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Healthcare provider adherence in prescribing antiplatelet therapy for patients with stroke symptoms within 48 hours upon arrival to hospital

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Healthcare provider adherence in prescribing antiplatelet therapy for patients with stroke
symptoms within 48 hours upon arrival to hospital

A Scholarly Project Presented to the Faculty of the
Nicole Wertheim College of Nursing and Health Sciences

Florida International University

In partial fulfillment of the requirements
For the Degree of Doctor of Nursing Practice

By

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Abstract

Background: According to the Center of Disease Control, stroke accounted for 1 in every 6 cardiovascular-related deaths in the U.S in 2018. This disease is the leading cause of long-term disability and limits mobility in more than half of people who survive stroke older than 65 (Centers for Disease Control and Disease Prevention [CDC], 2020). Due to the difficulty of a full recovery for cerebral vascular accidents, stroke prevention is the top priority in the approach to reduce the mortality and morbidity of the disease. Antiplatelet platelet therapy has been proven to reduce the incidence and complications of an ischemic stroke.

Context: A South Florida Hospital is less than excellent in initiating antiplatelet therapy for patients suspected of ischemic stroke. An educational intervention should be provided to healthcare providers to increase compliance to antiplatelet therapy for stroke patients.

Purpose: The objective of the quality improvement project is to improve healthcare providers' knowledge and compliance towards initiating antiplatelet therapy for patients admitted to the hospital with stroke symptoms.

Methods: A sample of 13 healthcare providers was provided with a link from the medical director of an acute care hospital in South Florida via email. The link included the pre-test survey, education intervention PowerPoint, and post-test survey. The pre-and post- test measure of knowledge and practice habits related to treating patients with ischemic stroke.

Results: There was an 8.9% improvement in scores on the knowledge-based questions in the post-test. Regarding the questions based on practice habits, post-test scores showed a 2% increase when compared to similar pre-test questions.

Conclusions: Therefore, it was proven that the education intervention could improve the knowledge of healthcare providers related to increasing compliance for prescribing antiplatelet therapy for patients with stroke symptoms within 48 hours upon arrival to the hospital.

Keywords: CVA, cerebral vascular accident, stroke, adults, antiplatelet therapy, provider adherence educational intervention

Introduction

Problem Statement

Throughout the years, antiplatelet agents have been proven effective in reducing the mortality, morbidity and recurrence of stroke. These medications help with patients with an acute ischemic stroke or transient ischemic attack. In order for antiplatelet medications to be effective, it is recommended that this medication is given to patients within 48 hours upon arrival to the hospital as long as there are no contraindications. However, many healthcare providers are not adhering to prescribing antiplatelets in a timely manner (“Cleveland Clinic Neurological Institute,” n.d.).

Get With the Guidelines is a notable quality improvement program that evaluates hospitals throughout the nation. This program provides statistics regarding effective treatments for the American Stroke Association and American Heart Association. This encourages healthcare providers to use current evidence-based guidelines to treat stroke patients by serving as a reference. According to Get With the Guidelines, the national average for early antithrombotic initiation was at 97.5% in 2019 (“Cleveland Clinic Neurological Institute,” n.d.). The ultimate goal is to be at 100%.

Background

A cerebral vascular accident, also known as stroke, occurs when there is an interruption of blood flow to the brain. The brain is unable to receive oxygen and blood if the blood flow is blocked for more than a few seconds. When this occurs, brain cells perish, which could result in permanent damage. Ischemic and hemorrhage stroke are two main types of stroke. An ischemic stroke happens when a blood clot blocks or clogs a vessel that supplies the brain with blood. On

the other hand, a hemorrhagic stroke takes place when a blood vessel bursts open or there is a blood leak into the brain (Sbampato dos Santos et al., 2017).

In most cases, a cerebral vascular accident is preventable by limiting the risk factors. Atrial fibrillation, hypertension, heart disease, high cholesterol, and poor blood circulation are all risk factors for stroke. Other risk factors include diabetes, family history of stroke, age older than 55, and unhealthy lifestyles (Sbampato dos Santos et al., 2017).

It is imperative to recognize the signs of stroke and act appropriately to reduce the effects of the disease. Sudden one-sided numbness, weakness or paralysis in the face, arm or leg, confusion is a common sign of stroke. Other signs of stroke include difficulty speaking, difficulty seeing, difficulty walking, and dizziness (Sbampato dos Santos et al., 2017). A severe headache with an unknown cause is also a sign of stroke, commonly hemorrhagic stroke. This may be associated with facial pain or neck stiffness as well (Sbampato dos Santos et al., 2017).

Cerebral vascular accident is one of the world's leading cause of mortality and disability. Ischemic stroke and transient ischemic attack (TIA), are frequently followed by a recurrent vascular event if not managed adequately. Ischemic stroke makes up 80-85% of all strokes (Rothlisberger & Oybiagele, 2015). This type of stroke is commonly caused by large or small blood clots in the artery or a blood clot that has traveled from the heart (Rothlisberger & Oybiagele, 2015).

Furthermore, activated macrophages grow and constrict the artery by producing a procoagulant tissue factor, which leads to the maturation of a thrombosis. Antiplatelet therapy is used to prevent this from occurring. To limit the recurrence of stroke, patients should be on antiplatelet if there are no contraindications. These antiplatelet medications include acetylsalicylic acid, clopidogrel, ticagrelor and several others (Rothlisberger & Oybiagele,

2015). For patients being admitted to the hospital, it is recommended by Joint Commission to initiate antiplatelet medications by the end of the second day of hospital admission. Antiplatelets have shown to limit the mortality and recurrence rate of patients with ischemic stroke.

Antiplatelet therapy may be harmful for patients with a hemorrhagic stroke and could cause more bleeding. Therefore, a CAT scan of the brain should be done to rule out hemorrhagic stroke prior to initiating antiplatelet therapy (Rothlisberger & Oybiagele, 2015).

Scope of problem

Today, there is still a need for more effective treatment approaches towards stroke. Cerebral vascular accident is still one of the world's leading causes of long-term disability and death. Stroke places a burden on patients, families, and society. In 2018, stroke accounted for 1 in every 6 cardiovascular-related deaths in the U.S. Cerebral vascular accidents is the leading cause of long-term disability and limits mobility in more than half of people who survive stroke older than 65. While someone experiences a stroke every 40 seconds, an individual dies from stroke every 4 minutes (Centers for Disease Control and Disease Prevention [CDC], 2020). Cerebral vascular accidents affect about 800,000 people every year; with about 600,000 experiencing strokes for the first time. Ischemic strokes are responsible for 87% of all strokes (CDC, 2020). Between 2014-2015, Cerebral vascular accidents have cost the United States about \$46 billion, which includes medications and health care services to treat the disease and missed workdays (CDC, 2020).

The effects of stroke varies in different ethnic groups. The risk of experiencing a stroke for the first time is almost twice as high for African American compared to whites (CDC, 2020). Stroke causes the highest death rate for blacks. Although stroke-related deaths have decline in

many ethnic groups, Hispanics has seen an increase in death rates. Stroke affects individuals of all ages. In 2009, 34% of people less than 65 years old were hospitalized for stroke (CDC, 2020).

Locally, stroke is the third leading cause of death in Miami-Dade County. This condition accounts for 41.5 deaths per 100,000 population from 2015-2017. Stroke continues to be a significant cause of disability and a significant contributor to increases in healthcare costs in the United States (Florida Department of Health in Miami-Dade County, 2019).

In 2010, the mortality and morbidity of stroke impacted the United States by \$73 billion (Rothlisberger & Oybiagele, 2015). Due to the difficulty of a full recovery for cerebral vascular accidents, stroke prevention is the top priority in the approach to reduce the mortality and morbidity of the disease. Stroke prevention is also vital for patients who have already had a stroke or transient ischemic attack to limit the recurrency rates (Rothlisberger & Oybiagele, 2015).

Stroke also has a worldwide effect. It is the second leading cause of death and it's significant cause of disability globally. As the population ages, the incidence of stroke also increases. And low and middle-income countries, more young people (20-64 years of age) are affected by stroke (Katan & Luft, 2018). This is seen in certain regions in Russia, China, and India. For example, about 12% of stroke in India occur in individuals younger than 40 years old (Katan & Luft, 2018). In high income nations, improvements have been seen in stroke prevention, acute treatment, and rehabilitation, which has led to a significant decrease in the burden of stroke over the past 30 years. Cerebral vascular accident are largely preventable due to modifiable risk factors. These risk factors include hypertension, obesity, smoking, diabetes, dyslipidemia, atrial fibrillation, and lack of exercise. High income countries have an advantage

of addressing these modifiable risk factors; therefore, there has been a decrease in the burden of stroke compared to low and middle income countries (Katan & Luft, 2018).

In 2010, the total annual direct costs were estimated at €26.6 billion for the European Union, Iceland, Norway, and Switzerland (Katan & Luft, 2018). It is believed that India lost about \$54 billion in 2015 due to coronary heart disease, stroke, and diabetes (Katan & Luft, 2018). From 2005-2015, China is believe the laws a national income of about \$558 billion due to coronavirus disease, stroke, and diabetes (Katan & Luft, 2018).

The health disparities of stroke are universal at widespread. Is affected by the ability to afford necessary medical infrastructure and personnel, imbalance access to healthcare, low health literacy, and issues with adherence and compliance and the primary and secondary prevention of stroke care. In terms of gender, the world health organization reported more stroke related deaths among women compared to men between 1990 and 2006, of which 60% accurate in those aged over 75 years of age (Katan & Luft, 2018).

Consequences of the problem

Cerebral vascular accidents impact an individual physically, economically, and mentally. Due to the various functions of the brain, a lack of blood flow to a region that controls a particular body function can cause the body part not to work. For example, a stroke that occurs in the occipital region of the brain can cause visual issues. The effect of the cerebral vascular accident is dependent on the location of the blood flow blockage and how much tissue of the brain is affected (CDC, 2020).

Physical Consequences. Due to the fact that one side of the brain regulates the opposite side of the body, a stroke on one side could affect the other side of the body. For example, a stroke of the left brain can result in right sided paralysis, weakness, numbness, and speech

abnormalities. A right sided stroke can lead to left sided paralysis, weakness, numbness, and visual issues. Visual issues include but are not limited to visual field loss, abnormal eye movement, visual processing issues, and light sensitivity. A stroke at the brain stem can affect both sides leaving individuals in a locked state, where someone can find difficulty speaking or achieving any movements below the neck (CDC, 2020). Stroke can also affect someone's sense of smell and taste. Individuals who have had a stroke have also reported difficulty swallowing. Bladder and bowel incontinence have also been seen in stroke victims. Therefore, a stroke could have a profound effect on someone's quality of life. Stroke survivors also find difficulty performing daily activities that requires multiple limbs, such as eating, dressing, walking, cleaning around the house, toileting, and driving (Lo Buono, Corallo, Bramanti, & Marino, 2017).

Financial Consequences. Beside the physical consequences of stroke, there are also financial impacts. An ischemic stroke costs the United States about \$50 billion a year (Majersik & Woo, 2020). This cost represents acute care hospitalization, initial rehabilitation, follow up visits, medications, and income loss from missing workdays (Majersik & Woo, 2020). Stroke patients are admitted to specialized units, such as stroke, intermediate care or intensive care units. Stroke patients should also be evaluated by a neurologist, physical therapist, occupational therapist, and speech therapist. Majority of stroke patients must undergo a brain MRI. Patients with residual defects of the stroke are often recommended rehabilitation therapy, which can last several weeks or more. All of these requirements during hospitalization contribute to a costly hospital admission. After hospitalization, patients are recommended to follow appointments with their primary care providers and neurologist. Follow up appointments are necessary to prevent recurrent stroke. This can lead to higher healthcare spending. Medication, such as anti-platelets,

anticoagulants, cholesterol, are often suggested for stroke victims. Medications can be costly as well. One sided weakness could limit an individual from working a job that requires physical labor. This can result in job loss or decrease in pay as one may not be able to contribute to the occupation similarly to the way one did before the stroke.

Emotional/Behavioral Consequences. A cerebral vascular accident could also lead to emotional and behavioral changes. Depending on the area affected by the stroke, biochemical changes may occur. These victims could experience confusion, carelessness, irritability, forgetfulness, depression, anxiety, and anger (Lo Buono, Corallo, Bramanti, & Marino, 2017). Neglect is often seen in stroke victims. Neglect occurs when a victim does not pay attention to things on one side of the body. They may also ignore food that is on the affected side of the body. Apathy is also seen in stroke victims. This occurs when survivors lose interest in an activity. Stroke survivors may also experience grief as they face lifestyle modifications to cope with their disabilities. Also, stroke may affect an individual's sex drive as well. No behavioral changes can overwhelm the victims caretaker or a loved one as well. Therefore, there is a significant emotional impact on stroke survivors (Lo Buono, Corallo, Bramanti, & Marino, 2017).

Knowledge Gaps

There are several knowledge gaps that can affect early initiation of antiplatelet therapy amongst healthcare providers in treating patients with ischemic stroke. Many clinicians find it difficult to detect patients with ischemic stroke. Healthcare providers tend to wait until the MRI is done to determine whether or not to initiate antiplatelet therapy (Lambda et al. 2013). MRIs are further delayed due to lack of staff. Many hospitals do not have MRI technicians working at night; therefore, the MRI technicians may be delayed until the morning or the next day. This can

cause the delay to extend beyond the 48-hour period. Clinicians must understand to initiate antiplatelet therapy for patients with suspected stroke as soon as possible if there are no contraindications (Igbal et al., 2020).

Healthcare providers may also feel uncomfortable to begin antiplatelet therapy due to certain contraindications. Therefore, healthcare providers must educate themselves on the contraindications of antiplatelet therapy. Antiplatelet therapy should be used with caution when prescribed to patients with certain conditions such as antiplatelet-induced dyspnea, nasal polyps, gastrointestinal bleeding, hematuria, epistaxis, hemorrhage, and low platelets (Igbal et al., 2020). Most common contraindications of antiplatelet therapy include large esophageal varices, intracranial hemorrhage, significant thrombocytopenia, major surgery within 72 hours, hypersensitivity to medication, acute significant bleeding, severe hypertension with a blood pressure above 200/110 mmHg (Igbal et al., 2020). In these scenarios, it is recommended to consult with a neurologist to determine the need for antiplatelet therapy. Other barriers to initiate antiplatelet therapy includes discussing treatment with patients. Many patients are be reluctant to start antiplatelet therapy due to higher risk of bleeding. They may not understand that the benefits outweigh the risk. Therefore, it requires knowledge from the clinician to be able to explain the significance of antiplatelet therapy. Poor communication among healthcare providers and specialists may also lead to delays in antiplatelet therapy initiation (Igbal et al., 2020).

Proposal solution

As previously discussed, it is apparent that knowledge gaps can delay the initiation of antiplatelet therapy. To address this knowledge gaps, an educational intervention can be done to help bridge the knowledge gaps. Educational intervention has been proven effective in educating healthcare providers (Akwe & Wallace, 2018). Clinicians would be more encouraged to initiate

antiplatelet therapy without waiting for the MRI to be done. Also, they would also be more comfortable prescribe antiplatelets and more cautious when dealing with patients with certain contraindications. When making tough decisions, healthcare providers are encouraged to consult with the neurologist. This quality improvement project includes a pre-test and post-test design to evaluate effectiveness of the educational intervention (Akwe & Wallace, 2018).

Summary of the Literature

Stroke is the nation's leading cause of long-term disability. It affects many Americans today. Due to the difficulty of having a full recovery from a cerebrovascular accident, stroke prevention is the priority in treating stroke patients (Akwe & Wallace, 2018). An educational intervention could be used to encourage healthcare providers to initiate antiplatelet therapy for patients with stroke symptoms within 48 hours upon arrival to the hospital. The PICO question for this proposed study is as follows: Healthcare providers at an acute care hospital in South Florida (P) who have received an educational intervention (I) gain more knowledge than before how they were before receiving an educational intervention (C) in initiating antiplatelet therapy within 48 hours upon arrival to hospital (O). This paper presents a literature review on this topic.

Expanding on the PICO question, subject terms and keywords were found and used in several database searches. When performing the review, a search strategy was in place. CINAHL, Embase, Ebscohost, and PUBMED were the search engines used during this review. Keywords, such as “antiplatelet”, “CVA”, “cerebral vascular accidents”, “stroke”, “TIA”, “transient ischemic attack”, “stroke core measures”, “adherence”, “compliance” and “quality improvement” were used. The search was limited to results between 2015-2020, and articles published in the English language.

Utilizing Order Sets

In this study, electronic health records were created to increase compliance to Joint Commission National Quality Measures for treating veterans with ischemic stroke. The sample took place at the Atlanta Veteran Medical Center. These patients were admitted for a stroke work up to the internal medicine service. This service included an admitting physician, an internal medicine resident, a pharmacist, a nurse practitioner, and two interns. From the 93 patients admitted using the stroke order set, 80% veterans received antiplatelet therapy by the end of hospital day 2 compared to 73 % veterans who were admitted without using the stroke order sets (Akwe & Wallace, 2018). Order sets are evidence-based admission orders that guides clinicians on the treatment of stroke patients. These order sets included early antiplatelet initiation and several other core measures developed by the Joint Commission. Healthcare providers were educated on the significance of these order sets and how to use them. The study suggested that orders sets help close the gap in meeting this core measure based on the results of the study. This research proved that using order sets improved the adherence of health care personnel in administering antiplatelets before the end of day 2 for ischemic stroke patients. The research article is relevant to my clinical question as it provides insight on methods to improve adherence to timely antiplatelet therapy initiation (Akwe & Wallace, 2018).

Concurrent Reviews

Many hospitals have used quality improvement strategies, such as concurrent reviews, to improve compliance to stroke core measures, such as early antiplatelet initiation. Gomes and Silver (2017) analyzed two different hospitals using concurrent review. Concurrent review is a quality improvement method that involves a daily analysis of patients admitted with stroke diagnosis and an evaluation to determine if the healthcare provider's care plan complied with the latest standard of care for stroke management. (Gomes McGillivray & Silver, 2017). For missing

items, the stroke coordinator provided an educational intervention by using direct feedback to the clinician within a day. Charts were randomly selected from two hospitals (A and B) during 3 different time periods. In period 1, none of the hospitals had a process for concurrent reviews. In period 2, hospital A, underwent concurrent reviews and was compared with hospital B without concurrent reviews. In period 3, both hospitals had the process of concurrent reviews. Despite the fact that hospital B had a higher number of beds and annual stroke volume, patient characteristics were similar. During period 2, hospital A applied concurrent reviews and hospital B did not. In Hospital A, 90% patients with stroke symptoms were prescribed antiplatelets within 48 hours upon arrival to the hospital compared to 86% in hospital B who did not implement the concurrent reviews. Both hospitals utilized concurrent review in period 3. Hospital A improved from 60% to 100%; while Hospital B improved from 77% to 93% in period 3. This study had several limitations. One limitation was the possible effect of external influences. The Joint Commission promoted stroke education to increase quality care and focused on specific core measures, such as early antiplatelet initiation. The study concluded that concurrent review is an effective quality improvement method to increase compliance to stroke measures, such as early antiplatelet initiation; hence, making this study relevant (Gomes McGillivray & Silver, 2017).

Multifaceted Quality Improvement Projects

A total of eight studies were reviewed as researchers explored the impact of an educational intervention developed to increase healthcare provider's adherence to initiating antiplatelet therapy for patients with stroke symptoms within 48 hours upon arrival to the hospital. While three of the studies involved over 2000 study subjects, the others involved from 302-1700 study subjects. The intervention in these studies involved implementing a multifaceted

quality improvement project, such as improving the electronic medical records, providing educational materials, interactive workshops and providing feedback reports (Machline-Carrion et al., 2019). The results proved that these quality improvement interventions did improve the clinician's adherence to initiating early antiplatelet therapy for patients with stroke symptoms.

In their study, Machline-Carrion et al. (2019) utilized a multifaceted quality improvement method to increase adherence to initiating early antiplatelet therapy. They used a method called BRIDGE stroke multifaceted quality improvement intervention. This strategy included reminders, healthcare providers educational materials, case management, treatment algorithm, audit and feedback reports, and interactive workshop (Machline-Carrion et al., 2019). The researchers used a pragmatic, two arm clustered randomized trial that involve 36 clusters and 1624 patients from Brazil, Argentina, and Peru. This method gave the strongest level of evidence, level 1. This made their study have a good validity and high reliability. Therefore, this research design made the findings credible (Machline-Carrion et al., 2019).

A similar study was conducted by Wang et al. (2018). The researchers aimed to determine whether a multi-faceted quality improvement intervention could improve healthcare personnel adherence to evidence-based performance measures in patients with stroke symptoms in China. They conducted a cluster randomized clinical trial that included 4800 patients from 40 different hospitals from August 10, 2014, through June 20, 2015, with a 12-month follow up through July 30, 2016 (Wang et al., 2018). Half of the hospitals received the multifaceted quality improvement intervention; while the other half did not. The multifaceted quality improvement intervention included educational intervention, care protocols, clinical pathways, quality coordinator oversight, and feedback report. The study revealed a 4.2% increase from the intervention group and a control group in adherence to early antiplatelet therapy initiation (Wang

et al., 2018). Therefore, the multifaceted quality improvement intervention was proven effective in increasing adherence from healthcare personnel and initiating early antiplatelet therapy.

Patients who present to the emergency department with symptoms, such as syncope, altered mental status, and other non-localized complaints, can also be diagnosed with a stroke. This type of patients is known as a stroke chameleon. Healthcare providers must recognize these symptoms because they are more likely to not to receive antiplatelet therapy in a timely fashion. Gribko et al. (2017) conducted a performance improvement project to improve stroke core measure compliance by performing educational intervention that educated clinicians on how to assess patients not admitted in a stroke unit. The study revealed an increase from 84% to 85.3% in early platelet initiation (Gribko et al, 2017). This study is relevant because it targets the patients that are often missed by clinicians in order for them to provide patients with the appropriate treatment, such as early antiplatelet initiation.

In another study, Su et al. (2017) aimed to analyze the effects of utilizing an educational intervention that promoted antiplatelet prescribing for patients with ischemic stroke. This study took place in Hainan province, China. The interventional group of study included five hospitals, who participated in the educational intervention. This study included 613 stroke patients. The control group included the usual stroke management program. After a year, the amount of patients prescribed on antiplatelets increased substantially, “reaching 73.2%, with a pre-post difference between two arms of 22.9% ($P < 0.01$) (Su et al, 2017). Therefore, the health promotion program was successful in increasing the healthcare provider’s adherence to antiplatelet therapy (Su, 2017).

In a separate study in efforts to address knowledge gaps with thrombolytics in stroke therapy, Lamba, Murano, Nagurka (2013) examined basic stroke management concepts and

ischemic stroke therapy in healthcare providers working in the Emergency Department and then assessed the impact of the educational intervention. These researchers used a 14-item questionnaire, which included 11 multiple choice and 3 open ended questions; this was given to 58 healthcare providers in a Level 1, academic, urban hospital. A 15-minute lecture was provided and a post-test was administered immediately and 6 months after. Out of the 58 participants, 77% recognized r-TPA as a thrombolytic agent, 62% reported unfamiliarity with the National Institute of Health's Stroke Scale and the eligibility criteria, 56% identified the therapeutic window, and 29% knew the "Door-to-CT" time (Lamba, Murano, & Nagurka, 2013). The educational intervention resulted in an increase in median score from 5/14 pre-education to 11/14 post educational intervention (Lamba, Murano, & Nagurka, 2013). This study is effective in improving knowledge of stroke guidelines and may subsequently improve prescribing behaviors.

Gutierrez-Jimenez et al. (2011) also examined the impact of an educational program by targeting medical students. During this study, researchers gave individuals a survey to determine the knowledge of the warning signs and risk factors of ischemic stroke. The participants then underwent six month education program, which was then followed by a post-educational intervention survey. Researchers noticed an increase from 57.1% to 65.9% in participants that were able to recognize risk factors (Gutiérrez-Jiménez et al., 2011). In regard to warning signs of stroke, the educational intervention improved from 37.6% to 48.1% for participants being able to recognize signs of stroke (Gutiérrez-Jiménez et al., 2011). This relevant study shows that educating novice healthcare providers helps them recognize warning signs and risk factors of stroke in order to prevent delay of care.

Ma et al. (2017) also aimed to assess the knowledge of physicians regarding fibrinolytic therapy for acute ischemic stroke in efforts to improve utilization fibrinolytic therapy in China. Physicians completed a 12 multiple-choice question on the basic knowledge of intravenous fibrinolytic therapy for acute ischemic stroke. These questionnaire assessed: time window for fibrinolysis, imaging results required fibrinolysis, lab results required for fibrinolysis, dose of alteplase, and several scenarios on whether or not to administer fibrinolytic therapy. Results showed that the mean accuracy rate of 12 questions was $54.9 \pm 25.01\%$ (range 0.8–96.2%) (Ma et al., 2017). This represents a knowledge deficit among healthcare providers, which can be address with an educational intervention.

From this literature review, it was proven that there are effective quality improvement interventions towards increasing clinicians' adherence to initiating early antiplatelet therapy for patients with stroke symptoms. The quality improvement method focused on an educational intervention that addressed proper utilization of updating orders sets, using concurrent reviews to educate staff, and promoting educational workshops in efforts to increase the knowledge of clinicians. Increasing the knowledge of healthcare provider's will help bridge the knowledge gap and increase compliance to early antiplatelet therapy initiation. Overall, this literature review supports my quality improvement project by addressing different types of educational intervention.

Author	Method	Summary of Findings
Akwe & Wallace, 2018	The hospitalist at Alana veterinary Medical Center conducted a study that involved where clinicians were educated on using evidence-based admission orders for all patients admitted for stroke or TIA. Results were	From the 93 patients admitted using the stroke order set, 80% veterans received antiplatelet therapy by the end of hospital day 2 compared to 73 % veterans who were admitted without using the stroke order sets.

	compared to clinicians who didn't use the order states. The study included a number of 323 patients.	
Gomes & Silver, 2018	620 charts from 2 hospitals (A and B) were randomly selected during 3 time periods were reviewed. In period 1, none of the hospital had a process for concurrent review. In period 2, hospital A, where concurrent review was implemented, was compared with In period 2, hospital A, where concurrent review was done, was compared with hospital B, without the concurrent reviews. In period 3, both hospitals received the process.	During period 2, hospital A applied concurrent reviews and hospital B did not. In Hospital A, 90% patients with stroke symptoms were prescribed antiplatelets within 48 hours upon arrival to the hospital compared to 86% in hospital B who did not implement the concurrent reviews. Both hospitals utilized concurrent review in period 3. Hospital A improved from 60% to 100%; while Hospital B improved from 77% to 93% in period 3.
Machline-Carrion et al., 2019	Researchers utilized a randomized controlled trial that involved 36 clusters and 1624 patients from Brazil, Argentina, and Peru. They conducted a multifaceted quality improvement method, named BRIDGE stroke multifaceted quality improvement intervention, to increase adherence to initiating early antiplatelet therapy.	The quality improvement project access at the bridge ACS Trail resulted in an 18% increase of uptake of evidence-based therapies during the first 24 hours, as seen but increased prescription rates of anti-thrombotic therapies and statins.
Wang et al., 2018	They conducted a cluster randomized clinical trial that included 4800 patients from 40 different hospitals from August 10, 2014, through June 20, 2015, with a 12-month	The study revealed a 4.2% increase from the intervention group and a control group in adherence to early antiplatelet therapy initiation.

	follow up through July 30, 2016 (Wang et al., 2018). Half of the hospitals received the multifaceted quality improvement intervention; while the other half did not.	
Gribko et al., 2017	Researchers conducted a performance initiative that included educating clinicians and using a stroke core measure checklist. Compliance was measured 24 months pre-intervention and 12 months post intervention. This was a three-year study that took place in a comprehensive stroke center and included 3,355 patients who had a stroke diagnosis.	The study revealed an increase from 84% to 85.3% in early platelet initiation.
Su et al., 2017	The researchers utilize a pre- and post-educational intervention program that involve 613 stroke patients to promote anti-platelet prescribing for a patient with ischemic stroke.	After a year, the amount of patients prescribed on antiplatelets increased substantially, reaching 73.2%, with a pre-post difference between two arms of 22.9%.
Lamba, Murano, Nagurka, 2013	The researchers aimed to improve stroke therapy in healthcare providers working in the Emergency Department. They used a pre and post-test educational intervention that included a 15 minute lecture followed by an immediate posttest and a posttest that followed 6 months after. There were 58 participants.	The educational intervention resulted in an increase in median score from 5/14 pre-education to 11/14 post educational intervention.
Gutierrez-Jimenez et al., 2011	Researchers conducted a pre- and post-educational	Researchers noticed an increase from 57.1% to 65.9% in

	<p>intervention that assessed the knowledge of fourth year medical students in regard to warning signs and risk factors of stroke. Medical students were from the School of Medicine of the Universidad Autonoma de Nuevo Leon in Monterrey, Mexico.</p> <p>Researchers perform 329 pre-test and 355 posttest surveys.</p>	<p>participants that were able to recognize risk factors (Gutiérrez-Jiménez et al., 2011). In regard to warning signs of stroke, the educational intervention improved from 37.6% to 48.1% for participants being able to recognize signs of stroke.</p>
Ma et al., 2017	<p>Authors aimed to assess the knowledge of physicians regarding fibrinolytic therapy for acute ischemic stroke in efforts to improve utilization fibrinolytic therapy in China. Physicians completed a 12 multiple-choice question</p>	<p>Results showed that the mean accuracy rate of 12 questions was $54.9 \pm 25.01\%$ (range 0.8–96.2%)</p>

Purpose/PICO Clinical Questions/Objectives

Will an educational intervention improve healthcare providers' adherence to prescribe antiplatelet therapy to stroke patients within the recommended timeframe.

Population: Healthcare provider's at an acute care in South Florida

Intervention: Performing an educational intervention to improve healthcare providers' adherence to prescribe antiplatelet therapy within the first 48 hours upon arrival for patients with stroke symptoms

Comparison: Pre-Post Test

Outcome: Improved adherence to prescribing antiplatelet therapy within the first 48 hours upon arrival for patients with stroke symptoms Knowledge should be here.

Specific: To increase the adherence of healthcare providers initiating antiplatelet therapy for patients with stroke symptoms within 48 hours upon arrival to an acute care hospital in South Florida.

Measurable: Compare the adherence rate of healthcare providers prescribing antiplatelets for patients with stroke symptoms within 48 hours upon arrival with the adherence rate for healthcare providers prescribing antiplatelets for stroke patients within 48 hours after the educational intervention. For immediate results, a pre-test and post-test would be given to providers after an educational intervention.

Attainable/Achievable: To perform a quasi experimental pre and post test design to analyze the effects of implementing of educational interventions to improve adherence for healthcare providers initiating antiplatelet therapy within the first 48 hours upon arrival to the hospital in a three-month time span.

Relevant: Today, more effective treatment towards stroke is needed. Stroke is one of the nation's leading cause of long-term disability. This disease puts a burden on patients, their families, and society. There are physical, mental and financial impacts of cerebrovascular accidents. From a physical standpoint, a stroke in one side of the brain can result in symptoms on the other side of the body. These symptoms include one-sided paralysis, weakness, numbness, and speech abnormalities. Stroke symptoms could prevent an individual from carrying out work duties. Victims of stroke have a hard time doing daily functions, such as dressing, eating, driving, toileting, and cleaning around the house (Lo Buono, Corallo, Bramanti, & Marino, 2017). Ischemic stroke has cost society nearly \$50 billion a year in acute care hospitalization,

follow up visits, medications, initial rehabilitation, and income loss from missing workdays (Majersik & Woo, 2020). Mentally, biochemical changes in the brain can occur due to stroke. These changes could lead to carelessness, confusion, forgetfulness, irritability, anxiety, and depression in stroke victims (Lo Buono, Corallo, Bramanti, & Marino, 2017). Many stroke victims must learn to cope with their disabilities, which may cause grief. It is also known that stroke may affect one's libido as well. Thus, stroke has a substantial impact on its victims (Lo Buono, Corallo, Bramanti, & Marino, 2017).

It is very difficult to expect a full recovery from stroke; hence, the top priority of treating cerebral vascular accidents is to prevent it with several measures, such as early initiation of antiplatelet therapy. Stroke prevention is also important for victims who already had a stroke or transient ischemic attack as recurrent strokes can be limited (Rothlisberger & Oybiagele, 2015). As previously stated, stroke is responsible for 41.5 deaths per 100,000 population in Miami-Dade alone (Florida Department of Health in Miami-Dade County, 2019). Currently at this chosen acute care hospital in South Florida, 91% of patients have received antiplatelet therapy within the first 48 hours upon arrival within March to July ("Aventura Hospital," n.d.). The goal is to increase that percentage to 100%. Improving early initiation of antiplatelet therapy by nine percent can have a significant impact on society, patients and their loved ones.

Time: Over a span of 3 months

Definition of Terms

Antiplatelet- medication that prevents cells in the blood from sticking together and creating a clot

Tissue plasminogen activator (TPA)- serine protease enzyme that dissolves blood clots by serving as a catalyst to convert plasminogen to plasmin, main enzyme involved in dissolving blood clots.

Cerebrovascular accident- when blood flow to an area of the brain is interrupted by a blockage or rupture in the blood vessel.

Hemorrhagic stroke- type of stroke that occurs when a weakened blood vessel in the brain breaks and bleeding occurs

Ischemic stroke- type of stroke that takes place when there is a blockage in a blood vessel in the brain

Order Sets- a group of orders that a clinician uses to direct other healthcare workers regarding the treatment of a patient

Stroke symptoms- sudden difficulty speaking, walking, understanding, and one-sided weakness/numbness in the face, arm or leg.

Transient ischemic attack (TIA)- takes place a blood flow to the brain is interrupted for a short amount of time, often less than 15 minutes

Methodology

The Plan-Do-Study-Act (PDSA) methodology model will be used as a reference to guide the quality improvement project (Spath & Kelly, 2017). The PDSA method is a highly respectable tool for developing, implementing, and reviewing a quality improvement project on a smaller platform before executing the project on a larger platform. This method is frequently used for quality improvement in many institutions (Spath & Kelly, 2017). The Plan part of the PDSA method involves doing a literature review. A literature review was conducted to review systematic reviews, meta-analysis, and primary research studies. It is vital to have relevant

sources that are connected to my clinical question: Can an educational intervention increase healthcare providers adherence to early antiplatelet therapy initiation for stroke patients within 48 hours upon arrival to the hospital? In conducting the literature review, a sufficient amount of evidence was found to back my clinical question. The literature review contained quality improvement methods, which included a pre-test and post-test survey that assessed the effectiveness of an educational intervention. The Do aspect of the PDSA method involves the educational intervention. Healthcare providers will be taught the benefits of early antiplatelet therapy initiation in efforts to increase compliance. The study portion of the PDSA method encompasses utilizing an independent t-test to analyze the difference between the pre-test and post-test. This would measure the effectiveness of the educational intervention. Act is the last step of the PDSA method, which involves carrying out the action. If the educational intervention has been proven effective in increasing healthcare provider's compliance to initiating early antiplatelet therapy, more participants can be used for educational intervention to improve quality in stroke care. If the educational intervention produces minimal or negative results, a reevaluation of efforts and measures will take place (Moran, 2020).

Settings and Participants

In Miami-Dade County, cerebral vascular accidents are the third leading cause of death. Stroke has been responsible for 41.5 deaths per 100,000 population from 2015-2017 (Florida Department of Health in Miami-Dade County, 2019). This condition leads to an increase disability and healthcare costs in the community (Florida Department of Health in Miami-Dade County, 2019). Therefore, it is essential to prevent stroke or minimize the effects of stroke, especially recurrent stroke. Antiplatelet therapy has been proven to significantly prevent or minimize the effects of stroke (Johnston et al., 2018).

The chosen acute care hospital in South Florida is a private hospital in Miami-Dade County that holds over 400 beds. This hospital also has a stroke team that includes many specialties, such as neurology, neurosurgery, neuro-interventionists, and neuroradiologist. The DNP student will be working with the stroke committee leader, Dr. Lozen, in performing an educational intervention to increase compliance to early initiation of antiplatelet therapy. In this hospital, 91% of patients have been started on antiplatelet therapy within the first 48 hours upon arrival within March to July (“Aventura Hospital,” n.d.). The goal is to have 100% of eligible patients suspected for ischemic stroke to be initiated on antiplatelet therapy. The participants of this project include internal medicine and neurology healthcare providers. This includes physicians, internal medicine residents, nurse practitioners, and physician assistants. This makes up about 25 healthcare providers. The inclusion criteria for healthcare providers included full-time physicians, internal medicine residents, medical fellows, nurse practitioners, and physician assistants. These participants are all over the age of 21 and can speak, write, and read English. They are all eligible to initiate antiplatelet therapy. Per diem employees were excluded from the sample (Moran et al, 2020).

Design

This quality improvement project was designed as a quasi-experimental pre-test/post-test intervention. It is pending review and approval for use with human subjects and deemed exempt by Florida International University’s Internal Review Board. The project consisted of three main components. The first part was an initial assessment of providers' knowledge and practices regarding ischemic stroke treatment guidelines. After the pre-test, an educational intervention was delivered by a PowerPoint presentation. Following the presentation, there would be time for

questions and then a post-test would be completed to assess the effects of the educational intervention (Moran et al., 2020).

The pre-test consisted of an electronic questionnaire developed by the DNP student using the Qualtrics system. It included two demographic questions, 11 self-assessment questions of knowledge of ischemic stroke, and six questions that assess habits. The pre-test and post-tests and the intervention were developed by the DNP student and were reviewed for validity by an expert physician specialized in neurology (Moran et al, 2020).

A literature review was used in the development of the PowerPoint educational intervention. The PowerPoint presentation provides a comfortable atmosphere for healthcare providers that will participate in this quality improvement project (Moran et al, 2020). The educational intervention considers the skill levels, attitudes, and prior knowledge of the healthcare providers. This educational intervention is also relevant to their practice as these participants either work in internal medicine or neurology, where many stroke patients are encountered. The educational intervention would last no longer than an hour to take the participant's personal/work time into consideration. Time for questions and feedback related to the intervention was also recognized as an essential component. The success of the educational intervention can lead to organizational benefits as better policy may be created to promote more compliance for early antiplatelet initiation (Moran et al, 2020).

In developing the educational intervention, relevant topics were discussed that affected the practice of healthcare providers. For example, they were taught about proper dosing, location of stroke order sets, and practice habits that affect timely initiation of antiplatelet therapy. The hospital environment was taken under consideration when developing the educational intervention (Moran et al, 2020). The quality improvement project focuses on the scope of the

problem of ischemic stroke and treatment, specifically antiplatelet therapy using evidence-based guidelines of the NIHSS. This would be delivered through Zoom, which allows participants to ask questions verbally and via chatbox (Moran et al, 2020).

Procedures and Measures

With the assistance of the medical director of the acute care hospital's stroke committee, Dr. Andrew Lozen, the DNP student developed a virtual educational intervention, which included a pre-test to each participant's email through an anonymous link for the Qualtrics system.

Due to the restrictions of COVID-19, large gatherings are not allowed from the Governor of Florida. No names or identifiers were included in the survey to protect privacy. Following a short introduction by the DNP student, the participants will be asked to sign an informational consent and take a pre-test. After the pre-test, an educational intervention will be delivered through a PowerPoint presentation. A post-test followed the educational intervention to measure the effectiveness of the presentation. The educational intervention should not last longer than 60 minutes. The pre-test and post-test should last about 10 minutes (Moran et al, 2020).

During the presentation, any questions that are verbally asked or submitted through the chatbox of the Zoom platform will be addressed by the DNP student. After the PowerPoint presentation, the link for the post-test was provided through an anonymous link to the Qualtrics system through the email or Zoom chat box. The post-test concluded the presentation (Moran et al, 2020).

Recruitment

An email would be used to announce to reach out to healthcare providers on the upcoming educational conference. Dr. Andrew Lozen would assist in sending out the emails to the

healthcare providers. The email includes a brochure that includes brief information about the education intervention. The brochure would include the qualifying participants, which includes nurse practitioners, physician assistants, medical residents, medical fellows, and attending physicians that specialize in internal medicine or neurology. The recruitment brochure informs the participants would be asked to take a pre-test and post-test. It also informs participants that the entire presentation will not last longer than an hour. The contact information of the DNP student, principal investigator and coinvestigators would also be provided (Moran et al, 2020).

Protection of Human Subjects/Data management

The Qualtrics system will collect the data after each education intervention. There will not be any names or identifiers included to protect privacy and comply with the Health Insurance Portability and Accountability Act (HIPPA). Also, an application will be completed and submitted by Florida International University Review Boards to comply with the protection of human subjects involved in the study and research ethics. The standards and interventions will be encrypted and documented (Moran et al, 2020).

Data Collection, Management and Analysis Plan

The Qualtrics system included the pre-test and post-test data. Statistics and scores were examined and compared. Practice habit questions and knowledge questions were analyzed differently. Descriptive and comparative graphs will also be used. Based on the results, conclusion will then be drawn to comprehend the effectiveness of the educational intervention (Moran et al., 2020).

Results

This quality improvement project consisted of 13 participants; however, only 12 of them completed the pre-test and post-test questionnaires. The demographic data of the participants

who completed the survey can be found in Table 1. Nurse practitioners (n=6, 46.2%) was the most common profession that were involved in the survey. Majority of the participants had three or more years of experience in Internal Medicine. The response rate to the post-test was 92%. There is an unclear reason for failure to complete the program by the one participant; however, this participant may have not understood that a post-test was necessary to assess the effectiveness of the educational intervention.

Table 1

Participant demographics

	Physicians	Nurse Practitioner	Physician Assistants
# of Professionals	4	6	3
% of Professionals	30.8%	46.2%	23%
	0-1 years	1-3 years	3 or more years
Years of Exp.	1	2	10
Experience %	7.7%	15.4%	76.9%

Overall, there was an improvement in the average scores between the pre-test and post-test surveys as seen in Table 2. In total, the overall scores increased by 5% after the educational intervention. There was a 23% increase on the question regarding STK-5. Regarding the definition of antiplatelet medications, an 8% increase was found after the educational intervention. Post-test average score for the deadline for antiplatelet therapy initiation increased by 12% when compared to the pre-test results. Regarding understanding stroke chameleons, there was a 2% decrease in the post-test results. When discussing the appropriate aspirin dosage for suspected stroke patients, there was a 23% increase in the post test results. The question

regarding the appropriate unit for stable stroke patient resulted in a 2% decrease from the post-test. There was no change in the question regarding administering antiplatelets for patients who failed the dysphagia screening. The last three questions were based on practicing habits. There was a 3% decrease in the tendency to order brain images for patient suspected of stroke. However, an 8% increase in the post-test was found in the question about prescribing an antiplatelet therapy for stroke patients upon discharge. Lastly, there was a 1% increase in patient education regarding follow up visits, medication prescribed at discharge, and warning signs of stroke.

Table 2

Pre-test and post-test analysis

Questions	Pre-test average	Post-test average	Change
STK-5	69%	92%	+23%
Antiplatelet	8%	16%	+8%
Time of antiplatelet initiation	38%	50%	+12%
Stroke Chameleon	77%	75%	-2%
Aspirin Dosage	69%	92%	+23%
Unit for stable stroke patients	85%	83%	-2%
Dysphagia screen	100%	100%	0
Ordering imaging	100%	97%	-3%
Discharge	92%	100%	+8%
Patient education	92%	93%	+1%

Total score	87%	93%	+5%
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Pre-test analysis

Characterization.

Respondents were asked to complete a questionnaire. The pretest began with two demographic questions, then seven knowledge-based questions, followed by three practice habit questions. Overall, there was a 5% increase in the post-test questionnaire that followed the educational intervention. The average score in percentage for the pre-test was 87% compared to 93% in the post-test questionnaire.

STK-5

The Joint Commission National Quality Measures describes STK-5 as antiplatelet therapy by the end of hospital day two. This core measure is monitored throughout hospitals. It is important for healthcare providers to be aware of this core measures as it relates to hospital reimbursement for stroke patients. In the pre-test, 69% of healthcare providers answered this question correctly. About 31% believed STK-5 was related to antiplatelet therapy, such as TPN. None of the participants identified STK-5 as venous thromboembolism prophylaxis and the need to assess stroke patients for rehabilitation.

Antiplatelet

Antiplatelet medications can be used interchangeably with antiplatelet medication. These medications work by preventing platelet aggregation, which was response C. Majority of the participants answered this incorrectly. About 77% of respondents (n=10) chose D, which stated A and C. Response A stated that an antiplatelet is a drug that prevents the coagulation of blood by reducing fibrin formation. The correct response is Response C, not Response D. Response D

included Response A and Response C. Only one person (7.7%) answered the question correctly and chose Response C. About 15% of participants (n=2) chose Response A. No respondents chose Response B, which stated a drug that breaks down blood clots in blood vessels.

Time of Antiplatelet Initiation

The latest time to initiate antiplatelet therapy is by the end of hospital day two. For example, if a patient was admitted to the hospital for rule out stroke at 11 PM on October 2, 2020, antiplatelet therapy should be initiated by 12 AM October 4th for eligible patients. Therefore, the correct answer is option A. About 38% of healthcare providers (n=5) answered this correctly. Five participants also chose option B, which stated by 12 AM October 3. Three participants chose option C, which stated by 12 AM October 2. There were no participants that chose option D, by 12 AM October 5th.

Stroke Chameleon

Question Four was a true or false question that defined stroke chameleon. Stroke chameleons are known as patients that presented to the hospital with altered mental status, syncope, and other non-localizing complaints that eventually are diagnosed with a stroke. 10 respondents (76.92%) chose true, which is the correct answer. Three of them chose false.

Aspirin dosage

The appropriate dosage for aspirin in the treatment of patients with suspected ischemic stroke ranges from 81 mg to 325 mg. Nine participants (69.23%) answered correctly by choosing Response B, which stated 81 mg to 325 mg. Four healthcare providers chose Response D, which stated 162 mg to 243 mg. None of them chose Response A (81 mg to 330 mg) nor Response C (126 mg to 400 mg).

Unit for stable stroke patients

Stable stroke patients should be admitted to the step-down unit. About 85% of the participants (n=11) answered this question correctly by choosing Answer C, which stated step-down unit. One healthcare provider chose the telemetry unit (Answer B) and another chose the intensive care unit (Answer D). There was no participant that chose the medical-surgical unit (Answer A).

Dysphagia screen

The seventh question represented another true and false question. For a patient who failed their dysphagia screening, antiplatelets can be administered rectally; therefore, the answer to this question is true. All 13 responders chose true. There were not any respondents that answered this question incorrectly by choosing false.

Ordering imaging

Question Eight aimed to assess the practice habits of these healthcare providers. The purpose of this question was to understand how often healthcare providers were ordering brain images, such as CT scan and MRI of the brain, for a patient suspected of stroke. All healthcare providers chose response three, which stated always. Those who chose this earned three points. Individuals who would have chosen response two, which stated it sometimes, would have scored only two points. Lastly, those who would have chosen response one, which stated never, would have not earned any points.

Discharge

The ninth question also intended to analyze the practice habits of healthcare providers in regard to prescribing anti-thrombotic therapy for ischemic stroke patients upon discharge. Majority of participants answered Response D (Greater than 75% of the time), which provided the highest score of four. One participant chose Response C (50 to 75% of the time), which

scored three points. Another one chose Response A (Less than 25% of the time), which earned one point. No one chose Response B (25-50% of the time), which could've scored two points.

Patient education

The goal of Question Ten was to see how often healthcare providers provided stroke patients with education with the need to follow up after discharge, medication as prescribed at discharge, risk factors for stroke and warning signs of stroke. About 85% of healthcare providers (n=11) chose Response Five, which stated always. One healthcare provider chose Response Four, which stated most of the time. Another healthcare provider chose Response One, which stated never. No one chose Response Two (sometimes) nor Response Three (about half the time).

Post-test analysis

Characterization.

The participants were also asked to complete a post-test questionnaire following the educational intervention. The post-test included the same seven knowledge-based question and three practice habit questions as the pre-test. Overall, a 5% increase was found in the post-test. The average score in percentage for the post-test was 93% compared to 87% in the pre-test questionnaire.

STK-5

In the post-test, 91% of healthcare providers (n=11) answered this question correctly by identifying STK-5 as antiplatelet therapy by the end of hospital day two. This was a significant increase from 69% that answered the question correctly. One healthcare provider believed STK-5 was related to antiplatelet therapy, such as TPN, compared to the 31% in the pretest. None of

the healthcare providers identified STK-5 as venous thromboembolism prophylaxis and the need to assess stroke patients for rehabilitation.

Antiplatelet

In the post-test survey, two participants (16.67%) answered the question correctly and identified antiplatelet medications as medications that work by preventing platelet aggregation, which was Response C. This was an increase compared to only one participant that answered correctly in the pre-test. 75% of the participants still answered this incorrectly and chose Response D, which stated A and C. On a positive note, this percentage decreased from 77% to 75%. One participant chose Response B, which stated drug that breaks down blood clot in blood vessel. No participant chose Response A, which stated that an antiplatelet is a drug that prevents the coagulation of blood by reducing fibrin formation.

Time of Antiplatelet Initiation

The correct answer is Option A, which stated by 12 AM October 4th. There was a 12% increase in the post-test compared to the pre-test. Therefore, one more person answered correctly. Four participants also chose Option B, which stated by 12 AM October 3. Three participants chose Option C, which stated by 12 AM October 2. There were no participants that chose Option D, by 12 AM October 5th.

Stroke Chameleon

Question Four was a true or false question that defined stroke chameleon as patients that presented to the hospital with altered mental status, syncope, and other non-localizing complaints that eventually are diagnosed with a stroke. Less respondents (n=9, 75%) answered this correctly in the post-test than the pre-test, which had 10 correct answers (76.92%). Three respondents chose false.

Aspirin dosage

In the post-test questionnaire, more participants answered this question correctly. About 92% of the participants answered right compared to the 69% (n=9) in the pre-test. One healthcare provider chose Option C, which stated 126 mg to 400 mg. None of them chose Response A (81 mg to 330 mg) nor Response D (162 mg to 243 mg).

Unit for stable stroke patients

As previously discussed in the pre-test analysis, stable stroke patient should be admitted to the step-down unit. Less participants (n=10, 83.33%) answered this correctly in comparison to the pre-test, which 85% of the participants (n=11) answered this question correctly. Two participants chose Option B, telemetry unit. There was no participant that chose the medical surgical unit (Option A) nor intensive care unit (Option D).

Dysphagia screen

Just as in the pre-test, all respondents (n=12) answered correctly by picking true. True meant that patients who failed their dysphagia screening may still receive antiplatelet medication, which could be administered rectally. There were not any respondents that answered this question incorrectly.

Ordering imaging

The eighth question aimed to assess the practice habits of these healthcare providers and understand how often healthcare providers were ordering brain images, such as CT scan and MRI of the brain, for a patient suspected of stroke. There was a slightly less favorable response to this question. 11/12 healthcare providers chose Response Three, which stated always. Those who chose this received three points. In the pre-test, all the healthcare providers chose Response Three or always. One individual chose Response Two, which stated sometimes. This person

received two points. Lastly, those who would have chosen response one, which stated never, would have scored one point.

Discharge

Question Nine also intended to analyze the practice habits of healthcare providers regarding prescribing antiplatelet therapy for ischemic stroke patients upon discharge. There was a better response in the post-test compared to the pre-test. All participants picked Response D (Greater than 75% of the time), which provided the highest score of four. No other participant chose Response C (50 to 75% of the time), Response A (Less than 25% of the time), nor Response B (25-50% of the time).

Patient education

As stated in the pre-test analysis, the aim of question 10 was to see how often healthcare providers provided stroke patients with education with the need to follow up after discharge, medication as prescribed at discharge, risk factors for stroke and warning signs of stroke. There was a slightly worse response in the post-test compared to the pre-test. About 83% of healthcare providers (n=10) chose Response Five, which stated always in comparison to 85% in the pre-test. One healthcare provider chose Response Four, which stated most of the time. Another healthcare provider chose Response Two, which stated sometimes. None chose Response One (never) nor Response Three (about half the time).

Discussion

Overall, the average scores improved after participants completed the educational intervention. There were improvements found in the STK-5 core measure, understanding of the significance of antiplatelet medications, the proper timeline to initiating antiplatelet therapy and the appropriate dose for aspirin in treating patients with stroke. The educational intervention also

improved the practice habits of healthcare providers by encouraging them to discharge eligible patients on antiplatelet medications and educating them on stroke and stroke management. Out of the 10 categories, only three sections showed negative impacts. The biggest difference was a -3% impact on the practice habits of ordering images for stroke patients. Understanding stroke chameleons and where to send stable stroke patient also showed a negative influence of -2%. Regarding administering antiplatelet medications to patients who failed their dysphagia screening, there was no improvement because all participants answered the question correctly.

Considering all this, an educational intervention proved that it could improve the knowledge of healthcare providers and improve their practice habits in prescribing antiplatelet medications to patients with stroke symptoms within 48 hours upon arrival to the hospital. This will lead to better patient care when treating patients with stroke.

Limitations

Like many quality improvement projects, there were a few limitations that concerned this DNP project while developing an educational intervention. Due to the impact of the COVID-19 pandemic, in-person interactions were restricted. This could have affected the effectiveness of the educational intervention. Participants would have felt more encouraged to ask questions to a particular subject they may not have understood well. Since the pre-test and post-test survey were given electronically, participants were not supervised and could have used testing aids to help them answer certain questions. However, the findings of this study should be examined considering these limitations. Through persistence, this quality improvement project was able to work around these limitations and provide enough evidence to conclude this study.

Implication for Advanced Nursing Practice

Antiplatelet therapy plays an integral role in ischemic stroke prevention and management. Healthcare providers should be familiar with the latest guidelines for treatment of ischemic stroke to prevent negative consequences. These negative consequences include the physical, economic, and mental effects that were discussed earlier (Johnston et al., 2018). Not only should healthcare providers be aware of the significance of antiplatelet therapy, but they should also be knowledgeable enough to be able to teach patients on the need for antiplatelet therapy and importance of adhering to the therapy (Faiz et al., 2019). Healthcare providers should also educate patient on the complication of antiplatelet therapy, which includes bleeding. Also, they must also be aware of barriers for medication adherence, such as patients with a history of dementia and medication noncompliance (Faiz et al. 2019).

This quality improvement project impacts the nursing practice in the school and outpatient settings as well. Nursing students will be encouraged to check for antiplatelet therapy in patients admitted for ischemic stroke. They would be more knowledgeable to educate their preceptor and motivate them to call healthcare providers to start their patients on antiplatelet therapy if there are no contraindications. From an outpatient perspective, this quality improvement project could encourage primary care providers to encourage their patients to stay compliant with antiplatelet therapy to prevent the recurrency of stroke.

Conclusion

It is practical to improve the knowledge of healthcare providers regarding early initiation of antiplatelet therapy for patients with stroke symptoms through an educational intervention. Improving this knowledge should result in a better outcome of stroke management. Over time, stroke patients will be able to manage their illness better with antiplatelets medications, which

would limit the negative impacts that stroke may bring to their physical, mental, and financial situations.

Dissemination

The dissemination plan is very essential to any scholarly work. It increases the awareness of the research to enhance the goals of the quality improvement project. Evident research findings encourage stakeholders to engage in more evidence-based practices, which would improve the health outcomes of patients. The stakeholders for this quality improvement project were executive members, physicians, nurse practitioners, physician assistants and registered nurses.

This quality improvement project has several dissemination plans. Initially, the quality improvement project would be presented at the acute care hospital that was reviewed in the study. This would aim to improve healthcare providers' adherence to prescribe antiplatelets for eligible patient with stroke symptoms within the first 48 hours upon arrival. Also, this quality improvement project would be presented at a Florida Nurses' Association conference. This would encourage other clinicians to conduct educational interventions to improve the knowledge of healthcare providers. Thirdly, this quality improvement project paper would be submitted to the American Academy of Neurology journal. This would serve to educate others on improving antiplatelet therapy utilization and promote educational interventions to improve the knowledge of healthcare providers.

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Appendix A: Recruitment Materials

How much do you know about treating patients with stroke symptoms?



How to qualify: Nurse practitioners, Physician assistants, Medical Residents, Medical Fellows, and Physicians

What will you do: Take a pre-test, view educational intervention PowerPoint, and take a post educational intervention test

How much time: 1 hour

“Let’s improve stroke care”

Volunteers are needed to improve stroke care throughout the hospital.

For additional Information please contact:

<p>James Celestin, MSN, FNP-C Principal Investigator: Florida International University Nicole Wertheim College of Nursing</p> <ul style="list-style-type: none"> • Phone: (786) 873-9735 • Email: jacelestin08@yahoo.com 	<p>Mechell Duran, DNP, APRN, FNP-BC, BC-ADM, CDCES, Clinical Assistant Professor Florida International University Nicole Wertheim College of Nursing</p> <p>Email: meadavi@fiu.edu</p> 	<p>Dr. Andrew Lozen, M.D. Stroke Program Director Wayne State University School of Medicine</p> <ul style="list-style-type: none"> • Email: andrewlozen@yahoo.com 
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Florida Aging Registry is sponsored by the National Institute on Aging #
FIU IRB #

Appendix B: Informational Letter

You are being asked to participate in a quality improvement project at Aventura Hospital and Medical Center. The principal investigator of this quality improvement project is Dr. Mechell Duran, a faculty member at Florida International University. The co-investigators of this project are James Celestin, a doctoral candidate at FIU, and Dr. Lozen, medical director of the stroke committee at Aventura Hospital and Medical Center. This project will include 25 healthcare professionals. Presentation may last an hour. You'll be given a pre-test, undergo an educational intervention, and take a post-test to evaluate the effectiveness of the educational intervention regarding early initiation of antiplatelet therapy for stroke patients. The quality improvement project aims to improve the knowledge of healthcare providers on stroke treatment and improve patient outcomes in the acute care setting.

Completion of this quality improvement project is completely voluntary.

If you agree to partake in this study and complete the pre-and post-questionnaire, all your responses will be strictly confidential. Only Dr. Duran, Dr. Lozen, and James Celestin will see the individual surveys. Information collected from this study will only be shared in research reports. No information will be given that could identify your responses. There is no foreseeable risk but to improve your knowledge, efficiency and delivering care for stroke patients.

If you volunteer to participate in this quality improvement project, please complete the pre-intervention questionnaire regarding your knowledge and habits for caring for patients with ischemic stroke. After completing the pre-intervention questionnaire, you will participate in a 30-minute presentation on stroke and its treatments. After the presentation, you'll be given a post

intervention questionnaire. Please answer these questions to the best of your knowledge even if you're unsure of the answer. If you agree to participate in this quality improvement project, you are free to withdraw at any time without any negative effect on your relationship with Aventura Hospital and Medical Center, FIU, and all the investigators involved in the study.

I appreciate your participation, and I am available to answer any questions while taking part in this study. If you have any questions later, you may contact me, James Celestin, at 786-873-9735 and Dr. Mechell Duran at 786-547-9933. If you wish to discuss about your rights of being a research subject in the study, you may contact the FIU Office of Research Integrity by phone at 305-348-2494 or by email at ori@fiu.edu. You will be provided with a copy of this for your records.

Appendix C: Organizational Support Letter

Dr. Andrew Lozen

Medical Director of Neurosurgical Specialist of South Florida

21097 NE 27th Ct, Suite 320

Aventura, FL 33180

February 2, 2021

Title: Healthcare provider's behaviors in prescribing antiplatelet therapy for patients with stroke symptoms within 48 hours upon arrival in hospital

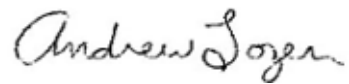
Dear Florida International University IRB Review Committee,

I am encouraged to compose this letter in substantial support of James Celestin's IRB application for the quality improvement project "Healthcare provider's behaviors in prescribing antiplatelet therapy for patients with stroke symptoms within 48 hours upon arrival in hospital." I concur that Aventura Hospital and Medical Center will serve as the study site for this quality improvement project. The quality improvement project will be led by Dr. Mechell Duran, DNP, APRN, FNP-BC ADM, CDCES and James Celestin, MSN, APRN, FNP-C at Florida International University.

This letter authorizes the readiness of Aventura Hospital and Medical Center to depend on another IRB for the evaluation of your activities. I recognize Florida International IRB will

function as the single IRB for this quality improvement project, and we would be satisfied to depend upon their evaluation.

Sincerely,

A handwritten signature in cursive script that reads "Andrew Lozen".

Dr. Andrew Lozen

Medical Director of Neurosurgical Specialist of South Florida

Appendix D: Pre-Test

1. What is your profession?
 - A. Nurse Practitioner
 - B. Attending physician
 - C. Physician assistant
 - D. Medical resident
 - E. Medical fellow
2. How long have you been in the profession?
 - A. 0-1 years
 - B. 1-3 years
 - C. 3 or more years
3. Which choice best describes STK-5?
 - A. Venous Thromboembolism (VTE) Prophylaxis
 - B. Thrombolytic Therapy
 - C. Assessed for Rehabilitation
 - D. Antiplatelet Therapy By End of Hospital Day 2**
4. What is an antiplatelet medication?
 - A. A drug that prevents the coagulation of blood by reducing fibrin formation
 - B. A drug that breaks down blood clots in blood vessels
 - C. A drug that prevents blood clots by preventing platelet aggregation**
 - D. Both A and C
5. If a patient was admitted to the hospital for rule out stroke at 11 PM on October 2, 2020, when is the latest time it is appropriate to initiate antiplatelet therapy?

- A. **By 12 AM October 4th**
 - B. By 12 AM October 3rd
 - C. By 12 AM October 5th
 - D. By 12 AM October 2nd
6. Patients presenting with altered mental status, syncope, and other non-localizing complaints may be subsequently diagnosed with minor ischemic or hemorrhagic strokes can be termed as stroke chameleon. **T** or **F**
7. What is the appropriate dose for aspirin?
- A. 81mg to 330 mg
 - B. 81mg to 325 mg**
 - C. 126 mg to 400 mg
 - D. 162 mg to 243 mg
8. Where do you admit stable stroke patient?
- A. Medical surgical unit
 - B. Telemetry unit
 - C. Step down unit**
 - D. Intensive care unit
9. If a patient fails their dysphagia screening, do you still administer anti-platelets? **T** or **F**
10. How often do you order brain imaging such as CT scan, MRI, for patients suspected of stroke?
- A. Never
 - B. Sometimes
 - C. Always

11. How often do you prescribe anti-thrombotic therapy for ischemic stroke patients at discharge?
- A. less than 25% of the time
 - B. 25 to 50% of the time
 - C. 50 to 75% of the time
 - D. Greater than 75% of the time
12. How often do you provide stroke patient with education on their need to follow up after discharge, medication as prescribed at discharge, risk factors for a stroke and warning signs of stroke?
- A. Less than 25% of the time
 - B. 25 to 50% of the time
 - C. 50 to 75% of the time
 - D. Greater than 75% of the time

Appendix E: Post-Test

1. What is an antiplatelet medication?
 - E. A drug that prevents the coagulation of blood by reducing fibrin formation
 - F. A drug that breaks down blood clots in blood vessels
 - G. A drug that prevents blood clots by preventing platelet aggregation**
 - H. Both A and C

2. If a patient was admitted to the hospital for rule out stroke at 11 PM on October 2, 2020, when is the latest time it is appropriate to initiate antiplatelet therapy?
 - E. By 12 AM October 4th**
 - F. By 12 AM October 3rd
 - G. By 12 AM October 5th
 - H. By 12 AM October 2nd

3. Patients presenting with altered mental status, syncope, and other non-localizing complaints may be subsequently diagnosed with minor ischemic or hemorrhagic strokes can be termed as stroke chameleon. **T** or **F**

4. What is the appropriate dose for aspirin?
 - E. 81mg to 330 mg
 - F. 81mg to 325 mg**
 - G. 126 mg to 400 mg
 - H. 162 mg to 243 mg

5. Where do you admit stable stroke patient?
 - E. Medical surgical unit
 - F. Telemetry unit

G. Step down unit

H. Intensive care unit


6. If a patient fails their dysphagia screening, do you still administer anti-platelets? T or F
7. How likely are you to order brain imaging such as CT scan, MRI, for patients suspected of stroke?
 - D. Never
 - E. Sometimes
 - F. Always
8. How likely are you to prescribe anti-thrombotic therapy for ischemic stroke patients at discharge?
 - E. less than 25% of the time
 - F. 25 to 50% of the time
 - G. 50 to 75% of the time
 - H. Greater than 75% of the time
9. How likely are you to provide stroke patient with education on their need to follow up after discharge, medication as prescribed at discharge, risk factors for a stroke and warning signs of stroke?
 - E. Less than 25% of the time
 - F. 25 to 50% of the time
 - G. 50 to 75% of the time
 - H. Greater than 75% of the time

Appendix F: IRB Approval Letter



**Office of Research Integrity
Research Compliance, MARC 414**

MEMORANDUM

To: Dr. Mechell Duran
CC: James Celestin
From: Maria Melendez-Vargas, MIBA, IRB Coordinator 
Date: April 5, 2021
Protocol Title: "Healthcare provider's behaviors in prescribing antiplatelet therapy for patients with stroke symptoms within 48 hours upon arrival to the hospital"

The Florida International University Office of Research Integrity has reviewed your research study for the use of human subjects and deemed it Exempt via the **Exempt Review** process.

IRB Protocol Exemption #: IRB-21-0114 **IRB Exemption Date:** 04/05/21
TOPAZ Reference #: 110098

As a requirement of IRB Exemption you are required to:

- 1) Submit an IRB Exempt Amendment Form for all proposed additions or changes in the procedures involving human subjects. All additions and changes must be reviewed and approved prior to implementation.
- 2) Promptly submit an IRB Exempt Event Report Form for every serious or unusual or unanticipated adverse event, problems with the rights or welfare of the human subjects, and/or deviations from the approved protocol.
- 3) Submit an IRB Exempt Project Completion Report Form when the study is finished or discontinued.

Special Conditions: N/A

For further information, you may visit the IRB website at <http://research.fiu.edu/irb>.

MMV/em

Appendix G: IRB Amendment Approval Letter



Office of Research Integrity
Research Compliance, MARC 414

MEMORANDUM

To: Dr. Charles Buscemi

CC: James Celestin


From: Maria Melendez-Vargas, MIBA, Coordinator

Date: June 10, 2021

Proposal Title: "Healthcare provider's behaviors in prescribing antiplatelet therapy for patients with stroke symptoms within 48 hours upon arrival to the hospital"

Approval # IRB-21-0114-AM01

Reference # 100098



The Florida International University Office of Research Integrity has approved the following modification(s):

- Replaced PI to Dr. Buscemi.

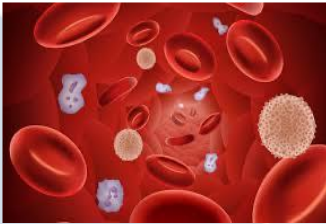
Special Conditions: N/A.

For further information, you may visit the FIU IRB website at <http://research.fiu.edu/irb>.

MMV/em

Appendix H: Healthcare Provider Antiplatelet Education

Improving antiplatelet therapy initiation for patients with an ischemic stroke



- James Celestin
- Dr. Mechell Duran
- Dr. Andrew Lozen



Learning Objectives

- Understand the core measure, STK-5
- Explain how antithrombotic therapy works
- Know the latest recommended time a clinician can initiate antiplatelet therapy
- Distinguish stroke chameleons
- Learn the appropriate dose of aspirin for treating patients with ischemic stroke
- Understand where stroke patients should be admitted to
- Understand the different routes aspirin can be administered
- Assess habits of ordering CT brain for patients with suspected stroke
- Assess prescribing habits of initiating antiplatelet therapy
- Assess habits on stroke education for patients on antiplatelet therapy



Stroke Introduction

- A cerebral vascular accident, also known as stroke, occurs when there is an interruption of blood flow to the brain (Sbampato dos Santos et al., 2017).
- It is one of the world's leading cause of mortality and disability (Sbampato dos Santos et al., 2017).
- It is imperative to recognize the signs of stroke and act appropriately to reduce the effects of the disease.
- Antiplatelets have shown to limit the mortality and recurrence rate of patients with ischemic stroke.



Significance

- In 2010, the mortality and morbidity of stroke impacted the United States by \$73 billion.
- Due to the difficulty of a full recovery for cerebral vascular accidents, stroke prevention is the top priority in the approach to reduce the mortality and morbidity of the disease.
- While someone experiences a stroke every 40 seconds, an individual dies from stroke every 4 minutes.
- In Miami-Dade County, stroke is the third leading cause of death in Miami-Dade County. This condition accounts for 41.5 deaths per 100,000 population from 2015-2017.



Consequences of stroke

Physical

- Visual deficits
- One sided weakness/numbness
- Difficulty walking
- Speech abnormalities

Mental

- Behavioral changes
- Memory loss
- Stress from lifestyle changes



Problem Statement

- One of the best treatment for stroke is by starting timely antiplatelet therapy if patient is not a candidate for TPA or mechanical thrombectomy
- In order for antithrombotic medications to be effective, it is recommended that this medication is given to patients within 48 hours upon arrival to the hospital along as there are no contraindications.
- However, many healthcare providers are not adhering to prescribing antiplatelets within 48 hours upon arrival to the hospital.



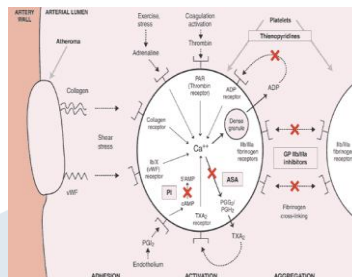
Aspirin

- 81 mg to 325 mg
- Can also be given suppository if pt unable to swallow



Mechanism of action

- irreversibly inhibits prostaglandin H synthase (cyclooxygenase-1) in platelets and megakaryocytes, and thereby blocks the formation of thromboxane A₂ (TXA₂; a potent vasoconstrictor and platelet aggregator).



Stroke Core Measures

- **STK-1: Venous Thromboembolism (VTE) Prophylaxis by admission day 2.** (Ischemic and Hemorrhagic)
- **STK-2 Discharged on Anti-thrombotic Therapy.** (Ischemic)
- **STK-3 Anticoagulation Therapy for Atrial Fibrillation/ Flutter.** (Ischemic)
 - Upon Discharge and while admitted unless contraindicated (Documentation must reflect)
- **STK-4 Thrombolytic Therapy (if applicable) within 60 minutes of patient arrival.** (Ischemic)
- **STK-5 Anti-thrombotic Therapy by end of hospital day 2.** (Ischemic)
- **STK-6 Discharged on a Statin.** (Ischemic) if LDL is 70 or greater
- **STK-8 Stroke Education** (Patient Specific Risk Factors Addressed). (Ischemic and Hemorrhagic)
- **STK-10 Assessed for Rehabilitation.** (Ischemic and Hemorrhagic)



Stroke Chameleon

- Patients presenting with altered mental status, syncope, and other non-localizing complaints may be subsequently diagnosed with minor ischemic or hemorrhagic strokes
- Check for risk factors (HTN, DM, smoking, dyslipidemia, lack of exercise, obesity)



Stroke Order Sets

All patients who are admitted with a CVA/TIA or Rule out CVA/TIA diagnosis must be admitted under the Stroke/TIA Order-sets. This is a One Stop Shop for Stroke Core Measures .

Search all Headers
STROKE

Go to Favorites Add to Favorites Process Uncheck

All Sets	ADMIT/DISCHARGE/TRANS	BEHAVIORAL HEALTH	CARDIOLOGY
CRITICAL CARE	RAD CONTRAST	COLOR/RECTAL SURGERY	GENERAL
GENERAL MEDICAL	GENERAL SURGERY	GASTROENTEROLOGY	GEN ITD URINARY
DIAGNOSTIC IMAGING	LABS	MEDICATIONS	NEUROLOGY
NEUROLOGICAL SURGERY	OB/GYN	ORAL/MAXILLOFACIAL	OPHTHALMOLOGY
ORTHOPEDIC	RESPIRATORY	SEPSIS	TRAUMA
UROLOGY	VASCULAR		

STROKE HEMORRHAGIC ADMISSION (OV)
 STROKE ISCHEMIC ADMISSION (OV)
 STROKE THROMBOLYTIC ALTEPLASE TIA

Search all Headers

Go to Favorites Add to Favorites Process Uncheck

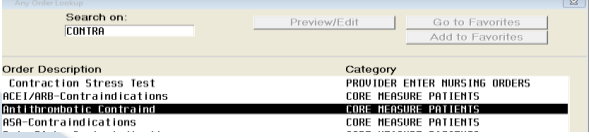
Remember STK-1 and STK -5 go by the **Arrival Date NOT the Admit Date.**
EXAMPLE.
 Patient arrived to the hospital 7/8/2019 22:00, end of hospital day 2 is 7/9/2019 @ 23:59

All Sets	ADMIT/DISCHARGE/TRANS	BEHAVIORAL HEALTH	CARDIOLOGY
CRITICAL CARE	RAD CONTRAST	COLOR/RECTAL SURGERY	GENERAL
GENERAL MEDICAL	GENERAL SURGERY	GASTROENTEROLOGY	GEN ITD URINARY
DIAGNOSTIC IMAGING	LABS	MEDICATIONS	NEUROLOGY
NEUROLOGICAL SURGERY	OB/GYN	ORAL/MAXILLOFACIAL	OPHTHALMOLOGY
ORTHOPEDIC	RESPIRATORY	SEPSIS	TRAUMA
UROLOGY	VASCULAR		

TIA ADMISSION (OV)

All stable patients suspected for stroke should be admitted to stepdown.

ASA Contraindication Order





Any Order Lookup

Search on: Preview/Edit Go to Favorites Add to Favorites

Order Description	Category
Contraction Stress Test	PROVIDER ENTER NURSING ORDERS
ACEI/ARB-Contraindications	CORE MEASURE PATIENTS
Anti-thrombotic-Contraindications	CORE MEASURE PATIENTS
ASA-Contraindications	CORE MEASURE PATIENTS

Documentation for ASA Contraindication must be placed in CPOE. If an alternative is available please ensure it is ordered before hospital day 2.

  Nicole Wertheim College of Nursing & Health Sciences

Questions?

- Email: andrewlozen@yahoo.com

  Nicole Wertheim College of Nursing & Health Sciences