by FY18 Transitions Nurses. **Appendix: Table 12** details barriers identified using the brainwriting premortem activity developed specifically for TNP by Dr. Gilmartin. A brainwriting premortem is a silent, written group brainstorming activity designed to identify reasons that a program might fail while engaging all participants within an environment that facilitates speaking up. These data were used to adapt TNP to site specific issues to enhance implementation, adoption, and sustainment. Facilitators to TNP implementation identified by Transitions Nurses included existing communication infrastructure, such as Skype and view alerts. These were viewed as structures that would support and sustain TNP. Second, existing team meetings were viewed as opportunities to conduct in-services, foster buy-in, engage local leadership, forge multidisciplinary relationships, and recruit Veterans to TNP. Third, the start-up nature of TNP (e.g. time and funding) was deemed an ideal opportunity to rebuild relationships between PACT clinics and tertiary hospitals to better understand processes and follow-up resources for rural Veterans. All Transitions Nurses traveled to rural PACT clinics within the first 3 months of TNP.

TNP Adaptations

Each site was encouraged to use the pre-implementation assessment results to tailor TNP to their unique context and needs. In FY 17 we conducted interviews with site champions and nurses to identify TNP adaptations. The primary adaptation across sites were changes to eligibility criteria. This resulted in an increase of enrollments across sites. Targeted education to provider groups and alterations to TNP program materials were also made to address barriers. We are in the process of conducting adaptation interviews with FY18 sites. To date, these sites report the primary adaptation is refinement of initial eligibility criteria. **Appendix: Table 13** details the types of adaptations identified across sites.

MAINTENANCE

Maintenance is measured by program continuation after external support has ceased. A primary focus in FY 18 was working with FY 17 sites regarding plans for maintenance of the Transitions Nurse role after funding ends on September 30, 2019. Our maintenance strategies include the learning collaborative (discussed in “Adoption”), encouraging each site to tailor implementation to their unique context (discussed in “Implementation”), providing program process and outcome data tailored to executive, medical, and nursing leadership, and working with site champions to strategize for maintenance. We conducted interviews with Transitions Nurses and site champions at the FY 17 sites (Iowa City, Seattle, Pittsburgh, Gainesville, and Salt Lake City) to learn about maintenance plans and to identify areas for engagement with site leadership by the Denver team. Both nurses and champions at all sites felt that the program works well and aligns with hospital wide goals such as improving Veteran satisfaction and improving a Veterans chances of seeing their primary care provider within 14 days of discharge. They were optimistic that with more enrollees we would detect a difference in readmission rates and death for Veterans enrolled in TNP. All Transitions Nurses interviewed voiced a desire to continue their work in VA care coordination.

During these interviews, site champions requested presentation materials to help them sell the Transitions Nurse role to leadership. The Denver team created 5 slide decks that cover TNP



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Background, TNP Training, TNP Evaluation, TNP Implementation, and TNP Outcomes. These have been used in university and hospital-based grand rounds and in facility leadership meetings. One site champion noted that the slides were “immensely helpful.”

The Transitions Nurses were recognized as experts and future leaders in care coordination in FY 18 (**Appendix: Table 14**). They were asked to participate in hospital committees and were given opportunities to talk about TNP at local and national presentations. With the support and guidance of Dr. Christine Engstrom, Director of Clinical Practice for the Office of Nursing Service and TNP advisor, the FY 17 cohort presented TNP successes on a national VHA Office of Nursing Service (ONS) call. In recognition of their efforts, Dr. Engstrom and Lynette Kelley nominated the Transitions Nurse group for an innovation and clinical leadership ONS award.

Maintenance of TNP: Update

To date, one site has committed to continuing the Transitions Nurse role, while the other five sites are in discussion with site leadership. The Iowa City VA has hired the current Transitions Nurse into a 1.0FTE, plus hired two additional care coordinators to focus on non-rural Veterans. The current Iowa City Transitions Nurse is training her colleagues and will continue to participate in the TNP learning collaborative through FY 19. The Gainesville VA is investigating hiring their Transitions Nurse through a 1.0FTE and is requesting expansion of the role to all inpatient medical teams. **Appendix: Table 15** summarizes maintenance efforts by FY 17 TNP sites.

Annual Training Plan: Executive Leadership Training

The FY19 annual training will focus on moving Transitions Nurses and site champions toward artistry in communication and leadership skills. The Denver team is developing leadership presentations using data from this annual report for Transitions Nurses and site champions to deliver to their site leadership to support maintenance efforts. All Transitions Nurses and site champions will be invited back to Denver for a two-day training conducted by CAPE. The training will guide learners through topics such as networking skills, executive presence, powerful presentations, and how to form a business argument. The learners will receive coaching and immediate feedback from standardized actors on their presentation skills. The learners will participate in networking events, to practice their skills in real-life situations. Lastly, the learners will polish their TNP presentations to maximize leadership engagement.

DISSEMINATION

The Denver team has initiated a multi-faceted dissemination campaign to spread TNP across the VA. We developed a TNP webpage (<https://www.seattledenvercoin.research.va.gov/TNP/RuralTNPMain.asp>) to distribute program materials and have established a presence on twitter (@seadencoin; #TNP) to broadcast timely, strategic updates to increase awareness of our program's components, milestones, reach, and successes amongst stakeholders, potential sites, other researchers, quality improvement teams, Veterans and their families. Over the course of eight months, this resulted in 29k impressions and 284 engagements on Twitter. We have also presented at national meetings and published our work in academic journals. **Appendix A** details TNP related presentations and publications.



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Table 1. TNP Reach

Site	TNP Enrollments	Eligible Admissions	% Enrolled of eligible admissions
Denver (FY17)	237	1172	20%
Durham (FY18)	41	396	10%
Gainesville (FY17)	425	5783	7%
Minneapolis (FY18)	74	374	20%
Iowa City (FY17)	304	985	31%
Pittsburgh (FY17)	301	2272	13%
Portland (FY18)	99	1793	6%
Reno (FY18)	17	126	13%
Salt Lake City (FY17)	239	634	38%
San Francisco (FY18)	79	172	46%
Seattle (FY17)	375	1995	19%
Total	2191	15702	14%

Key: Methods and data sources available upon request.

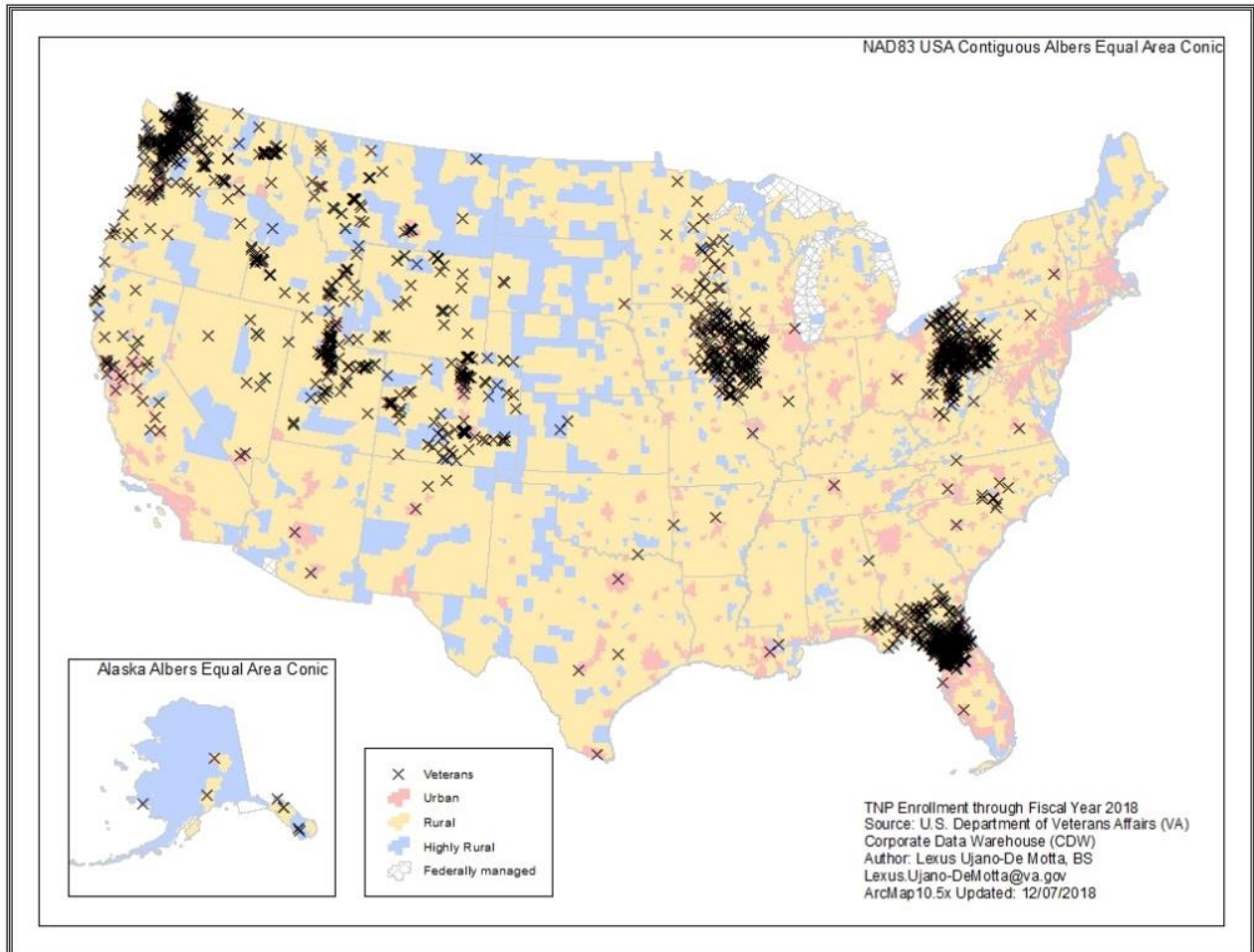


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Figure 1. National GIS Map (May 1, 2016 and September 20, 2018)



Key: Each “x” represents the unique residential address (physical, street, postal) of a TNP enrollee at the time of their discharge from a VAMC. Geocoded residential addresses were queried from the Planning Systems Support Group (PSSG) Enrollee File, a geographic dataset that is updated quarterly. All duplicate addresses, which suggest multiple enrollments in TNP, and missing addresses were removed from the sample. The yellow and light blue areas depict rurality at the census tract level. We use the definitions adopted by PSSG in FY2014Q4 which retain the urban, rural, and highly rural nominal categories from earlier definitions used in the VA. This method collapses the primary and secondary Rural Urban Commuting Area (RUCA) categories developed by the Department of Agriculture and Health and Human Services’ Health Resources and Services Administration into urban, rural, and highly rural categories.

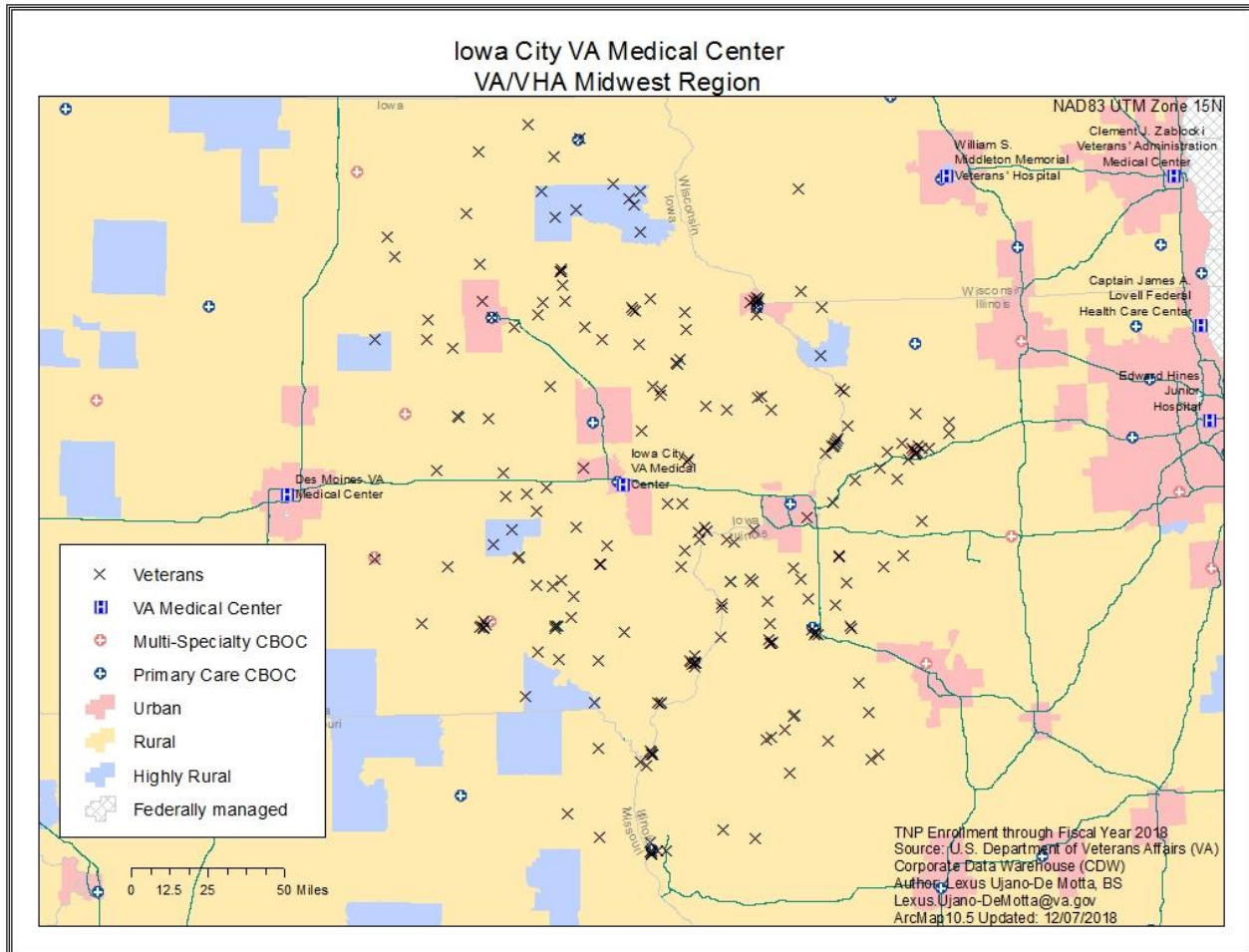


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Figure 2. Single Site GIS Map (May 1, 2016 and September 20, 2018)



Key: This figure shows an example of a GIS map for the Iowa City VAMC. TNP sites received a similar map showing the location of Veterans enrolled in TNP. Each “x” represents the unique residential address (physical, street, postal) of a TNP enrollee at the time of their discharge from a VAMC. Geocoded residential addresses were queried from the Planning Systems Support Group (PSSG) Enrollee File, a geographic dataset that is updated quarterly. All duplicate addresses, which suggest multiple enrollments in TNP, and missing addresses were removed from the sample. The yellow and light blue areas depict rurality at the census tract level. We use the definitions adopted by PSSG in FY2014Q4 which retain the urban, rural, and highly rural nominal categories from earlier definitions used in the VA. This method collapses the primary and secondary Rural Urban Commuting Area (RUCA) categories developed by the Department of Agriculture and Health and Human Services’ Health Resources and Services Administration into urban, rural, and highly rural categories.

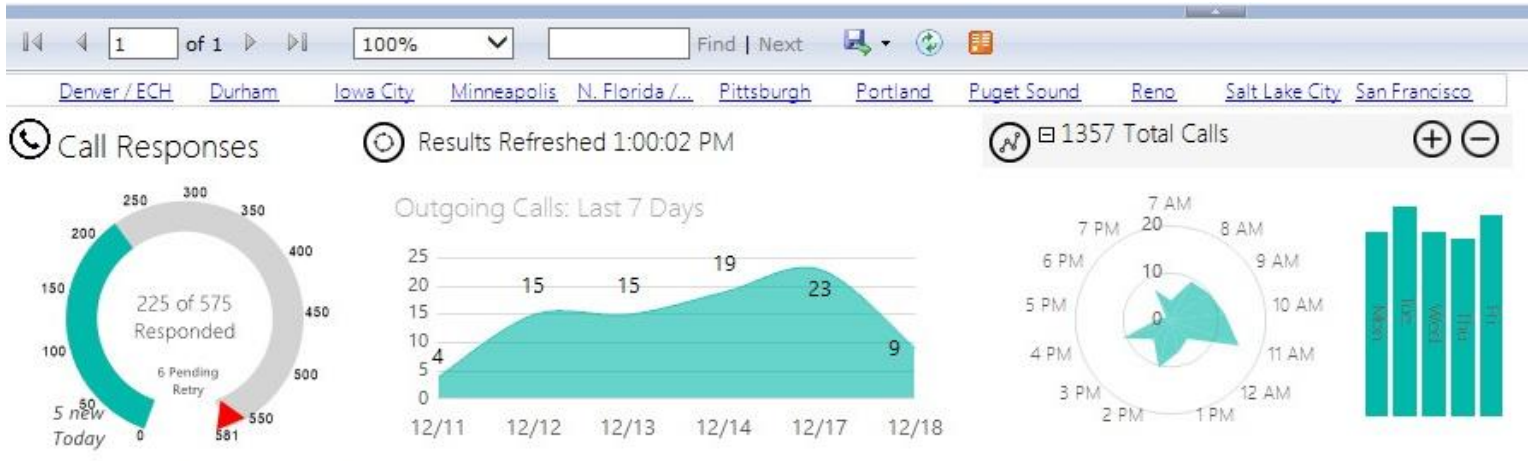


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Figure 3. TNP Interactive Voice Response Dashboard



IVR Summary: Denver / ECH

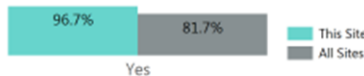
All years and quarters are calendar year and quarter, not federal fiscal quarters. The IVR system makes three attempts to contact the veteran beginning fifteen days after their discharge date.



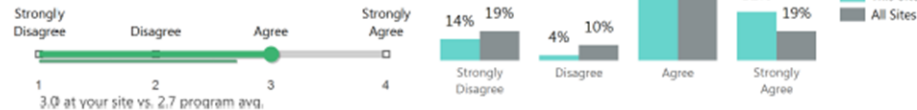
The response rate is the number of contacts where one or more question was answered.



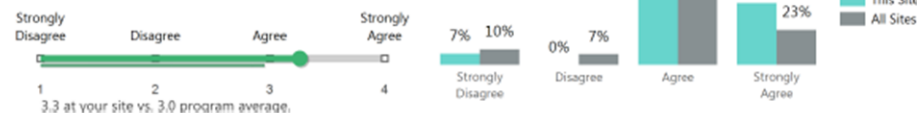
Do you remember meeting with the Transitions nurse?



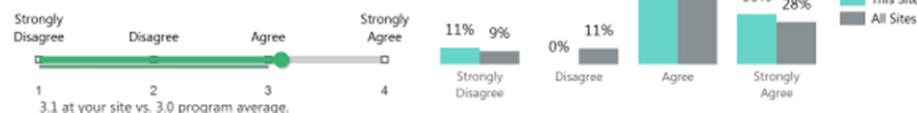
Did the Transitions nurse talk with you & your family about whether you would have the help you needed when you left the hospital?



When you left the hospital, did you have a good understanding of the things you were responsible for in order to manage your health?



Did the Transitions Nurse talk with you about your medications and any changes to your prescriptions?



When you left the hospital, did you clearly understand the purpose for taking each of your medications?



Key: The IVR server attempts to contact a Veteran up to three times. This begins fifteen days post-discharge. The operations dashboard (top) helps the Denver team understand and optimize response rates. Sites can view a summary of their individual results (bottom) and generate a PDF document that compares their site's scores to program averages.



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Table 2. Veteran Feedback on TNP

<p>[The follow-up call] was [helpful] actually. ...I had to go back up about a week after discharge, and I would have had to go back earlier, but [The Transitions Nurse] coordinated with the department so that I wouldn't have to go back more than once, because it's about 3 hours away.</p>
<p>[It's a] helpful program; addressed [my] medication questions and organized [my] PCP appointment</p>
<p>What I could not coordinate in years, [The Transitions Nurse] put in place within a very short period of time. This kind of in-house proactive patient advocacy that reaches out to solve problems for Veterans living in distant or rural communities is outstanding and I could not be more thankful... Thank you for taking the risk to change the model and become more patient centric rather than hospital centric. Please consider this my vote for making your pilot program [TNP] permanent and please add more Transition Nurses.</p>
<p>I think that was the best time I've ever had, you know I've been [hospitalized before]. That's the most support I've ever received. I felt educated. I was very impressed. I felt wanted and not alienated.</p>
<p>[The Transitions Nurse] took care of any issues I might have had. She made it very clear, so I understood.</p>

Key: Quotes are from TNP feedback forms mailed by enrolled Veterans.



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Table 3. Methods for TNP Outcomes

<p>Data Collection</p>	<p>All TNP patients enrolled from 5/1/2017 to 8/31/2018 were captured in the analysis. Controls were selected from a cohort of individuals discharged from 5/1/2017 - 8/31/2018 from the same sites as TNP patients but excluded the following services for they were not eligible for TNP enrollment: Home Based Primary Care, Medical Foster Home, Palliative Care (only site 573), Spinal Cord Injury Home Program, Residential Rehabilitation Treatment Program, Homeless, State Home Adult Day Health Care. Since palliative care was removed from controls, 152 palliative patients were also removed from the TNP cohort. Final counts of TNP and eligible controls were 1874 and 37,880 respectively.</p>
<p>Matching</p>	<p>Matching was conducted using the software MatchIt with the nearest neighbor method. Appropriateness of the matched cohort was checked by assessing the propensity score balance between TNP and controls as well as the standardized differences. Three of the TNP individuals were removed from the cohort due to aspects that highly differed from the control group and no suitable matches existed.</p> <p>We fit at a ratio of 2 controls to each TNP patient. Diagnostic plot tables were created to assess for appropriateness of fit. Standardized differences close to 0.1 in covariates predictive of the outcome were considered poor matching. We attempted to match at a 3:1 ratio. However, the standardized difference for CHF was 0.075, and several others were higher than desired, so we restricted the analysis to 2:1 for the ideal match. All standardized differences were below 0.05 for predictive covariates, indicating appropriate covariate balance.</p>
<p>Outcomes</p>	<p>Once matching was achieved the effect of the program was the difference in average effect of the treatment effect on the controls vs. the treatment (TNP).</p> <p>Data were correlated at a site level, thus random effects at sites were considered in the analysis. Logistic regression was used for analysis of binary outcomes, proportional hazard models were used for survival outcomes and linear regression for continuous outcomes.</p> <p>Survival outcomes were assessed in a cause specific framework, considering each event as terminal (emergency room/urgent care visit, readmission, death). Cox proportional hazard models were used to calculate hazard ratios. Given most covariates were adjusted for in the propensity matching, they were excluded from the final analysis.</p>



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Table 4. 14 day PCP, 30-day and Length of Stay TNP Outcomes

	TNP		Control		
	N = 1871		N = 3742		
	n	%	n	%	p-test
14-day Primary Care Visit	1074	56	1374	36.7	<0.001
Readmission	225	12	500	13.4	0.172
ED Visit	271	14.50	520	13.9	0.578
Death	15	0.80	62	1.7	0.013
	mean	sd	mean	sd	p-test
Index Length of Stay Hours	110	102	108	150	0.627

Key: This table shows unadjusted counts and adjusted rates for each 30-day outcome for both TNP patients and controls from 5/1/2017 to 8/31/2017. Controls are matched to TNP patients 2:1, and this is reflected in the relatively higher counts for control patients. Index length of stay is reported in hours, and the mean and standard deviation (sd) are presented for both TNP and control patients. Data for individual sites are available upon request.

Table 5. 60-day TNP Outcomes

	TNP		Control		
	N = 1871		N = 3742		
	n	%	n	%	p-test
Readmission	351	18.8	752	20.1	0.249
ED Visit	369	21.2	800	21.4	0.881
Death	41	2.2	110	2.9	0.122

Key: This table shows unadjusted counts and adjusted rates for each 60-day outcome for both TNP patients and controls from 5/1/2017 to 8/31/2017. Controls are matched to TNP patients 2:1, and this is reflected in the relatively higher counts for control patients. Data for individual sites are available upon request.



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Table 6. 90-day TNP Outcomes

	TNP		Control		
	N = 1739		N = 3478		
	n	%	n	%	p-test
Readmission	405	23.3	829	23.8	0.687
ED Visit	438	25.2	876	25.2	1.000
Death	70	4	145	4.2	0.863

Key: This table shows unadjusted counts and adjusted rates for each 90-day outcome for both TNP patients and controls. Controls are matched to TNP patients 2:1, and this is reflected in the relatively higher counts for control patients. Data for individual sites are available upon request.

Table 7. National TNP Survival Analysis:

Outcome	Hazard Ratio	Lower	Upper	p. value
30-day readmission	0.8244686	0.6377015	1.0659353	0.14
60-day readmission	0.8708485	0.7139184	1.062274	0.17
90-day readmission	0.9226591	0.7388887	1.152135	0.48
ED/urgent care visit 30-day	1.0257263	0.8686218	1.2112457	0.76
ED/urgent care visit 60-day	0.9782572	0.8294768	1.153724	0.79
ED/urgent care visit 90-day	1.0044256	0.8925245	1.130356	0.94
Death 30-day	0.4695417	0.2650302	0.8318653	0.009
Death 60-day	0.6214191	0.3603724	1.071563	0.09
Death 90-day	0.7162795	0.4249560	1.207316	0.21

Key: Survival analysis across all TNP sites for 30,60,90-day readmission, ED/urgent care visit, death. The table presents hazard ratios and 95% confidence interval for each outcome. Hazard ratios measure how often a particular event occurs in TNP enrollees vs. control patients. A smaller 95% confidence interval indicates higher accuracy in an estimated value. Outcomes for 30 days are also presented on survival curve plots (Figures 6-8).

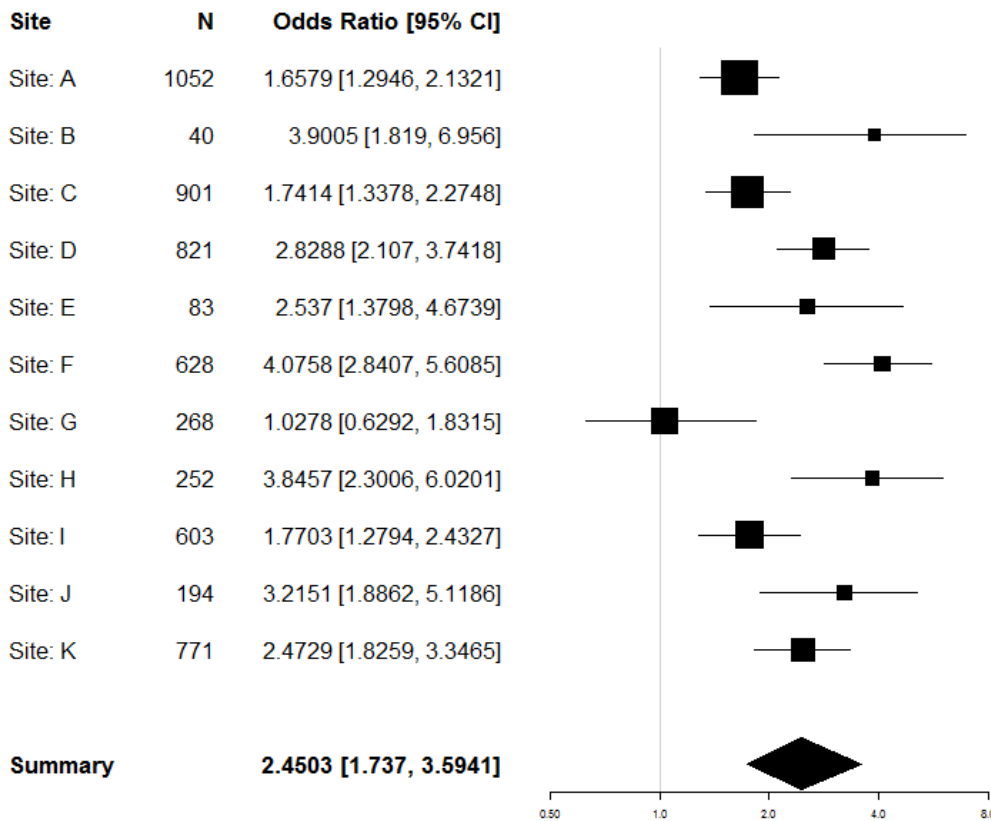


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Figure 4. Adjusted Odds of Primary Care Visit within 14 days



Key: This forest plot shows conditional effect of TNP at a site level and marginal effects (averaged over site). It was found that TNP significantly increased the likelihood of a patient having a PCP visit within 14 days after discharge.

Key to Site Letters:

- A: Gainesville
- B: Reno
- C: Seattle
- D: Pittsburgh
- E: Durham
- F: Denver
- G: San Francisco
- H: Portland
- I: Salt Lake City
- J: Minneapolis
- K: Iowa City

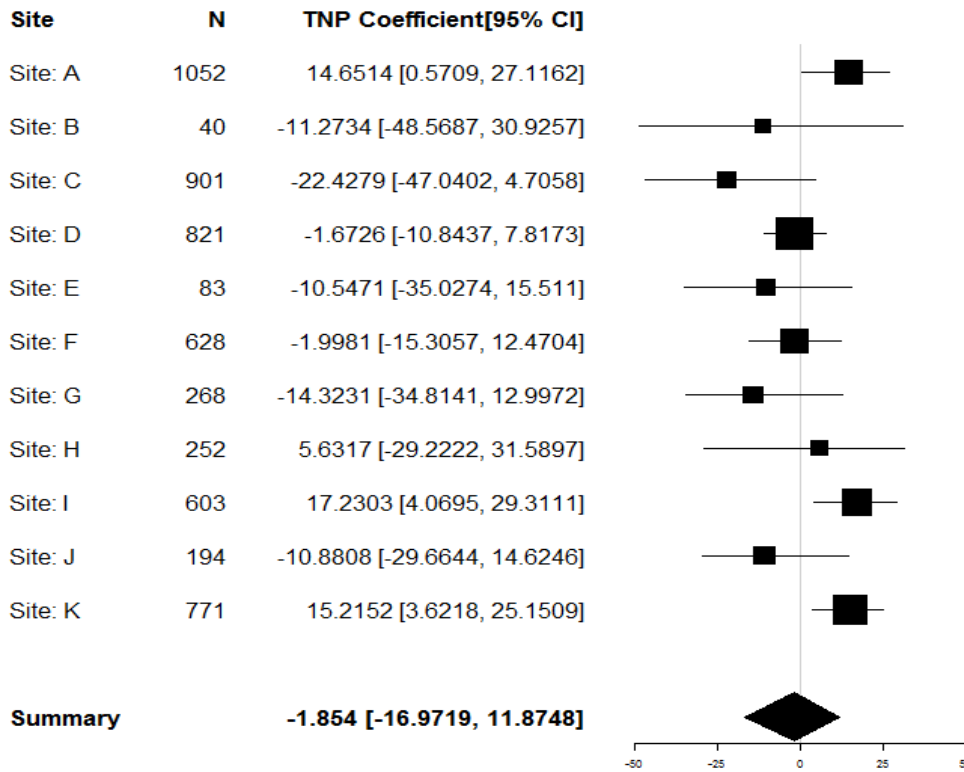


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Figure 5. Effect of TNP on Index Length of Stay



Key: Linear regression was used calculate the effect of the TNP on the index visit length of stay. Length of stay was calculated in hours and considered continuous. Random intercept and slope were added to the model since it was found that the effect differed by site. The estimated effect of TNP by site with 95% confidence intervals are reported below. A negative number indicates TNP enrollees had lower length of stay, units are hours.

Key to Site Letters:

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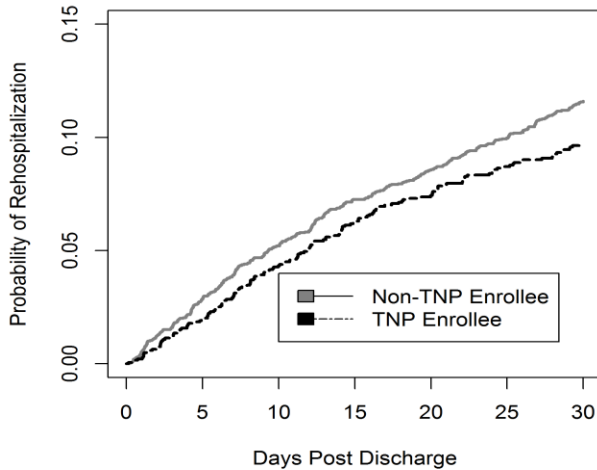


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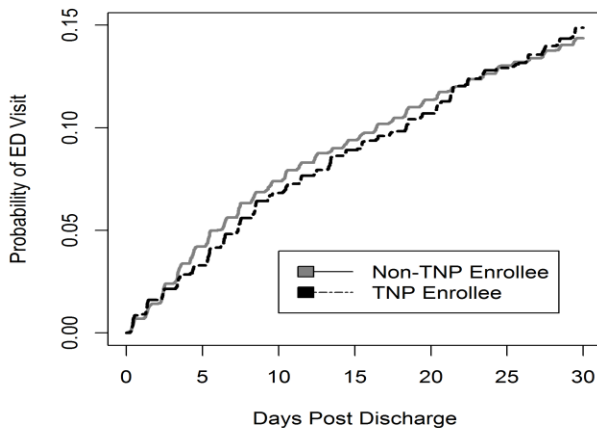
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Figure 6. Likelihood of Rehospitalization within 30 days of Discharge



Key: Figure 5 shows the probability of hospital readmissions within 30 days in both TNP enrollees and control patients. The figure shows that TNP did not impact the probability of rehospitalization within 30 days relative to the control group ($p=0.14$).

Figure 7. Likelihood of Emergency Department Visit within 30 days of Discharge

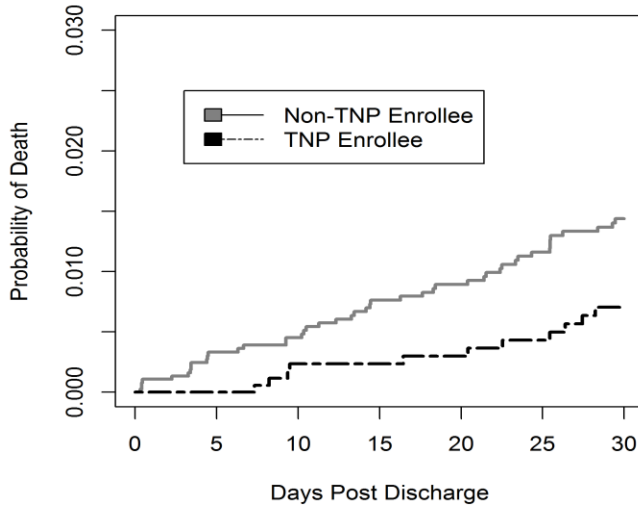


Key: Figure 6 shows the probability of an emergency department visit within 30 days in both TNP enrollees and control patients. The figure shows no difference in the probability of an ED visit within 30 days of discharge ($p= 0.76$).



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Figure 8. Likelihood of Death within 30 days of Discharge



Key: Figure 7 presents the probability of death within 30 days of discharge in both TNP enrollees and control patients. The figure shows a significant relationship between TNP and decreased likelihood of death within 30 days of discharge ($p < 0.001$).

Table 8. TNP Enrollment Per Site

Site (Cohort)	Total Enrollment
Denver (FY17)	241
Iowa City (FY17)	333
Gainesville (FY17)	454
Seattle (FY17)	393
Salt Lake City (FY17 [†])	264
Pittsburgh (FY17 [†])	308
Reno (FY18 [*])	18
San Francisco (FY18 [*])	88
Portland (FY18 [*])	102
Minneapolis (FY18 [*])	80
Durham (FY18 [*])	47
National (Total)	2328

Key: Enrollment numbers are calculated FY17 Q2 to FY18 Q4. [†]Salt Lake City and Pittsburgh are FY17 sites, however the current Transitions Nurses began enrolling in FY18. ^{}FY18 sites began enrolling patients in FY18 Q2*



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Table 9. Sources of Referrals to TNP

Role	FY 17 Cohort # of referrals	FY 18 Cohort # of referrals	Total N (%)
Nurse Practitioner	21	121	142 (27.7)
Hospitalist	24	112	136 (24.6)
Attending	20	53	73 (13.2)
RN Discharge Coordinator	18	52	70 (12.7)
Senior Resident	3	43	46 (8.3)
Social Worker	28	4	32 (5.8)
Physician Assistant	12	8	20 (3.6)
Unrecorded Referral	3	7	10 (1.8)
Floor RN	1	5	6 (1.1)
Physician (non-hospitalist)	5	1	6 (1.1)
Inpatient Care Coordinator	2	3	5 (0.9)
Clinical RN Leader	0	1	1 (0.2)
Intern	0	1	1 (0.2)
Patient	0	1	1 (0.2)
Discharge Medical Assistant	1	0	1 (0.2)
Pharmacist	1	0	1 (0.2)
Assistant RN Manager	0	1	1 (0.2)
PACT	0	1	1 (0.2)
Total	140	413	553 (100)

Key: RN – Nurse; Data tracked in TNP Database. Referrals between FY 17 Q2 and FY 19 Q1.



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Table 10. Examples of TNP In-services/Presentations

Site	FY 17	FY 18
Denver	New Medical Resident Orientation	N/A
Iowa City	Iowa City PACT Care Managers	N/A
Gainesville	Nursing Professional Practice Council (Outpatient PACT Nurse Managers and Chiefs)	N/A
Seattle	Office of Nursing Service National Webinar	N/A
Salt Lake City	N/A	Utilization Management Committee
Pittsburgh	Advance Heart Failure Cardiology Team	Evidence Based Practice Nurse Council
Reno	N/A	Social Work and Inpatient/Outpatient Care Management Teams
San Francisco	N/A	Neurosurgery Nurse Practitioner Team
Portland	N/A	Nursing Leadership and Nursing Professional Standards Boards
Minneapolis	N/A	Inpatient Medicine/ Step Down Unit
Durham	N/A	Nursing Executive Leadership

Key: Information tracked by Transitions Nurses.



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Table 11. Fidelity to TNP Core Components

Site	FY 17 Cohort N (%)	FY 18 Cohort* N (%)
Denver	234(97)	n/a
Iowa City	283(78)	n/a
Gainesville	392(86)	n/a
Seattle	351(89)	n/a
Salt Lake City	226(89)	n/a
Pittsburgh	281(91)	n/a
Reno	n/a	15(83)
San Francisco	n/a	80(91)
Portland	n/a	97(95)
Minneapolis	n/a	72(90)
Durham	n/a	41(87)
National (Total)	2000	475

Key: This table shows the number of TNP patients at each site who had all four steps of the TNP intervention completed. Enrollment numbers were obtained from the TNP database for FY 17 Q2 to FY 18 Q4. *FY 18 sites began enrolling patients in FY 18 Q2



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Table 12. Examples of Barriers to Implementation

Site	FY 17 Cohort	FY 18 Cohort
Iowa City	Lack of community resources	n/a
Seattle	Duplication of roles	n/a
Gainesville	Large volume of rural Veterans for one nurse	n/a
Pittsburgh	Veterans may lack transportation to follow up appointments	n/a
Salt Lake City	Difficulty identifying which resources are available in rural communities	n/a
Durham	n/a	Difficult to schedule appointments in primary care
Minneapolis	n/a	Poor communication between departments
Portland	n/a	Transitions Nurse role may be too broad
Reno	n/a	Poor communication by case managers regarding patient discharge
San Francisco	n/a	Transportation challenges and poor access to care for rural patients.

Key: Examples were identified from papers written during the brainwriting premortem activity.



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Table 13. TNP Adaptations Across Sites

Cohort	Adaptation Description	N
FY 17	Eligibility criteria changes	15
FY 17	Adaptations pertaining to multidisciplinary rounds attendance	2
FY 17	More intense post-discharge coordination	1
FY 17	Going from 2 part-time TNs to 1 full-time TN	1
FY 17	Changes to the eligible patient referral process	2
FY 17	More focus on medication reconciliation due to shortage of pharmacy support	1
FY 18	Changes to the eligible patient referral process	1
FY 18	Eligibility criteria changes	2
FY 18	Coordination of home health orders for Veterans who do not yet have VA primary care assigned	1

Key: Data sources include interviews with Transitions Nurses and site champions 6 months after program implementation and mid-line site visits for FY 18 Transitions Nurses. Data collection and analysis for FY 18 sites is in progress.



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Table 14. Transitions Nurse Accomplishments

Cohort	Hospital Committee Membership	Internal presentations	National presentations
FY 17	4	18	0
FY 18	3	36	1

Key: Information tracked through TNP Learning Collaborative.

Table 15. TNP Maintenance Strategies

Site	FY 17 Cohort (6 sites)
Iowa City	Transitions Nurse hired into care coordination department, 1.0FTE. Two additional care coordinators hired, to be trained by TNP Transitions Nurse
Denver	Presentations to leadership to discuss maintenance of TNP at site. Transitions Nurse applying for openings in care coordination department
Gainesville	Nursing leadership considering expansion of TNP role with 10 additional FTEs
Seattle	Presentations to leadership ongoing to discuss maintenance of TNP at site
Salt Lake City	Presentations to leadership ongoing to discuss maintenance of TNP at site
Pittsburgh	Presentations to leadership ongoing to discuss maintenance of TNP at site

Key: Data pulled from maintenance interviews with Transitions Nurses and site champions conducted between August and October 2018.

Appendix A. TNP Presentations and Publications, FY 18

PRESENTATIONS:

VA Audience:

- Gilmartin, H. (2018). *The VA rural transitions nurse program*. Presented at the Office of Rural Health Community Call.
- Gilmartin, H. (2018). *Brainwriting premortem: A novel focus group method to engage stakeholders and identify pre-implementation barriers*. Presented at the Denver Veterans Affairs Eastern Colorado Health Care System: Clinical Research Days, Denver, CO.
- Harris, D., Kelley, L., on behalf of the Cohort 1 transition nurses. (2018). *Nursing service conference call agenda*. Presented at the Office of Nursing Services Call.
- Kelley, L. (2018). *Improving transitional care for rural veterans: The expansion of the transitions nurse program*. Presented at Denver Veterans Affairs Eastern Colorado Health Care System: Clinical Research Days, Denver, CO.
- Caldwell, J. (2018). *Improving transitional care for rural veterans: The rural transitions nurse program*. Presented at the Denver Veterans Affairs Eastern Colorado Health Care System: Nursing Grand Rounds; Scan Webinar Podium Presentation, Denver, CO.
- Gilmartin, H. (2018). *Brainwriting Premortem Method: Implementation science in action*. Presented at the Denver VA Medical Center Research Day, Denver CO.
- Kelley, L., Leonard, C., McCreight, M., Mayberry, A., Lippman, B., Coy, A., Gilmartin, A. (2018). *Enhancing transitional care for rural veterans: Expansion of the rural transitions nurse program*. Poster presented at the Denver VA Research Day, Denver, CO.

National Audience:

- Gilmartin, H. & Battaglia, C. (2018). *Role of mentorship program for new investigators* [Audio podcast]. Retrieved from <https://www.hsrd.research.va.gov/news/podcasts/default.cfm>
- Gilmartin, H., Leonard, C., McCreight, M. (2018). *Engaging stakeholders in project evaluation through process mapping and a brainwriting premortem*. Presented at the Evaluating Better Together Conference. University of Denver, CO.
- Kelley, L. (2018). *Training nurses in advanced transition care: Implementation of a nationwide, multicomponent program in the Veterans Health Administration*. Presented at the American Public Health Association Annual Meeting, San Diego, CA.
- Kelley, L. & Mayberry, A. (2018). *Improving transitional care for rural veterans: The expansion of the transitions nurse program*. Poster presented at 30th Annual Rocky Mountain Interprofessional Research & Evidence-Based Practice Symposium, Denver, CO.

- McCreight, M. (2018). *Process mapping: A method to guide the design and implementation of care transitions interventions in the VA*. Presented at the American Public Health Association Annual Meeting, San Diego, CA.
- McCreight, M., Ayele, R., Lawrence, E., Leonard, C., Kelley, L., Mayberry, A., . . . Battaglia, C. (2018). *Designing for dissemination: Multi-Level approaches to improving care coordination in the Veterans Health Administration*. Academy Health Annual Research Meeting (ARM), Seattle, WA.
- Ujano-DeMotta, L., Leonard, C., Gilmartin, H. (2018). *Visualization of the reach of an intervention: Use of Geographic Information Systems (GIS) in implementation research*. Paper presented at the 11th Annual Conference on the Science of Dissemination and Implementation. Arlington, VA.

PUBLICATIONS:

- Gilmartin, H., Lawrence, E., Leonard, C., McCreight, M., Kelley, L., Lippmann, B., ... & Burke, R. E. (2018). Brainwriting Premortem: A Novel Focus Group Method to Engage Stakeholders and Identify Pre-Implementation Barriers. *Journal of nursing care quality*.
- Rabin, B. A., McCreight, M., Battaglia, C., Ayele, R., Burke, R. E., Hess, P. L., ... & Glasgow, R. E. (2018). Systematic, Multimethod Assessment of Adaptations Across Four Diverse Health Systems Interventions. *Frontiers in public health*, 6, 102.