Reducing Readmission Rates By Improving Transitions Of Care For Stroke Patients In The Pre-Covid And Covid Eras

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Background

Stroke readmissions represent a significant source of morbidity, mortality and healthcare spending. According to statistics from the Centers of Disease Control and Prevention (CDC), someone suffers a stroke every 40 seconds in the United States, and approximately 795,000 individual events occur annually.[1] All-cause readmissions account for $26 billion in healthcare spending per year, which prompted creation of the Medicare Hospital Readmission Reduction Program as a component of the Affordable Care Act in 2012. This legislation standardized the 30-day window after discharge as a target for readmission improvement.[2]

Previous literature utilizing the Nationwide Readmissions Database showed that between 11.98 – 13.47% of stroke patients are readmitted within 30 days of discharge.[3] A separate study considering Medicare fee-for-service records found a 14.4% readmission rate among the publicly insured.[4]

Transitions of care (TOC) is a means of providing continuity from one setting or level of care to another through strategic counselling. Previous studies have shown that TOC clinic follow-up visits are an effective means of reducing all-cause readmissions for a variety of chronic conditions including congestive heart failure, asthma, diabetes and depression.[5] A previous study looking specifically at 30-day stroke readmissions among the Medicare fee-for-service population showed a slight improvement in the hazard ratio when employing TOC clinic with either a neurologist or primary care physician.[6]

Study goals:

❖ **Aim 1:** Examine if there is a difference between 30-day stroke readmission rate when employing TOC clinic and the reported national average.

❖ **Aim 2:** Examine if there is a difference between 30-day stroke readmission rate when employing TOC clinic and the TJUH average with TOC patients removed.

❖ **Aim 3:** Determine if in-patient TOC clinic and telemedicine TOC clinic elicit different results in terms of 30-day stroke readmission rate at TJUH.

❖ **Aim 4:** Examine patient reported survey measures (self-efficacy, confidence, perceived TOC value) to guide improvements.

Methods

Our study seeks to build on previous literature by exploring the efficacy of TOC clinic for reducing stroke readmission at Thomas Jefferson University Hospital (TJUH), a certified comprehensive stroke center in Philadelphia. We are utilizing a prospective cohort study design. Potential participants were identified at TJUH beginning in January of 2019 by ICD-10 codes corresponding with various ischemic and hemorrhagic stroke diagnoses. Patients were initially automatically scheduled for an in-clinic TOC appointment with a vascular neurologist or clinical nurse practitioner within 1 to 3 weeks of hospital discharge. When coronavirus precautions were implemented at TJUH in February of 2021, these visits were transitioned to telemedicine appointments.

Goals of these visits:
❖ Clarify diagnosis and treatment plan
❖ Improve medication adherence by reinforcing appropriate use
❖ Assuage fears from discharge

Telephone follow-up surveys are administered to TOC participants within 6 months of their visit. These questionnaires employ measures of self-efficacy, confidence and perceived value of TOC clinic. Individual survey items were assessed for validity by all team members prior to clinical implementation. 30-day readmission rates are collected from individual patient electronic health records. All patient data is collected and stored in a password-protected living document that can only be accessed by the three team members actively recording data for the project. Data analysis is being conducted on a Macintosh computer (OS 10.15.5) using IBM SPSS (version 27).

Results

Preliminary analysis included 208 individuals (95 in-person, 113 telemedicine). Our results showed that among these patients, 12 (5.8%) experienced all-cause readmissions within 30 days of hospital discharge. Of the 12 patients readmitted, 2 were seen in-person (2.1%) and 10 were seen via telemedicine (8.8%). Chi Square revealed a between group difference (X^2 = 4.318, p = 0.038).

Telemedicine or In-Person * 30 Day Readmission Crosstabulation

			30 Day Readmission		
			no	yes	Total
Telemedicine or In-Person	in-person	Count	93	2	95
		% within Telemedicine or In-Person	97.9%	2.1%	100.0%
	telemedicine	Count	103	10	113
		% within Telemedicine or In-Person	91.2%	8.8%	100.0%
Total		Count	196	12	208
		% within Telemedicine or In-Person	94.2%	5.8%	100.0%

Comparison of 30-Day Readmission Rates Between Sources
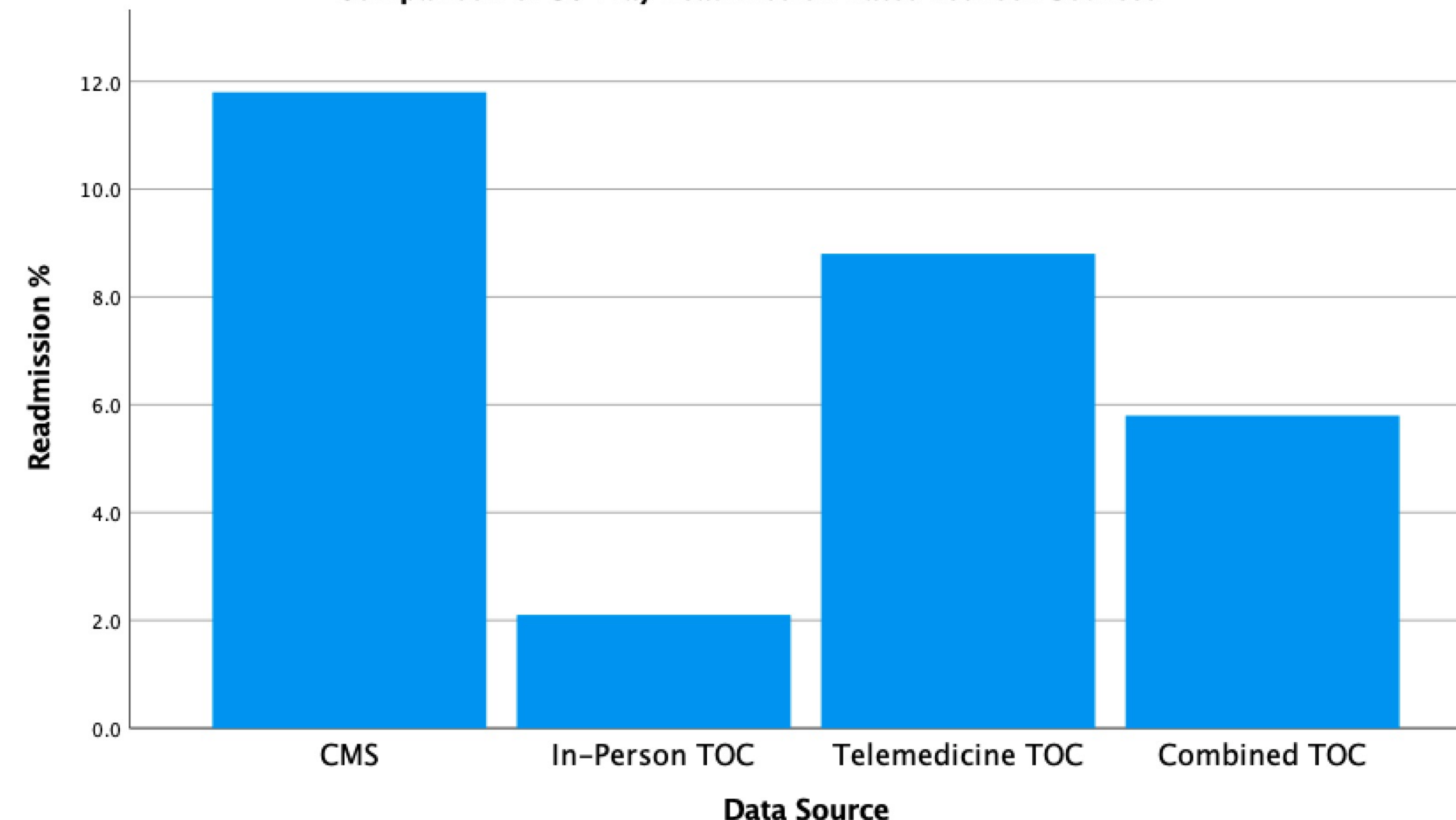
Participants in both the in-person group (u = 8.421, SD = 1.835) and telemedicine group (u = 8.100, SD = 1.875) considered TOC a valuable experience. Analysis of perceived TOC value did not differ between groups (t = 0.654, p = 0.515). Measures of patient confidence (before TOC clinic versus after) are still being conducted and will be analyzed using a paired samples t-test.

Group Statistics

	Telemedicine or In-Person	N	Mean	Std. Deviation	Std. Error Mean
How Valuable was TOC	in-person	19	8.421	1.8353	.4211
	telemedicine	60	8.100	1.8749	.2420

Measures of patient confidence (before TOC clinic versus after) were added to the survey in December of 2020 and are still being collected. When a sufficient sample size has been achieved, we will analyze this using a paired samples t-test. An annual TJUH 30-day stroke readmission dataset is being prepared with TOC patients removed to enable internal comparison. When preparation is complete, we will compare our final TOC figures to TJUH standard of care home discharge rates as well as a nationally representative sample based on the most recently published Medicare/Medicaid stroke readmission data from the Centers of Medicare and Medicaid Services (CMS). This analysis will be performed using one sample z-test in excel.

Discussion

TOC clinic has been shown to be efficacious for reducing 30-day readmissions for numerous chronic conditions. However, there is a dearth of literature reflecting its utility with stroke. Our initial results are extremely encouraging when comparing our derived 30-day readmission rates with those reported in previous publications. Our combined figure (5.8%) as well as individual telemedicine (8.8%) and in-person (2.1%) readmission numbers outperform those most recently published by the CMS (11.8%) from 2015-16 (see graph).[7]

The difference between in-person and telemedicine TOC readmission statistics might be explained by numerous different factors. Telemedicine data was predominantly collected during the height of the coronavirus pandemic. Patients may have been experiencing worse overall health due to limited access to medical care, isolation and fewer opportunities for exercise. Because telemedicine clinic can be conducted from home, it may capture patients who would forego in-person clinic due to various personal barriers (apathy, time, transportation). These patients may also be less adherent to their treatment regimens. Navigating novel technology is challenging for many individuals. The added complexity of using a virtual platform may detract from the ability to absorb information and result in poorer adherence to therapies. Further research into perceived barriers should be conducted.

We have ascertained evidence for two of our aims (1 & 3) thus far. We are awaiting queries from TJUH data managers to explore aim 2. More samples incorporating confidence measures are currently being collected to allow us to perform a meaningful analysis for aim 4.

Limitations & Future Directions

Limitations:
❖ Telemedicine TOC was not initially a component of the project charter, thus the sample size when considering each group individually is smaller than intended
❖ Patients may experience recall bias when answering telephone survey questions
❖ Nationally representative figures have not been updated annually and may not reflect current trends

Future Directions:
❖ Translate findings into practical institutional policy
❖ Perform qualitative study of perceived barriers to telemedicine stroke clinic to make platform more accessible
❖ Repeat study parameters in post-covid era to determine if pandemic confounded findings

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