Creating a Self Learning Module For Nurses Caring for Patients Undergoing Angioplasty and Receiving Anticoagulation Therapy

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Creating a Self Learning Module For Nurses Caring for Patients Undergoing Angioplasty and Receiving Anticoagulation Therapy

Abstract
Nurses in the Cardiac Catheterization Lab (CCL or commonly referred to as the Cath Lab) play a critical role in the delivery of high quality care to their patients. Being knowledgeable and current on evidence based practice is the key to being an effective and efficient nurse. Every year there are annual competencies that nurses must demonstrate to prove that they are capable of performing these patient tasks independently. These annual competencies are institution and unit specific and may include tasks such as demonstration of inserting an intravenous catheter, drawing a blood specimen from an arterial line, and reading and interpretation of electrocardiograms (ECG). Some competencies involve the use of Self Learning Modules (SLM) to provide education on topics such as the use of central lines and anticoagulation therapy. Education on anticoagulation is extremely important in CCL nursing. Nurses administer anticoagulants to patients several times a day and need to closely monitor the patient. During an angioplasty procedure high doses of blood thinning medications are administered. It may be possible that nurses administer these medications without fully understanding the purpose or effects. There are differences in institutional protocols regarding nursing care for patients receiving anticoagulants, however general knowledge on the concepts is crucial.

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Creating a Self Learning Module

For Nurses Caring for Patients Undergoing Angioplasty and Receiving Anticoagulation Therapy

By

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Submitted in partial fulfillment of the requirements for the degree

Master’s in Advanced Practice Nursing

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Introduction

Nurses in the Cardiac Catheterization Lab (CCL or commonly referred to as the Cath Lab) play a critical role in the delivery of high quality care to their patients. Being knowledgeable and current on evidence based practice is the key to being an effective and efficient nurse. Every year there are annual competencies that nurses must demonstrate to prove that they are capable of performing these patient tasks independently. These annual competencies are institution and unit specific and may include tasks such as demonstration of inserting an intravenous catheter, drawing a blood specimen from an arterial line, and reading and interpretation of electrocardiograms (ECG). Some competencies involve the use of Self Learning Modules (SLM) to provide education on topics such as the use of central lines and anticoagulation therapy. Education on anticoagulation is extremely important in CCL nursing. Nurses administer anticoagulants to patients several times a day and need to closely monitor the patient.

During an angioplasty procedure high doses of blood thinning medications are administered. It may be possible that nurses administer these medications without fully understanding the purpose or effects. There are differences in institutional protocols regarding nursing care for patients receiving anticoagulants, however general knowledge on the concepts is crucial.

Background

Coronary Artery Disease (CAD) is the leading cause of death in both men and women (CDC, 2010). CAD occurs primarily due to a build-up of plaque inside the arteries of the heart which supply blood to the heart muscle. When the arteries become narrowed from plaque, there is a lack of blood circulating to the heart muscle which can cause
irreversible damage. This in turn can lead to chest pain, myocardial infarction (MI) and possibly death (Schiks, Schoonhoven, Aengevaeren, Nogarede-Hoekstra, Achterberg, & Verheugt, 2008). According to the Centers for Disease Control (CDC), it was estimated that over 631,000 people died from heart disease, and more than half of those individuals were women (2006). In the United States (US), someone has a heart attack every 34 seconds, and every minute there is a death related to a heart disease related event (CDC, 2010).

CAD can present with a wide variety of symptoms. These unfortunate effects range from mild chest pain to cardiogenic shock and sometimes death. When a patient is experiencing a heart attack, he or she is often sent to the Cath Lab immediately. The physician may try to perform a procedure called angioplasty, to open the blocked artery that is causing the MI with a stent. A stent is a metal coil that is inflated within the artery to allow blood flow.

When a patient is experiencing a heart attack, high doses of blood thinning medication are administered. From the time the patient is admitted in the Emergency Department (ED) to the time he or she arrives in the Cath lab, the patient may receive any combination of blood thinners. Most commonly, these medications include Heparin, Angiomax, Integrelin, and Plavix.

Due to the frequency with which these procedures are carried out, it was determined that regularly scheduled educational inservices on the anticoagulants that are administered to patients before, during, and after angioplasty would be helpful for nurses to remain current.
Nurses will always benefit from continuing education and being kept up to date regarding changing aspects of care within a hospital setting. For some adult learners, it is more convenient for them to learn on their own time rather than in a more formal work or school setting (Richardson, 1997). Self learning modules may provide learning opportunities in which the learner can feel more autonomous than with traditional classes (Yeazel & Center, 2004). Self learning modules may increase knowledge of a particular topic. These are a low cost way to provide information so that nurses are better able to care for their patients. Self learning modules can be constructed on paper, through video, or computer and the subject matter should be concise and focused on the topic (Yeazel & Center, 2004).

**Purpose**

The purpose of this educational program was to create an Anticoagulation SLM for nurses who care for patients receiving anticoagulation therapy before, during, or after an angioplasty procedure. The development of the SLM required soliciting the expert opinions of nursing professionals with experience administering anticoagulants and to determine whether this teaching tool would be beneficial to nurses who administer these medications. The experts (i.e., nursing professionals) were to evaluate the adequacy, effectiveness, accuracy, and convenience of the SLM. An evaluation form was provided for their constructive feedback. Changes were made to the SLM based on their feedback. The purpose of the evaluation form was to assist the researcher in development of a current, concise and comprehensive form of education that met the needs of the nurses. This also was an easy and desirable method to obtain information on the chosen topic. The opinions of the experts also allowed the researcher to determine whether nurses
would benefit from this program as part of an orientation process for nurses who are to begin working on a patient care unit where these medications are administered. Nurses also may benefit if this teaching tool were to become an annual competency for review in health care facilities.

**Objectives for this self learning module**

- The learner should have knowledge of coronary artery disease and angioplasty
- He or she should be able to provide background information on various anticoagulants used during angioplasty (i.e., Heparin, Angiomax, Integrelin, and Plavix).
- The learner should also have an understanding of each medication’s purpose, pharmacokinetics, adverse effects, benefits, and proper dosing.
- The learner will also have an understanding of nursing considerations when caring for patients receiving blood thinning medications such as bleeding complications and close monitoring of patients with renal insufficiency.

The goal of this project was the development of a comprehensive learning module for nursing administration of anticoagulation therapy. While data were collected on the actual use of this module in practice, it was expected that providing continuing education for nurses would result in increased knowledge and improved quality of patient care. Completion of a Self Learning Module on anticoagulation used during angioplasty and the protocol of care of a patient on these medications may increase nurses’ knowledge of anticoagulation therapy.
Summary: The purpose of this project was to develop a module to provide information on and assess nurses’ knowledge of administering anticoagulation therapy to patients undergoing angioplasty. It was expected that assessment of nurses’ knowledge would help to determine whether nurses would benefit from this education. It is understood that newly hired nurses to a unit where anticoagulation medications are administered, would benefit from this educational tool becoming part of the orientation process. This increased knowledge base for nurses who care for angioplasty patients may improve the quality of care delivered to their patients. However, the aspect of improving quality of care was not measured in this study due to long term nature of the data. Future studies may involve medical record review to determine whether health care professionals were compliant with institutional and unit specific policies regarding optimal care of these patients, to quantify documented errors during the procedure.

**Theoretical Framework**

Individuals must understand how they learn best in order to be taught successfully. Participants must relate theories and concepts and recognize the value of experience in learning (Lieb, 1991). Knowles’ Adult Learning Theory was utilized in the development of this project. There are five principles of the Adult Learning Theory: self-concept, experience, readiness to learn, orientation to learning and motivation to learn. Knowles stated “adults should acquire a mature understanding of themselves. They should be able to understand their needs, motivations, interests, capacities, and goals”. This theory supports the idea that the quality of experiences people have in society will influence the skills and attitudes they will carry into the future. (Smith, 2002)
Several studies have been conducted to determine the effectiveness of self learning modules. With the increasingly rapid pace of society, many people do not have the time to participate in traditional education classes and are more likely to participate when it is convenient for them. Self learning modules include a complete education package allowing learners to gain knowledge at their own pace. These provided a self directed learning opportunity for the nurses participating in this study. It also allows individuals to gain the knowledge needed to perform tasks and be successful at their jobs (Richardson & Bostick, 1996).

**Research Technique**

When researching the topic of anticoagulation during angioplasty, the following databases were searched to obtain literature from 2002-present: MEDLINE, CINAHL, Cochrane, and Joanna Briggs. When refining the search to “nurses managing patients receiving anticoagulation medications”, there were no accessible research articles related to this topic. Other key words used to limit the search were: nurse’s knowledge of thrombolytics, percutaneous coronary intervention, antiplatelet therapy, Angiomax, Integrelin, and Plavix.

While researching the topic of self learning modules, the following databases were used to obtain literature addressing adult education concepts from 1997-present: MEDLINE, CINAHL, Cochrane, and ERIC Proquest. Key words used to limit the search included: nursing continuing education, Knowles’ Adult Learning Theory, and Adult learning methods.
Literature Review: Anticoagulation

It was important to review the most current literature on the use of anticoagulant therapy as the basis for the development of the educational module. For patients undergoing elective percutaneous intervention (PCI), the optimal antiplatelet and antithrombin regimens are controversial. Compared to unfractionated Heparin (UFH) alone, additional use of glycoprotein IIb/IIIa inhibitors (GPIs) significantly reduces ischemic complications but may be associated with increased bleeding. A study conducted by Steinberg, et al. (2008) examined whether excess bleeding in patients treated with UFH and GPIs may have been caused by excessively high doses of UFH and increased activated clotting times. The study focused on the bleeding risk of low dose UFH and GPIs compared to Angiomax in patients undergoing elective PCI. In a sample of 1,205 patients undergoing PCI, 602 were treated with UFH and GPIs and 603 were treated with Angiomax. Inclusion criteria involved those with stable or unstable angina undergoing elective PCI, and exclusion criteria involved patients with positive troponins significant for acute coronary syndrome (Steinberg, et al, 2008).

All study patients received aspirin 325 mg and Plavix 600 mg before the procedure. The UFH and GPI sample needed to achieve an activated clotting time of 200-300 seconds. Patients receiving Angiomax received a bolus dose prior to the infusion. After the procedure, Aspirin 325 mg was continued indefinitely and Plavix was maintained for 4 weeks for bare metals stents and 6 months for those who received drug coated stents. Unlike bare metal stents, drug coated stents do not become fully coated with a patient’s own tissue and the patient has a high risk of developing blood clots. Therefore, a
maintenance dose of Plavix for at least 6 months after angioplasty is used to decrease this risk. (Steinberg, 2008)

Results of the study showed that patients undergoing PCI treated with low dose UFH and GPIs experienced similar rates of bleeding and clinical events compared with patients treated only with Angiomax. These results are most significant when considering UFH for patients during PCI, since Angiomax has been shown to decrease ischemic complications than with UFH alone. Thrombolytics are the standard for coronary stenting, however the risks and benefits must be weighed due to the cost of potential bleeding. The results were inconsistent with findings of previous studies that compared Angiomax with UFH/GPIs in which higher rates of complications occurred. (Steinberg, 2008)

Gurbel (2009) examined the effect of therapy with Angiomax alone when compared to Angiomax plus Integrelin on platelet reactivity measured by turbidometric aggregometry and thrombin-induced platelet fibrin clot strength (TIP-FCS) in PCI. The researcher also examined the relationship of platelet aggregation and TIP-FCS to the occurrence of periprocedural infarction. Ischemic complications during PCI are influenced by platelet function. High post-PCI platelet reactivity has been coorelated to periprocedural MI and stent thrombosis. (Gurbel, 2009)

The study included a random sample of 200 patients who were treated with Angiomax or Angiomax plus Integrelin. Over half of the patients were administered a loading dose of Plavix immediately after stent placement. Patients were pre-treated with Plavix for two weeks prior to the procedure along with an 81 mg aspirin for one week before. After the procedure, patients were placed on Plavix 75 mg daily, and aspirin 325 mg daily.
Integrelin was initiated using the ESPRIT (Enhanced Suppression of the Platelet IIb/IIIa Receptor with Integrelin Therapy) protocol as a double bolus and an infusion for 18 hours after the procedure. Angiomax was administered with a bolus dose followed by an infusion which was discontinued immediately after the intervention. (Gurbel, 2009)

Results demonstrated that with the addition of Integrelin, patients had an immediate reduction in periprocedural platelet aggregation and reduced overall maximum TIP-FCS. Researchers found that Angiomax and Plavix with Integrelin was associated with much lower platelet reactivity. During angioplasty, the addition of Integrelin to Angiomax lowered platelet reactivity (PR) to multiple agonists and the tensile strength of the thrombin induced platelet-fibrin clot strength (TIP-FCS), 2 measurements associated with periprocedural myonecrosis. This determines whether there has been damage to the heart muscle during the procedure which may cause the heart to work harder to be more effective. The researchers noted that future studies of PR and TIP-FCS measurements may facilitate personalized antiplatelet therapy with the appropriate selection of patients with GP IIb/IIIa blockade in effective stenting. (Gurbel, et al., 2008)

LeMay, et al. (2009) investigated angioplasty with and without Integrelin in ST-segment elevation myocardial infarction. They looked at safety and efficacy of Integrelin-facilitated versus primary PCI in ST-segment elevation MI (ASSIST). Angioplasty is the preferred method of restoring blood flow after an acute myocardial infarction. The researchers wanted to determine if administering Integrelin before catheterization would improve clinical outcomes in PCI patients. (Le May, et al., 2009)

Methods involved randomly assigning 400 patients with ST-segment elevation MI referred for PCI to treatment initiated before cardiac catheterization with either Heparin
and Integrelin together or Heparin alone, in addition to oral aspirin and high dose Plavix. The primary outcome evaluated was incidence of death from any cause, recurrent MI, or recurrent severe ischemia during the first 30 days after randomization. The final sample size included 13 patients assigned to Heparin with Integrelin and 11 patients assigned to Heparin alone. Results showed that rates of minor bleeding were higher in patients assigned to the Heparin and Integrelin group than in those that were given Heparin alone. Individuals pre-treated with Plavix who were referred for PCI, treatment with Heparin and Integrelin did not benefit from improved clinical outcomes, and had more bleeding complications than the group that was given Heparin alone (LeMay, et al., 2009).

Karjalainen (2007) examined safety of PCI during uninterrupted oral anticoagulant treatment. Patients taking Warfarin who are referred for PCI poses a significant management challenge for physicians during invasive procedures. They must be aware of the increased potential for periprocedural hemorrhage, thrombotic complications, and thromboembolism. It is the current standard of practice that these patients have discontinued their warfarin prior to invasive procedures. An international normalized ratio (INR) of less than 1.8 is recommended. The patient may be started on Heparin as bridging therapy until the INR ratio reaches therapeutic levels. (Karjalainen, 2007)

Data collection for the above study included secondary analysis of computerized databases in 7 Finnish hospitals. The researchers analyzed all consecutive patients on warfarin therapy referred for PCI in four hospitals with protocols to interrupt anticoagulation (IAC) prior to PCI, and in three centers utilizing uninterrupted anticoagulation (UAC) during PCI. However, each hospital had different treatment approaches based on the physician’s preference (Karjalainen, 2007). In 20 hospitals with
an IAC policy, patients underwent PCI with UAC. In the UAC group, a total of 51 patients had IAC during PCI even though the INR was above therapeutic range (Karjalainen, 2007).

Coronary angiography and PCI were performed using either radial or femoral approach for arterial access. Immediate post procedure was preferred in all but one hospital. Medical records were reviewed to determine anticoagulation medications given and incidence of bleeding complications during the procedure (Karjalainen, 2007).

Results revealed that over 5% of patients undergoing long term oral anticoagulation therapy because of other chronic medical conditions. During the study, researchers found bleeding and access site complications in this group of patients. They also found uninterrupted anticoagulation to be just as safe as interrupted anticoagulation in PCI patients. (Karjalainen, 2007) However, bleeding and complications were more common in the IAC group. This may be due to the explanation that those individuals were also administered glycoprotein IIb/IIIa inhibitors and low molecular weight heparin. The IAC group analyses suggest that bridging therapy with low molecular weight heparin may lead to increased risk of access site complications compared with standard UAC (Karjalainen, 2007).

**Literature Review: Self Learning Module**

For some adults, it is more convenient for them to learn on their own time when compared to a work or school setting (Richardson & Bostick, 1997). Self Learning modules provide learning opportunities in which the learner can feel more autonomy than with traditional classes. Self learning modules may be presented in different formats
(paper, video, or computer) but the subject matter should be concise and focused on the topic (Yeazel & Center, 2004).

Studies have been conducted to analyze the effectiveness of self learning modules with adults. Yeazel and Center (2004) developed three modules on preventative medicine topics in Family Medicine residency program. Pre and post tests were given to evaluate residents’ ability to meet the objectives of the modules. Residents rated appropriateness and accessibility of the modules. Each module took an hour to complete and involved ten to twenty pages of learning material. A multiple choice test was given at the end of each test to determine whether the learning objectives were met. Residents were more able to meet the goals of the self learning module after completing the module than before going through the learning module. Their scores ranged from 85-100%. While residents noted that they preferred hands on methods such as clinical rotations and programmatic workshops, they also rated the quality of the self learning module favorably and found the information was very informative (Yeazel & Center, 2004).

In a study conducted by Saethang and Kee (1998), the researchers investigated the use of games to teach non-critical care nurses how to safely administer critical cardiovascular medications. Traditionally, lectures have been a teaching method of choice, however these can be considered uninteresting and may result in poor retention of knowledge (Saethang and Kee, 1998).

In a large metropolitan hospital, the educational program was initially designed for the health professional group to identify critical content and formulate learning objectives. Some of the learning objectives included stating admission criteria for a medical-surgical unit for patients who will be receiving vasoactive medications, list the cardiovascular
medications given via continuous IV, intermittent IV, or IV push that require patient care monitoring. Also, the staff nurses needed to describe the mechanism of action, classification, dosing, and nursing considerations for various vasoactive and vasopressing medications. This method was difficult and created a great deal of anxiety among the nursing staff, which led to the development of a gaming strategy (Saethang and Kee, 1998).

The game strategy began with a caricature case study which seemed to reduce the seriousness of the learning experience and make it more interesting. The game followed the case study and involved the nurses to form two teams. The nurses were asked to spin a wheel which consisted of categories including drug dosing, mechanism of action, generic name, drug classification, nursing implications and side effects. Each section had a stack of cards with questions pertaining to that category. Team captains kept track of the points, and the winning team received prizes such as heart figures and candy. The instructor described the correct responses to unanswered and incorrect questions as well as additional concerns about the medications. An evaluation form was distributed at the end of the game (Saethang and Kee, 1998).

Results of the evaluation showed that the desired learning outcome was achieved. Nurses rated the effectiveness from “very good” to “excellent” and described the method fun and innovative. The game provided staff with an opportunity to increase their knowledge base and feel more comfortable during emergency situations (Saethang and Kee, 1998).

Kang (2002) conducted a study that focused on the effectiveness of using a self learning module to educate nurses working with tracheostomy patients. The researchers
gathered data through a needs assessment to determine whether a knowledge deficit existed. The needs assessment revealed a deficit by the nurses regarding hospital care and teaching needs for children. The self learning module was developed in a simple writing format and addressed the important learning needs of the nurses. A pre test and post test consisting of 15 questions each were available on each pediatric unit for nurses to complete (Kang, 2002).

Results of the study revealed an increase in the scores of the post test when compared to the pre test. On the first try, 93% of nurses received a score greater than 86% on the post test. Of the individuals surveyed, only 6% did not feel as if they would be better able to teach the patients’ families how to care for a patient with a tracheostomy after the self learning module was completed (Kang, 2002). A majority of the nurses gave a positive evaluation of the self learning module. They thought the module was attractive, and agreed that topics were comprehensive, and would help them to better care for their patients (Kang, 2002).

Straight (2008) developed a self learning module to evaluate nurses knowledge of safe medication delivery. The module was presented on the hospitals website with the primary focus on current resources available to promote safe medication administration. The self learning module was designed using Power Point and included text, visual images, and a hands-on assignment requiring participants to use Lexi-Comp on their units. Lexi-Comp is a type of software that delivers clinical and drug information to healthcare workers that may improve patient safety (Straight, 2008).

Results showed an increase in usage and awareness of resources available after the completion of the self learning module. Prior to the introduction of the module, 42%
used Meditech and 69% used Medline Plus for looking up information on medications. Meditech and Medline Plus also are software that provide information on clinical and drug information. After the introduction and use of the self learning module, awareness and use of Lexi-Comp increased 81.82% (Straight, 2008). Participants strongly supported the study methods. All participants expressed a desire for more training similar to that used in this study (Straight, 2008).

Self learning modules are used frequently for nurses in hospital settings and expand knowledge needed to successfully perform tasks. Results of these studies showed that self learning modules have the potential to increase knowledge of a particular topic, and were accepted by the participants. Use of SLMs is a low cost way to provide information so nurses are better able to care for their patients.

**Needs Assessment**

An informal needs assessment was carried out following a thorough and lengthy search of the literature. There is a notable lack of literature related to the nursing care of patients receiving anticoagulation therapy as well as the management of angioplasty patients. An informal assessment including nurses who have had experience administering these medications resulted in recommendations for educational opportunities to be offered throughout the year regarding the anticoagulation medications that are administered to patients before, during, and after angioplasty. Nurses would benefit the most if this educational program were to be part of a hospital or unit specific orientation process. Nurses always benefit from continuing education and being kept up to date on changes in evidence based practice.
Sample

Subjects who were eligible for this project included members of the American Association of Critical Care Nurses (AACN), Greater Rochester Area Finger Lakes (GRAFL) chapter. Members of this group have prior clinical experience administering anticoagulants and were able to provide expert opinion on the self learning module. Members of the AACN include nurse practitioners, clinical nurse specialists, nurse educators, and registered nurses from various medical facilities in western New York. In order to have access to the members of an appropriate professional organization, this researcher collaborated with Virginia Riggall, the president of the AACN, Greater Rochester Area Finger Lakes (GRAFL) Chapter. In order to ensure confidentiality of participants, an email was sent to GRAFL Chapter members by Virginia Riggall (Appendix A). This email was sent for purpose of requesting their participation in this project. Participation was voluntary and completion of the evaluation form constituted implied consent.

The purpose of this project was to develop a program that would be evaluated by nurses with experience administering anticoagulants. The SLM consisted of a pre test (Appendix B), post test (Appendix D), and evaluation form (Appendix E). A power point presentation was created to provide information regarding various anticoagulants (Appendix C). The data collection tool for evaluation of components of this project was delivered through the use of Survey Monkey which was available to participants for one month.
Benefits and Risks

There are many benefits to the collection of this data. The self learning module will expand nurses’ knowledge of anticoagulation therapy used during angioplasty. They will have a better understanding of the purpose of giving these medications, dosing, nursing considerations and complications of administration. In addition, the researcher will gain experience in data collection by evaluating the effectiveness of using a self-learning module as an education tool. The evaluation form did not contain any questions that would specifically identify any individual participant.

There were no risks associated with this program other than the time commitment by the volunteers. Participation was voluntary and all comments provided will remain anonymous. The researcher had no responsibilities as a supervisor or manager for any person participating in this project.

Educational Program Instructional Design

The program was developed to educate nurses who work or have worked in an area of a hospital where they have administered anticoagulants. A secondary purpose was to determine the needs of learners and provide them with the appropriate knowledge.

Methods

The time frame for the project was between Spring 2011 and Summer 2011. The self learning module was created by the graduate student (Stacy Incardone, RN), a registered nurse with clinical experience administering anticoagulants to patients undergoing angioplasty. The SLM was developed in a power point format. This education tool was accompanied by a pre test, and a post test, and an evaluation form.
Questions were based on the content discussed in the power point. Participants were instructed not take the pre and post tests, but only to review the tests and anticoagulation power point to provide constructive feedback. In May 2011, participants were contacted via their home emails to explain the purpose of the project. This email included a letter of introduction asking for their participation. In early June, the SLM, pre test, post test and evaluation form were available on Survey Monkey for them to review. Use of Survey Monkey allowed participants to remain anonymous. Survey Monkey summarized the responses into aggregate format. These responses were incorporated into the revised SLM. In the email sent out to the nurses, their participation was strongly encouraged in evaluating the self learning module as a teaching tool for nurses who administer anticoagulation therapy.

Program Implementation

The Anticoagulation SLM was developed with the goal that it would prove to be a beneficial teaching tool for nurses who administer anticoagulation therapy to angioplasty patients. It was expected that this process would help to determine whether this SLM would be useful for new nurses as part of a hospital orientation process. It is possible that this program may be implemented in the future on units utilizing anticoagulation therapy for patients.

Results

Of the 100 members of the AACN (GRAFL chapter), there were 24 individuals who participated in the evaluation of the program. All participants are members of the AACN which includes nurses at different education levels (associated degree prepared, diploma
graduates, nurses prepared with a baccalaureate degree and masters degree prepared nurses). Of the 24 participants, 15 people did not complete the evaluation of the program, 17 people answered the test questions but did not provide comments, and 9 people offered suggestions regarding improvements to the SLM. Many of the same participants answered the test questions and did not complete the evaluation of the program. There were very few nurses (4) who stated they did not work in an area where these medications were administered which made it difficult for them to understand the test questions. All participants felt that the use of Survey Monkey was convenient and 19 said they liked the power point format as the method of delivery.

**Learning Outcomes**

To evaluate learning outcomes, a two part evaluation form was presented at the end of the SLM. The first part consisted of nine Likert scale questions utilizing a rating evaluation ranging from excellent to poor. The second part consisted of eleven short answer questions to provide comments on specific areas of the SLM. These comments were reviewed and changes were made to the SLM.

**RESULTS**

Reviewing the evaluation form questions (Part 1):

1. **Accuracy of Information**

   Of the 24 participants, forty-six percent (11) responded “excellent” to this question. Seventeen percent (4) rated the information “good”, four percent (1)
rated the accuracy of information “fair”, no participants thought it was poor, and thirty three percent (8) did not respond.
2. **Selected Medications are Appropriate**

Forty two percent (10) of the participants rated this question as excellent. Twenty one percent (5) rated it good, four percent (1) rated it fair, and no participant gave it a rating of poor. Thirty three percent (8) did not respond.
3. Nursing Care Topics Covered are Appropriate Teaching Methods

Thirty eight percent (9) rated this question as excellent, twenty one percent (5) rated it good, four percent (1) rated it fair, four percent (1) rated the question poor, and thirty three percent (8) did not respond.
4. The Teaching Methods

Thirty three percent (8) rated this question as excellent, twenty five (6) rated this question as good, four percent (1) rated it fair, and thirty eight percent (9) did not respond.
5. Power point as Method of Delivery

Thirty eight percent (9) rated this question excellent. Twenty five percent (6) of participants responded to this question with good. Four percent (1) responded with fair, and thirty three percent (8) did not respond.
6. Ease of Completion

Forty two percent (10) people who participated responded to this question with excellent. Twenty one percent (5) participants responded with good, four percent (1) responded fair, and thirty three percent (8) did not respond.
7. **Usefulness of the Program**

Forty six percent (11) people who participated responded to this question with excellent, seventeen percent (4) had a response of good. Four percent (1) responded with fair, and thirty three percent (8) had no response.
8. Test Questions are Appropriate

Forty two percent (10) of participants responded to this question with excellent. Thirteen percent (3) responded with good, thirteen percent (3) responded with fair and thirty three percent (8) had no response.
9. Convenience of Survey Monkey

Sixty three percent (15) responded to this question with excellent, four percent (1) responded to this question with good. No participants responded with fair or poor to this question. Thirty three percent (8) of participants did not respond.
Reviewing the evaluation form questions (Part II)

1. **Do you think the information covered will give nurses a better understanding of anticoagulation therapy?**

   A majority of participants, sixty three percent (15), responded yes to this question. Many said that the information was broken down into sub topics that will help them understand and be able to refer to it. They also felt that the information was presented in a clear, concise manner and easily understood. Thirty eight percent (9) did not respond to the question. There were no negative comments to this question.

2. **What knowledge did you gain from reading this Self Learning Module?**

   Of the 24 participants, there were many different responses to this question. Seventeen percent (4) responded that they enjoyed learning about the renal aspect of the medications of which they were previously unaware. Another seventeen percent (4) gained knowledge from the information on angiomax. Another seventeen percent (4) responded that they gained knowledge of the differences in the medications and reinforced knowledge of medications that they had not used in a while. Other comments included that they enjoyed learning about the importance of nursing care of patients going through PCI, and some did not realize that the Joint Commission had set standards for anticoagulation therapy. Thirty eight percent (9) of participants did not respond to the question.
3. **Do you think that new nurses would benefit from this being part of a hospital or unit specific orientation process?**

Thirty eight percent (9) of participants responded yes, they think new nurses would benefit from this educational program being part of a hospital or unit specific orientation process. Seventeen percent (4) felt that since it is more specific to cardiology, nurses who will begin working on a cardiac floor would benefit the most. One participant commented that new nurses may not grasp the importance of an acute MI and PCI. Thirty eight percent (9) participants did not respond to this question.

4. **What other medications do you feel would be important to cover and why?**

Participants provided many different responses to this question. Those who were familiar with the medications covered and use them frequently felt that the medications in the power point were enough for the subject. They were satisfied with the SLM and did not feel that any other medications needed to be addressed. One person felt that all anticoagulants should be covered, another participant responded with Nitroglycerin and Effient, and two people stated that Aspirin should have been covered in the module. Forty six percent (11) did not respond to this question.
5. Were the selected medications covered appropriate? Are they relevant to your particular area of nursing?

Of the 24 participants, forty two (10) responded to this question with yes, they felt that the medication were appropriate and is relevant to their specific area of nursing. One participant commented that these medications are not usually started in the Emergency Department. Several individuals commented that the medications discussed were appropriate for this population and the learner can focus on patient care, but were not relevant to their particular area of nursing. Thirty eight percent (9) participants did not respond to this question.

6. Do you think that using a power point self learning module as the method of delivery is adequate?

Of the 24 participants sixty three percent (15) responded to this question with yes. They felt that using a power point was quick, efficient and appropriate for self learning. One participant commented that the online format gives the learner the freedom to complete as slowly or quickly as they desire. Thirty eight percent (9) of people did not respond to this question.

7. Do you think that the nursing care topics covered are appropriate?

Please explain.

Sixty three percent (15) of participants responded to this question with yes. Several individuals elaborated on their comments saying nursing considerations are always an important topic that needs to be covered.
Another person responded that the presentation covered pre, intra, and post procedural interventions which assist in presenting a total picture. Thirty eight percent (9) did not respond to this question.

8. **The program is based on Knowles’ Adult Learning Theory which states that adults learn better when instruction is relevant, problem-centered, experience oriented and active. Do you agree with this style of learning?**

Of the 24 participants, sixty three percent (15) responded to this question with yes. Thirty eight percent (9) of participants did not respond to this question.

9. **What did you like most about the Self Learning Module?**

Of the 24 participants, twenty nine percent (7) responded to this question saying that it was quick, easy to use, easy to read, easy to follow and the self learning format allows you to go back and forth. Other comments include: the pre test, short direct subjects, you can take your time, to the point and relevant, liked learning about Angiomax, direct and to the point, nursing directed. Thirty eight percent (9) did not respond to this question.

10. **In what ways can the Self Learning Module be improved?**

All of the participants had a different answer to this question. Some of the comments included: use of color and pictures, larger font, change the pain scale from 0-10 rather than 1-10 and make a grid to compare all of the drugs.

Forty two percent (10) of participants did not respond to this question.
Revisions Made to the Self Learning Module Based on Participants

Suggestions

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Discussion

Overall, with over half of participants rating the program by responding to the questions with excellent or good, the program was a success. In part two of the evaluation form, a majority of the people had positive comments regarding the SLM. Most people felt that the information covered would give nurses better understanding of anticoagulation therapy. Nurses who were not familiar with the medications covered and/or did not provide care for patients undergoing angioplasty felt that they gained knowledge about renal complications and dialysis dosing with Angiomax. Nurses who have not had experience with the medications in the power point found the information very useful. Also, most participants felt that if new nurses were to begin working on a unit where these medications are used frequently, this educational tool would be beneficial. However, some felt that new nurses may not grasp the importance of an acute MI and angioplasty if they are not working on a cardiac unit.
Most of the participants felt that the information was presented in a clear, concise manner, was easy to read, and the specific medications discussed were appropriate to this particular area of nursing. Sixty three percent (15) of participants felt that the use of Survey Monkey was convenient and easy to use. Some participants had suggestions for improvements to the SLM such as: Use of color and graphics, create a grid to compare all the drugs, and use larger font. The challenge in creating this self learning module was that the information had to be presented in a clear, concise manner and understandable on all learning levels. However, there had to be adequate information on the medications presented. Participants felt that the presentation was well written and thought provoking.

Despite the frequency of angioplasty procedures, there are limited data related to the nursing care of patients undergoing this procedure. Currently, there are no widely accessible nursing practice guidelines focusing on the management of PCI patients. This project was created after informal questioning of other nurses in the Rochester area. These nurses felt that there is not enough education regarding anticoagulation therapy for patients undergoing angioplasty. It also was determined that new nurses would benefit from this SLM becoming part of a unit specific orientation process.

Overall, out of 100 nurses who received the email about the project there was a 24% participation rate. Of those 24 participants there was a 66% (n=16) completion rate. After having this educational program reviewed by experienced nurses, it was determined that this is an excellent teaching tool for nurses caring for patients receiving anticoagulation before, during, and after angioplasty. Several participants had suggestions for improvements and changes will be made to the SLM prior to further
implementation of this program. However, some suggestions may be difficult to implement. One participant stated that there should be information included on emergency drugs such as Epinephrine or Atropine. While these medications also may have a role in the care of patients receiving anticoagulation therapy, these were not felt to be appropriate in the targeted scope of this learning module. Another participant stated that there should not be a pre test at all. The inclusion of a pre test is an appropriate and effective method for nurses to test themselves on their knowledge of the subject prior to reading the information. It was determined by the researcher that the pre test will remain a part of the SLM.

**Relation to Other Evidence**

The Anticoagulation Self Learning Module was developed due to a notable lack of educational programs offered for nurses who care for patients undergoing angioplasty. A thorough review of the literature on this topic proved this to be a timely and innovative project, as little prior research on this topic was found. Health care institutions mandate nurses to demonstrate yearly competencies on various topics. Some use SLMs as a method of providing information to nurses and testing what they learned. Many institutions have been using the same SLMs for lengthy periods of time. It is important for nurses to be kept up to date on changes in evidence based practice guidelines in order to better care their patients. Actual measurement of the effectiveness of this self learning module on direct patient care was not in the scope of this project. Future studies involving medical record review to determine compliance with recommended guidelines are warranted.
Limitations

Some limitations of this program included participation by several nurses who did not work in an area where these medications were administered, and who had difficulty knowing whether they were being provided the correct information. Another limitation included was that participants were asked to evaluate the module on their own time which may have explained the low response rate. The lives of many individuals can become hectic after work with family or other obligations. An email was sent out one month before the program was available online. It is possible that a reminder email could have prompted more participation. Also, the project involved querying all nurses from the AACN GRAFL Chapter, but it seemed to be more relevant to nurses who care for angioplasty patients. The major limitation to this study was that Survey Monkey does not allow importing a power point file accessible via link. Each slide had to be saved as a picture and inserted into Survey Monkey. If this were to be used as a unit specific educational program, the pre test, post test and power point would be printed out as a hard copy to give to nurses and they will not need the use of the internet.

Interpretation

Knowles’ found adults to be autonomous and learn from their own topics of interest. Their readiness to learn becomes oriented increasingly to the developmental tasks of their social roles, and they often approach learning as problem solving. Orientation to learning suggests that adults learn best when the topic is of relevant value (Lieb, 1991). Since this program was designed for healthcare workers, the program was designed with the idea of flexible learning. Participants were asked to complete the program on their own time and
at their own pace. While it was hoped that more nurses would have participated in the review of this project, of the twenty four people who participated, over half provided excellent feedback that was very useful for the researcher. A majority of participants thought the information was presented in a clear, concise manner and was very user friendly. Eight out of twenty four did not respond to the questions in part I of the evaluation form so the findings were based on those participants who provided feedback. Very few people did not respond to certain questions in Part II of the evaluation form. As for how this program could be improved participants suggested adding more color and pictures to the power point, use larger font, and create a grid that would compare all the medications discussed. Most participants liked the online format and the fact that they could go back and forth as necessary. The online format also decreased the ability of participants to work together on the SLM, promoting more concise assessment of individual knowledge.

To further improve outcomes, the researcher could have given hard copies of the SLM to participants as an option instead of using the online format. It is possible that some participants would have spent more time if they could have returned to the survey on more than one occasion. Use of Survey Monkey limits customization of surveys and it is possible that more participants would have responded to a professionally appearing, attractive hard copy. The program can be used on Survey Monkey, Qualtrics, or hard copy for those who prefer a more traditional education method.

Conclusion
Nurses would benefit from this educational program being part of a unit specific competency, along with being part of an orientation for nurses who begin working on a unit where these medications are administered. It was determined by those who provided feedback on the evaluation form that the anticoagulation SLM was very instructive to nurses, and that using this as part of unit specific education would help improve the quality of patient care. Being knowledgeable about how to manage patients who have received a large amount of anticoagulants while undergoing angioplasty and the necessary nursing considerations is crucial for patient safety.
References


Steinberg, D., Shah, P., Kinnaird, T., Pinto Slottow, T., Roy, P., Okabe, T., Bonello, L., Labriolle, A., Smith, K., Torguson, R., Xue, Z., Suddath, W., Kent, K., Satler, L.,


Appendix A
Letter to Participants

April 12, 2011

Dear Nursing Colleague,

As a Cath Lab nurse with experience caring for critically ill patients, I would like to invite you to take part in my project examining the administration of anticoagulation therapy in patients undergoing angioplasty. This project is very important to nurses because angioplasty patients can be given large amounts of anticoagulants and need to be closely monitored. It is especially important for graduate nurses and nurses without previous experience using these kinds of medications. Nurses need to be properly educated before administering anticoagulants. They need to know the medications purpose, and be aware of side effects, and contraindications.

In order to fulfill a requirement for a masters’ degree in nursing at St. John Fisher College, I have developed a Self Learning Module (SLM) regarding commonly used anticoagulants administered before, during, and after an angioplasty procedure. The Institutional Review Board at St. John Fisher College has reviewed and approved this project. The purpose of this teaching tool is to see if it would be beneficial to nurses who work in areas where these kinds of medications are used. The SLM may provide some insight to whether or not there is a knowledge deficit and if more education is needed.

In June of 2011 the Self Learning Module will be available on Survey Monkey which can be accessed using the link: http://www.surveymonkey.com/s/HJ5D3LL. The SLM will be in power point format and will be accompanied by a pre test, post test and evaluation. Participants will not take the pre and post tests, only provide comments and feedback on the information that is provided in the power point and test questions. You will be asked to evaluate the SLM for accuracy of information, convenience, and if nurses would benefit from this teaching tool. Evaluation of the SLM will take approximately 30 minutes. You will have one month to evaluate the SLM and I ask that you please do this on your own time. Survey Monkey will summarize the responses into aggregate format. Participation in this project is completely voluntary and evaluation of the Self Learning Module is implied consent.

The feedback provided will remain confidential, and there is no way that your responses will be traced back to you. No one other than the researcher and faculty at St. John Fisher College will have access to the data as we analyze the information gathered.

If you are willing to participate in this project, I would greatly appreciate your attention in evaluating this teaching tool. Please feel free to contact me by phone at 585-313-1310 or Dr. Christine Nelson-Tuttle at St. John Fisher College at CNelson-Tuttle@sjfc.edu if you have any questions or concerns.
Thank you for your consideration, and best wishes to you in your professional role.

Stacy Incardone, RN, BSN
Appendix B

Anticoagulation Pre Test

1. Coronary artery disease is caused by:
   a. build up of plaque in the artery that reduces blood flow
   b. lack of blood flow to the heart muscle causing necrosis
   c. smoking
   d. all of the above

2. Without anticoagulation during PCI the patient is at risk for:
   a. stroke
   b. heart attack
   c. death
   d. all of the above

3. Nursing care during PCI includes:
   a. assessing the risk of suboptimal outcomes
   b. promote patient comfort
   c. decrease patients anxiety through education
   d. all of the above

4. Angiomax is metabolized by:
   a. liver
   b. kidneys
   c. blood stream
   d. heart

5. The appropriate dose of Angiomax for dialysis patients is:
   a. 180 mcg/kg bolus followed by 2 mcg/kg/min infusion
   b. 180 mcg/kg bolus followed by 1 mcg/kg/min infusion
   c. 0.75 mg/kg bolus followed by 1.75 mg/kg/hr infusion
   d. 0.75 mg/kg bolus followed by 0.25 mg/kg/hr infusion

6. An adverse effect of Angiomax is:
   a. bleeding
   b. back pain
   c. nausea
   d. all of the above
7. The appropriate dose of Integrelin for patients with renal insufficiency is:
   a. 1 mcg/kg/min
   b. 0.25 mg/kg/hr
   c. 1.75 mg/kg/hr
   d. 2 mcg/kg/min

8. Heparin Induced Thrombocytopenia (HIT) is:
   a. low red blood cell count
   b. low white blood cell count
   c. low platelet count
   d. all of the above

9. The Joint Commission’s rationale for implementing the National Patient Safety Guidelines (NPSG) stemmed from common problems associated with anticoagulation management including:
   a. unclear indication
   b. appropriate labs not ordered
   c. target INR not known
   d. all of the above

10. One goal for the National Patient Safety Guideline (NPSG) is:
    a. when Angiomax is infusing only use pre-programmed pumps
    b. use hospital specific anticoagulation protocols
    c. use the swoop method when re-capping needles
    d. always give medications Intravenously and not Intramuscularly
Appendix C

Anticoagulation Power Point

Objectives
At the end of this module, the learner will be able to:
- Review Coronary Artery Disease and Angioplasty
- Provide background information and purpose for anticoagulation therapy used during Percutaneous Coronary Intervention (PCI)
- Discuss commonly used anticoagulants administered to patients undergoing angioplasty and their purpose, including their mechanisms of action, precautions, contraindications, safety guidelines, and nursing considerations

Coronary Artery Disease
- Is the leading cause of death in men and women
- Affects men and women equally
- Caused by the build-up of plaque in the artery resulting in blockage
- Lack of blood flow to the heart muscle causes cell damage and necrosis
- Risk factors:
  - High cholesterol
  - Hypertension
  - Family history
  - Smoking
  - Diabetes

Coronary Artery Disease
Most acute coronary ischemic events (sudden death, myocardial infarction, myocardial ischemia, vessel occlusion) are triggered by rupture or erosion of atherosclerotic plaque and subsequent occurrence of thrombotic process in a coronary artery.

Percutaneous Coronary Intervention
- Involves a variety of procedures to treat diseased coronary arteries including:
  - Balloon angioplasty
  - Stent placement
  - Balloon tipped catheter is threaded up from the femoral or radial artery to the blockage
  - Balloon is inflated pushing plaque against arterial wall increasing blood flow
  - Stent is inflated to prevent artery from re-closing

Anticoagulation During PCI
*Anticoagulation is essential during PCI to reduce the risk of thrombus formation*
Inflation of the balloon during angioplasty causes arterial injury and increases the risk for clot formation. Arterial injury triggers thrombosis through platelet adhesion and other components of the coagulation cascade. Without anticoagulation, inflation of the balloon may cause pieces of plaque or the blood clot to detach from the arterial wall and break through the blood stream possibly leading to cerebral, heart attack, pulmonary embolism, and/or death.
Anticoagulants
Some of the most common anticoagulants used during angioplasty include:
- Bivalirudin (Angiomax)
- Epifibatide (Integrilin)
- Heparin
- Plavix

Angiomax
- Thrombin-specific antithrombotic
- Has been proven to improve clinical outcomes
- Decreases the incidence of bleeding complications
- Short half life (2.5-4.5 h; Post-op activity)
- No need for continuous ACT or PT/INR monitoring
- Needle platelet activation
- Studies show that Angiomax is more effective as a clot buster than HEPARIN
- One major advantage of using Angiomax is that it has been shown to reduce bleeding complications at the insertion site.

Angiomax
In ST Elevation Myocardial Infarction (STEMI) patients undergoing PCI who are at high risk for bleeding, Angiomax is an effective medication to avoid complications

Angiomax Adverse Effects
- Back pain
- Nausea
- Headache
- Significant decrease in BP from baseline
  *Unexplained drop in BP, consider hemorrhage and stop Angiomax immediately

Sheath Removal After Angiomax
Depends on hospital protocol and physician preference
If sheath needs to be pulled with manual pressure being applied to the groin, usually can remove sheath 2 hours after Angiomax has been discontinued
If physician uses a closure device to close the artery, sheath may be removed immediately post cath, even if Angiomax is continued
### Angiomax Dosing
- Concentration: 250mg Angiomax mixed with 50ml NS
  - A bolus dose is always administered prior to starting the infusion
  - Bolus: 0.75 mg/kg
  - Infusion: 1.75 mg/kg/hr for the remainder of PCI

Continuing Angiomax after the procedure is decided according to physician preference. Some physicians feel it is more beneficial to continue anticoagulant therapy, and that it will reduce the risk of platelets and blood cells adhering to the new stent. (Angiomax, 2006)

### Angiomax and Renal Insufficiency
- Angiomax is cleared from plasma by a combination of renal mechanisms
- Has a half-life of 25 minutes in those with normal renal function
- Clearance is reduced 29% in moderate to severe insufficiency and 66% in dialysis patients
- Patients with severe renal impairment should have ACT's monitored during the procedure

Bolus Dose: remains the same
- Infusion Dose: rate remains the same unless on dialysis, then decreases to 0.25 mg/kg/hr
(Angiomax, 2006)

### Dialysis Patients and Angiomax
- Chronic renal failure and patients receiving dialysis is associated with poor clinical outcomes after PCI
- Procedural success is reduced
- Bleeding complications are more frequent
- Mortality is increased

Studies show that plasma clearance is reduced by 80% in dialysis-dependent patients with a half-life increased to 5.5 hours, however 26% of Angiomax can be cleared by hemodialysis (Jul, 2015)

### Eptifibatide (Integrilin)
- Inhibits platelet aggregation by preventing binding fibrinogen to glycoprotein IIb/IIIa receptor
- Reduces risk of ischemic events
- Used to treat Acute Coronary Syndrome (unstable angina and Non ST Elevated Myocardial Infarction (NSTEMI) and those undergoing PCI

### Integrilin Contraindications
- History of bleeding or active bleeding within 30 days
- Severe hypertension (>200 mm Hg)
- Major surgery with in 6 weeks after PCI
- History of stroke within 30 days
- Dialysis patients

### Integrilin Precautions
- Associated with major and minor bleeding at the sheath site
- Control bleeding with manual pressure, if it doesn't stop, discontinue Integrilin immediately
- Inhibits platelet aggregation, use caution when combining with other oral anticoagulants and NSAIDS

(Angiomax, 2006)
Integrillin Dosing
- Integrillin is usually administered with a bolus, followed by an infusion, along with a second bolus 10 minutes after the first.

**Bolus:** Based on patients weight. 100cc vial contains 1mg/mL. Dose is 180 mg/kg.

**Infusion:** 100cc bottle contains 0.75 mg/mL to infuse at 2 mg/kg/min for renal impairment. Infusion should be continued until hospital discharge or up to 24 hours.

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Integrillin and Renal Insufficiency
- 50% is reduced by kidneys in those with normal kidney function.
- In patients with a creatinine clearance (CrCl) <50, drug clearance is decreased by 50%.
- Infusion dose should be reduced to 1mcg/kg/min.
- Cockcroft-Gault equation when calculating CrCl.

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Heparin
- Used least often for anticoagulation during angioplasty in elective cases.
- In emergency situations, patients are usually given a bolus dose and sometimes started on an infusion in the ED during an acute MI.
- Once patient arrives in the Cath Lab, Heparin is commonly discontinued and an ACT will be drawn prior to PCI.
- If patient needs to go to the OR for bypass surgery, heparin may be restarted.
- Based on physician preference. If ACT is below 200, another bolus of Heparin will be administered, or patient will be started on Angiomax.

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Indications for Heparin
- Acute ST elevation MI receiving pre-hospital fibrinolysis.
- Acute ST elevation MI being transported for emergent PCI.
- Patients requiring anticoagulation during inter-facility transport.
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Heparin Contraindications
- Severe hypertension (>200).
- Known adverse reaction to Heparin in the past.
- Thrombocytopenia.
- Active TB.
### Heparin Induced Thrombocytopenia (HIT)
- Severe complication of Heparin
- Development of a low platelet count after administration of various forms of Heparin
- Predisposes patient to thrombosis
- Less than 25% present with fever, chills, hypertension, tachycardia, shortness of breath, and chest pain
- More commonly patients present with red macular skin rash

(Froman, Lass, and Parker, 2006)

### Plavix
- Prodrug with slow onset of action
- Acts as platelets from sticking together to form blood clots that can lead to heart attack or stroke
- Given to patients undergoing angioplasty to prevent arterial restenosis
- Should be taken along with an aspirin for 1 year after bare metal stent placement and recommended to be taken for life with drug coated stents
- FDA approved indications are to reduce the rate of stroke, MI, and death in patients with recent MI or stroke, peripheral arterial disease or acute coronary syndrome

(Froman, Lass, and Parker, 2006)

### Plavix Dosing
- Angioplasty patients receive a bolus of 600 mg PO
- A dose of 75 mg should be taken once daily for at least 1 year after stent placement

(Froman, Lass, and Parker, 2006)

### Plavix Adverse Effects
- Severe itching
- Rash with purplish spots (purpura)
- Diarrhea

(Froman, Lass, and Parker, 2006)

### Nursing Considerations During PCI
- Assess and reduce the risk of suboptimal outcomes such as: access site complications, and kidney damage due to contrast dye
- Promote patient comfort—assess pain level on 0-10 scale and make the physician aware
- Be alert for emergency situations—EKG rhythm changes, significant drop in blood pressure, and be ready to intervene
- Educate the patient on what to anticipate during and after the procedure

(Journal of Clinical Nursing, 2006)

### Nursing Considerations Post PCI
- Reduce the risk of complications by:
  - Continuous monitoring until discharged home
  - Methods of sheath removal (manual cut with pressure applied for 30 minutes, clamping device)
  - Methods of controlling bleeding (Manual pressure, Lidocaine with Epinephrine 1:1000 injected SQ at sheath site, hemostatic patches, sandbags)
  - Amount of time needed before ambulation (depends on method of sheath removal and physician preference)
  - Provide effective pre-discharge information and education

(Journal of Clinical Nursing, 2006)
Nursing Considerations
For Bleeding Complications

- Multiple studies show that among patients, bleeding upon coronary artery stenting and may be related to major bleeding complications.
- Check access site frequently for bleeding, and advocate patient to call for a nurse if pain is noted or pain.
- Should monitor PTINR closely if patient is at risk for bleeding.
- Patients may be required to take daily and Anticoagulant (warfarin) to prevent early rethrombosis, maintain an adequate INR, and bleeding complications.
- Medicated access may close up without a daily dose of Plavix.

(Drew, 2009)

Joint Commission Safety Guidelines

Joint Commission initiated the National Patient Safety Goals in 2006 to "reduce the likelihood of patient harm associated with anticoagulation therapy.

Joint Commission's rationale for common problems associated with anticoagulation:

- unclear indication
- appropriate labs not ordered
- target INR not known
- factors affecting doses of anticoagulant are not recognized
- Only addresses Heparin, low molecular weight heparin (LMWH), and Warfarin
- Should be updated to include other anticoagulants

(Joint Commission, 2009)

Joint Commission Safety Goals

- Safe medication supply-use only oral unit-dosed products or pre-filled syringes
- Use hospital-specific anticoagulation protocols
- Baseline coagulation status for warfarin
- Dietary considerations-manage potential food and drug interactions for warfarin
- Heparin administration-use programmable pumps for infusions
- Appropriate labs for Heparin
- Education for staff, patients, and families
- Quality improvement by evaluating anticoagulation safety practices

(Joint Commission, 2009)

References


Appendix D

Anticoagulation Post Test

1. Three types of anticoagulants commonly used for patients undergoing angioplasty are:
   a. Integrilin, Lovenox, and Argatroban
   b. Integrilin, Heparin, and Warfarin
   c. Angiomax, Integrilin, and Heparin
   d. Warfarin, Plavix, and Lovenox

2. Post angioplasty, nurses should provide education to the patient explaining:
   a. patient will be able to ambulate immediately after the procedure
   b. If the sheath site feels wet or warm they should call for a nurse immediately
   c. They will be discharged home 2 hours after stent placement
   d. It is not necessary to monitor the patients vital signs if they look stable

3. Without the use of a closure device, the protocol for sheath removal after Angiomax is discontinued is:
   a. 4 hours
   b. 6 hours
   c. 2 hours
   d. 24 hours

4. The half life of Angiomax in dialysis patients is:
   a. 30 minutes
   b. 1 hour
   c. 3.5 hours
   d. 8 hours

5. The mechanism that takes place with Integrilin is:
   a. inhibits thrombin by binding to the catalyst site and the anion-binding site of circulating and clot bound thrombin
   b. antithrombotic that inhibits platelet aggregation by preventing binding fibrinogen to glycoprotein IIb/IIIa
c. anticoagulant agent that combines with Factor X and the conversion of pro-thrombin to thrombin

6. One contraindication with Integrilin is:
   a. severe hypertension
   b. on a daily aspirin
   c. thrombocytopenia
   d. chest pain

7. In patients with normal kidney function, how much integrilin is reduced by the kidneys?
   a. 10%
   b. 20%
   c. 50%
   d. 100%

8. One indication for the use of Heparin is:
   a. Acute ST elevation being transferred for emergent PCI
   b. Unstable angina undergoing PCI
   c. Severe hypertension
   d. Diabetes

9. A common symptom of HIT is:
   a. fever
   b. back pain
   c. vomiting
   d. generalized red macular skin rash

10. Because Angiomax is not a low molecular weight heparin, the National Patient Safety Guidelines (NPSG) do not apply. T/F
Appendix E

Anticoagulation Self Learning Module Evaluation

Please fill out this two part evaluation form. Thank you for your participation.

Part 1

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Part 2

1. Do you think the information covered will give nurses a better understanding of anticoagulation therapy?
   ________________________________________________________________
   ________________________________________________________________
   ________________________________________________________________
   ________________________________________________________________

2. What knowledge did you gain from reading the Self Learning Module?
   ________________________________________________________________
   ________________________________________________________________
   ________________________________________________________________
   ________________________________________________________________
3. Do you think that new nurses would benefit from this being part of hospital orientation process?
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________

4. What other medications do you feel would be important to cover and why?
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________

5. Were the selected medications covered are appropriate? Are they relevant to your particular area of nursing?
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________

6. Do you think that using a power point self learning module as the method of delivery is adequate?
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________

7. Do you think that the nursing care topics are appropriate? Please Explain.
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________

8. The program is based on Knowles’ Adult Learning Theory which states that adults learn best when instruction is relevant, problem-centered, experience oriented and active. Do you agree with this style of learning?
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
9. What did you like about the Self Learning Module?
__________________________________________________________________
__________________________________________________________________
__________________________________________________________________
__________________________________________________________________

10. In what ways can the Self Learning Module be improved?
__________________________________________________________________
__________________________________________________________________
__________________________________________________________________
__________________________________________________________________

Additional comments:
__________________________________________________________________
__________________________________________________________________
__________________________________________________________________
__________________________________________________________________
__________________________________________________________________
__________________________________________________________________
__________________________________________________________________
Appendix F

IRB Approval Letter

May 9, 2011

File No: 2091-042111-09

Stacy Goler
151 Kim Lane
Rochester, NY 14626

Dear Ms. Goler:

Thank you for submitting your research proposal to the Institutional Review Board.

I am pleased to inform you that the Board has approved your Expedited Review project, "Creating a Self Learning Module for Nurses Caring for Cardiac Patients Undergoing Angioplasty and Receiving Anticoagulation Therapy."

Following federal guidelines, research related records should be maintained in a secure area for three years following the completion of the project at which time they may be destroyed.

Should you have any questions about this process or your responsibilities, please contact me at 385-5262 or by e-mail to emerges@sjfc.edu, or if unable to reach me, please contact the IRB Administrator, Jamie Mosca, at 385-8318, e-mail jmosca@sjfc.edu.

Sincerely,

Eileen M. Merges, Ph.D.
Chair, Institutional Review Board

E:emjim

Copy: OAA IRB
IRB: Approved expedited doc
5. Collection of hair and nail clippings, in a non-disfiguring manner; deciduous teeth; and permanent teeth if patient care indicates a need for extraction.

6. Collection of excreta and external secretions including sweat, uncannulated saliva, placenta removed at delivery, and amniotic fluid at that time of rupture of the membrane prior to or during labor.

7. Recording of data collected from subjects 18 years of age or older in the course noninvasive procedures routinely employed by professionals certified/licensed in the clinical practice of medicine, psychology and social work. This includes the use of physical practice sensors that are applied either to the surface of the body or at a distance and do not involve input of matter or significant amounts of energy into the subject or an invasion of the subject’s privacy. It also includes such procedures as weighing, testing sensory acuity, electrocardiography, electroencephalography, thermography, detection of naturally occurring radioactivity, diagnostic echography, and electroretinography. It does not include exposure to electromagnetic radiation outside the visible range (for example x-rays, microwaves).

8. Collection of blood samples by venipuncture, in amounts not exceeding 450 milliliters in an eight-week period and no more often than two times per week, from subjects 18 years of age or older who are in good health and not pregnant.

9. College of both supra- and subgingival dental plaque and calculus, provided the procedure is not more invasive than routine prophylactic scaling of the teeth and the process is accomplished in accordance with accepted prophylactic techniques.

Certification

1. I am familiar with the policies and procedures of St. John Fisher College regarding human subjects. I subscribe to the standards described in the document, IRB Policies and Procedures for the Protection of Human Subjects.

2. I am familiar with the published guidelines for the ethical treatment of subjects associated with my particular field of inquiry (e.g., as published by the American Psychological Association, American Sociological Association).

3. I am familiar with and will adhere to any official policies in my department concerning research with human subjects.

4. I understand that upon consideration of the nature of my project, the IRB may request a full application for review of my research at their discretion and convenience.

5. If changes in procedures involving human subjects become necessary, I will submit these changes for review before initiating the changes.

Date & Signature - Investigator(s)

Date & Signature - Collaborator(s) and/or Student Investigator

Date & Signature - Faculty/Staff Sponsor

All student applications and applicants from outside the College must have a College sponsor.

Date & Signature - Researcher

Decision of Institutional Review Board

Reviewed by: [Signature]

Subcommittee Member #1

Date

[Signature]

Subcommittee Member #2

Date

☑ Approved

☐ Not Approved

Comments:

☐ No Research
☐ Minimal Risk
☒ The proposed project has a research component but does not place subjects at risk and need not be in further compliance with Article 24-A.
The proposed project has a research component and places subjects at risk. The proposal must be in compliance with Article 24-A.

Chairperson, Institutional Review Board

Date 5/6/11

Rev. 12/10 jm