Spring 5-11-2024

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GPNS 961 Doctor of Nursing Practice Practicum II

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May 3, 2024

5/1/24

Abstract

Stroke is a significant public health problem in the United States and globally. For patients experiencing an acute ischemic stroke, also known as “infarct” or “brain attack,” the effectiveness of treatment is extremely time dependent. This DNP Project presents a program evaluation of stroke care delivered in five emergency departments (EDs) in community hospitals in a health system newly formed through the merger of two smaller organizations. This evaluation focused on assessing the five programs’ effectiveness in delivering timely and effective care to stroke patients with the standardized performance measure door-to-needle (DTN). The evaluation also included a review of factors influencing timely telestroke utilization, including workflow evaluation of the Stroke Alert process and interviews with interprofessional Stroke Center Team members.

By comparing these elements, the evaluation identified areas for improvement including streamlining “telestroke” activation, expanding interprofessional stroke team members role responsibilities including considering the stroke coordinator role who would support protocol adherence and training of nurses specifically trained and designated to respond in ED stroke alerts.

A significant recommendation of this program evaluation is the adoption of a single Stroke Center certification for all five programs. Standardizing certification processes not only streamlines data collection efforts but also ensures consistency in performance metrics and benchmarks. This, in turn, facilitates meaningful comparisons between campuses, allowing for more accurate assessment of quality improvement initiatives and patient outcomes. Moreover, a unified certification entity would promote alignment with industry best practices and regulatory requirements, fostering a culture of continuous improvement and accountability across the organization.

Keywords: acute ischemic stroke, door-to-needle time, emergency nursing, intravenous thrombolysis, program evaluation, stroke system of care

Strokes of Excellence and Opportunity: A Program Evaluation Analyzing Emergency Department Stroke Care in a New Five-Hospital Health System

Stroke is a significant public health problem in the United States and globally. For patients experiencing an acute ischemic stroke, also known as “infarct” or “brain attack,” the effectiveness of treatment is extremely time dependent. The classic and widely cited study by Saver (2006) estimates the typical patient loses 1.9 million neurons for each minute brain parenchyma is not being perfused. Thirty years of research and quality improvement efforts have focused on developing and improving access to effective reperfusion treatments such as intravenous thrombolysis and endovascular therapy. Notably, there is also a functional loss associated with this devastating death of tissue over time, often meaning an individual will never recover the quality of life they had before an index stroke. Newly published data in 2024 by Martin et al. reveal that 795,000 Americans experience a new or recurrent stroke annually. Importantly, projections indicate that by 2030, an additional 3.4 million US adults will have had a stroke, a 20.5% increase in prevalence from 2012.

While the incidence of stroke has dropped in recent years for certain sub-populations such as white Americans due to improvements in managing cardiovascular risk factors, racial and ethnic disparities persist and the total cost of stroke in 2019-20 was estimated to be $56.2 billion, with direct medical costs of hospital inpatient stays, outpatient visits, emergency department visits, prescribed medications and home health services accounting for $34.5 billion, or 61.4% of the total (Martin et al., 2024). Another startling data point is that between 2015 and 2035, the direct medical stroke-related costs to society are expected to more than double to $94.3 billion (Martin et al., 2024). Because of this burden of disability for the individual and substantial cost to the health care system and society, research and quality improvement efforts have narrowed their focus to improving and expanding access to the two effective treatments in the hyperacute phase of stroke: intravenous thrombolysis and endovascular therapy. Coordinated systems-level initiatives began as early as the year 2000, when the

Brain Attack Coalition, a multidisciplinary group of representatives from major professional organizations involved in stroke care, came out with the consensus statement “Recommendations for Establishment of Primary Stroke Centers” (Alberts et. al., 2000). A priority of this widespread quality improvement work has been decreasing any potential delays which may occur throughout the process from when symptoms are identified to the point when a patient receives appropriate definitive care for their type of ischemic stroke.

As a result, healthcare organizations have sought to apply improvement science to decrease the intervals of time from when symptoms begin and when the patient receives definitive care appropriate for the type of stroke they are experiencing. Recognizing and treating ischemic stroke has thus been at the forefront of many health systems’ planning and implementation of building stroke services, however, assessing and managing hemorrhagic stroke is equally important. Though it varies slightly based on population, incidence of ischemic strokes far outnumbers hemorrhagic strokes by a ratio of about four to one (Denny et al., 2020). Hemorrhagic stroke patients bear a disproportionate share of mortality associated with their condition and therefore require an expedited evaluation and advanced care from a neurosurgical perspective which is not available in most hospitals. Although lack of recognition and standardized care processes for hemorrhagic stroke is worrisome and warrants significant attention, this paper specifically addresses acute stroke care systems and interventions targeted toward identification and treatment of ischemic strokes.

Proposed hospital standards for stroke care have been developed by the American Heart Association and the American Stroke Association in collaboration with The Joint Commission (The Joint Commission, n.d.); this in turn guided the development of stroke centers across the nation. Thrombolytic studies have demonstrated that the efficacy of tissue plasminogen activator to be time dependent and national recommendations have set specific benchmarks for door-to-needle (DTN) times, nevertheless rapid administration of thrombolytic therapy remains rare in US hospitals and these

benchmarks are frequently unattainable (Banna, 2022). The standards promulgated in Target: Stroke (Xian, 2022) were used as a foundational element of this program evaluation and include the development of the healthcare teams that are highly trained in stroke care and lead by stroke coordinators; effective use of telemedicine or in this specific case "telestroke" services that support timely treatment of stroke in all hospitals, and on-going monitoring of stroke center effectiveness and patient outcomes.

The overall purpose of this program evaluation therefore is to assess the existing state of emergency department ischemic stroke care in five hospitals in a newly formed regional health system and evaluate and analyze the effectiveness, efficiency, and overall impact of emergency department structures and processes related to ischemic stroke care using national standards for Stroke Centers. Specific elements that will be evaluated include the telestroke services, stroke coordinator role and healthcare team support, and patient and system outcome measures and their compliance with stroke center certification standards applied to the emergency department setting. Throughout the evaluation process, focused efforts were executed to bring renewed awareness and heightened sense of urgency on the timeliness of stroke assessment and treatment with the interprofessional ED teams. The project's desired outcome is providing a thorough stroke center evaluation that can allow organizational and clinical leaders to make informed decisions, allocate resources effectively, and continually improve the quality of care provided to stroke patients in the emergency department.

Healthcare Problem

Late in the summer of 2023, the popular media picked up on a study published in JAMA, printing headlines such as "America's ERs struggle with timely care for stroke patients" (Iskander, 2023). Recent data from the Centers for Disease Control (2023) confirms the ongoing significance of the stroke burden in the United States: every 40 seconds, someone in the U.S. has a stroke and every 3 minutes and 14 seconds, someone dies from stroke. Notably, stroke is a leading cause of death and serious long-term

disability among Americans, reducing mobility of more than half of stroke survivors aged 65 and older. Stroke-related costs in the U.S. totaled nearly $56.5 billion between 2018-2019 (Martin et al., 2024). Early action is key in treating stroke, and knowing the signs and symptoms for both the lay public as well as healthcare providers leads to better outcomes as it makes timely intervention more probable. The CDC plays an important policy role in providing resources and funding to address stroke prevention and cardiovascular disease, with several areas of emphasis including WISEWOMEN which provides low-income and uninsured or underinsured women with risk factor screening, lifestyle programs and referral resources to prevent cardiovascular disease and stroke, the Paul Coverdell National Acute Stroke Program which is a federally-led but state coordinated initiative to measure, track, and improve quality of care for stroke patients, and the Million Hearts initiative, which operates broadly with other federal agencies and private-sector partners to elevate awareness of stroke and stroke prevention as well as other cardiovascular diseases (Centers for Disease Control and Prevention, n.d.).

This program evaluation of a five-hospital community health system in southwestern Pennsylvania was informed by a community assessment and the identified risk factors within the populations they serve. This system has recently expanded from a three-hospital system to a five-hospital system with the merger of two smaller hospital systems. To best understand the potential stroke program impacts and ensure a coordinated response to the needs of all patients and communities served, an examination of the geographic and demographic characteristics of the region is desirable. Three acute care hospitals (alias Hospital A, Hospital B, and Hospital C and collectively referred to here as the “Southern Region”) are all located within Westmoreland County, Pennsylvania. These hospitals are within an approximately 10-mile radius of one another and already share resources including personnel, supplies and equipment with close ties facilitated by their proximity. The two hospitals comprising the other division (alias Hospital D and Hospital E, “Northern Region”) are situated approximately 50 miles away from each other in the respective county seats of Butler County and

Clarion County. While marketing materials provided by the health system indicate that it serves ten counties and three-quarters of a million residents (Independence Health, 2023), the following analysis of demographic and epidemiologic characteristics focuses primarily on the three counties in which the hospitals themselves are situated – Butler, Clarion, and Westmoreland – with a combined population of approximately 587,000 (United States Census, 2023). Butler and Westmoreland Counties are considered "metro fringe" based on their proximity to Pittsburgh, while Clarion is a rural county.

Out of Pennsylvania's sixty-seven counties, Butler, Clarion, and Westmoreland rank #6, #34, and #20 respectively according to the County Health Rankings & Roadmaps data (2023) from the University of Wisconsin Population Health Institute (UWPHI). When examining specific health behaviors, Westmoreland County has higher rates of adult smoking, adult obesity, and excessive drinking than both Pennsylvania and the United States overall. Similarly, Clarion's adult smoking and adult obesity rates are higher as well, in addition to having significantly fewer primary care physicians and a higher proportion of uninsured adults. Both Clarion and Westmoreland, however, have preventable hospitalizations approximately 20% higher than Butler County (University of Wisconsin Population Health Institute, 2023). The health behaviors and outcomes are enumerated further in Table 1.

In terms of county level health data specific to cardiovascular disease and stroke, the Centers for Disease Control and Prevention Interactive Atlas of Health Disease and Stroke (2023) provides a wealth of insights into prevalence, risk factors, social/economic/environmental indicators, healthcare delivery and insurance, and healthcare costs. During 2018-2020, the most recent timeframe available, Westmoreland is the highest of the three counties for all stroke hospitalizations with a rate of 13.7 per 1,000 Medicare beneficiaries; Clarion is 13.0 per 1,000 and Butler is just below with 12.9 per 1,000. When evaluating death rates for hemorrhagic stroke during that same time frame, Clarion County is the 4th highest in Pennsylvania with a rate of 18.5 per 100,000, likely due to its rural setting and distance from tertiary neurosurgical care. Butler County has a rate of 18 per 100,000 and Westmoreland County

is 17.2 per 100,000 for the same condition. For ischemic stroke death rates, Clarion is highest of the three with a rate of 38.8 per 100,000, Westmoreland falls second at 37.1 per 100,000 and Butler is 36.3 per 100,000. The complete data comparing the three counties' most recently available CDC stroke data is in Table 2.

As a final, overarching metric to use as a basis for comparing the three counties, the U.S. Department of Health and Human Services includes measure HDS-03, "Reduce Stroke Deaths", among the Healthy People 2030 project data set (n.d.). For the most recent five-year period available to analyze for this measure, Pennsylvania as a whole had a rate of 36.3, Butler County's rate was 37.6, Clarion County's rate was 39.5, and Westmoreland County's 32.7; only Westmoreland is currently meeting the goal of a death rate of less than or equal to 33.4 by 2030 (Pennsylvania Department of Health, n.d.). Considered collectively, these health behavior and health outcome measures, in combination with demographic trends, play a crucial role in understanding stroke care needs. They can help tailor interventions to address challenges in accessing care, risk factors, and outcomes among diverse populations, ultimately improving the effectiveness and equity of stroke care initiatives.

The three Southern Hospitals A, B, and C are currently certified Primary Stroke Centers by The Joint Commission. Of the two hospitals that make up the Northern Region, the larger one, Hospital D is certified as a Primary Stroke Center by the Accreditation Commission for Health Care and Hospital E does not currently have certification. The four out of five hospitals which have external certification are also recognized by the Pennsylvania Department of Health as receiving hospitals for stroke patients. For the purpose of collecting and analyzing data, they also participate in the stroke registry Get With The Guidelines® - Stroke (GWTG-S), a digital registry platform intended to improve the quality of care for stroke patients. GWTG-S involves the systematic abstraction of data on stroke patient care processes and outcomes. The data is then used by the organizations for performance measurement and analysis, allowing the organizations to identify areas for improvement and track their progress over time.

In the pursuit of enhancing stroke care and optimizing patient outcomes, this project completed a comprehensive evaluation of interdisciplinary team dynamics, the workflow of stroke coordinators and the pragmatic structure and process components needed for achieving and maintaining stroke program certification. The focus will extend to scrutinizing the utilization of telestroke resources, a critical component in the modern healthcare landscape. The project aims to measure compliance with established and proven strategies outlined in the Target: Stroke initiatives, seeking to identify areas for improvement, innovation, and standardization to gain efficiency across a newly formed health system of five community hospitals.

Moreover, the investigation will encompass a thorough examination of relevant certification standards and requirements set forth by two prominent healthcare certification bodies, The Joint Commission and the Accreditation Commission for Health Care. This will involve a detailed analysis of how well the interdisciplinary teams and stroke coordinators align with and adhere to the prescribed clinical practice guidelines. By aligning with these standards, the project aims to ensure that the stroke care meets the highest quality benchmarks and contributes to the continual improvement of healthcare practices in the context of stroke program management. Through this multifaceted approach, the project aspires to enhance the overall effectiveness and efficiency of local stroke care delivery, fostering a patient-centric and evidence-based healthcare environment.

Literature Review

Literature Search

The evidence-based practice question was formatted as follows: What are best practices to support interdisciplinary teams including nurses in initial assessment and treatment of stroke patients, specifically in community hospital emergency departments without continuous on-site neurology expertise? To elaborate upon the EBP question, PICO elements were applied according to the framework of Dang, et. al., (2022). The population (P) being studied is patients presenting to an

emergency department experiencing new onset stroke symptoms. The intervention (I) and comparison (C) are current best practices to incorporate in a stroke protocol response as compared with lack of adoption and adherence to a standardized bundle of best practices. Finally, the outcome (O) includes process measures including documentation of recognition of symptoms and time of onset to time of imaging, onset to telestroke activation time and video evaluation by a neurologist, and arrival to treatment or disposition with definitive diagnosis. Additional outcome measures, if available from published studies, may include survival to discharge and modified Rankin scale post-discharge. Beginning in July 2022 and repeated in September 2023, searches were conducted using the following scholarly bibliographic databases: PubMed®, Cumulative Index to Nursing and Allied Health Literature (CINAHL), Scopus, Web of Science, and Google Scholar. Additionally, a citation alert was created on the Google Scholar platform, generating a notification anytime a new publication was created. The initial search terms used were:

- emergency department and stroke protocol (1,022 results) AND
- stroke thrombolysis OR
- stroke reperfusion therapy AND
- stroke systems of care

Further inclusion criteria parameters limited the selection to English-language studies published from 2017 onward, bringing the total to review down to 263. From those, a total of twelve articles were deemed appropriate for consideration, demonstrating both high quality and relevance to the specified aims of the project. Rejected studies addressed a range of topics including heatstroke, complications from stroke, secondary prevention and risk factors, and stroke rehabilitation. Three additional earlier studies are included for enduring significance and long-standing relevance in the pursuit of stroke excellence. A summary of the literature appraisal is in Appendix A. Three areas of evidence were found

to be critical to the development of this Program Evaluation are: National Standards for Stroke Care, Telestroke and the role of a stroke coordinator in healthcare team development.

National Standards for Stroke Care

Many hospitals pursue certification as a Stroke Center from The Joint Commission as well as other certification entities. In 2010, the American Heart Association/American Stroke Association (AHA/ASA) launched the Target: Stroke initiative to support hospitals in achieving this designation. Target: Stroke was the first collaborative, systematic effort in the U.S. to close the gap between research and practice in the early identification and treatment of acute ischemic stroke, improving door to needle (DTN) times. Ten key strategies were identified and encouraged and include: early hospital pre-arrival notification by emergency medical services (EMS) followed by a single call activation for a stroke team, rapid acquisition and interpreting of brain imaging (CT) on arrival to hospital, rapid access to thrombolytic medication, and a team-based approach with prompt data feedback (Fonarow et al., 2011).

Based on the success of the Target: Stroke program, a Phase II guidelines followed in 2014 to advance those gains. More recently, Phase III was initiated in 2018 establishing yet more aggressive goals for stroke systems of care (American Heart Association, 2018). Phase III also included the first goals to be established for endovascular therapy based on its established effectiveness for strokes caused by large vessel occlusion (Smith et al., 2017). Endovascular treatment has been determined to be the standard of care for infarcts caused by large vessel occlusion in anterior cerebral circulation and sometimes posterior circulation, although this is a resource-intensive offering available only in highly specialized, tertiary hospitals (Goyal et al., 2019). In 2023, the Society of Neurointerventional Surgery began promoting simplified and standardized classifications for stroke centers and patient triage in a model mirroring how trauma systems of care have evolved. They also created the public awareness and public policy advocacy campaign “Get Ahead of Stroke” as part of this endeavor. “Get Ahead of Stroke”

used the examples of two high-profile individuals, then-Pennsylvania lieutenant governor and Senate candidate John Fetterman and U.S. Sen. Chis Van Hollen (Md.) to highlight that the swift recovery of both individuals without evident dramatic impairment following strokes suggested the successful implementation of efficient triage, transportation, and treatment procedures. These life-saving protocols aim to enhance the chances of reducing disability resulting from strokes for everyone.

Telestroke

The Target: Stroke initiative has recommended the use of telemedicine by Stroke Center teams. Telemedicine is addressed in the American Stroke Association's publication "Guidelines for the Early Management of Acute Ischemic Stroke" (Powers et al., 2019) specifically with the class 1, level C recommendation for "the administration of IV alteplase guided by telestroke consultation for patients with AIS can be beneficial" (p. e353). The Target: Stroke initiatives identified that Stroke Centers could achieve improved nurse-sensitive stroke time metrics through consistent and disciplined use of telemedicine. Olson et al. (2022) emphasize the importance of interdisciplinary collaboration including telemedicine in the early management of AIS. The utilization of telestroke within a stroke system of care to guide local ED clinicians in correct reperfusion eligibility decision made through access to experienced neurology expertise is supported by evidence included in American Heart Association/American Stroke Association clinical practice guidelines (Powers et al., 2019) and also Hendrickx et al (2023).

Stroke Coordinator Role and the Healthcare Team

Studies that have evaluated the effectiveness of stroke centers have identified several system barriers that impact stroke patient outcomes. Effective hospital-based stroke care is anchored in efficient emergency department recognition and treatment of ischemic and hemorrhagic stroke. Hospitals with Stroke Center designation strive to attain a DTN standard of 60 minutes or less but many times the goal is not met due to many factors including emergency department (ED) nursing turnover and inexperience, use of nursing agency personnel, and emergency department capacity. The 60-minute

DTN target for stroke treatment is a critical benchmark established through a combination of medical research and global quality improvement initiatives. Saver et. al. (2013) found from a pooled analysis of over 58,000 patients treated with the thrombolytic alteplase that for every 15-minute faster acceleration in treatment, an additional 18 in 1,000 patients would have improved ambulation, 13 more would be discharged to a more independent environment, and 4 fewer would die prior to hospital discharge. However, specific complex system issues within emergency departments have been identified by Zodda and Underwood (2019) including overcrowding with a significant number of admitted inpatients awaiting beds ("boarders") which contribute to substandard performance on stroke care and other time-sensitive measures due to delayed assessment and treatment and prolonging DTN. The COVID-19 pandemic has been especially challenging for hospital emergency departments and findings by Griffin et al. (2023) suggest that it too has contributed to an increase in not only ED boarding, but in-hospital mortality as well.

Powers et. al (2019) outline the key stroke program recommendations that contribute to improved patient outcomes through system efficiencies. In combination with recommendations set forth in the 2023 framework by Dusenbury et al., discussion and emphasis of the following eight points center on a need to robustly standardize and adopt best practices for emergency department accessibility, assessment and treatment:

1. Clinical variability: There can be significant variability in the way different emergency departments assess and treat stroke patients. This leads to inconsistencies in the quality of care provided, resulting in suboptimal outcomes for patients.
2. Time sensitivity: Stroke care is time-sensitive, and delays in evaluation and treatment have a direct impact on patient outcomes. The lack of standardized practices and protocols may contribute to delays in identifying and treating stroke symptoms promptly.

3. Evidence-based practices: The field of stroke care is continuously evolving, with new research and evidence emerging. Standardizing practices ensures that the latest evidence-based guidelines are consistently applied, leading to improved patient care and outcomes.
4. Resource utilization: Inconsistent practices may lead to inefficient use of resources, both in the emergency department and throughout the hospital and health system setting. Standardization can optimize resource allocation, ensuring that stroke patients receive appropriate and timely interventions without unnecessary delays or redundancies.
5. Interdisciplinary collaboration and the role of a stroke coordinator: Hyperacute stroke care is inherently a team sport. It requires collaboration between various healthcare professionals, including prehospital emergency medical services, emergency physicians, radiologists, neurologists, telemedicine providers and nursing staff. Standardized practices can enhance communication and coordination among those disciplines, promoting a more seamless and effective care pathway. In many settings, the RN stroke coordinator's primary responsibility is to enhance acute stroke services in their organization and integrate it effectively into the community stroke system. They work with the interdisciplinary team to design and execute quality improvement initiatives and evaluate performance metrics. Education and training of healthcare staff in acute stroke care are also crucial aspects of the role. The RN stroke coordinator spearheads efforts to enhance the stroke care system, collaborating closely with medical directors and other stakeholders. Furthermore, they manage clinical staff competencies related to stroke, identify areas for program improvement, and lead the certification journey and process for stroke centers.
6. Quality improvement: Standardization provides the foundation for continuous quality improvement initiatives. By establishing clear protocols and monitoring adherence to best

practices, healthcare providers can identify areas for improvement and implement changes to enhance the overall quality of stroke care.

7. Regulatory compliance: Adherence to standardized practices is a necessary component of regulatory compliance and accreditation or certification. Ensuring that a patient's care begins by the emergency department following established guidelines for stroke care is essential for meeting these standards and maintaining high quality healthcare delivery.
8. Patient outcomes: The ultimate goal of standardizing practices in stroke care is to improve patient outcomes. This includes reducing mortality rates, minimizing disability, and improving the overall quality of life for stroke survivors. Standardized practices facilitate a systematic and effective approach to achieving these outcomes.

Synthesis of Literature

The studies under consideration, predominantly originating from tertiary academic medical centers, highlight a notable trend wherein stroke assessment, treatment, and quality improvement efforts may face fewer resource constraints in such well-equipped settings. This suggests that tertiary academic medical centers, often equipped with relatively abundant resources, create environments conducive to focusing on the enhancing stroke care and implementing quality improvement measures. The implication is that the findings, advancements and recommendations reported in these studies may not be universally applicable to healthcare settings with more limited resources, such as rural and community hospitals. Two of the influential papers from the past three years, published as scientific statements by the AHA, have such academic medical center top-heavy authorship (Dusenbury et al., 2023 and Ashcraft et al., 2021). This underscores the imperative for tailoring strategies and solutions in resource-constrained environments to ensure effective stroke management and meaningful quality improvement.

To provide a credible response to the questions at hand, a growing organization must establish the capability to acquire relevant data, conduct meaningful analyses, and identify instances where processes deviate from established leading practices. The foundation of this understanding lies in the organization's ability to systematically collect and interpret data, allowing for insights into the effectiveness of current procedures. Furthermore, it necessitates an awareness of when, how, and where these processes diverge from the recognized best practices in the field. However, obtaining these valuable insights is only the first part of the equation. Effecting real change requires a proactive stance from the organization. This involves not only recognizing areas for improvement but also cultivating a willingness to adapt.

Effective tangible change demands a commitment from leadership to both standardize existing processes and integrate recognized best practices into the organizational framework in a proactive stance. This commitment is pivotal, serving as the cornerstone for cultivating a culture of continuous improvement. In such a culture, the organization actively seeks to evolve, optimize and align its practices with the most effective and efficient standards for stroke care. Ultimately, this proactive approach ensures that the organization remains response to emerging challenges, consistently striving for excellent in stroke management and quality improvement.

Methodology

The methodology selected for this DNP project is a program evaluation based in the framework outlined by the W.K. Kellogg Foundation (Kellogg Foundation, W.K., 2017). This evaluation model is a useful tool for a variety of reasons. As stroke care is complex and involves multiple components including prehospital care, emergency department interventions and community support, the WKKF model's emphasis on a holistic approach aligns well with the need to understand the entire stroke care continuum. Various stakeholders also play crucial roles and the WKKF model's focus on stakeholder involvement is beneficial in ensuring that perspectives from all relevant parties are included in the

evaluation. Stroke care is rapidly evolving, with ongoing advancements in treatment, and the model's emphasis on evaluation as a tool for learning and improvement is crucial for an organization seeking to stay competitive, abreast of the latest evidence-based practices, and continuously enhancing its services. Finally, the utilization-focused approach of the WKKF program evaluation model is valuable in ensuring that evaluation findings are actionable and can be used to inform decision-making, program improvement, and advocacy efforts. Applying the WKKF program evaluation model to a DNP project allows the evaluator and the organization being evaluated to systematically assess the current state as well as the impact of any proposed interventions, contributing to improving stroke care outcomes for patients.

Project Purpose

The purpose of this Doctor of Nursing Practice (DNP) project is to conduct a comprehensive assessment of the existing stroke processes and outcomes within a five-hospital community health system in located in southwestern Pennsylvania. The evaluation will be structured and guided by the established criteria and standards put forth by reputable organizations, namely the American Heart Association/American Stroke Association, The Joint Commission, and the Accreditation Commission of Health Care.

This initiative is driven by the recognition that stroke care is a dynamic and evolving field, and continuous evaluation is paramount to ensuring the highest standards of quality and effectiveness. By leveraging the criteria and standards of these organizations, the project aims to provide a thorough analysis of the community health system's current practices in stroke management. The American Heart Association/American Stroke Association and The Joint Commission are recognized leaders in establishing evidence-based guidelines and certification standards for stroke care. Their criteria encompass various facets of stroke processes, including timely diagnosis, appropriate intervention, adherence to best practices, and the overall quality of patient outcomes. By aligning the evaluation with

these standards, the project seeks not only to identify areas of strength but also pinpoint potential areas for improvement and standardization within the community health system.

The geographic focus on southwestern Pennsylvania adds a regional context to the evaluation, acknowledging that healthcare delivery is influenced by regional factors and demographics. This project serves as a proactive step ensuring that the community health system remains at the forefront of providing state-of-the-art stroke care, catering to the specific needs of its population.

Ultimately, the findings and recommendations resulting from this evaluation will contribute valuable insights to health system leaders seeking to advance the stroke care processes within the system. The goal is to foster continuous improvement, aligning the organization with the latest evidence-based practices, and ultimately, improving the health outcomes for individuals affected by stroke in the southwestern Pennsylvania communities served by this health system.

Aims & Objectives

Aim #1: Evaluate the current emergency department process and patient outcomes (DTN) of each of the five hospital's stroke program services.

1.1 Collect stroke program process measures including patient volume, time seen, patient DTN times and patient outcomes data for the past 12 months for each emergency department.

1.2 Facilitate focus groups regarding effectiveness and barriers to stroke care with emergency department staff including nursing and interdisciplinary representation such as physicians, advance practice providers, radiology technologists, registration personnel, and others as available between June-July 2023.

1.3 Analyze data from discussions to determine a baseline assessment for whether the current process as outlined in organizational policies and procedures is being followed. Identify any themes that present as inconsistencies in practice or barriers to the implementation of best practice.

1.4 Conduct a real-time workflow observation of two or more ED stroke alerts to identify compliance with protocols, team effectiveness, use of telestroke services and waste or inefficiency to target for improvement.

1.5 Develop draft of recommendations for changes to current Stroke Alert process including role definitions and responsibilities.

Aim #2: Improve the timeliness of DTN through implementation of revised Stroke Alert process, facilitated by “boots on the ground” clinical staff.

2.1 Evaluate the current effectiveness of a department level “stroke champion” in the emergency departments.

2.2 Develop a new enhanced role of stroke team leader, driving ownership and responsibility at the site level for stroke performance measure monitoring and quality improvement.

2.3 Provide immediate and continuous feedback for the team treating any stroke patient regardless of whether they receive thrombolytics. For all patients who do receive thrombolytics, provide staff a detailed analysis of timed metrics from door to treatment.

Aim #3 Analyze data obtained from telestroke activation process and determine recommendations for telestroke platform standardization.

3.1 Evaluate compiled timed metric data from stroke alerts during October 2023-January 2024. These metrics will include door to provider, door to CT, door to specialist, and door to needle.

3.2 Perform an economic evaluation based on short-term patient outcomes.

3.3 Using visual aids, provide telestroke data analysis to stakeholders in clear, concise, and actionable format.

Aim #4: Summarize the strengths and opportunities related to all data and make recommendations for stroke process optimization across the system.

This represents a crucial phase focused on synthesizing and leveraging the extensive quantitative and qualitative data collected throughout the project to draw meaningful conclusions and propose actionable recommendations. The ultimate goal is to evaluate strengths and opportunities associated with the ED Stroke Alert process and formulate recommendations for standardizing across the health system. The specific objectives for this aim are as follows:

4.1 Present results to key stakeholders including the Chief Quality Officer, Emergency Department Medical Director and Stroke Neurology Medical Director by April 16, 2024.

4.2 Determine a comprehensive action plan for the implementation of any identified optimizations at additional hospitals within the health system.

4.3 Prepare manuscript suitable for publication or conference presentation submission.

Aim #4 represents the culmination of the DNP project, transforming data into actionable insights and recommendations that have the potential to significantly improve the stroke care landscape within the healthcare system.

Implementation

Logic model

Lewin's force field analysis is a helpful tool for macro-level evaluation of stroke program structures and processes (Reyes, 2023). Developed in the 1940s by pioneer of organizational psychology Kurt Lewin, it operates on the idea that any situation is shaped by two opposing forces: driving forces, which advocate for change, and restraining forces, which oppose change. Driving forces, such as staff training and more efficient protocols, could be reinforced to enhance stroke management. These push for change and drive an individual or group toward a desired outcome. Simultaneously, restraining forces, like resource constraints or outdated procedures, resist change and seek to maintain the status quo. Examples include fear of uncertainty, potential for job loss, and disruption to established workflows and routines. These need addressed to minimize obstacles in delivering optimal care.

Successful change occurs when driving forces are stronger than restraining forces. Lewin's model heaps analyze these forces to develop strategies for making change initiatives more effective. The two main approaches are strengthening driving forces and weakening restrained forces. Lewin's force field model also works in synergy with his three-stage change model of unfreezing, change, and refreezing. By understanding the forces at play, leaders can effectively navigate and develop targeted strategies for facilitating change.

By adapting Lewin's force field principles into the logic model framework proposed by W.K. Kellogg Foundation (2017), one can visually depict how seemingly disparate, unconnected elements are linked. It links short-term and long-term outcomes with the processes and activities of a program, along with theoretical principles. Utilizing the logic model helps empower the evaluator and practitioner in various stages of the program evaluation such as planning, designing, implementation, analyzing and applying knowledge gained. Developing the logic model is a deliberate process that sheds light on available resources, future challenges, and timelines and moreover, it promotes a balanced perspective on both the overall objective and specific components of the program. The logic model developed for evaluating emergency department stroke care is shown in Figure 1.

Timeline

A high-level proposed and actual timeline of the DNP project is as follows:

- April-May 2023
    - Revisions as suggested by DNP committee and faculty mentor to project proposal.
    - Secure local and university IRB approval for QI project.
- June-July 2023
    - Conduct focus group interviews.
    - Determine whether feedback from focus groups indicates existing organizational policies are adequate as is or require revisions.

- September 2023
    - Implement revised Stroke Alert process at three Southern Region sites with emphasis on telestroke activation timeliness.
    - “Reframing” – transition from QI project to a program evaluation model.
- October 2023-February 2024
    - Collect and analyze data from stroke alerts.
- March 2024-April 2024
    - Dissemination of findings

Data Management Plan

To achieve the objectives of this project, several strategies were employed using a mixed method evaluation approach. According to W.K. Kellogg Foundation (2017), this approach of using qualitative and quantitative measures combined enables an evaluation that is more comprehensive and stronger than a single method. The qualitative aspects of the evaluation included semi-structured individual face-to-face and telephone interviews and small group discussions with key stakeholders at each of the five hospitals who shared important insights into the general strengths, barriers and opportunities they perceived at their respective locations. Additionally, existing telestroke quality reports that consolidate data from the hospitals within each region are analyzed. These compiled data underwent analysis to assess the impact of already implemented Target: Stroke strategies on DTN measures. Of particular focus is the examination of telestroke processes and their influence on the aforementioned measures. By examining the efficacy of telestroke processes within the context of Target: Stroke strategies, we aim to gain insights into how these interventions contribute to optimizing DTN measures. The W.K. Kellogg Foundation, Centers for Disease Control, and International Federation of the Red Cross all support the concept of triangulation in program evaluation to validate findings. This is similar to looking at an object from different angles to get a clear understanding of its shape; by cross-

referencing qualitative data from interviews and focus groups with quantitative data from the timed metrics, the overall reliability and validity of conclusions can be improved, reducing biases or limitations present with any singular approach. As such, this analysis will provide valuable information for improving stroke care delivery, particularly in the realm of telestroke, thereby enhancing patient outcomes and healthcare delivery efficiency.

Findings

Aim 1

This aim was to evaluate the current state of emergency department stroke processes and patient outcomes as measured by door to needle in each of the five hospitals' stroke program services. When reviewing January 2023 through December 2023 stroke alert metrics, the collected data revealed a significant variation in patient volumes among the five hospitals, with Hospital A having the highest volume and hospital E having the lowest (Table 3). The focus groups, interviews and email communication compiled from emergency department staff uncovered common barriers to effective stroke care, such as communication challenges between team members and delays in accessing imaging services. Several respondents attributed the communication challenges to a lack of experience and perhaps confidence among nursing. These themes seemed to be most prevalent at Hospitals A, B, and C although it appears likely that staff from Hospitals D and E may not have been as forthcoming about their specific challenges due to lack of familiarity and rapport with the evaluator. The greatest inconsistencies in implementation of organizational policies and procedures was also evident among Hospitals A, B, and C, although Hospital E had a very small number of patients who received thrombolytic treatment in 2023 (n=3) making any generalization difficult. The real-time workflow observations were only able to be conducted at Hospitals A, B, C, and D and they highlighted notable variation in the application of telestroke in the treatment of patients. Whereas Hospitals A, B, C, and E use telestroke to evaluate all emergency department patients with a potential for time-sensitive stroke

treatment, Hospital D is in the unique position of utilizing the neuroscience advanced practice nurse as the primary ED stroke alert responder during weekday hours 0800-1600, and telestroke at all other times. This dichotomy was responsible for a 50% telestroke, 50% local neurology response during 2023. Lastly, no significant changes were made to the Stroke Alert process at any of the hospitals; rather, at Hospitals A, B, and C, re-education and emphasis was placed on already defined criteria for a multi-tier stroke alert criteria corresponding to time since patient was last confirmed well (Figure 1).

Aim 2

This aim sought to further sustain and advance any improvement which was made evident through Aim 1 focusing on any changes to the ED stroke alert process. In Hospital A, which maintained a stable and consistent ED stroke champion who was also a member of the ED nursing leadership team, there was meaningful engagement with the evaluator and thus ongoing awareness and adherence to stroke protocols in the ED. Hospital D remained successful due to the highly visible and engaged presence of the neuroscience advanced practice nurse.

While a draft job description was developed at Hospitals A, B, and C for enhanced role of nurse stroke team leader (Appendix B), emergency department nursing leadership felt that there should be corresponding changes in compensation for those who assumed the role. This received consideration by the chief nursing officer, chief quality officer and human resource business partners, and ultimately was not pursued for approval at this time due to financial and other workforce constraints. However, the previously identified stroke champions within the departments at Hospitals A, B, and C continued their engagement and monitoring and analysis of DTN times and metrics leading up to DTN. For Hospital D, the neuroscience coordinator provided very detailed one on one feedback for members of the ED clinical team involved in stroke care, whereas at Hospitals A, B, and C the program evaluator provided this feedback as an email with attached “time tracker” worksheet, providing the timestamps of “door to” metrics, but requesting staff identify what they perceive to be areas for improvement.

Aim 3

One significant known challenge is that the hospitals have very limited on-staff internal neurology specialist coverage. At the three Southern Region facilities, one neurologist is available around the clock to cover all 3 sites, but physical presence can only be maintained in one hospital at a time and is typically available during daylight hours of 0600-1600 or 0700-1700. This position is supported by a physician assistant at the largest hospital. In a stroke coordinator role, currently one masters-prepared registered nurse with specialty certification in emergency nursing, critical care nursing, and stroke coordination supports all 3 facilities and spends time at the sites accordingly, however the stroke program is only one of many responsibilities assigned to that individual under the umbrella of general quality, regulatory and accreditation affairs. For the two Northern Region facilities, the larger site of the two has a vacant neuro-hospitalist position and thus currently relies on contracts from locum tenens neurologists. There is, however, a consistent advance practice clinician presence, one of whom is a nurse practitioner with specialty certification in neurovascular advanced practice nursing and fulfilling the role as the program's stroke coordinator. Lastly, Hospital E, the smaller of the two Northern sites does not have any resources specifically allocated to stroke care.

The Southern and Northern regional divisions each have a separate contract arrangement with two different local comprehensive stroke centers to provide telestroke services. Telestroke is used around the clock for hyperacute emergency department stroke alert responses at the Southern Region hospitals (A, B, C, and E) and the smaller of the two Northern sites, though for the larger Northern region hospital (D) it is predominantly only used after-hours when the neuroscience nurse practitioner is not on site.

Aim 4

Results stemming from the evaluation of aims one through three have been shared with the systemwide interdisciplinary stroke steering committee. This committee comprises dedicated members

deeply committed to enhancing stroke performance across the healthcare system. The presentation of these results marks an important milestone in the system's ongoing efforts to adopt best practices and refine stroke care protocols and processes. While the healthcare system is steadily gaining momentum in its pursuit of excellence in stroke care, the next crucial step involves the development of a comprehensive action plan. This plan will delineate the specific steps toward implementing the identified optimizations across various departments and hospitals within the system. It will include detailed timelines, specifying when each initiative will be initiated and completed. Additionally, the action plan will assign clear responsibilities to individuals or teams accountable for executing each task. This ensures that progress can be effectively monitored and tracked.

Moreover, the action plan will incorporate relevant metrics for evaluating the success of the optimization effort. These metrics will provide objective benchmarks against which progress can be measured, enabling the healthcare system to assess its performance and make adjustment as indicated. In essence, while the healthcare system is making significant strides in improving stroke care, the development of a detailed performance improvement plan represents a critical next phase in translating the evaluation findings into tangible, impactful changes.

Interpretation

The variability across hospitals, especially noticeable in the two smaller, rural facilities, highlights a significant issue. While it may be unreasonable to expect these facilities to meet the same level of advanced care as their busier, larger, and better equipped "hub" campuses, there should still be a baseline of essential standards for stroke care that are universally applied and upheld. This necessity for basic standards is underscored by authors Feldmeier et al. (2024) in their study "Heterogeneity of State Stroke Center Certification and Designation Processes." The authors address how the lack of standardization is evident between individual states' processes for stroke center designation, but this also is prone to occurring within states which allow different certification entities to administer similar,

albeit not identical, standards. In essence, while recognizing the diversity in resources and capabilities among hospitals, there remains a pressing need for consistency in fundamental standards across the board. This ensures that regardless of location or size, patients receive a high level of care and quality assurance.

Limitations

The process of merging two smaller health systems into a unified organization is inherently complex, involving the integration of disparate systems, protocols, and cultures. One of the primary challenges encountered in carrying out this program evaluation lies in data acquisition and management. With each legacy system employing a different approach in the implementation of their ED stroke alert protocols, in addition to collecting and analyzing performance data, comparing and consolidating this information became akin to comparing oranges to apples. Without standardization, discrepancies in data interpretation and reporting may arise, hindering the ability to accurately capture the effectiveness of interventions and initiatives across campuses.

Conclusions

By advocating for the adoption of a single certification entity within the new health system, the challenges described previously can be mitigated. Standardizing certification processes not only streamlines data collection efforts but also ensures consistency in performance metrics and benchmarks. This, in turn, facilitates meaningful comparisons between campuses, allowing for more accurate assessment of quality improvement initiatives and patient outcomes. Moreover, a unified certification entity would promote alignment with industry best practices and regulatory requirements, fostering a culture of continuous improvement and accountability across the organization.

In addition to enhancing data comparability and integrity, standardization through a single certification entity might offer operational benefits. Consolidating certification processes would reduce administrative burden and overhead costs associated with managing multiple certification entities. It

also simplifies staff training and education, as clinicians can become proficient with a single set of protocols and guidelines, regardless of where they work within the health system. Efforts toward fostering consensus and conducting further process evaluation are imperative to elevate the standard of emergency department care for patients with stroke.

In conclusion, the need for standardization through the adoption of a single certification entity within the merged health system is clear. By harmonizing stroke certification processes and performance metrics across campuses, the organization can overcome the challenges posed by data heterogeneity and fragmentation. This not only facilitates accurate performance evaluation and benchmarking for stroke care but also promotes operational efficiency and staff alignment. As the nursing landscape continues to evolve, standardization emerges as a cornerstone for achieving organizational cohesion, quality improvement, and ultimately, superior patient care. Embracing a unified approach to stroke certification sets the stage for a culture of excellence, innovation and continuous advancement in healthcare delivery and treatment of acute stroke patients.

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Table 1

Health behaviors and health outcomes, 2023

	Butler	Clarion	Westmoreland
Adult smoking, %	16%	22%	18%
Adult obesity, %	33%	37%	35%
Access to exercise opportunities, %	83%	52%	89%
Excessive drinking, %	23%	22%	23%
Uninsured, %	6%	10%	5%
Primary care physicians (ratio of population to PCPs)	1,440: 1	2,130: 1	1,350: 1
Preventable hospital stays per 100,000 Medicare enrollees	2,565	3,107	3,049

Table 2

CDC Stroke Data 2018-2020

	Butler	Clarion	Westmoreland
All stroke hospitalizations, 2018-20, per 1,000 Medicare beneficiaries	12.9	13.0	13.7
Ischemic stroke death rate per 100,000	36.3	38.8	37.1
Ischemic stroke hospitalizations, per 1,000 Medicare beneficiaries	8.4	8.8	8.4
Ischemic stroke, discharged home, %	47.6	51.9	43.5
Ischemic stroke, discharged acute care facility or other facility, %	15.8 + 2.0	15.5 + 2.8	14.4 + 2.4
Hemorrhagic stroke death rate per 100,000	18.0	18.5	17.2
Hemorrhagic stroke hospitalizations, per 1,000 Medicare beneficiaries	1.6	1.3	1.5
Hemorrhagic stroke, discharged home, %	18.9	24.5	21.6
Hemorrhagic stroke, discharged acute care facility or other facility	16.1 + 3.0	22.2 + 1.4	12.1 + 2.9
High blood pressure prevalence, %	30.9	34.2	35.7
Stroke prevalence, %	2.9	3.6	3.4

Table 3

ED Stroke Alert DTN Analysis 2023

	Total Number ED Stroke Alerts Evaluated by Neurology (internal or Telestroke)	Total Number Treated with Tenecteplase	Percent Utilizing Telestroke (T/S)	Median Door to Needle
Hospital A	160	30 (18.8%)	100%	52 min
Hospital B	117	18 (15.4%)	100%	68 min
Hospital C	26	12 (46.1%)	100%	54 min
Hospital D	64	28 (43.4%)	50%	73 min (internal) 78 min (T/S)
Hospital E	41	3 (7%)	100%	99 min

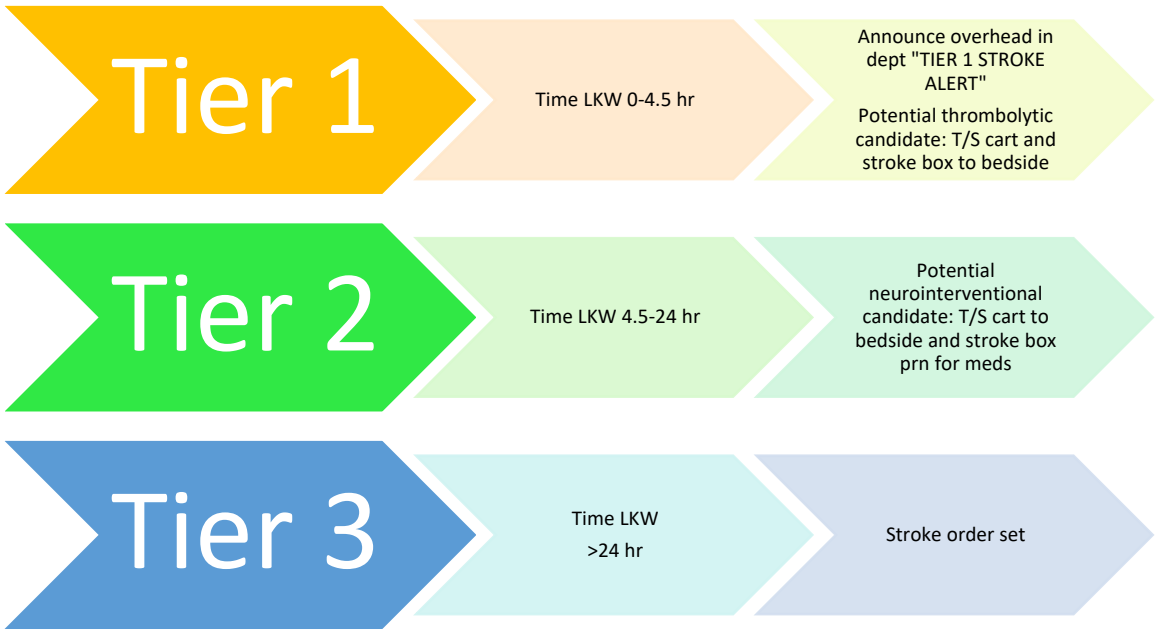
Figure 1

Logic Model for Stroke Program Evaluation

Project: "Strokes of Excellence and Opportunity: A Program Evaluation Analyzing Emergency Department Stroke Care in a Newly Formed Five-Hospital Health System" **Goal: Conduct a systematic evaluation of current emergency department processes for acute stroke care.**					
Inputs (What we invest)	Activities (What we do)	Outputs (Who we reach)	**Outcomes** Initial	Intermediate	Long-term
-Funding: Financial resources allocated to the stroke program. -Staffing: Qualified healthcare professionals including nursing, physicians, stroke coordinator, and support staff. -Facilities: Access to appropriate medical equipment, technology and infrastructure	-Triage: Implementing standardized protocol for identifying stroke symptoms upon arrival in the ED -Rapid assessment: conduct timely assessment including NIHSS, imaging, and lab tests -Treatment initiation: Administer thrombolytic therapy or other appropriate interventions based on clinical guidelines -Multidisciplinary care: coordinate care among various healthcare professionals to address acute needs of stroke patients	-Patients triaged for stroke -Patients for whom telestroke is utilized -Patients diagnosed with stroke and treated with thrombolytics -Time to treatment initiation	-Physicians and nurses will demonstrate increased comfort and improved timeliness executing initial ED stroke alert with telestroke process	-Improvement in campus DTN metrics -Improvement in staff satisfaction and self-efficacy -Health system standardization and improvement: inform policy and practice changes to optimize stroke care delivery and outcomes	-Replication of efforts at sister hospitals -Improved outcomes for stroke patients who receive thrombolytics as evidenced by modified Rankin score at discharge -Possible increase in revenue as more patients stay locally for care
Assumptions **-** No changes to drug therapy due to pharmaceutical shortages - Minimal staff turnover above current baseline - No changes to telestroke capacity or process - Average seasonal fluctuations in hospital census and ED throughput with no major pandemic surges			**External Factors** (-) Organizational uncertainty post-merger		

Figure 2

Multi-tier Stroke Alert Criteria with Timeframes Since Last Known Well (LKW)



Appendix A

Key Literature Appraisal

Author	Title	Appraisal
Ashcraft et al. (2021)	Care of the patient with acute ischemic stroke (prehospital and acute phase of care): Update to the 2009 comprehensive nursing care scientific statement a scientific statement from the American Heart Association	Level IV – High quality opinion of nationally recognized expert committee based on scientific evidence
Dusenbury et al. (2023)	Ideal foundational requirements for stroke program development and growth: A scientific statement from the American Heart Association	Level IV – High quality opinion of nationally recognized expert committee based on scientific evidence
Fonarow et al. (2014)	Door-to-needle times for tissue plasminogen activator administration and clinical outcomes in acute ischemic stroke before and after a quality improvement initiative	Level II – High quality pre and post intervention (enduring significance)
Fonarow et al. (2011)	Improving door-to-needle times in acute ischemic stroke: the design and rationale for the American Heart Association/American Stroke Association's target: stroke initiative	Level IV – High quality opinion of national recognized expert committee (enduring significance)
Hendrickx et al. (2023)	Use of telestroke to improve access to care for rural patients with stroke symptoms	Level III – High quality registry-based retrospective
Kamal et al. (2018)	Thrombolysis: improving door-to-needle times for ischemic stroke treatment – a narrative review	Level II – High quality pre and postintervention
Kamal et al. (2017)	Improving door-to-needle times for acute ischemic stroke effect of rapid patient registration, moving directly to computed tomography, and giving alteplase at the computed tomography scanner	Level III – High quality quantitative non-experimental
Koca et al. (2023)	Optimizing acute stroke treatment process: insights from sub-tasks durations in a prospective observational time and motion study	Level III – High quality quantitative non-experimental
Man et al. (2020)	Target: stroke was associated with faster intravenous thrombolysis and improved one-year outcomes for acute ischemic stroke in Medicare beneficiaries	Level III – High quality registry-based retrospective

Mohamed et al. (2023)	Is telestroke more effective than conventional treatment for acute ischemic stroke? A systematic review and meta-analysis of patient outcomes and thrombolysis rates	Level II – High quality registry retrospective
Olson et al. (2022)	Outcomes from a nursing-driven acute stroke care protocol for telehealth encounters	Level II – High quality pre and postintervention
Schwamm et al. (2009)	Get With the Guidelines–Stroke is associated with sustained improvement in care for patients hospitalized with acute stroke or transient ischemic attack	Level III – High quality registry-based retrospective
Siarkarski et al. (2020)	Meta-analysis of interventions to reduce door to needle times in acute ischaemic stroke patients.	Level II – High quality metaanalysis
Stamm et al. (2023)	Door-in-door-out times for interhospital transfer of patients with stroke	Level III – High quality registry-based retrospective
Xian et al. (2022)	Achieving more rapid door-to-needle times and improved outcomes in acute ischemic stroke in a nationwide quality improvement intervention	Level III – High quality registry-based retrospective

Appendix B

Nurse Stroke Team Leader Role Description

Stroke Team Lead Expectations

1. Attends Stroke Steering Committee meeting at least six times per calendar year
2. Attends Stroke Interdisciplinary Case Conference at least six times per calendar year
3. Annually:
    a. Completes 8 hours of ongoing stroke education
    b. Attends one of the following virtually or in-person (applies toward 8-hour requirement above):
        i. International Stroke Conference (February, virtual nursing symposium reg. fee approx. $150)
        ii. UPMC Annual Stroke Conference (late spring/early summer, reg. free)
        iii. AHN Annual Stroke Symposium (mid-late fall, reg. fee approx. $70)
    c. Maintains annual NIHSS recertification
4. Monthly:
    a. Attends monthly Stroke Team Lead Meeting (or 1:1) with Stroke Coordinator
    b. Reviews Stroke Steering Committee minutes, analyzes/displays hospital and department specific stroke data, and disseminates to coworkers via multiple channels (e.g. huddles, team meetings, departmental Teams page, unit bulletin boards, etc.).
5. Daily (Monday-Friday):
    a. Concurrent review – Reviews daily email for stroke measure compliance of patients in-hospital flagged as possible/confirmed stroke or TIA. Conducts follow-up as indicated with nursing staff and practitioners for education opportunities. Escalates ongoing non-compliance via established channels.
    b. ED thrombolytic cases – Reviews all thrombolytic cases (TNK) for compliance with all measures. Provides summary to ED medical director and ED clinical nursing director in real time, and Stroke Committee by the following meeting. Follow-ups as indicated for education and performance improvement opportunities.
    c. RRT Stroke Alert activations – Reviews all events for appropriateness of RRT Stroke activation, and is point person for bidirectional feedback with unit staff soliciting suggestions for improvement after each in-hospital stroke alert
    d. Attends/participates in Stroke Alert/RRT Stroke Alerts as able and consistent with job description
6. Ongoing:
    a. Perform department specific stroke audits/chart review, ensuring unit meeting benchmarks and develop department specific action plans for compliance below 95%.
    b. Identify opportunities for improvement related to stroke care.
    c. Mentor and develop unit level stroke champions through guidance, support, and continuous learning opportunities.
    d. Communicate with interdisciplinary stroke team, including nurses, clinical director, medical director, hospitalists, imaging, lab, and stroke steering committee members.
7. Periodic:
    a. Participates in Joint Commission PSC mid-cycle review (once every 2 years)
    b. Is the “voice” of the site’s Stroke Program during on-site review (once every 2 years)

By signing below, I agree to meet the Stroke Team Lead expectations outlined above.