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Development of the Stroke Modules for Kent County Hospital Stroke Unit

Barbara J. Bird

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DEVELOPMENT

OF THE STROKE MODULES FOR

KENT COUNTY HOSPITAL STROKE UNIT

by

Barbara J. Bird

A Major Paper Submitted for Partial Fulfillment

of the Requirements for the Degree of

Master of Science in Nursing

in

The School of Nursing

Rhode Island College

2012

Abstract

Stroke is the number one cause of disability in the United States and costs over $68 billion annually. The majority of strokes are preventable but require education of the public on modifiable risk factors and prevention. Nurses play a major role in education related to prevention and care of stroke patients. The purpose of this project was to develop a self study educational program for nurses caring for stroke patients. A four module program was created. It was piloted by the sample population of nurses working on the stroke unit at Kent County Hospital. There was a thirteen point improvement in scores from the pre-test to the post-test scores after completing the educational modules. The Advanced Practice Registered Nurse (APRN) plays a key role in implementing, updating and evaluating the program as well as serving as a resource for nurses caring for stroke patients. The APRN should be instrumental in providing education and resource information to the stroke patient and their family. Recommendations are to implement the educational, self-study stroke modules throughout the hospital for use by all nurses who might care for a stroke patient.

Acknowledgements

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Background and Significance Statement of the Problem

Simply stated, stroke is a brain attack and time is brain. Stroke is the number three cause of death in the United States (US) and the number one cause of disability. Approximately 795,000 strokes occur each year, one every 40 seconds. The cost of stroke care in the US is over $68 billion annually (Summers, 2009). Nurses play a key role in the care of stroke patients as well as in educating the public about stroke recognition and early intervention. The majority of strokes are preventable. Nurses have an important role in educating the public by communicating the health information related to modifiable risk factors and encouraging people to engage in activities to reduce their risk of stroke (Pugh, 2009).

Optimal care for the stroke patient depends on rapid diagnosis and aggressive implementation of evidence-based treatment (Pugh, 2009). Reducing disabilities that may result from a stroke are part of the critical role the nurse plays in early recognition and intervention of stroke signs and symptoms (Pugh). The Joint Commission (TJC) requires "healthcare provider competency as an integral part of disease specific certification" (Daniels, 2011, pg 74) in order to become a certified stroke center. The American Stroke Association (ASA) Guidelines (2005) for caring for the stroke patient require nurses to be educated and have expertise in stroke care. Stroke education is essential for nurses working in the Emergency Department, Intensive Care Unit, the stroke unit, and medical/surgical units. Nurses often coordinate the care of stroke

patients in the hospital. Improved outcomes and decreased length of stay can be

attributed to the coordination of the care of the stroke patient by the stroke nurse

(Daniels, 2011). "Thirty percent of patients will deteriorate within the first 24 hours.

Intensive monitoring by nurses trained in stroke is very important" (Summers, 2009, pg.

41). Nursing professionals must have knowledge pertaining to the new stroke standards

and be able to manage care quickly and appropriately according to the ASA guidelines

(Pugh, 2009). Promoting knowledge in practice and expert skill in the care of the stroke

patient is not only a goal but is fundamental. High quality nursing care is a key factor in

determining patient outcomes after a stroke (Daniels, 2011). Current, state of the science

stroke education modules are one way to ensure that nurses are educated according to the

best-evidence practice guidelines.

Overview and Critique of Key Literature

CINAHL and Pub Med databases were searched using key words nurse education, stroke, CVA, and stroke modules, for information regarding the need for and core components of stroke education for nurses.

The brain is a complex organ that controls various body functions. A stroke occurs when blood cannot reach part of the brain, and subsequently the body functions controlled by that part of the brain cannot work appropriately (Pugh, 2009). There are two main categories of stroke: ischemic and hemorrhagic. Ischemic strokes account for 80-85% of strokes and result from decreased blood flow to a portion of the brain, either by reduced or blocked blood flow causing cell death. Hemorrhagic strokes result from bleeding within the brain (Pugh, 2009). Transient Ischemic Attacks or TIA's are 'mini strokes' and present with symptoms such as numbness, trouble speaking, and loss of coordination but usually resolve without any deficits in a relatively short period of time, sometimes as quickly as 15 minutes (Hinkle, 1997).

Approximately one third of the 50,000 people who have experienced a TIA will subsequently suffer a stroke in the future (Hinkle,1997). Understanding risk factors that can and cannot be changed are key components in prevention of strokes. It is therefore imperative that evaluation, diagnosis, and intervention are completed for those patients (Hinkle). Nurses are instrumental in educating the patient and family about the importance of recognition and treatment of TIA symptoms. Stroke mortality has declined in the past two decades because of better acute care, reduced stroke severity, and earlier,

more accurate diagnosis (Hinkle). In attempting to educate the public, the term "brain

attack" is now favored instead of the term stroke but it is an ongoing education process.

Dr Vladimir Hachinski and Dr John Norris, neurologists from Canada, are credited with

coining the phrase brain attack in 1990 to create a sense of urgency to the public

(National Stroke Association's Complete Guide to Stroke, 2003).

Created in 1994, The Brain Attack Coalition (BAC), consists of the following groups:

The American Academy of Neurology; American Association of Neurological Surgeons;

American Association of Neuroscience Nurses; American College of Emergencey

Physicians; and the American Heart/Stroke Association. The BAC led several important

collaborative initiatives that included the publication of a paper on the establishment of

comprehensive stroke centers designed to offer a higher level of stroke care (The Brain

Attack Coalition Guidelines, 2011). In 2003, The American Heart Association (AHA)

and the ASA worked together to develop programs that recognized physicians who

provided high quality care for patients with cardiovascular disease and stroke.

(Schwamm, 2010). In the same year, the ASA served as a scientific advisor to TJC to

develop a national disease–specific Primary Stroke Center (PSC) certification program

based upon the BAC recommendations (ASA). The BAC recommends that all patients

experiencing stroke symptoms should be taken to the nearest Certified Stroke Center. The

BAC defines two types of stroke centers: PSCs and comprehensive stroke centers

(CSCs). A PSC has the necessary staffing, infrastructure and programs to stabilize and

treat most acute stroke patients. CSCs are able to treat stroke patients who require a high

intensity of medical and surgical care and that have a higher level of technological

resources (Alberts, 2005).

Strokes can have a devastating effect on people. The ASA and the National Stroke

Association (NSA) stated that in order to reduce the number of strokes or brain attacks, a

concerted effort should be made to educate the public, integrate the emergency response

system, and have a multidisciplinary treatment team approach (Pugh,2009). The

multidiscplinary team includes nurses, doctors, physical therapists, occupational

therapists, and speech therapists.

Key content components of stroke education include management of acute stroke

patients, overview of stroke care, use of thrombolytics in acute strokes, emergency

medical services involvement, and the hospital's role in acute stroke care (Smith, 2009).

Using the National Institute of Health's Stroke Scale (NIHSS), the ASA has partnered

with other groups to develop on-line, free certification and training programs for

healthcare professionals. The NIHSS is a systematic assessment tool that provides a

quantitative measure of stroke-related neurologic deficit. The NIHSS was originally

designed as a research tool to measure baseline data on patients in acute stroke clinical

trials and is now widely used as a clinical assessment tool to evaluate acuity of stroke

patients, determine appropriate treatment, and predict patient outcome. (NSA, 2012).

The ASA has also developed a program called *Get with the Guidelines* (GWTG) to

provide hospitals with the tools needed to ensure that patients are treated according to

the latest evidence based guidelines (Schwamm, 2010). The original seven measures

were identified as: 1.) the patient receiving IV tPa within two hours from the time that the

patient was last known to be well; 2.) early anti-thrombic therapy; 3.) deep vein

thrombosis prophylaxis therapy; 4.) patient is discharged on anti-thrombic therapy; 5.)

anticoagulation therapy for atrial fibrillation/flutter; 6.) patient receives and is discharged

on anti-cholesterol medication if low density lipoprotein (LDL) >100 or on anti-

cholesterol medication prior to admission; and 7.) smoking cessation education provided

to patient (Schwamm). The stroke performance measures have been updated in addition

to the original seven measures to include dysphagia screening prior to being given

anything by mouth, education regarding stroke to patients and family members and

assessing for rehabilitation services (Schwamm). These educational programs and

guidelines have contributed to a rapid improvement in the implementation of the seven

measures defined in the program for appropriate care of the stroke patient. Figure 1

illustrates improvement over time in the GWTG stroke program, resulting in a 32.5%

decline in stroke deaths rates between the years 1999-2007 (Schwamm).

During the initial, acute stage of stroke care for the hospitalized stroke patient, critical

care nurses are one essential component of the multidisciplinary approach needed in the

care of this challenging patient (Hinkle, 1997). Nurses across the continuum, from the

ED through discharge and rehabilitation, coordinate the care and treatments for the stroke

patient. Preventing complications and providing appropriate care are best obtained on a

dedicated stroke unit where the nurse is trained specifically in the care of the stroke

patient (Hinkle). These nurses are instrumental in educating patients and families

regarding diagnostic tests, therapies, and available care (Hinkle). One risk factor for

stroke is having a family member who has had a stroke; therefore, family education is

equally as important as patient education (Summers, 2009).
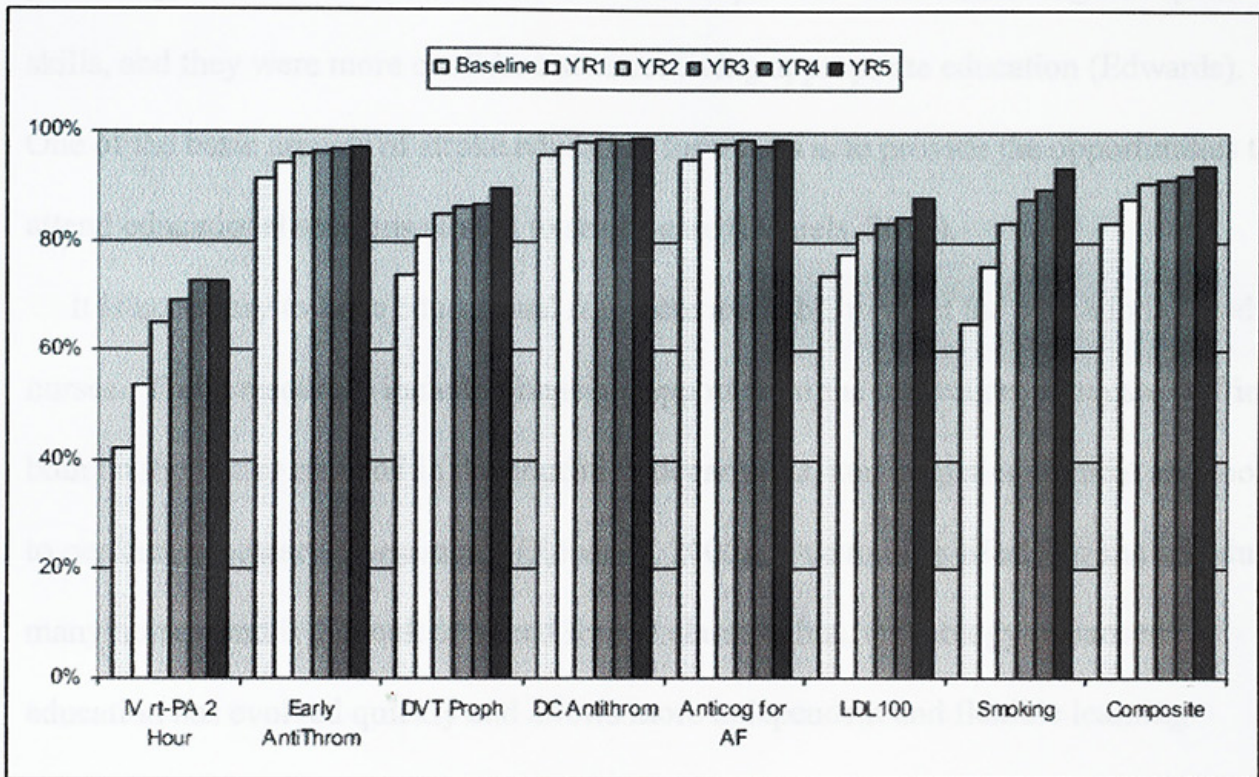
Figure 1. Improvement of GWTG stroke program over 5 year period of time (Schwamm, 2010).

TJC Disease Specific Care Certification requires healthcare provider competency as

an integral part of certification for an institution to become a Certified Stroke Center

(Daniels, 2011). The requirement states that care providers working in the stroke unit

demonstrate evidence of initial and on-going training in the care of acute stroke patients

and receive eight hours of stroke education or other equivalent activity annually

(Daniels). Educational opportunities upon hire to a stroke unit should provide the nurse

with adequate skills and knowledge for the role as a stroke nurse. Several studies have supported the observation that nurses were highly motivated to learn and wanted further education in the care of stroke patients (Edwards, 2006). Nurses felt their knowledge prior to specific education for stroke care did not provide them with enough adequate skills, and they were more confident after receiving appropriate education (Edwards). One of the basic aspects of stroke education for nurses is to provide the opportunities to attend educational sessions related to stroke care (Daniels, 2011).

It is necessary to have educational resources available to meet the educational needs of nurses. These resources include financial support from the institution, adequate staffing both on the stroke unit and in the education department, and proper equipment and tools to perform necessary assessments (Edwards, 2006). Due to busy lifestyles and schedules, many nurses find it difficult to attend formal classes; thus, technology-enhanced education has evolved quickly and allows more independent and flexible learning environments. Using multi-media resources such as clinical databases and simulation laboratories, which encourage real world situations for healthcare provider education with immediate feedback, has promoted confidence in caring for the stroke patient (Carter, 2009). While the use of new technologies may benefit some learners there may be learners who continue to prefer paper versions of educational material for self study. Using a variety of methods allows each individual to choose their preferred style of learning.

Education on how to prevent and treat strokes is greatly needed for both nurses and the community ("Nurses Need Education to Prevent and Treat Stroke," 2010/2011). Institutional support of educational programs and promotion of the use of the best evidence guidelines will provide nurses with the appropriate tools and skills to care for the stroke patient on a dedicated stroke unit (Edwards, 2006)

Educational learning modules provide a context for understanding and applying specific information related to the topic being presented. Modules consist of series of individual sessions focusing on a smaller topic within the broad category (Stewart,1999). Modules that are developed as self study educational opportunities facilitate the transformation of classroom learning into self directed learning that allows the student to study at their own pace, building on their own past experience (Stewart). Adults learn differently than children: self directed learning allows the adult to enjoy the flexibility to learn at times that fit into their schedules drawing on their previous knowledge base. Many self directed learners are attempting to gain new skills, knowledge, and attitudes to improve their work performance (Lowry, 2003). Developing stroke educational modules for nurses working on stroke units are one cost effective means of providing this knowledge, while also potentially empowering them to use their increased knowledge to promote positive outcomes for their patients (Daniels, 2011).

The purpose of this program development project was to develop and evaluate stroke education modules, using the best evidence practice guidelines, for Registered Nurses (RNs) at Kent County Hospital (KCH). These modules will replace the existing set of

education modules developed in 2003. In addition to using the latest guidelines for best

practice, the modules were developed using methodologies conducive to self learning,

allowing for flexibility and self-study. Next, the theoretical framework guiding this

program development will be discussed.

Theoretical Framework

The stroke education modules were developed using the W.K. Kellogg Foundation's

Logic Model for program development (Logic Model Development Guide, 2004). The

Logic Model provides a clear, organized approach to planning and designing a program.

The Model elements include purpose and goals, design and resources, implementation,

evaluation, and disseminating the program (Figure 2).

Purpose / Goals	Design / Resources	Implement ation	Evaluation	Dissemina tion
Step 1	Step 2	Step 3	Step 4	Step 5
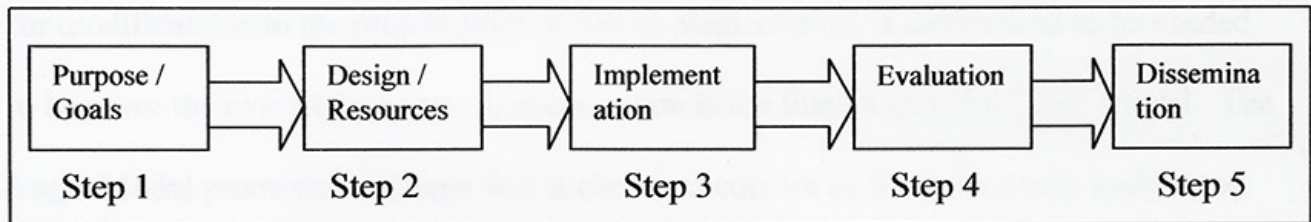
Figure 2. Template of Logic Model.

While the Logic Model is used in business, it can be translated for other uses and can

be used to guide program development. The Model begins with the process of

identifying the targeted audience, the purpose of the project, and the identification of

goals to accomplish the project.   Step 2 focuses on resources that will be needed to

identify key results. Exploring resources that already exist will help reduce the work

needed to complete the project. If there is a program currently being used that is similar

to the new project, it may be necessary to review the current program or extract pieces of

the program that will enhance the new project. Some of the barriers to developing a new

project are financial, availability of people to assist with implementation, as well as the

system process of getting the project approved by various committees upon completion.

The design of the project is developed using the available resources. Once the project has

been created, implementation of the project plan occurs, which corresponds to Step 3 in

the Model. It is often imperative to pilot the new project before disseminating it to the

target audience, which would require education of the pilot group related to the new

project. Upon completion of the pilot project, an evaluation is completed (Step 4). The

outcomes and impacts, which are specific, measureable, action – oriented, realistic, and

in a timed framework, are assessed. Evaluation after a pilot implementation also allows

for modifications to the project prior to full implementation, if determined to be needed

to improve the overall outcome. Dissemination is the final step in the Logic Model. The

Logic Model promotes language that is clear and concise so it can be easily understood

and evaluated (Logic Model Development Guide, 2004).

Methodology and Process for Implementation

Purpose

The purpose of this project was to develop, pilot, and evaluate stroke education modules, using best evidence practice guidelines, for RNs at KCH.

Design

This program development used a pre-test, implementation, post test design.

Site and Sample

This program was implemented at KCH, a Primary Stroke Center centrally located in Warwick, Rhode Island. The units involved in stroke care include the emergency department, the intensive care unit, the cardiac care unit and the stroke unit, 5West. For purposes of evaluating the newly developed stroke modules, RNs on 5West were recruited to participate in the pre-test, review the modules, complete the post-test and evaluate the program. All RNs employed on 5 West were eligible to participate.

Planning and Resources

Approval from the Rhode Island College (RIC) IRB was obtained prior to beginning implementation of the project. An action letter from the IRB indicated the project was exempt from continued review and the project could be implemented. A Letter of Agreement was obtained from the Kent County Hospital Education Department.

A four step approach (Rouda, 1999) was used for the needs assessment. The **first step** was to determine the gap in the existing education modules (Rouda, 1999). The current modules were not up to date, having been established in 2003. The director of the

Education Department had requested that these existing modules be revised and updated

to reflect and incorporate the most recent, evidenced based guideline for care of the

stroke patient, thus supported the need for revision. The **second step** examined the

importance and priority of creating new education stroke modules (Rouda). According to

the Education Department members who administer the stroke education modules, many

of the nurses who had recently completed the current modules stated that they were time

consuming and not user friendly for self study. These modules had originally been

designed for use in a formal classroom setting. The Stroke Program Coordinator felt that

should be updated to reflect current best practices. The Stroke Unit Manager indicated

that it was taking longer than necessary for his newly hired staff to complete the current

modules. The manager felt that it was a high priority to restructure this learning tool to

provide the nurses with the information they need to perform their role as a stroke unit

nurse.

The **third step** was to explore performance problems (Rouda). Due to the length of

time it took for nurses to complete the previous modules, it was deemed necessary to

design a format that would be user friendly and promote completion in a shorter period of

time. The possiblity if making the modules available on-line as well as a paper version

would offer the adult learner a choice and allow for individual learning style. The **fourth**

step is to identify possible solutions and growth opportunities (Rouda). Expert feedback

was elicited in regard to the module content, format, and presentation. This was obtained

from the nurse manager of the stroke unit and the stroke program coordinator prior to

implementation. Suggestions for revisions were made and implemented after discussion

with them. Utilizing available resources to assist with the development of the project

included input from the Stroke Program Coordinator and Stroke Unit Manager regarding

relevant content for each module and the organization of the modules. Reviewing the

current education modules being utilized by the Emergency Department (ED) assisted in

the format style. The nurses who currently work on the stroke unit made it possible to

pilot the project with a group who were knowledge in stroke care making them able to

effectively evaluate the project

Program Development

The new modules were developed using the best practice guidelines related to care of

the acute stroke patient as recommended by the AHA and the ASA (2010), in an effort to

promote the best patient outcomes for stroke patients. The content from current literature

was organized into modules that flow in an orderly fashion. Four content areas were

identified based on the literature as well as a self study program that was currently being

successfully used by the ED at Kent County Hospital that had been developed in July

2011. The modules used by the ED nurses reflected content specific for patients being

treated in the ED prior to transfer to another unit. Table 1 illustrates the content and

objectives for each module intended for the stroke unit.

Table 1.

Content and Objectives of the Stroke Modules

Content	Objective
I: Anatomy and physiology of the nervous system.	The student will understand the role and functioning of the various regions in the brain.
II: Types of strokes: ischemic, hemorrhagic and TIA, and related nursing care.	The student will describe the difference types of strokes and appropriate nursing care based upon the type of stroke exhibited.
III: Kent County Hospital specific tools and protocols for nursing care of the stroke patient, including: dysphagia screening tool; the NIH stroke scale; the tPa protocol; the stroke pathway guidelines; and physician orders sets for both tPa and non-tPa patients.	The student will be knowledgeable in the use of screening tools and protocols in providing nursing care for the stroke patient at KCH.
IV: Provide supplemental information that may be helpful to the nurse caring for a stroke patient including: links to ASA, AHA, NSA, Patient Health Education Booklet, the education department, the unit CNS, NIHSS	The student will understand where to obtain additional information and reference materials pertaining to the care of the stroke patients, including patient education as well as personal education updates.

Instruments

Pre-post test. A 20 question pre-test/post-test was created based upon content in each module; some of the questions that had been used in the prior stroke education program were included (Appendix A). The Stroke Program Coordinator reviewed the questions for relevant content and clarity prior to their use.

Implementation and Procedures

A sample of RNs who worked on the stroke unit (5 West) were recruited to participate. Thirty five potential RN participants received an IRB approved informational letter through email (Appendix B): the letter explained the purpose of the project, content of the modules, pre testing and post testing that was required, and that participation was expected to involve one to four hours to complete the modules and testing. The letter also indicated that the responses were anonymous and the pre and post tests were for purposes of evaluating the modules, not their performance, and would not be reflected in their educational record. While there was no compensation provided for this, nurses were encouraged to participate in evaluating the project.

Interested participants were instructed to contact the student investigator. Prior to providing the modules to the participants, subjects were again asked to review the informational letter (Appendix B) and were provided the opportunity to ask questions. Once their participation was agreed to, they were then asked to complete a brief pre test (Appendix A) and to return it to the student investigator in a sealed envelope as able. Once the pre-test was received, the participants were given the stroke module packet to take home and complete over a two to three weeks time period. Participants were encouraged to complete each module separately, and were allowed to keep the modules upon completion.

The participant was instructed to complete the post test at the end of each module after completion of the module content. There were four test questions after each module that

reflected the content in each specific module; these questions were used for review purposes only. After completion of all of the modules and post-tests, there was a program evaluation form (Appendix C) included for completion, with the opportunity to provide suggestions. Participants were asked to insert a unique identifier on each test and on the evaluation. Instructions were provided on how to create the unique identifier. Participants were reminded to return the completed forms to the student investigator in the sealed envelope provided.

Names of nurses who have taken the modules were recorded separately from the pre-tests. Nurses who did not return the modules after the three week period were contacted by email and simply reminded to complete the modules, post test, and evaluations within one week. No further reminders were sent.

Data Analysis

The pre and post test scores were compared for percent improvement. Evaluation comments were tabulated and summarized. Comments were made on questions 3, 7 and 10.

Results

Twenty five RNs responded to the email soliciting interest in participation, and those

25 were given the pre-test. Twenty three nurses returned the pre-test and were given the

modules to complete. Nineteen nurses returned the post test and evaluations; four

participants who did not return the post tests were excluded from the study.

Pre-test scores ranged from 60 - 95 out of a possible 100 points, with a mean score of

78. Post test scores ranged from 65 – 100 out of a possible 100 points with a mean score

of 91. Table 2 illustrates the pre and post test scores and the change in scores.

Table 2.

Pre-Test, Post-Test, and Change Scores for Participants
Completing the Modules (N=19)

ID	Pre	Post	Change
1	60	90	30
2	60	90	30
3	65	90	25
4	75	65	-10
5	75	75	0
6	75	90	15
7	75	100	25
8	75	100	25
9	80	90	10
10	80	90	10
11	80	90	10
12	80	95	15
13	80	95	15
14	80	95	15
15	85	95	10
16	85	95	10
17	85	95	10
18	90	100	10
19	95	95	0
Mean	78	91	13

The pre-test / post-test scores are illustrated in Figure 3.

Stroke Module Test Results
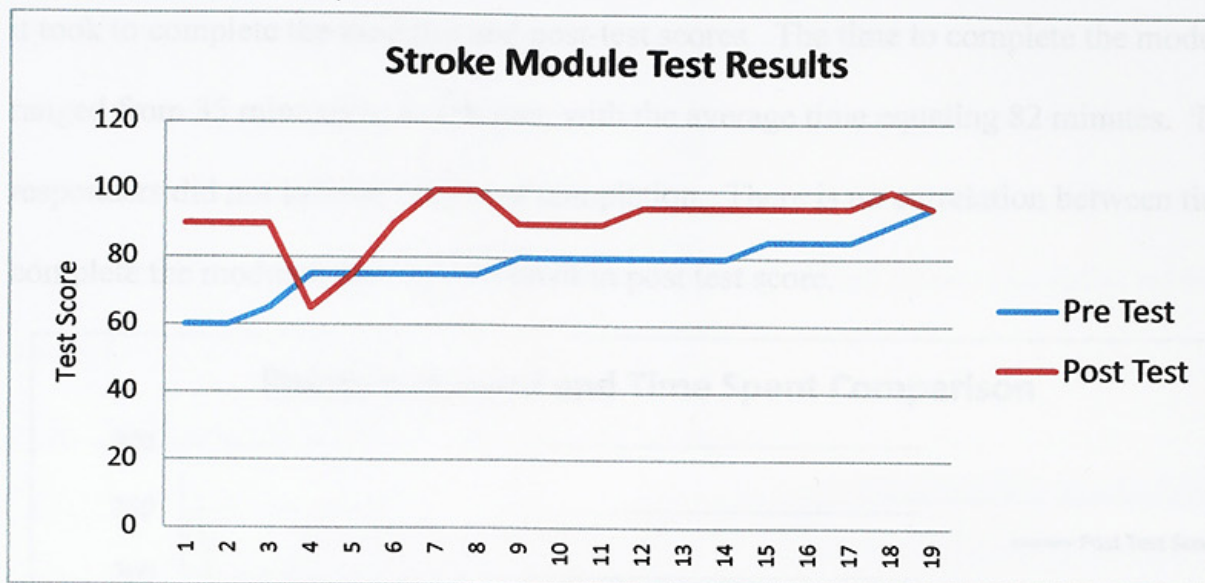

Figure 3: Comparison of pre and post test results

Next, percent improvements, in intervals of 15%, were identified. Figure 4 illustrates

identified categories of percent change and number of participants within each category.

There was a 13 point gain in raw score between the pre test and post test or 19%

improvement after reviewing the modules.
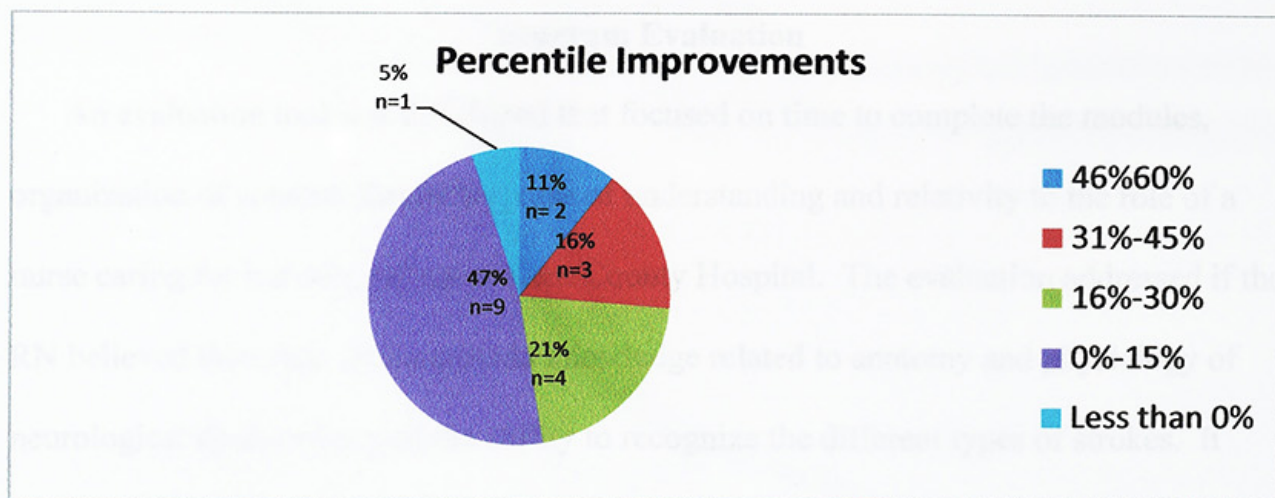
Figure 4. Percentile Improvements

Figure 5 indicates the time to complete the modules and the relationship between the time

it took to complete the modules and post-test scores. The time to complete the modules

ranged from 35 minutes to four hours, with the average time equaling 82 minutes. Two

responders did not indicate a time of completion. There is no correlation between time to

complete the modules and improvement in post test score.
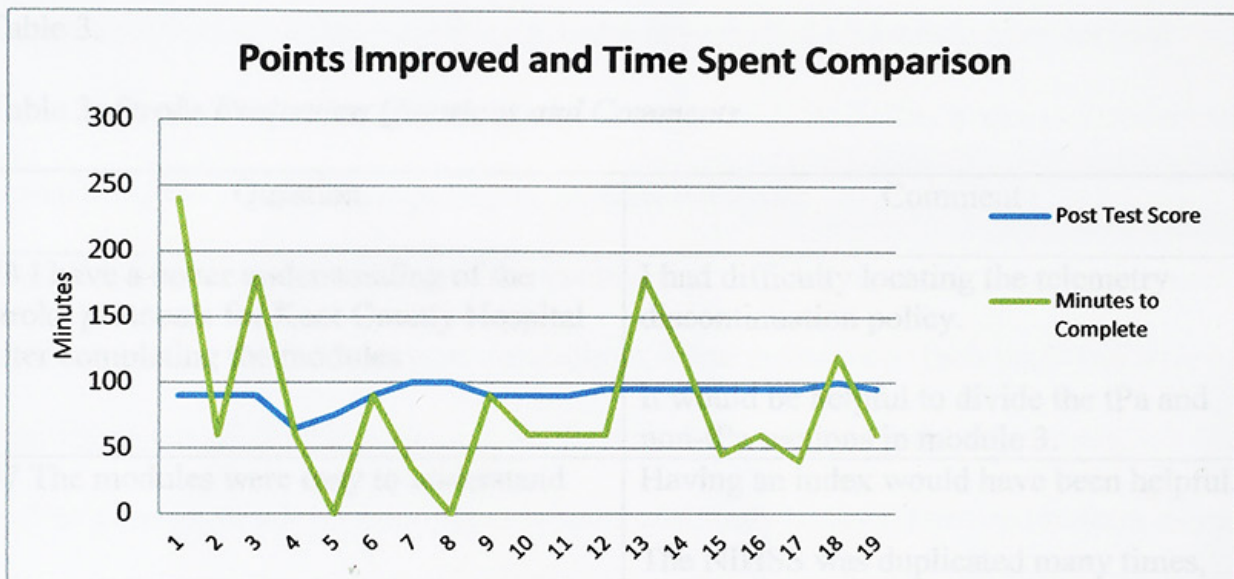
Figure 5: Time of completion and post test

Program Evaluation

An evaluation tool was developed that focused on time to complete the modules,

organization of content, flexibility, ease of understanding and relativity to the role of a

nurse caring for a stroke patient at Kent County Hospital. The evaluation addressed if the

RN believed there was an increase in knowledge related to anatomy and physiology of

neurological dysfunction and the ability to recognize the different types of strokes. It

also looked to assess the understanding of the Kent County Hospital specific stroke

policies and protocols. (Appendix C). A few participants offered comments on the

evaluation form and some communicated comments verbally.

The evaluation consisted of eleven questions, the response options provided a range

from 0 through 5 for each response, with 0 being disagree and 5 being strongly agree

(Appendix C). Questions 3, 7 and 10 had written and verbal comments, reflected in

Table 3.

Table 3: *Stroke Evaluation Questions and Comments*

Question	Comment
#3 I have a better understanding of the stroke protocols for Kent County Hospital after completing the modules	I had difficulty locating the telemetry discontinuation policy. It would be helpful to divide the tPa and non-tPa sections in module 3.
#7 The modules were easy to understand	Having an index would have been helpful. The NIHSS was duplicated many times, did not see why so many were needed.
#10 The process of completing the modules and tests were user friendly	It was much easier to do than the current modules

Summary and Conclusions

Stroke or brain attack can be a life changing event. Nurses play a key role in managing the care of stroke patients and educating the public in stroke prevention. Optimal care for the stroke patient depends on rapid diagnosis and aggressive implementation of evidence based treatment (Pugh, 2009). It is imperative that nurses receive the most up to date education in order to provide the best outcomes for their stroke patients. The use of self study education modules facilitates stroke unit nurses to in obtaining the education necessary to work on the stroke unit and allows the nurses flexibility to fit the study into their busy schedules. Making the modules available with on-line access as well as paper versions allows learners to choose their preferred style of learning as not all adult learners are comfortable with technology based learning.

The purpose of this project was to create a self study stroke education program using modules that were developed based upon evidence based guidelines. The modules were created using the guidelines described in the literature and following the Logic Model framework. After a needs assessment was performed, it was deemed necessary to develop a new educational self study program. The topics for each model were based upon the required information that nurses working on the stroke unit would need to be knowledgeable in caring for stroke patients. These were divided into four modules addressing anatomy/physiology of neurological dysfunction, types of strokes, specific policies and protocols for Kent County Hospital, and supplemental resource information. The modules were piloted on the Stroke Unit at Kent County Hospital. Nineteen of the

35 possible participants completed the pre-test, then reviewed the stroke modules and completed the post test. Analysis of the scores revealed an average 13 point improvement from the pre-test to the post-test, indicating a gain in knowledge using this module based program. Overall, the program was positively evaluated.

These evidence-based modules were successful in improving knowledge related to essential stroke content in this pilot study and were positively evaluated by nurses. This author concludes that implementation of the stroke modules for nurses working on the stroke unit is warranted. Providing the newly hired nurses on the stroke unit with these modules for self study will allow them to complete the educational requirements in a timely manner and in a user friendly structure. These modules should provide the nurse with adequate skills and knowledge needed to assume the role of a stroke nurse. Several studies have supported the observation that nurses are highly motivated to learn (Edwards, 2006). These modules will provide motivated nurses with an additional resource to support learning needs. Since this was a pilot study, it is recommended that they continue to be evaluated. Exploration for broader use in the hospital with some adaptation as needed is recommended.

Limitations

Since there were 35 RNs employed on the stroke unit, the sample of 19 participating in the pilot study is reasonably reflective of the population of nurses. It is acknowledged that those nurses who chose to participate may be different in some key characteristics than nurses who did not. However, nurses newly hired to the stroke unit who may not

have experience as a stroke nurses-may have different results. The variety of shifts

worked could also have impacted the ability of some of the nurses to participate in this

pilot, potentially impacting the scores.

Resources

Institutional support is a key component in stroke education. Resources necessary

include financial support, adequate staffing both on the stroke unit and the education

department, and proper equipment and tools to perform the necessary assessments and

learning activities (Edwards, 2006). Allowing time for educational opportunities and the

resources to access them is instrumental. Currently the nurses are required to complete

them on their own time with the education department as a resource for questions. It may

be necessary to provide time for nurses to complete the modules during working hours or

to provide funds so that nurses may be compensated for completing the modules.

One of the modules focused on resource information. The Brain Attack Coalition,

the American Stroke Association, and the National Stroke Association are just a few of

the resources that provide educational information for both health professionals and for

their patients. Encouraging the exploration of these resources will help to enhance

nurses' knowledge of stroke care and provide educational materials for r patients and

family members. The use of computer technology in the work environment allows

access to this information, which can be immediately printed and given to patients. The

CNS is in an ideal position to develop such a program, continue to monitor and

evaluate it, and to encourage expansion and implementation of available resources.

Practice Potential

The results were shared with the Director of Education. Following a review of the pre

and post test results and the narrative comments, revisions will be considered. Upon

approval of the Director of Education the stroke education module packets will be sent to

the following management personnel and committees within the hospital for approval:

The Stroke Unit Manager; The Stroke Program Coordinator; the Nurse Practice Council;

and the Nursing Education Committee. Once their approval has been obtained, the

modules will be printed for hard copy use and also integrated into the on-line learning

site, NetLearning, for access by the newly hired stroke nurses.

Recommendations and Implications

Based upon the results of the pre- and post-tests, a 19% improvement in scores, it is recommended to implement the self-study stroke education modules for newly hired nurses on the Stroke Unit at Kent County Hospital. It is recommended that the module content be made available as both an online learning activity as well as hard copy paper version.

Currently, the nurses hired for the stroke unit are required to complete the stroke modules on their own time. Since several nurses who participated in the pilot study indicated that it took then several hours to complete; including this as a compensated requirement would confirm the administration's belief that staff development will improve patient outcomes. It is also recommended that the educational stroke modules be utilized for the nurses who work in the Intensive Care and Rehabilitation Units. The importance of educating all nurses who care for stroke patients is vital.

Advanced Practice Registered Nurses, (APRNs) play a key role in updating and disseminating educational information for use by nurses. Reviewing current best practice guidelines and then informing nurses about these changes will ensure that the nurses are kept abreast of the most recent changes in stroke care. APRNs are an excellent resource for nurses and can provide research evidence and support to nurses caring for a stroke patient and their family. Strokes are the number one cause of disability in the US and therefore a costly entity in healthcare. The APRN is influential in educating nurses as well as the public about stroke recognition and early interventions.

The role of the APRN can be expanded to develop a program to teach stroke prevention and risk reduction to patients and families, possibly utilizing a support group forum. This should begin while the patient is still in the hospital as this is the perfect opportunity to have contact with both the patient and family. Follow up should continue throughout the rehabilitation phase. It is equally as important to stay in contact with those patients who have had a TIA to emphasize the need for continued care as they are now have a higher risk for strokes.

Proposing a role for the APRN as the stroke resource expert, the APRN could be instrumental in developing a stroke focused interdisciplinary group within the hospital to ensure that the resources are available to become and maintain TJC disease specific care certification as a Primary Stroke Center. Part of the role of the APRN should be to work with the Stroke Program Coordinator to collaborate statewide to assure that the most up to date research and guidelines are being emphasized and to continually educate the stroke nurses to any change in best practice in caring for stroke patients.

The APRN can identify and recommend opportunities for participation in funded research regarding stroke care to their institution's administration. This would be an effective way to lead the stroke nurses to become enthusiastic about researching best evidence practices, promoting prevention, and delivering the best possible outcomes for stroke patients. The APRN can be pivotal in assisting nurses to identify clinically significant questions for further investigation and guide them in the process.

As the patient enters the rehabilitative phase of stroke care, there are less obvious issues that evolve such as mood disorders, cognitive changes and communication problems. Adding modules that address stroke care in the rehabilitative phase to include early identification of mood disorders, cognitive changes and communication problems might be considered. Ross, Barton and Read (2009) developed and tested staff in-service training on psychological and communication issues. As in this study, more rigorous measures of learning outcomes need to be developed. Educational programs and guidelines have contributed to a rapid improvement in the implementation of the seven measures defined in the program for appropriate care of the stroke patient (Schwamm, 2010).

To provide the most up to date technology used in education, consideration of the cost and benefit of adding more technological support should be entertained. The use of high fidelity simulation strategies was demonstrated to be effective (Roots, Thomas, Jaye, Birns, 2011) for nurses working on a high acuity stroke unit. Simulation learning cannot replace real life experiences but it does contribute to developing clinical skills and can be used in conjunction with other traditional learning strategies.

As healthcare is evolving, consumers expect nurses to be educated in the most recent evidence based information. Access to technology and the explosion of research makes it even more important to remain well versed in the current standards and guidelines. as patients expect professionals to be knowledgeable in their area of practice.

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Appendix A

Pre/Post Test

Your unique identifier is: the 1st letter of your mother's maiden name/the 2 digit month of your birthday/the 1st letter of the city/town you reside in- for example - S02C
Unique identifier: _____

1.   Blood is the second component in the skull; it occupies 10% of intracranial space. The brain receives a constant supply of blood at a rate of:

     a.) 200 mL/min
     b.) 500 mL/min
     c.) 750 mL/min
     d.) 1000 mL/min

2. A lacunar infarction affects _____blood vessels in the brain.

3. The cerebral volume consists of 3 components, name 2 of the components.

    1._____2._____

4. Which major artery feeds the mid-cerebral artery?

  a.) The aorta
  b.) The subclavian artery
  c.) The carotid artery
  d.) The Circle of Willis

5. Ischemic strokes are caused by an interruption of blood flow to an area of the brain. Name 3 symptoms of ischemic stroke.
  1._____ 2._____ 3._____

6. Circle all of the following that are modifiable risk factor(s) for stroke.
  a.) Hypertension
  b.) Gender
  c.) Smoking
  d.) Prior stroke

7. According to statistics, 85% of all strokes are ischemic. True or False.
  True_____ False _____

8. According to Kent County Hospital Protocols, a patient must remain NPO until a dysphagia screen has been performed. Within the nursing department, who is allowed to perform a dysphagia screen?

a.) The CNA
b.) The Dietitian
c.) The Registered Nurse
d.) All of the above

9. The NIH Stroke Scale is used to determine the severity of a patient who has had a stroke. A high score would indicate the patient has minimal deficits. True or False?

True_____ False _____

10. According to Kent County Hospital physician orders - *brain attack –no tPa*, vital signs and neurological assessment must be done how often on a patient with a stroke in the first 24 hours?

a.) every 24 hours
b.) every 15 minutes
c.) every 4 hours
d.) every 8 hours

11. According to the Kent County Hospital's stroke initial physician's orders, all stroke patients are placed on telemetry for 24 hours. This is a time limited order, but if a patient has a cardiac arrhythmia what would be your intervention?

a.) Discontinue telemetry after 24 hours
b.) Ask the CNS (clinical nurse specialist) on your unit to assess the patient
c.) Refer to the discontinuation of telemetry policy
d.) Have the house officer evaluate the patient

12. Where can the nurse find educational resources?

a.) The education department
b.) The American Stroke Association web site
c.) The CNS for your unit
d.) All of the above

19. Stroke performance measures are audited by the stroke coordinator for compliance; these include some of the following: circle all that apply
   a.) DVT prophylaxis
   b.) Patient is discharged on a statin
   c.) Appropriate educational materials are provided to the patient/caregiver including warning signs for stroke, follow-up care, risk factors and Emergency Medical System activation
   d.) Smoking cessation

20. The brain attack pathway should be completed daily by:
   a.) The nurse manager
   b.) Any nurse caring for the patient
   c.) The social service department
   d.) The physician

Appendix B

Informational Letter

You are being asked to participate in a review of stroke modules newly developed for

Kent County Memorial Hospital.   These modules were developed as an educational self-

study packet for Registered Nurses who work on the stroke unit -5 West.

First, you will be asked to take a pre-test prior to reviewing the modules. You will be

asked to return the pre-test in a sealed envelope to the student developer, Barbara Bird,

and to not add your name to the test. Rather, you should use a unique identifier known

only to you that you will easily remember. Once the completed pre-test is returned, you

will be provided with a copy of the stroke modules. This is a self-study program. There

are four modules that you will be asked to review and then take a post test after each

module. Each module should take no more than 30 – 45 minutes to complete. Upon

completion of the module review and post tests, you will also be asked to complete an

evaluation of the program itself. Please remember to include your unique identifier on

the tests and evaluation forms, and return to the student developer, Barbara Bird, in a

sealed envelope. You may either keep or return the modules. If at any time you do not

wish to continue completing the modules, you may return the modules and tests to me.

You may withdraw at anytime without prejudice. The modules should be returned within

2-3 weeks; if not returned, you will be reminded once to return them.

None of the information you provide will identify you and the results will not be reflected

in your educational record. None of the completed tests or evaluation forms will identify

you. No identifying information will be recorded. You may benefit from participating in

this review in that your knowledge about care of the stroke patient may be increased.

Your participation will be helpful in developing stroke care modules that are evidence

based and that also meet the identified needs of the nursing staff. Your participation is

voluntary and your results will remain anonymous and will be kept confidential.

If you have any questions about the modules or the procedure you can contact me at:

 737-7000 ext. 31228.

Thank you for your participation and your time,

Barbara Bird, BSN, RN-BC
Student, Master of Science in Nursing program, RIC
Staff Nurse Stroke Unit – 5 West Kent County Hospital

Appendix C

Evaluation Form

Your unique identifier is: the 1st letter of your mother's maiden name/the 2 digit month of your birthday/the 1st letter of the city/town you reside in-   for example - S02C
Unique identifier: _____
Please evaluate the stroke modules. Any comments or suggestion for improvement can

be added at the end of the evaluation, use a blank page if necessary for comments and

suggestions. Please do not put your name on this form. Please return the form in the

envelope provided, sign your name on the outside of the envelope, and return to Barbara

Bird.

Using a 0-5 scale   0= disagree, 1= slightly disagree, 3= agree, 4= slightly agree, 5 =

strongly agree.

1. I have increased knowledge in the anatomy and physiology of the brain _____

2. I am better able to understand the different types of strokes _____

3. I have a better understanding of the stroke protocols for Kent County Hospital

    after completing the modules_____

4. I have a better understanding of the screening tools used by Kent County Hospital

    for care of the stroke patient_____

5. The content was relevant to my role as a stroke unit nurse _____

6. The modules allowed for flexibility and should continue to be done as self-study

    _____

7. The modules were easy to understand _____

8. Enough time was allowed to complete the modules_____

9. The modules were structured in an organized manner and were easy to

   follow_____

10. The process of completing the stroke modules and tests were user friendly

   _____

11. Please indicate how long it took for you to complete all the

   modules_____

Please add any comments or suggestions for improvement: