A DOCTOR OF NURSING PRACTICE-LED TRANSITION OF CARE MODEL FOR STROKE AND TRANSIENT ISCHEMIC ATTACK

by

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# TABLE OF CONTENTS

LIST OF FIGURES ..........................................................................................................................6  
LIST OF TABLES ...........................................................................................................................7  
ABSTRACT .......................................................................................................................................8  

CHAPTER ONE: INTRODUCTION .....................................................................................................10  
  Transitions of Care .........................................................................................................................11  
  Doctor of Nursing Practice as TOC leader ......................................................................................13  

CHAPTER TWO: METHODS ...............................................................................................................15  
  Setting and Study Design ...............................................................................................................15  
  Population and Sampling ...............................................................................................................15  
  Data Analysis .................................................................................................................................16  

CHAPTER THREE: RESULTS ............................................................................................................17  
  Description of the Stroke and TIA Population .............................................................................17  
  Readmissions .................................................................................................................................18  
  Post Discharge Phone Surveys ....................................................................................................18  
  DNP-led Transitions of Care Model for Stroke and TIA ..............................................................20  

CHAPTER FOUR: DISCUSSION .........................................................................................................21  
  TOC Elements Derived from the Stroke Database ......................................................................21  
  TOC Elements Derived from the Post Discharge Phone Surveys ...............................................23  
    Comprehensive Care Plan ...........................................................................................................24  
    Follow Up ....................................................................................................................................24  
    Stroke Education ..........................................................................................................................25  
    Point of Contact ...........................................................................................................................26  
  Limitations and Future Studies ......................................................................................................27  
  Summary .........................................................................................................................................28  

APPENDIX A: Telephone Script for Follow Up Post-Discharge Phone Surveys .........................29  

REFERENCES ....................................................................................................................................39
LIST OF FIGURES

FIGURE 1. DNP-led Care Delivery Model for Stroke and TIA ........................................32
LIST OF TABLES

TABLE 1. Stroke and TIA Patient Demographics by Stroke Subtype ........................................34
TABLE 2. Readmission Length of Stay, Admitting DRG .................................................................37
ABSTRACT

BACKGROUND/OBJECTIVES: Gaps in care due to the movement of patients between health settings and/or practitioners, known as transitions of care (TOC), may contribute to second stroke or TIA events. The elements that impact TOC in the stroke/TIA population have not been fully elucidated. The purpose of this study is to identify key elements of a Doctor of Nursing Practice-led TOC model that could be used to develop and evaluate a TOC program for the stroke/TIA population.

DESIGN: A descriptive study was performed to 1) identify elements that may affect transitions of care using a stroke database and post-discharge phone surveys and 2) based on information from Aim 1, propose a DNP-led TOC model specific to the stroke/TIA.

SETTING: An urban primary stroke center in the southwest United States.

PARTICPANTS: All patients in the GWTG®-stroke database from May 1 – December 31st, 2012 and patients who consented at discharge from the stroke unit following a stroke or TIA.

MEASUREMENTS: Patient demographics including: length of stay (LOS), age, race, ethnicity, comorbidities, insurance, discharge status, thirty-day readmission rate, and follow up survey.

RESULTS: Patient data (n=276) from GWTG®-stroke database was obtained. Average LOS was 7.81 +/- 11.15 days. The majority of patients were greater than age 65 (59%); 53% relied on Medicare support; those age 50-59 (21%) were most likely to be uninsured (47%). Fifty-one percent were discharged directly home, 48% of those were referred to outpatient rehab services. Two-thirds received rehabilitation services during hospitalization. Eight patients experienced a subsequent hospital readmission; two of those had a repeat stroke event. Although patients reported understanding their discharge instructions, their perception of ongoing care was poor.
CONCLUSION: Key elements of a TOC model specific to the stroke and TIA patient population could include: patient surveillance, comprehensive care planning, follow-up, stroke education and point of contact. Advanced practice nurses have been successful in leading such programs, and a DNP-led model providing continuity of care would support the transition of an effective model into clinical practice.

Key words: Transitions of Care, Stroke, TIA, and Doctor of Nursing Practice
CHAPTER ONE: INTRODUCTION

Once an individual has experienced a stroke or transient ischemic attack (TIA), the chances of experiencing a second event leading to hospital readmission are significantly increased (Andersen et al., 2000; Goldstein & Matchar, 1994). Approximately 185,000 recurrent stroke and TIA events, representing 25% of all strokes, occur each year (Rogers et al., 2011). Roughly 14% of stroke survivors will experience a recurrent stroke within a year of the primary event (Summers et al., 2009). In addition, recent studies indicate that 10-15% of patients with TIA have a stroke within three months, with half occurring within forty-eight hours (Easton et al., 2009). Stroke mortality is only expected to worsen with the increasing number of complex comorbidities, and the sociodemographic factors affecting today’s aging population (Elkins & Johnston, 2003). This will lead to expansion of stroke-related health costs, particularly as stroke is one of the leading causes of adult disability. In 2010, average stroke costs per person for an acute hospitalization alone were reported to be between $15,000 to $18,500 depending on age and stroke severity (Steiner, 2012). The result is a net domestic cost of roughly $74 billion (Lloyd-Jones et al., 2010). Clearly, identifying strategies to decrease recurrent events is essential in order to reduce the public health burden of stroke and TIA.

Potential factors impacting the rate of recurrent stroke and or TIA are multifaceted, including the lack of patient knowledge and the understanding of their diagnosis, risk factors, medication changes, need to seek healthcare attention, and follow up care following an initial event (West et al., 2012; Yonaty & Kitchie, 2012). Recent studies suggest recurrent events are likely influenced by either the patient’s and or provider’s ability to identify signs of stroke as well as to correctly identify the transitory focal neurological symptoms associated with TIA.
(Easton et al., 2009; Johnston et al., 2003). Another factor that may impact second events and readmission rates, a common indicator for recurring events of high impact diseases (Kind, Smith, Frytak, & Finch, 2007; Prvu Bettger et al.), are the patient’s transitions among multiple health care settings (Coleman & Berenson, 2004). However, the multiple factors effecting transitions of care in the stroke and TIA population have not been well described.

Transitions of Care

The terms “transitions of care” (TOC) or “care transitions” refer to the movement a patient will make between health care settings and/or health care practitioners as their condition or care needs change during the course of their acute, then chronic illness (Coleman & Berenson, 2004). Following the Affordable Care Act’s call for the extension of care beyond the acute phase, there has been a burgeoning of published work describing various TOC programs and models that aim to reduce preventable, early hospital readmissions, as nearly one in five hospitalizations is a readmission within 30 days (Cykert, 2012; Innovation; Naylor, Aiken, Kurtzman, Olds, & Hirschman, 2011).

There is a consensus among experts that the TOC from the acute care phase to the chronic care phase is complex (Boult et al., 2009; Coleman, 2003; Coleman et al., 2004; Dedhia et al., 2009; Kind, Smith, Pandhi, Frytak, & Finch, 2007). The concept of TOC programs is gaining support from the Centers for Medicare and Medicaid Services (CMS), evidenced by the recent (2011) launching of their Community-based Care Transitions program (CCTP), a program that supports TOC models designed to provide measurable savings to the Medicare Program (Innovation). Models of transitional care such as Eric Coleman’s Care Transitions Intervention (CTI®) (Parry, Coleman, Smith, Frank, & Kramer, 2003) and Mary Naylor’s Transitional Care
Model (TCM®) (Naylor, 2008) have been well described, particularly with respect to their effectiveness in reducing hospital readmissions (Brooten et al., 2002; Coleman, Parry, Chalmers, & Min, 2006; Naylor et al., 2004; Parry, Min, Chugh, Chalmers, & Coleman, 2009). Both models utilize an interdisciplinary team approach with a focus on patient self-management as a central theme to their success; the models differ with respect to program leadership. Coleman’s CTI® model utilizes a Transitions Coach® who provides guidance and communication skills without provision of skilled care or addressing new problems as they arise. Naylor’s TOC model, described in 2000, was built on early work from the 1980’s and 1990’s in which the advanced practice nurse (APN) led the patient’s comprehensive discharge planning. Thus, in contrast to Coleman’s model, the APN is central in Naylor’s TOC model, providing advanced practice care with known success along the continuum of the patient’s transition between environments and providers (Bradway et al., 2012).

The majority of TOC studies have focused on describing the effects of models that address multiple complex diseases in one program, such as congestive heart failure, chronic obstructive pulmonary disease, and stroke compared to usual care in chronically ill populations through organization-based programs, for example, a community health organization or a hospital to achieve optimal long-term outcomes (Coleman & Boul, 2003; Dedhia et al.; Parrish, O’Malley, Adams, Adams, & Coleman, 2009). In the few studies that have addressed the effects of TOC unique to the stroke population alone (K. R. Allen et al., 2002; Prvu Bettger et al., 2012), specific elements of a given TOC program have been evaluated independently, such as comprehensive care planning by an advanced practice nurse (K. Allen et al., 2009; K. R. Allen et al., 2002; Claiborne, 2006), mobile follow up (Fjaerof, Indredavik, Johnsen, & Lydersen,
2004), and continued education including home visits by social workers (Grasel, Schmidt, Biehler, & Schupp, 2006). However, to our knowledge, no studies have examined the essential elements of a comprehensive TOC model for the stroke and TIA population, which may present unique care challenges. Stroke and TIA care is currently delivered in distinct phases, often exhibiting a profound lack of communication and continuity of care between settings. This “silo” approach to stroke and TIA care may contribute to recurrent events or complications requiring readmission, as well as to the perception of poor quality of care by patients and caregivers. In addition, although similar concepts in TOC exist with other chronic disease states, there are unique challenges within the stroke population that must be addressed in order to provide optimal care.

Doctor of Nursing Practice as TOC Leader

Within the next decade, it is estimated that the Doctor of Nursing Practice (DNP) will be a significant provider in the healthcare workforce, in both the rural and urban settings (Mundinger, Starck, Hathaway, Shaver, & Woods, 2009). The DNP is a nurse practitioner that uniquely focuses on clinical aspects of nursing with an emphasis on advanced knowledge and leadership to improve health outcomes through incorporating current research findings and innovative quality improvement programs into practice (Kark, 2009). Using their knowledge base as practitioner-researchers, the DNP can lead initiatives to close the current research-to-practice gap in healthcare (Vincent, Johnson, Velasquez, & Rigney, n.d.).

While TOC models led by various health care professionals have been described, the existing literature, specifically, Naylor’s work, suggests that the most effective reductions in readmission rates are achieved in nurse-led, team management programs that focused on patient
self-management and interventions that proactively connected the acute care provider with the primary care provider to ensure a smooth transition (Naylor et al., 2011). Thus, the DNP is uniquely situated to lead a TOC program for stroke and TIA.
CHAPTER 2: METHODS

Setting and Study Design

This descriptive study was conducted within a primary stroke center of a 375-bed university teaching hospital situated in the southwest United States. The Institutional Review Board at the University of Arizona approved this study.

Population and Sampling

A retrospective analysis of the stroke center’s Get With The Guidelines (GWTG®)-stroke database was performed in order to identify elements that may affect transitions of care specific to stroke and TIA. GWTG®-stroke is a national de-identified database created by the American Heart Association (AHA) and American Stroke Association (ASA) as a hospital-based quality improvement initiative to improve upon the care of patients with cardiac disease and stroke (Association, 2013). Patients in the primary stroke center’s GWTG®-stroke database between May 1–December 31, 2012, who had an admitting diagnosis of acute ischemic stroke, transient ischemic attack, subarachnoid hemorrhage or intracerebral hemorrhage, according to the International Classification of Diseases, Ninth Edition (ICD-9), were included in this study. Readmissions were defined as an admission within 30 days of the initial hospitalization.

In order to capture elements that may affect transitions of care that were not captured in the GWTG®-stroke database, a follow-up, post-discharge survey was conducted. For the post-discharge survey, patients that met the above ICD-9 code criteria or their families were recruited from the stroke center’s medical stroke unit from August 1–December 31, 2012. All stroke patients and/or their family or caregivers were asked by the stroke unit nurse manager if they would be willing to participate in the study. If they agreed, study information and a consent
form were provided. Consistent with stroke center protocol, all patients were provided with stroke education and individualized risk factor education prior to discharge. Patients or family members who agreed to participate were contacted by phone within 30-45 days of discharge. There were nine questions on the survey that generally captured information related to the patients experience with the discharge process, how well the patients followed the discharge instructions, and what their perceptions about the next steps in their care would include (Appendix 1).

Data Analysis

Data was exported from GWTG®-stroke database to a Microsoft Excel spreadsheet (Mac version 12.3.5). Descriptive statistics were used including mean, +/- SD, and frequency to describe the population. A simple content analysis was used to describe data from the discharge phone calls surveys. The post-discharge phone calls were transcribed during the call. Frequencies of the common elements that emerged were identified.
CHAPTER 3: RESULTS

Description of the Stroke and TIA Population

From May 1–December 31, 2012, 276 stroke or TIA patients meeting ICD-9 criteria were included in the GWTG®-stroke database. Table 1 provides the characteristics of the stroke and TIA population identified by stroke subtype. The average total length of stay (LOS) for all patients was 7.81 +/- 11.15 days. LOS for those with TIA was 2.47 +/- 2.43 days, for ischemic stroke 7.52 +/- 9.82 days, and hemorrhagic stroke 13.33 +/- 16.06 days. The average age was 67.7 +/- 15.8 years, with the largest percentage of those aged 80-89 (22%), followed closely by those aged 50-59 (21%). This latter age group, the “pre-Medicare” group, represented the largest percentage of individuals who were uninsured (47%). The largest percentages of those uninsured were identified themselves as white, or non-Hispanic (47%).

Sixty six percent of patients received rehabilitation services in the hospital and 12% of patients were ineligible to receive rehabilitation because their symptoms resolved. The majority (51%) of patients were discharged directly home, while fewer patients were discharged directly to an inpatient rehabilitation center (16%) or skilled nursing facility (15%). Of those discharged directly home, the majority were in the 50-59 age group (27%), followed by those aged 60-69 (20%), age 70-79 (20%), and age 80-89 (17%). Forty-six percent of individuals discharged home were Medicare beneficiaries (46%), followed by private insurance (32%), Medicaid (12%), and no insurance (11%). Referral to outpatient or in-home rehabilitation services occurred in 48% of the study population.

Approximately 2/3 of the study population was hypertensive (67%), 1/3 was diabetic, 1/3 was dyslipidemic and 18% had atrial fibrillation/flutter. Almost 1/4 of the population had
experienced a previous stroke or TIA (23%). When discharged home, medications prescribed at discharge included antithrombotics (83%), statins (79%), antihypertensives (76%) and anticoagulants (11%).

Readmissions

Over the course of the study, 8 patients (3%) were readmitted to the hospital (Table 2). All readmissions were within thirty days of their initial hospitalization with an average of 11.9 +/- 7.37 days between admissions. The initial hospitalization LOS was 7.25 +/- 6.8 days, while the LOS of their hospital readmission was 4 +/- 3.97 days. Of note is that only two of the eight readmitted patients (25%), or (0.7%) of total patient population were coded as a recurrent stroke or TIA event. The other readmissions were: respiratory signs and symptoms; esophagitis, gastroenterological and miscellaneous digestive disorder; cervical spinal fusion; extracranial procedure; and fracture of the femur.

Post Discharge Phone Surveys

Of the twenty-four patients who agreed to participate in the study, fifteen (62%) could be reached. Three of the patients (20%) either asked their caregiver to complete the survey for them or the caregiver joined in on the conversation with them. It took five to ten minutes to complete each survey. On a practical note, it is worth mention that a fair amount of time was required to contact the patients or families who agreed to participate. After five attempts to reach a patient and leave messages, patients were no longer contacted. For those who were eventually reached, two to three attempts were required.

Although the majority (93%) of patients reported understanding their discharge instructions, stating that they were “clearly written,” and “very succinct,” there were several
elements that emerged that may have contributed to poor perception of their stroke or TIA follow-up care. The first element was a common confusion and anxiety about the next steps in their recovery, with 33% of the patients making statements such as, “where to from here,” and “what do I do at home now that I am out of rehab?” Patients were unsure of what the course of recovery would involve with one patient stating, “I am terrified of being disabled,” and another “am I at risk for a stroke?”

The second element uncovered in the discharge phone calls was the lack of understanding or support with the education provided at discharge including changes in medications. One patient struggled with the “lingo” used in the hospital, and was concerned how it would affect his ongoing care at home. Other times instructions were provided prior to the family being present, leading to caregiver stress in what to expect in caring for their family at home. Patients reported difficulty in obtaining medication, in affording the medication, or in understanding the need to take a medication on a continuous basis. Comments included “I was not given new prescription at discharge,” and “I only take my blood pressure medication if it is high.” However, when asked who they could contact to resolve these issues, they were unsure who this might be. Even when they were able to identify their primary care provider (PCP) as a start to resolve the issues, there was an apparent lack of urgency to do so.

The third consistent element identified during the survey was a lack of understanding of whom they should or could contact with questions. Two patients had called Emergency Medical Services (EMS) to their homes for assistance (which did not result in a repeat hospitalization). Some patients reported calling the hospital itself with questions after discharge, only to be
directed to their PCP, or instructed to return to the hospital setting, as their care had terminated at discharge. As one patient described, “There was no one to call, talk to, or ask questions.”

The fourth consistent element that emerged was related to perceived urgency or need to make a follow up visit with a neurologist. Patients stated “I will see my own neurologist,” “my symptoms completely resolved so I did not make an appointment,” “I’ll take care of it after the holidays,” or “why see both my primary care doctor and a neurologist,” as reasons for not following up with the recommended neurologist as instructed on discharge. Interestingly, although these patients were able to report that they were instructed to see a neurologist, it was apparent that they were not connecting with the urgency or the need for ongoing neurology care. Two patients stated that they had no primary care provider (PCP) to help coordinate their ongoing care, thus their follow up instructions could not be met.

DNP-led Transitions of Care Model for Stroke and TIA

Elements from GWTG®-stroke database and post-discharge surveys guided the construction of a DNP-led transitions of care model for stroke and TIA (Figure 1). Central to the model are the patients and caregivers affected by stroke and TIA. Elements affecting transitions of care surround the patients and caregivers, and include patient surveillance, comprehensive care plan, follow-up, stroke education and point of contact. The model also incorporates Naylor’s concept of an APN providing continuity of care. This care encircles both the elements and the patients and caregivers, and reflects the coordination of transitions of care. This model is purposefully fluid and flexible; elements affecting patients and caregivers can be added or deleted in order to accurately describe the elements that affect unique stroke and TIA populations.
CHAPTER 4: DISCUSSION

TOC Elements Derived from the Stroke Database

Elements identified from the GWTG®-stroke database that could potentially affect transitions of care and that guided the development of the TOC model element “Patient Surveillance” were LOS, age, insurance status, discharge status, and co-morbidities. The information obtained from GWTG®-stroke or an equivalent database is likely to be easily retrievable at other hospitals, especially at primary stroke centers that are required to maintain a database. The information from a stroke database will provide the basic description of the patient population unique to each organization. These unique elements may have different influences on TOC for a given stroke and TIA population. For example, additional data related to urban versus rural living status or education levels, both of which may significantly affect transitions of care, may vary between various stroke and TIA populations.

In a report from the Agency for Healthcare Quality Research (AHRQ), the national average for stroke and acute cerebrovascular disease hospital LOS was 6.6 to 8.5 days depending on age; those greater than 65 had the shortest LOS compared to those age 18-45 years of age (Steiner, 2012). The LOS is projected to continue to decrease within the next several years, to 5.8 days based on the current trend (Steiner, 2012). The hospital LOS in our population was consistent with the national average for stroke and future quality improvement studies are needed to evaluate these patients ability to gain and use knowledge necessary for self-care management and successful transitions especially if hospital LOS is expected to decrease.

Similar to discharge dispositions found in previous studies, half of the patients in this study were discharged home (Bejot et al., 2012; Gregory & Han, 2009; Parry et al., 2009;
Discharge data regarding a Rankin score or National Institute of Health Stroke Score (NIHSS) indicating a patient’s functional capacity or disability, respectively, were not available in GWTG®-stroke database for our population, but rather all patients were assessed by the organization’s therapy services using well-accepted guidelines, including CMS guidelines for rehabilitation and skilled nursing facility and home health qualifications. While it was determined that these patients were well enough to go home, these patients may, in fact, be unprepared to make this transition with respect to their cognitive and emotional abilities to coordinate appropriate self-care and/or follow up to prevent a readmission. While described as safe to go home, information about their or their caregivers needs once they are home with respect to their abilities to address their stroke risk factors were likely not assessed. In a similar fashion, little information is known about the needs and abilities of patients and caregivers once they have transitioned home from a rehabilitation facility or skilled nursing facility. Identifying the needs and abilities of patients and/or their caregivers as they transition among facilities likely poses one of greatest gaps in stroke care.

While the full burden of stroke and TIA readmission is not fully captured in the literature, data from Medicare beneficiaries indicate that 30% of stroke patients experience at least one readmission within 90 days after discharge (Fonarow et al., 2011). In our study, readmission rates fall below this average, however, they are still occurring within thirty days of the first event. The average LOS for readmissions averaged four days, which clearly represents additional costs to patients and organizations. To our knowledge, there are no studies examining the LOS for hospital readmissions, and a cost analysis of stroke and TIA readmissions would be of benefit in future studies. Currently, readmission data only captures recurrent events in those patients
that return to the same hospital as the original admission. True readmission rates may be under represented, as there could be readmissions to other health care facilities. In addition, similar to findings in previous studies, if the patient was readmitted to the original hospital for recurrent events, variance in hospital coding may account for an under-reporting of readmission rates providing challenges in adequately addressing prevention strategies (Fonarow et al., 2011). Finally, recurrent events and readmission rates are not synonymous; patients may, in fact, not seek medical care for mild or even severe recurrent events. Clearly, further research related to gaps in stroke care related to transitions among care facilities and its impact on readmissions is needed to better define the essential elements of a TOC program.

In this study, stroke patients were likely to be older and qualify for Medicare support. Those with the second highest incidence of stroke or TIA were those who fell within the pre-Medicare age group and were likely to be uninsured. In addition, most patients had significant modifiable risk factors for stroke, including hypertension, diabetes, and dyslipidemia (Goldstein et al.). These data may be important for hospitals when analyzing the reasons for stroke or TIA readmissions.

TOC Elements Derived from the Post-Disposition Survey

The post-discharge survey was a necessary component and served as a first attempt in identifying elements that might affect transitions of care that were not captured in GWTG®-stroke database such as fear, denial and reluctance to rely on the help of others or after an acute stroke event (Mackintosh et al., 2012). Patient comments were categorized into four consistent elements and annotated in the model as “Comprehensive Care Plan,” “Follow up,” “Stroke Education,” and “Point of Contact.”
Comprehensive Care Plan

Even with improvements in discharge planning it estimated that 49% of patients are still experiencing adverse events related to frequent adjustments in medications, coordination of follow up tests and appointments, and changes in functional and cognitive capacity indicating the need for comprehensive care planning (Dedhia et al., 2009). In addition to the written discharge summary provided to patients, an individualized comprehensive care plan with patient involvement outlining goals and treatment strategies from the multidisciplinary team and compiled by the DNP would be of benefit to these patients as they transition through care settings and providers. Similar to stroke specific comprehensive care plans studied by Allen et al.(K. Allen et al., 2009; K. R. Allen et al., 2002) (2002; 2009) it would include targeted strategies aimed at reduction of modifiable risk factors, maintenance of health status, management of post stroke complications(K. Allen et al., 2009; K. R. Allen et al., 2002), in addition to identification of who to contact with questions, what to expect during the next phases in recovery, goals to accomplish in the home setting and ongoing stroke education. This care plan would need to be accessible to the multidisciplinary team and outside providers who may be linked to patient care, updated at each visit, and shared with the patient for their ongoing care, ideally through the use of electronic health records.

Follow Up

Patients voiced concerns, confusion, and anxiety related to the next steps, or the follow up steps related to their recovery process that they felt were not adequately addressed during their acute hospitalization. It is known that the lack of timely and appropriate follow up care can undermine the benefits achieved in previous setting (Coleman & Boult, 2003). In addition, it is
known that there are often a multitude of health care providers and disciplines for a patient to follow-up with after their acute phase discharge (Swan, 2012). This component of care can be daunting, overwhelming, and often not completed appropriately by patients. Claiborne (2006) reported that important follow-up elements are ongoing screening and provision of self care management, stroke education, medication adherence, and service needs (Claiborne, 2006). In addition, Kripalani et al., (2007) found that follow-up in the form of a simple telephone call can improve patient satisfaction, increase medication adherence, and decrease subsequent readmissions or emergency room visits (Kripalani, Jackson, Schnipper, & Coleman, 2007). Therefore, building upon previous studies and the current study, the DNP-led TOC model could facilitate scheduling of ongoing care with pre-arranged appointments, arrange new appointments as review outstanding tests and a scheduled review of progress in self-management and rehabilitation therapies through telephone and/or in home visits.

*Stroke Education*

Uncertainty about the stroke education provided in the acute setting (e.g., cause of stroke, purpose for or questions about medications) was an element not captured by GWTG®-stroke database but was identified as an essential element of a TOC model by the phone surveys. Discharge from the acute care setting is a vulnerable time for patients; instructions at discharge often neglect the cognitive impairment, lack of supportive resources, and inadequate health literacy often experienced by stroke patients (Chugh, Williams, Grigsby, & Coleman, 2009). With a projected decrease in average LOS and increased acuity at discharge, ongoing stroke education is necessary to the success of the patient and caregiver’s transition. Therefore, stroke education should occur at each contact with the patient using the teach-back method to ensure
that understanding is met. However, in spite of the fact that there was in-hospital, individualized stroke education provided to each patient and/or caregiver that was surveyed, including causative factors of stroke the patient experienced, their risk factors for stroke, what do for recurring stroke symptoms, medication instructions, and the telephone number for making a follow up visit with the neurologist, most patients stated that there remained concerns regarding the meaningfulness of this education, especially in regards to medication. In addition, there was a decided lack of urgency regarding the need for ongoing care or follow up for assessment of stroke and TIA risk factors. Clearly, patient/caregiver education regarding the importance of risk factors to prevent recurrent stroke and TIA, what actions to take in case of recurrent events (e.g., call 9-1-1), and who to contact for other concerns are essential elements to include in a TOC model.

**Point of Contact**

Several studies have described the importance of a designated point of contact or liaison between the acute care experience through discharge who can offer support and counseling in reducing hospital readmissions (Claesson, Gosman-Hedstrom, Lundgren-Lindquist, Fagerberg, & Blomstrand, 2002; Jacob & Poletick, 2008). A study by Kripalani et al., (2007) described the value of telephone follow up conducted after discharge to discuss the patients transitions and any unforeseen needs that may have emerged in bridging the gaps in TOC (Kripalani et al., 2007). It was evident from the phone surveys in this study that patients wanted to have a person to contact with their concerns and questions when they arose. In today’s fragmented health care system, provision of this type of service presents a challenge. The hospitalist, neurologist, nurse, case manager or social worker may all provide information to the patient and/or caregiver during the hospital stay and at discharge, but are not typically available to the patient on an on-call basis
after discharge. Even if the patient has a PCP, they may not receive information about the patient’s hospitalization for a significant period of time after discharge and thus be hesitant to provide advice. Further, depending on the availability of services in a given community, patients are often unable to make timely follow up appointments with their PCP or neurologist, in spite of the fact that risk factors may need to be urgently addressed. Previous studies in hospital follow up completed by either a pharmacist or APN in a general medical service indicate that if this person is established prior to discharge, it may foster a sense of security, self care management, medication adherence, and decrease the possibility of hospital readmissions while promoting an ongoing caring relationship (Dudas, Bookwalter, Kerr, & Pantilat, 2001; Naylor et al., 1999). To address this gap in stroke care, we posit that a DNP is ideally suited to establish contact with the patient in the acute setting, facilitate information sharing, provide care coordination and continuity throughout each transition, be available to answer patient and provider questions as they arise, and provide advanced nursing care or referrals as necessary.

Limitations and Future Studies

This study was a first attempt to identify elements of a DNP-led TOC model that could be used for future TOC program development and implementation into practice. While valuable information was obtained, we recognize that additional important elements need to be identified and may vary across stroke and TIA populations and health care systems. For example, elements that were not covered here such as urban versus rural settings, use and timing of medical transport, educational status, whether patients were living alone or with a caregiver, organizational resources for TOC programs, and the extent of community resources for stroke were not addressed here. However, the model presented here is purposefully flexible; the
elements surrounding the stroke and TIA patient and caregiver transitions can be added or deleted as needed to reflect a particular population. The authors also recognize that the survey design and content analysis do not meet the criteria for a rigorous qualitative study. Further qualitative studies are needed to help identify elements that affect transitions of care from the patient’s perspective. Further studies are also needed to guide the development, implementation and evaluation of TOC programs for stroke and TIA.

Summary

There currently are significant gaps in stroke care due to the complex nature of our health care delivery that result in multiple transitions among care settings and providers; complex transitions may affect second events, readmissions and patient satisfaction. Studies on the effects of transitional care programs specific to the stroke and TIA patient population are urgently needed. Before TOC programs are developed and implemented, identification of the elements that affect TOC for this population is needed, and was the goal of this study. We used data from a comprehensive stroke database and from post discharge surveys to inform the development of a DNP-led TOC model for stroke and TIA. The model presented here is purposefully fluid and flexible and can be tailored to unique stroke and TIA populations. The DNP practice-researcher is perfectly poised to take the lead in designing, implementing and evaluating a TOC program for stroke and TIA. The results of this study may provide the foundation for future studies examining the effects a DNP led TOC program for stroke and TIA.
APPENDIX A

TELEPHONE SCRIPT FOR FOLLOW UP POST-DISCHARGE PHONE SURVEYS
APPENDIX A: Telephone Script for Follow Up Post-Discharge Phone Surveys

Title of Project: A Doctor of Nursing Practice-Led Transitions of Care Model for Persons in Southeast Arizona with Stroke or Transient Ischemic Attack

Principal Investigator: Helena Haynes RN, BSN

Granting Agency: South East Arizona Health Education Center (AHEC)

Discharge Script to be completed within thirty to forty-five days of discharge:

Investigator: Hi Mr./Mrs./Ms. ____________, My name is ____________, I am a Doctor of Nursing Student at the University of Arizona. I want to thank you for your time. I am completing a research study to evaluate and improve upon the discharge and follow up process of patients admitted to University of Arizona Medical Center for either a stroke or transient ischemic attack.

You may choose not to participate in the study at any time, for any reason.

Do you have any questions?

If you choose to participate, I will ask you several questions in order to understand your experience with the current discharge process at the University of Arizona Medical Center related to your stroke or TIA. These questions will only take a few minutes of your time. May I ask you these questions?

(Choose one of the responses below):

(If they do not agree to participate in interview): Thank you very much for your time, good bye.

(If they do agree to answer the questions): Thank you for your time. Please feel free to share with me any comments/concerns you have related to your stroke or TIA…

1. Were you satisfied with your discharge process from University of Arizona Medical Center? If not, why?

2. Did you understand your discharge instructions? How did you feel about them, what did you get, what did you not get?

3. Do you currently have a follow up appointment scheduled or have you completed a follow up appointment with your primary care provider?
   a. If no, do you plan on scheduling one?
b. If yes, what is/was the date of your follow up appointment?

4. Do you have an appointment scheduled or have you completed an appointment with the Neurologist to follow up in the stroke clinic?
   a. If no:
      i. Why not?
      ii. Were there any problems on our end scheduling this appointment?
      iii. Do you plan on following up with your own Neurologist (or a neurologist closer to your home)?
   b. If yes, what is/was the date of your follow up?

5. Did you understand any changes in your medication regimen? Were there any difficulties in obtaining new medications?
   a. Who changed the medication? (You, Neurologist, PCP?)
   b. Was it during an office visit or call to doctor?

6. What could we have done better during your hospitalization?

7. When you left, what do you wish you knew?

8. Did you for any reason need to seek medical care at a hospital since your discharge?
   a. If yes;
      i. Which hospital did you go to?
      ii. When was it?
      iii. Was it related to your previous stroke/TIA?
   b. No

9. Do you have any additional questions or concerns related to your follow up care?
   Do you feel like you know what is going on from here?

Thank you for your time.
FIGURE 1

DNP-LED CARE DELIVERY MODEL FOR STROKE AND TIA
Figure 1: DNP-led Care Delivery Model for Stroke and TIA
TABLE 1

STROKE AND TIA PATIENT DEMOGRAPHICS BY STROKE SUBTYPE
<table>
<thead>
<tr>
<th>Demographic</th>
<th>TOTAL</th>
<th>TIA</th>
<th>ISCHEMIC</th>
<th>ICH/SAH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender (Male)</td>
<td>52.17</td>
<td>9.06</td>
<td>32.61</td>
<td>10.51</td>
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<tr>
<td>Age 1-29</td>
<td>1.81</td>
<td>0.72</td>
<td>0.36</td>
<td>0.72</td>
</tr>
<tr>
<td>Age 30-39</td>
<td>3.99</td>
<td>0.36</td>
<td>2.17</td>
<td>1.45</td>
</tr>
<tr>
<td>Age 40-49</td>
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<td>0.36</td>
<td>2.90</td>
<td>0.72</td>
</tr>
<tr>
<td>Age 50-59</td>
<td>21.38</td>
<td>5.07</td>
<td>12.32</td>
<td>3.99</td>
</tr>
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<td>Age 60-69</td>
<td>20.65</td>
<td>3.62</td>
<td>13.41</td>
<td>3.62</td>
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<td>Age 70-79</td>
<td>20.65</td>
<td>3.99</td>
<td>12.32</td>
<td>4.35</td>
</tr>
<tr>
<td>Age 80-89</td>
<td>22.46</td>
<td>8.33</td>
<td>9.78</td>
<td>4.35</td>
</tr>
<tr>
<td>Age 90+</td>
<td>5.07</td>
<td>1.09</td>
<td>3.99</td>
<td>0.00</td>
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<tr>
<td>Race White non-Hispanic</td>
<td>57.97</td>
<td>12.68</td>
<td>35.14</td>
<td>10.14</td>
</tr>
<tr>
<td>Race Hispanic</td>
<td>28.26</td>
<td>8.70</td>
<td>13.77</td>
<td>5.80</td>
</tr>
<tr>
<td>Race Black</td>
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<td>1.45</td>
<td>2.90</td>
<td>1.45</td>
</tr>
<tr>
<td>Race Asian</td>
<td>1.45</td>
<td>0.00</td>
<td>1.09</td>
<td>0.36</td>
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<tr>
<td>Race Am. Ind/Alaska Nat.</td>
<td>3.62</td>
<td>0.72</td>
<td>1.45</td>
<td>1.45</td>
</tr>
<tr>
<td>Race Nat. Haw/Pac. Isl.</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Race Other</td>
<td>2.90</td>
<td>0.00</td>
<td>2.90</td>
<td>0.00</td>
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<td>Insured Medicare</td>
<td>53.26</td>
<td>15.58</td>
<td>27.54</td>
<td>10.14</td>
</tr>
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<td>Insured Medicaid</td>
<td>10.87</td>
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<td>5.80</td>
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<tr>
<td>Insured Self Pay/No Insurance</td>
<td>7.61</td>
<td>1.09</td>
<td>5.80</td>
<td>0.72</td>
</tr>
<tr>
<td>Insured Private/VA/Champus/Other</td>
<td>27.90</td>
<td>5.07</td>
<td>18.12</td>
<td>4.71</td>
</tr>
<tr>
<td>LOS, Days, Avg (SD)</td>
<td>7.81 (11.15)</td>
<td>2.47 (2.43)</td>
<td>7.52 (9.82)</td>
<td>13.33 (16.06)</td>
</tr>
<tr>
<td>Readmit w/in 30 days</td>
<td>8</td>
<td></td>
<td></td>
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<tr>
<td>Arrival From Home</td>
<td>81.88</td>
<td>19.93</td>
<td>47.46</td>
<td>14.49</td>
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<tr>
<td>Arrival From Another ACF</td>
<td>0.36</td>
<td>0.00</td>
<td>0.00</td>
<td>0.36</td>
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<td>Arrival From Chronic HCF</td>
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<td>2.17</td>
<td>1.81</td>
<td>2.17</td>
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<tr>
<td>Arrival From Outpatient HCF</td>
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<td>0.72</td>
<td>1.45</td>
<td>0.36</td>
</tr>
<tr>
<td>Arrival From In Hospital</td>
<td>9.06</td>
<td>0.72</td>
<td>6.52</td>
<td>1.81</td>
</tr>
<tr>
<td>Discharged to: Home</td>
<td>51.45</td>
<td>19.20</td>
<td>26.00</td>
<td>6.16</td>
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<tr>
<td>Discharged to: Hospice - Home</td>
<td>0.72</td>
<td>0.00</td>
<td>0.36</td>
<td>0.36</td>
</tr>
<tr>
<td>Discharged to: Hospice - HCF</td>
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<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
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<tr>
<td>Discharged to: Acute Care Facility</td>
<td>2.54</td>
<td>0.00</td>
<td>1.81</td>
<td>0.72</td>
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<tr>
<td>Discharged to: Skilled Nursing Facility</td>
<td>14.49</td>
<td>3.26</td>
<td>7.97</td>
<td>3.26</td>
</tr>
<tr>
<td>Discharged to: Inpatient Rehabilitation</td>
<td>15.94</td>
<td>0.00</td>
<td>13.04</td>
<td>2.90</td>
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<td>Discharged to: Long Term Care Hospital</td>
<td>0.36</td>
<td>0.00</td>
<td>0.36</td>
<td>0.00</td>
</tr>
<tr>
<td>Discharged to: Intermediate Care Facility</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Discharged to: Expired</td>
<td>9.78</td>
<td>0.00</td>
<td>5.07</td>
<td>4.71</td>
</tr>
<tr>
<td>Discharged to: AMA</td>
<td>2.90</td>
<td>1.09</td>
<td>1.81</td>
<td>0.00</td>
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<tr>
<td>Discharged to: None</td>
<td>7.61</td>
<td>2.17</td>
<td>3.62</td>
<td>1.81</td>
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<tr>
<td>Discharged to: A fib/ A. Flutter</td>
<td>17.75</td>
<td>3.62</td>
<td>11.23</td>
<td>2.90</td>
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<tr>
<td>Discharged to: CAD/Prior MI</td>
<td>24.64</td>
<td>5.80</td>
<td>12.68</td>
<td>6.16</td>
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<tr>
<td>Discharged to: Carotid Stenosis</td>
<td>0.72</td>
<td>0.00</td>
<td>0.72</td>
<td>0.00</td>
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<tr>
<td>Discharged to: Pregnancy</td>
<td>0.72</td>
<td>0.00</td>
<td>0.00</td>
<td>0.72</td>
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<tr>
<td>Discharged to: Diabetes</td>
<td>34.06</td>
<td>6.88</td>
<td>19.57</td>
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<tr>
<td>PMH</td>
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</tr>
<tr>
<td>Condition</td>
<td>Value 1</td>
<td>Value 2</td>
<td>Value 3</td>
<td>Value 4</td>
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<td>-------------------------------</td>
<td>---------</td>
<td>---------</td>
<td>---------</td>
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<td>Dyslipidemia</td>
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<td>18.12</td>
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<td>Heart Failure</td>
<td>11.23</td>
<td>2.54</td>
<td>6.52</td>
<td>2.17</td>
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<td>Hypertension</td>
<td>67.39</td>
<td>17.03</td>
<td>39.13</td>
<td>11.23</td>
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<td>Previous Stroke</td>
<td>22.46</td>
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<td>3.99</td>
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<td>Previous TIA</td>
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<td>9.06</td>
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<td>1.45</td>
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<td>Peripheral Vascular Disease</td>
<td>4.84</td>
<td>0.00</td>
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<td>Prosthetic heart valve</td>
<td>28.57</td>
<td>1.09</td>
<td>1.45</td>
<td>1.81</td>
</tr>
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<td>Sickle Cell</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
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<tr>
<td>Smoker</td>
<td>17.03</td>
<td>2.90</td>
<td>11.23</td>
<td>2.90</td>
</tr>
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<table>
<thead>
<tr>
<th>Rehabilitation Services</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Received rehab in hospital</td>
<td>65.58</td>
<td>12.68</td>
<td>41.30</td>
<td>11.59</td>
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<tr>
<td>Transferred to rehab facility</td>
<td>28.99</td>
<td>2.54</td>
<td>20.65</td>
<td>5.80</td>
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<tr>
<td>Referred to rehab services following discharge</td>
<td>47.83</td>
<td>6.52</td>
<td>32.61</td>
<td>8.70</td>
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<tr>
<td>Pt ineligible to receive rehab/pts resolved</td>
<td>12.32</td>
<td>6.52</td>
<td>5.43</td>
<td>0.36</td>
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</table>
TABLE 2
READMISSION LENGTH OF STAY, ADMITTING DRG
Table 2. Readmission Length of Stay, admitting DRG

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<thead>
<tr>
<th>Pt ID</th>
<th>Initial Episode DRG</th>
<th>Age</th>
<th>Initial LOS (Days)</th>
<th>Days from first DC to Readmit</th>
<th>Next Encounter LOS (Days)</th>
<th>Next Encounter DRG</th>
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</thead>
<tbody>
<tr>
<td>A</td>
<td>ICH or Cerebral Infarction W/MCC</td>
<td>56</td>
<td>17</td>
<td>5</td>
<td>13</td>
<td>Respiratory Signs &amp; Symptoms</td>
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<td></td>
<td>ICH or Cerebral Infarction W/O CC/MCC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>ICH OR Cerebral Infarction W/MCC</td>
<td>62</td>
<td>20</td>
<td>29</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>ICH or Cerebral Infarction W/O CC/MCC</td>
<td>57</td>
<td>2</td>
<td>14</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>ICH or Cerebral Infarction W/CC</td>
<td>92</td>
<td>4</td>
<td>12</td>
<td>4</td>
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</tr>
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<td>E</td>
<td>ICH or Cerebral Infarction W/O CC/MCC</td>
<td>66</td>
<td>2</td>
<td>9</td>
<td>1</td>
<td></td>
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<tr>
<td>F</td>
<td>ICH or Cerebral Infarction W/MCC</td>
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<td>8</td>
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<td>1</td>
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<tr>
<td>G</td>
<td>Intracranial Hemorrhage or Cerebral Infarction W/O CC/MCC</td>
<td>68</td>
<td>2</td>
<td>14</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>Intracranial Hemorrhage or Cerebral Infarction W/O CC/MCC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Mean + SD</strong></td>
<td></td>
<td><strong>64(13.9)</strong></td>
<td><strong>7.25 (6.8)</strong></td>
<td><strong>11.875 (7.37)</strong></td>
<td><strong>4 (3.97)</strong></td>
<td>**DRG= Diagnosis Related Group, LOS=Length of Stay, DC= Discharge, ICH= Intracerebral Hemorrhage, <em>MCC= Major Complications and Comorbid Conditions, <em>CC= Comorbid Conditions. * As defined by the Centers for Medicaid and Medicare Services, SD = Standard Deviation</em></em></td>
</tr>
</tbody>
</table>
REFERENCES


STROKEAHA.109.192362 [pii]


