

# Feasibility of a Telemedicine-Based Principal Illness Navigation (PIN) Service for Complex Populations Following Hospital Discharge After Acute Stroke

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## Abstract

### Background

Principal Illness Navigation (PIN) services may play an important role in helping patients through important transitions in care following acute hospitalization. We evaluated a novel PIN telemedicine approach to understand the feasibility of providing these services to diverse patient cohorts.

### Methods

A single-arm, retrospective observational study of Kandu Health's post-acute PIN service was conducted in patients experiencing ischemic or hemorrhagic stroke in California and New Jersey. The technology-enabled program offered remote healthcare support led by occupational therapists and licensed clinical social workers that was tailored to individual patient needs to facilitate transition to community settings post-discharge. Barriers to recovery were addressed through patient education, one-on-one guidance, and specialized referrals. Patient outcomes were assessed through in-app assessments and clinician-assessed modified Rankin Scores conducted via video consultation. Readmissions were monitored through both patient reporting and admission/discharge/transfer feeds from health information exchanges.

### Results

A total of 111 patients were enrolled between June 22, 2022 and January 11, 2024. Patients were onboarded an average of  $29 \pm 40$  days (median 18, IQR 8-32) after acute care hospital discharge and spent an average of  $81 \pm 21$  days (median 90, IQR 75-90) in the program. During that time, the average enrollee spent  $333 \pm 156$  minutes (median 350, IQR 205-435) of 1:1 time interacting with their dedicated navigator, and navigators spent an additional  $113 \pm 87$  minutes (median 95, IQR 61-140) per patient on care coordination and curriculum curation. Patients with 5 or more social determinants of health (SDOH) needs required over 50% more navigator time than those without any SDOH needs. Within 6 weeks of hospital discharge, 8.5% experienced an inpatient hospital all-cause readmission that was not associated with race, ethnicity, or SDOH.



## Conclusions

High rates of enrollment and extensive patient engagement in both navigator-facilitated and self-directed program elements can be achieved using the Kandu program. Our findings indicate that telemedicine facilitated, app-supported PIN is feasible to deliver following acute stroke discharge across diverse ages, races, ethnicities, functional status (mRS), and social needs.

**Key words:** Stroke Navigation, Social Determinants of Health, Engagement, Readmissions.

## INTRODUCTION

Patients discharged from inpatient care following stroke must navigate complex and competing factors as they embark on the dual aims of functional recovery and prevention of secondary events.<sup>1,2,3</sup> Barriers to recovery include physical and psychological stroke-related impairments, chronic underlying health conditions, fragmented healthcare delivery systems, insufficient insurance coverage, and inequities in social determinants of health (SDOH).<sup>1,2</sup> In the face of these barriers, most patients receive suboptimal post-acute care, and many deteriorate over time instead of improving.<sup>4</sup> A recent publication on the experiences and outcomes of young stroke survivors demonstrated that one year after stroke, 28% rated their quality of life as “poor or worse than death.”<sup>3</sup>

Despite the best efforts by some inpatient hospital teams to prepare stroke survivors to manage their discharge instructions and follow up care, patients have a generally poor understanding of their follow-up plan.<sup>5</sup> Individuals who are lower income and those that have not completed high school are at higher risk of poor understanding of discharge instructions.<sup>5</sup>

Recent work has demonstrated the opportunity to improve stroke outcomes and underlying health conditions with behavioral health interventions. The Take Charge After Stroke (TaCAS) intervention was developed

and delivered as an in-person intervention by Dr. Harry McNaughton and colleagues in New Zealand, encouraging survivors to foster a sense of purpose, autonomy, mastery, and connectedness with others.<sup>6</sup> Randomized clinical trials validating TaCAS have demonstrated a decrease in both dependent disability (mRS of 3-5) and overall healthcare spending at 12 months post-stroke.<sup>7</sup> Care partners of survivors participating in TaCAS were also less likely to experience caregiver strain.<sup>8</sup> Additionally, a systematic review of motivational interview-based interventions showed a statistically significant reduction in systolic and diastolic blood pressure compared with no or minimal additional intervention.<sup>9</sup>

The Center for Medicare and Medicaid Services (CMS) has recognized the value of healthcare navigation for patients with serious, high-risk conditions that place the patient at significant risk of hospitalization, nursing home placement, acute exacerbation/decompensation, functional decline, or death.<sup>10</sup> In 2024, CMS initiated reimbursement for a new category of outpatient services, called “Principal Illness Navigation (PIN).” With PIN, healthcare providers can now deliver individualized support, education and care coordination addressing both the medical and social aspects of managing a patient’s disease.<sup>11,12</sup>

This study explored the feasibility of delivering a telemedicine-based PIN service



to patients discharged to home or inpatient rehab following inpatient hospitalization for ischemic or hemorrhagic stroke. We evaluate the timing of patient engagement with PIN, the time required from clinicians to deliver the services, and how those requirements vary between demographic cohorts. We also assess preliminary operational metrics and readmission outcomes.

## METHODS

We conducted a retrospective, single-arm, observational study of a post-acute PIN service provided by Kandu Health that was delivered to patients in partner facilities experiencing ischemic or hemorrhagic stroke in California and New Jersey.

### The Kandu Program

Kandu's program is a tech-enabled, fully remote healthcare service that was co-designed by clinicians and stroke survivors to support patients as they return to community settings after inpatient discharge. Patients and their care partners were assigned a dedicated navigator who provided consistent support for the entire duration of the program. Navigators were occupational therapists (OTs) and licensed clinical social workers (LCSWs) with experience caring for stroke patients and specialized training in navigation best practices, motivational interviewing, and case management. Navigators worked within a multidisciplinary Kandu clinical team encompassing broad facets of stroke recovery including psychiatry, mental health specialists, neuro-optometry, occupational therapy and medical nutrition support. Patients are referred to outside specialists including neurology, allied health and rehabilitation providers, as needed. The Kandu clinical team participated in regular case conferences and was available for specialty consults. Patients interacted with

clinicians through video consultations, telephone calls, and in-app messaging.

Navigators assisted patients with understanding and prioritizing their discharge plan, addressing each individual's barriers to recovery, such as limited health literacy or stroke-related impairments. They provided education and guidance on next steps in their journey to maximize their recovery potential. As part of program implementation with partner hospitals, resources were gathered in the various domains pertinent to the Accountable Health Communities (AHC) Social Needs Screening Tool<sup>13</sup> (Figure 1) and cross-walked to the SDOH needs identified for each enrollee. Resource maps were populated with hospital, hospital system, local community, national, and virtual resources so that navigators could support enrollees across differing insurance carriers and diverse geography.

Navigators designed a curated learning curriculum for each stroke survivor and care partner, delivered through the app with a unique combination, sequence, and timing of articles tailored to their specific impairments and post-stroke needs. The available library includes over 600 articles that were co-written with source documentation and editorial oversight by stroke survivors, care partners, and clinicians representing 10 medical disciplines. The curriculum was informed by self-determination theory, which encourages participants to "take charge" of their life and health after a stroke.

Each enrollee was offered a navigator-facilitated TaCAS session between weeks 6-8 of the program. Participants could record in their workbooks and pursue additional self-directed learning sessions in the Kandu app. As a complement to TaCAS, navigators utilized a motivational interviewing approach to support survivors with management of stroke risk factors including blood pressure



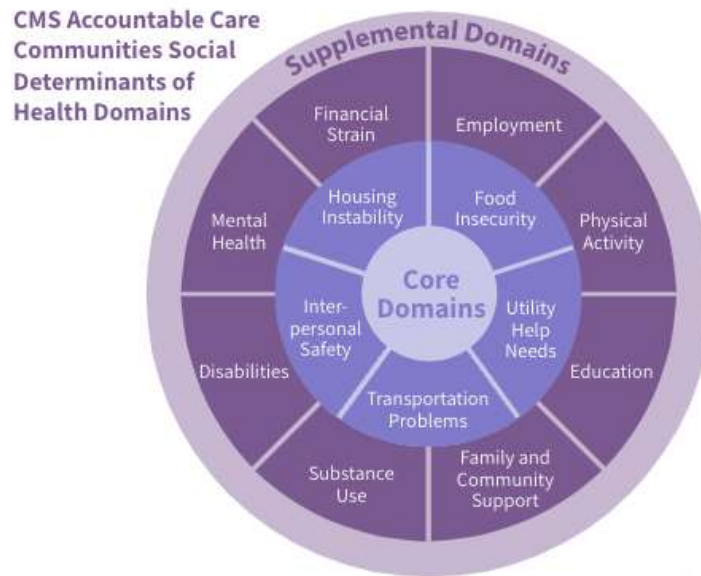


Figure 1: Centers for Medicare and Medicaid Services (CMS) Accountable Health Communities (AHC) Social Needs Screening Tool cross-walked with social determinants of health domains.

control, dietary changes, stress management, and other general health behavior changes to reduce subsequent stroke risk.

The program encouraged community connection through “Connect” groups, to which enrollees were assigned by role (survivor or care partner) and circumstances. In addition to asynchronous in-app message boards, several virtual video-based Connect groups were offered each week for survivors and care partners to connect with their peers. The Connect groups offered a space for individuals to review their own lived experiences, reduce social isolation, and provide or receive support throughout their stroke recovery. The sessions were led by Kandu Ambassadors made up of stroke survivors and care partners with lived experience and training in peer support facilitation.

For a survivor to be considered ready to “graduate” from the Kandu program, they need to demonstrate achievement of a majority of the characteristics or desired

outcomes depicted in Figure 2. This model allowed the Navigator team flexibility in survivor self-determination and goal setting while adhering to objective criteria for program completion.

### Study Management

At each site, referrals and sharing of protected health information (PHI) were governed by approved administrative contracts and Business Associate Agreements (BAAs). Subjects were included based on consecutive enrollment from the date of program inception. All data were collected and stored in Kandu Health’s medical records. Patients were referred to the program from a variety of sources, including acute care hospitals, outpatient clinics, inpatient rehabilitation facilities, and community support groups. Referring parties were directed to refer ischemic or hemorrhagic stroke patients if they had access to a smartphone, spoke English, were expected to be returning to a community setting, and were able to consent to services; no exclusion criteria were utilized.





Figure 2: Kandu Program Completion Criteria

### Study Endpoints

Patient reported outcome measures (PROMs) were collected through in-app assessments, while modified Rankin Scores (mRS) were assessed by navigators over video consultation at enrollment, 30 days, and 90 days post-discharge. During program onboarding, navigators assessed patients' social determinants of health (SDOH) using the AHC Social Needs Screening Tool. Person-centered assessments were also conducted so that patient goals and living situations could be understood and better contextualized alongside the discharge plan, enabling individualized recovery priorities to be set. Readmissions were monitored through both patient reporting and admission-discharge-transfer feeds from health information exchanges. Navigator minutes were tracked in the electronic medical record (EMR) and through use of Toggl time tracking software. For the purposes of this study, readmissions were defined as any post-discharge acute care hospital stay for any cause lasting at least 2 midnights. Differences in proportions of readmissions between groups were examined by Chi-Square analyses; differences in continuous measures (navigator minutes and days to program

enrollment) were examined using one-factor ANOVA.

### Results

Between June 22, 2022 and January 11, 2024, 249 patients were referred to the Kandu program; 131 (52.6%) patients declined to enroll, and 7 were still in-program at the time of this data analysis, with complete data available for analysis in 111 patients. Of these, 104 (93.6 %) completed all criteria for program graduation, 1 (0.9%) died, and 6 (5.4%) discontinued before completing the program.

The volume and complexity of patient referrals from the participating hospitals grew each quarter, with average monthly enrollment more than doubling from the beginning to the end of the study period. The proportion of patients choosing to enroll following their referral remained consistent through the study period.

### Patient Demographics

The average patient age at the time of referral was  $59 \pm 14$  years (median 62, IQR 48-69); 52% were men and 68% co-enrolled with a





Figure 3: Most prevalent stroke survivor social needs as assessed by the AHC Screening Tool.

care partner. Patients were 59% White, 30% Black, 10% Asian, and 1% Native American; 14% were of Hispanic/Latino ethnicity. The median modified Rankin Score (mRS) was 2 (IQR 1-3); 48% had dependent disability (mRS 3-5) on enrollment. Insurance status was 42% commercial health plans, 31% Medicare, and 27% Medicaid or uninsured. The median number of SDOH needs per patient was 2 (IQR 0-4), with 23% of enrollees having 5 or more SDOH needs. Figure 3 shows the distribution of the most prevalent SDOH needs identified by the AHC Screening Tool for the cohort.

### Operational Metrics

Enrollees onboarded an average of  $29 \pm 40$  days (median 18, IQR 8-32) after acute hospital discharge and spent an average of  $81 \pm 21$  days (median 90, IQR 75-90) in the program. During that time, the average enrollee spent  $333 \pm 156$  minutes (median 350, IQR 205-435) of 1:1 time interacting with their dedicated navigator, and navigators spent an additional  $113 \pm 87$  minutes (median 95, IQR 61-140) per patient on care coordination and curriculum curation. The total navigator time per patient averaged  $446 \pm 209$  minutes (median 447, IQR 280-589).

The Take Charge intervention was completed by 67% of patients, and 82% took part in a Kandu “Connect Group”. Of the 21 patients who did not have an existing primary care provider (PCP) at enrollment, 95% of these

successfully established a PCP by program completion. Among patients enrolled in the program within 6 weeks of hospital discharge, 89% confirmed completion of a neurology follow up by program completion.

The Kandu app was activated and used by 90% of stroke survivors enrolled in the program. The average stroke survivor spent  $271 \pm 323$  minutes (median 173, IQR 51-393) in the app and read  $32 \pm 39$  articles (median 18, IQR 0-57). Among the 35 survivors who did not complete any in-app readings, 49% had a care partner who completed readings instead.

The average survivor received  $2.8 \pm 3.5$  resource connections (median 2, IQR 1-3) from their navigator to support both their medical and SDOH needs. The top 5 categories of resource connections were Healthcare, Rehabilitation, Mental Health, Transportation, and Equipment.

Over the course of program enrollment, 55% of enrollees had at least one no-show for a scheduled navigator appointment, with the average enrollee having  $1.5 \pm 2.2$  (median 1, IQR 0-2) no-shows. In total, 13.1% of scheduled appointments with enrollees were no-shows.

Table 1 describes the demographics, operational metrics, and 90-day readmission rates among Kandu enrollees. In most cases, the program experience was consistent across



	Number	Proportion	Navigator 1:1		Days btw Discharge & Onboarding		90d Readmission	
			Minutes	p-value		p-value	Rate	p-value
All	111	100.0%	333 ± 156		29 ± 40		8.5%	
Gender								
Male	58	52.3%	321 ± 176	0.42	27 ± 47	0.57	9.4%	0.72
Female	53	47.7%	345 ± 132		31 ± 32		7.3%	
Age								
<65	68	61.3%	344 ± 160	0.34	29 ± 36	0.92	5.4%	0.18
65+	43	38.7%	315 ± 151		29 ± 47		13.2%	
Race								
White	65	58.6%	311 ± 161	0.09	32 ± 44	0.13	8.9%	0.56
Black	33	29.7%	381 ± 143		19 ± 17		10.3%	
Asian	11	9.9%	300 ± 143		45 ± 59		0.0%	
Ethnicity								
Hispanic/Latino	15	13.5%	309 ± 132	0.53	20 ± 18	0.35	0.0%	0.22
Non Hispanic/Latino	96	86.5%	336 ± 160		31 ± 43		10.0%	
Co-Enrolled with Care Partner								
Yes	76	68.5%	337 ± 161	0.70	33 ± 43	0.15	11.3%	0.18
No	35	31.5%	324 ± 148		21 ± 32		3.1%	
Primary Insurance Source								
Commercial	47	42.3%	306 ± 152	0.08	35 ± 41	0.16	10.5%	0.83
Medicare	34	30.6%	322 ± 147		32 ± 51		10.7%	
Medicaid or Uninsured	30	27.0%	386 ± 164		17 ± 17		3.6%	
Number of SDOH Needs								
0	29	26.1%	268 ± 140	0.003	20 ± 27	0.35	7.4%	0.43
1-4	56	50.5%	331 ± 137		33 ± 38		14.0%	
5+	26	23.4%	408 ± 182		30 ± 56		0.0%	
Referral Source								
ACH	73	65.8%	340 ± 154	0.48	16 ± 17	<.0001	8.7%	0.91
IRF	12	10.8%	295 ± 137		29 ± 15		10.0%	
Outpatient Clinic	11	9.9%	285 ± 159		67 ± 42		0.0%	
Community	15	13.5%	364 ± 181		65 ± 80		10.0%	
Post-Stroke Impairments								
Neither	39	35.1%	368 ± 166	0.26	17 ± 23	<.0001	10.8%	0.39
Aphasia	38	34.2%	329 ± 137		28 ± 35		12.1%	
Hemiparesis	24	21.6%	289 ± 147		25 ± 21		0.0%	
Aphasia + Hemiparesis	10	9.0%	315 ± 196		89 ± 84		0.0%	
mRS at Program Enrollment								
0-2	56	50.5%	351 ± 152	0.27	28 ± 46	0.94	10.4%	0.52
3-5	53	47.7%	319 ± 160		28 ± 27		6.7%	
Stroke Type								
Ischemic	92	82.9%	329 ± 154	0.85	28 ± 42	0.78	7.5%	0.87
Hemorrhagic	10	9.0%	344 ± 203		33 ± 38		12.5%	
Other/Unknown	9	8.1%	357 ± 129		37 ± 27		16.7%	
Post-ACH Discharge Disposition								
Home	73	65.8%	343 ± 153	0.83	25 ± 42	0.91	9.2%	0.81
Inpatient Rehab	31	27.9%	336 ± 163		28 ± 23		7.7%	

Table 1: Demographic subsets, operational metrics, and 90-day readmission rates. Data not reported for cohorts less than 9 patients. Readmissions only reported among patients who enrolled within 6 weeks of acute care hospital (ACH) discharge. SDOH = social determinants of health; IRF = inpatient rehabilitation facility.

Patient	Cause	Days Between Index		
		Timing of Readmission: Days Post Discharge	Timing of Readmission: Program Day	Discharge and Program Onboarding
1	Hypertensive Crisis	2	1	1
2	Recurrent Stroke	27	21	6
3	GI Bleed	73	45	28
4	Seizure	77	-23	100
5	Hypertensive Crisis	50	39	11
6	COVID	56	44	12
7	Cancer	9	13	-4
8	Recurrent Stroke	20	15	5
9	Lupus	45	0	45
10	Food Poisoning	43	9	34

Table 2: All-cause 90-day readmissions in the cohort.



subgroups, with a few cohorts demonstrating significant relationships to operational quality metrics.

The time that navigators spent with patients increased with the number of SDOH needs. Patients with 5 or more SDOH needs required over 50% more navigator time than those without any SDOH needs. Clinician-assessed SDOH needs were more strongly correlated with navigator time than primary insurance status. However, the need for navigator support was not limited to patients with high SDOH. Even those patients without any SDOH needs required  $268 \pm 140$  minutes (median 257, IQR 145-370) of 1:1 navigator support and  $117 \pm 80$  minutes (median 100, IQR 74-143) of care coordination and curriculum curation from their navigators.

Referral from an acute care hospital or inpatient rehabilitation facility was correlated with a shorter delay between hospital discharge and program onboarding. As detailed in Table 1, patients referred from these inpatient institutions were typically onboarded within a month of discharge, while those referred from outpatient clinics or community groups were not onboarded until the third month after discharge. Patients experiencing aphasia and hemiparesis were more likely to have a late referral, reflected in longer average days between acute hospital discharge and program enrollment.

### Readmissions

A total of 10 program participants experienced a readmission within 90 days of hospital discharge. Among the 94 patients who enrolled in the program within 6 weeks of hospital discharge, 8.5% experienced an inpatient readmission. Readmission was not associated with race, ethnicity, or SDOH. Table 2 presents readmission data for the cohort.

## DISCUSSION

Despite the high rates of stroke worldwide, there remains a considerable lack of multidisciplinary post-acute stroke support available to survivors as they return to community settings after inpatient discharge. Many stroke survivors and care partners experience a loss of identity, challenges with managing daily activities, difficulty adapting to life after a stroke, and limited access to services or emotional support.<sup>14,15,16</sup> PIN is well positioned to treat post-acute stroke as a chronic condition, assisting stroke survivors and their care partners with comprehensive, survivor-specific care plans and multidisciplinary support after hospital discharge.

Our findings indicate that navigator facilitated, app-supported PIN is feasible to deliver following acute stroke discharge across age, race, ethnicity, functional status (mRS), and social needs. With recently published readmission rates ranging from 8.7 to 12.5% at 30 days post-stroke discharge, and 18.9 to 20.7% at 90 days,<sup>17,18</sup> it is imperative to engage with patients as soon as possible once they return to community settings. In this cohort, partnerships with acute care hospitals and inpatient rehab facilities were critical to achieving early onboarding. While CMS rules mandate that PIN be preceded by a prescription from an outpatient evaluation and management visit,<sup>10</sup> referral to that outpatient visit and introduction to the concept of PIN in post-stroke care should ideally occur as part of a patient's discharge planning process.

CMS coverage of PIN services was born out of decades of work in cancer navigation,<sup>19</sup> which has demonstrated the ability of navigation to reduce health disparities and improve patient outcomes, while establishing standards for the ethics, qualifications, knowledge, skills, activities and supervision of navigators.<sup>20</sup> While the CMS coverage





decision allows for PIN services to be delivered to stroke patients, the standards for PIN after stroke are less well understood. Where cancer models largely rely on nurses and social workers for navigator services, our post-acute stroke program was delivered by OTs and LCSWs with stroke-specific experience and training, demonstrating acceptable feasibility; this is an important finding, given the tremendous need for navigators and a shortage of registered nurses.

We also found that, as anticipated by the 2024 CMS physician fee schedule final rule, stroke survivors have complex post-acute needs and require large amounts of navigator time to effectively respond to those needs. To bill for PIN services, a minimum of 60 cumulative minutes of care must be delivered in a calendar month. Recognizing how challenging some cases can be, there are no limitations on the number of times that an additional 30-minutes of services can be billed in a month.<sup>11</sup> In our 12-week program, the average month of PIN services for stroke survivors required nearly 2.5 hours of navigator time, and stroke survivors with high SDOH needs (greater than 5) required over 50% more time than those without any SDOH needs. These findings will be useful to plan and budget for future navigator staffing needs, making them key metrics for collection by all navigator programs.

The complex dynamics of both a survivor's SDOH needs, like housing and food insecurity, and post-stroke impairments, like memory deficits and post-stroke fatigue, can result in stroke survivors being a uniquely difficult population to consistently engage.<sup>21,22,23</sup> No-shows and cancellations are to be expected in this population and persistence and empathy are important to accommodate survivors' changing needs. We found that the telehealth delivery used in our program can reduce disparities in access to

care for a population that is often confined to home, limited in access to transportation, and experiencing social isolation and stigma. The program achieved high rates of enrollment and extensive patient engagement in both navigator-facilitated and self-directed program elements. This was achieved by addressing barriers to digital literacy, co-designing with stroke survivors, utilizing navigators to assist with digital literacy challenges, and utilizing other methods like texting, secure in-app messaging and other solutions that do not require access to high-speed internet.<sup>21</sup>

As half of referred patients elected not to enroll, we will continue working to understand the most effective timing, channels and messaging to increase the proportion of patients that enroll in PIN services following referral. It was important, during the course of this study, to dedicate personnel and resources to the onboarding and enrollment process, separate from and complementary to clinical service providers. With continuous learning, and development of best practices, we were able to significantly increase both the volume and complexity of referred patients without experiencing reductions in successful patient enrollment.

The 90-day readmission rates in this cohort compare favorably to published literature, and the causes of readmission were diverse and not atypical for this patient population based on previous publications. In this small cohort, there were no trends or associations between readmission rates and demographic or operational metrics.

### Limitations

Our study is limited by use of a self-selected, single-arm cohort, with most patients screened for program appropriateness by facility-based clinicians at partner hospitals



prior to referral. As such, we cannot determine the extent to which the outcomes and patient engagement in this population were driven by patient selection vs. the quality of the clinical care, or whether the program definitively improved patient outcomes. The study population, while diverse, and with meaningful representation across broad demographic cohorts, includes a younger distribution of patients than typically seen in stroke. However, it is well documented that the median age of stroke is changing globally, with 67% of stroke survivors now under the age of 70,<sup>24,25</sup> making this a critical population to study. In addition to age differences, important segments of the population, like those who did not speak English, had very limited digital literacy, or lacked access to necessary technologies (smartphones) were not included. Further research in expanded populations, and using propensity-matched controls, or a randomized clinical trial approach, will strengthen our knowledge of the contribution of PIN to patient outcomes. Lastly, we made extensive efforts to capture and include all readmissions, utilizing both self-reporting by highly engaged patients and third-party monitoring of data through admission-discharge-transfer feeds in health information exchanges. Despite this proactive monitoring, it is possible that some readmissions were missed, potentially making our reporting incomplete.

### Future Research

In addition to the aforementioned propensity-matched and randomized studies, there is opportunity to explore the utility of outcomes beyond those traditionally used in stroke clinical trials. The primary endpoint for nearly all studies in stroke treatment has traditionally been a dichotomized mRS, with any score from 0-2 on the 7-point schedule considered a “good outcome”. With the patient engagement afforded by effective

digital health tools and outpatient services, a broader set of patient-reported measures can be collected, and with greater frequency, including PHQ 2/9 for depression, GAD-7 for anxiety, and the PROMIS Global 10 measures for general, physical, and mental health. Further research is required to establish associations between these patient-reported outcomes measures and modified Rankin Scores, as well as minimal clinically important differences for these measures in the stroke population.

Due to the pilot nature of this study, we limited access to the program to English speaking individuals and to those with access to the internet. It is imperative that future studies address the reduced generalizability derived from this approach by extending inclusion to individuals not represented in this study, who by nature of their exclusion represent a patient population particularly in need of enhanced post stroke discharge care.

Importantly, with the conduct of assessment comes an ethical obligation to be prepared to respond when problems are revealed by those assessments. PIN services provide a novel vehicle to do so. Those delivering PIN services, whether for research or as part of standard clinical care, should be prepared with escalation plans and resource maps to respond to diverse time-sensitive needs including food and housing insecurity, domestic violence, suicidal ideation, recurrent stroke, infections, and sepsis.

Finally, future research can better establish which components of PIN are most critical to achieving improved patient outcomes and how much that varies across demographic cohorts. For example, how much is too much, or not enough, and which interventions, resources, and tools are used most frequently and to best effect? Multivariate analysis of operational metrics and demographics relative to outcomes in a larger cohort of



patients will be critical to teasing out these insights.

## CONCLUSIONS

Principal illness navigation for stroke survivors and care partners has the potential to enhance the patient and care partner experience early in their recovery process, establish connectivity with others during a

time of vulnerable isolation, increase access to stroke and wellness education and clinical resources during home and community reintegration, and improve patient outcomes.<sup>26,27</sup> This study demonstrates the feasibility of enrolling and engaging patients with diverse and complex physical and psychosocial needs in these services utilizing a remote, outpatient telehealth service in the days to months following stroke discharge.

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## Conflicts of Interest:

Lauren Sheehan, Tailar Johnson, and Kirsten Carroll are employed by the study sponsor, Kandu Health; Dr. Jovin is the Chief Medical Officer at Kandu Health.

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