



2-1-2018

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### Recommended Citation

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Preoperative Low Dose Aspirin Therapy

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Nursing 997: Independent Study

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Spring 2018

## PERMISSION

Title

Department    Nursing

Degree        Master of Science

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### **Abstract**

Preoperative physical exams are medically necessary to assess and identify risk factors of patients undergoing surgery to help decrease surgical adverse outcomes. These physical exams assess to identify risk factors such as pulmonary and cardiovascular complications that may arise before, during or after the procedure. Along with assessing risk factors, the provider also assesses the patient's current management of common comorbidities such as diabetes mellitus, hypertension, and dyslipidemia. The importance of assessing these variables prior to surgery help reduce risks for complications and promote a faster recovery following the procedure. With discussing common comorbidities associated with pulmonary and cardiovascular risk factors, it is also crucial to discuss the recommended requirements for administration of patient's daily medications preoperatively. There continues to be a lack of consensus within the literature as to whether or not low dose aspirin therapy should be discontinued preoperatively. The foundation of this review was determined after a preoperative physical exam for a left total knee procedure that was performed in an outpatient, educational setting. This case involves a 62-year old Caucasian female with the comorbidities of hypertension, diabetes mellitus type two, dyslipidemia, and tobacco abuse. This sanctioned a systematic search for a correlation between low dose aspirin therapy and preoperative surgery.

*Keywords:* aspirin, preoperative, aspirin therapy, low dose aspirin, before surgery, and preoperatively.

### **Background**

Thromboembolic events are amongst one of the most devastating causes of mortality and morbidity in the healthcare setting. To prevent these tragic events from occurring, low dose aspirin therapy has been utilized for preventative measures of cardiovascular accidents from

occurring such as stroke, myocardial infarction and/or death. The daily administration of low dose aspirin has been proven to inhibit platelet formation and reduce cardiovascular events that occur in high-risk cardiovascular patients with many comorbidities (Myles et al., 2016).

Preoperative discontinuation of aspirin therapy not only has the ability to decrease the risk of bleeding but may also cause a cardiovascular event to occur preoperatively (Meier et al, 2016).

Weighing these risks and benefits, this case presentation includes a 62-year-old Caucasian woman presenting for a preoperative physical exam for a left total knee arthroplasty. Significant past medical history includes the following comorbidities of hypertension, diabetes mellitus type two, dyslipidemia, and tobacco abuse. These common comorbidities put the patient at an increased cardiovascular risk making it necessary for low dose aspirin therapy to be initiated.

Postoperative research clearly identifies the importance of initiating aspirin therapy in prevention of thrombotic events following surgery, however, the literature continues to have controversy amongst continuing versus discontinuing aspirin therapy prior to surgical procedure. This controversy is a question primary care providers are facing in preoperative physical exams along with the medical personnel involved in surgical procedures (Meier et al, 2016).

### **Case Report**

A 62-year old Caucasian female who works as a bank teller presents to the clinic for a preoperative physical exam for her left total knee procedure to be done by Dr. Peterson. Type of anesthesia will be general. No other concerns. Past medical history includes arthritis, diabetes type two, hypertension, and dyslipidemia. No known bleeding tendencies. The patient is taking daily aspirin for anticoagulation therapy. No prior surgical history. Social history includes married with one adult child, working as a bank teller, 15pack-year smoking history, drinks 1-2

glasses of wine per night. Family history includes both mother and father have heart disease along with type two diabetes mellitus. Maternal grandfather deceased from colon cancer, otherwise family history unremarkable. No family history of complications from anesthesia. Medication history includes Lisinopril 10 mg daily, Metformin 1,000mg two times a day, simvastatin 20mg nightly, Aspirin 81mg daily and no known drug allergies. Vital signs include blood pressure 142/92, heart rate 78, respiratory rate 24 and temperature of 98.6. Physical exam abnormalities included decreased range of motion to left knee due to increasing pain, otherwise physical exam was unremarkable. Preoperative labs included Hgb A1C of 6.2, lipid panel, CMP, and CBC all within normal limits and EKG resulting in normal sinus rhythm. The plan concluding this visit included education on smoking cessation, discussed options for cessation and importance of cessation. Discussed with the patient to avoid alcohol prior to the procedure to reduce the risk of increased bleeding. Dr. Peterson's office advised the patient to discontinue Aspirin 81mg seven days prior to the procedure, otherwise may take all medications with a small sip of water the morning of the procedure. Educated patient on taking no food or liquids by mouth after midnight on the day of surgery. The patient was advised to contact Dr. Peterson's clinic prior to the procedure if she develops any respiratory illness, fever, or other illness. The patient is at a low risk for a perioperative cardiac event, and this was discussed with the patient. May proceed with surgery as planned.

Based on this specific case and many other preoperative physical exams performed by this author, the question continues to rise in acknowledging concern to interrupt low dose aspirin therapy prior to surgery. The controversial topic of whether this discontinuation causes more risks than benefits, or whether it is harmful or not. Understanding these effects will assist in better preoperative along with postoperative care for patients within the primary care setting.

### **Literature Review**

To find research to support whether low dose aspirin therapy preoperatively should be continued or discontinued, this author utilized the University of North Dakota's Harley E. French Library of the Health Sciences website. The intention of searching strategies performed would include research from both CINAHL, Pubmed and Cochrane library database. To answer the clinical question whether the benefit outweighs the risk of interrupting preoperative low dose aspirin therapy, this search focused on aspirin therapy and preoperatively. First selected resource database was CINAHL, as it contains "nursing and allied health literature" (Stillwell, et al, 2010, p. 42). Performing a search with the term "aspirin" and "preoperative" to find general background information on this topic of interest. The search was then limited to published dates between 2013-2018, English language and academic journals in order to find the most recent and relevant information. This resulted in 17 articles. Of the articles resulting, seven were chosen based on relevance to enhance knowledge and understanding of this topic of concern. The next search term included "aspirin" and "before surgery". Limiting the publication date from 2013-2018 to include the most relevant and recent data. Utilizing these terms 24 articles resulted, 6 of which were relevant. Within the CINAHL database the terms of "aspirin therapy" and "preoperatively" were then used which obtained nine articles. A last additional search was made with the terms "low dose aspirin" and "preoperatively", three articles resulted. Of those results, one additional article was relevant as some articles were identical amongst searches.

PubMed was then utilized as it contains "medial and health science literature" (Stillwell, Fineout-Overholt, Melnyk, & Williamson, 2010, p. 42). To initiate this search, the term "preoperative aspirin therapy" was utilized together to enhance the relevance amongst the articles. This search was then limited to include articles printed within the last five years and was

of English language to provide the most recent yet relevant articles. This decreased search results to 35 articles. Of those 35 articles, four were found of relevance to assist in the outcome of distinguishing the controversy of low dose aspirin therapy preoperatively. Many of the resulted articles were identical amongst the CINAHL database previously utilized.

Cochrane Library was then utilized as it provides “systematic reviews of healthcare interventions and promotes the search for evidence in the form of clinical trials and other studies of interventions (Fink, 2013, p. 42)”. To initiate the final database search, the term preoperative low dose aspirin therapy was used to find generalized studies performed on this topic of interest. There were 22 results however, none of these articles were either new to obtain in this review, relevant to the topic or published within the last five years. The search term “aspirin before surgery” was then utilized with one resulting article in which was also not relevant.

Amongst the databases utilized there were many articles that were irrelevant as they discussed the comparison of other variables. These irrelevant variables included topics of post-operative complications such as acute kidney injuries, the importance of implementing deep venous thrombus therapy by quick mobilization and compliance of wearing compression stockings postoperatively. After researching various databases and eliminating irrelevant articles, there were a total of 16 articles to have been found relevant to this topic question. Within further depth amongst those 16 articles, six were not utilized as they were more focused on the variables of aspirin therapy in general and not pertaining to preoperative administration. Therefore, a total of ten relevant articles will be utilized amongst this review.

### **Synthesis of Literature**

From the ten research articles that were analyzed in this search, five of them were prospective cohort studies. Each of these articles explored the relationship between the effects of



continuation of aspirin therapy and surgery. Although they had similar variables, each study distinguished a different type of surgery. One article compared aspirin therapy prior to total hip and knee arthroplasty. These results concluded there was some marked noticeable knee swelling in patients who continued aspirin therapy, though there was not any significant blood loss or other local complications. They also noted more positive outcomes from a cardiovascular standpoint preoperatively overall and suggested the safety to continue therapy from a surgical standpoint after one-year postoperatively from total hip and knee arthroplasty (Meier et al., 2016).

Another cohort study compared aspirin administration preoperatively with patients with cardiac stents undergoing spinal surgery. This cohort study concluded there was no increased risk of bleeding amongst their patients observed who continued aspirin prior to surgery (Cuellar, Petrizzo, Vaswani, Goldstein, & Bendo, 2015). An additional cohort study compared blood loss effects with continuing antiplatelet treatment postoperatively for ankle and foot amputations. The results of this study also concluded no significant risk factors for blood loss, transfusion rate or operation time when continuing aspirin therapy (Schweer, Carmouche, Jupiter, Ball, & Clements, 2016).

The fourth cohort study analyzed equated aspirin therapy prior to microlaryngeal surgery. The results of this study concluded that it would be deemed safe to continue anticoagulation therapy prior to microlaryngeal surgery (Francis, Dang, Fritz, & Garret, 2014). The fifth and final cohort study analyzed the associations of laparoscopic cholecystectomy or a colorectal cancer resection along with aspirin continuation. Results concluded amongst both types of procedures, there was not an increased surgical time nor was there any increased blood loss (Ono et al., 2013). When comparing continuation and discontinuation of aspirin therapy amongst a

variety of surgical procedures, the results concluded were all in consensus. The conclusion overwhelmingly stated that low dose aspirin therapy continuation did not have a significant impact on loss of blood or impact on the amount of red blood cell transfusions. However, each article did discuss the need for larger studies to be performed amongst each specific surgery. (Cuellar, Petrizzo, Vaswani, Goldstein, & Bendo, 2015; Francis, Dang, Fritz, & Garret, 2014; Ono et al., 2013; Schweer, Carmouche, Jupiter, Ball, & Clements, 2016).

Two secondary analysis of data performed on randomized control trials were analyzed. The purpose of the randomized controlled studies was to explore the relationship between patients undergoing coronary artery surgery and discontinuing versus continuing aspirin therapy prior to surgery. The results of these studies concluded there was not an increased risk of death or thrombolytic complications. There was also no additional higher risk of surgical bleeding or the requirement of blood transfusions for patients continuing therapy compared to those discontinuing (Gielen et al., 2015; Myles et al., 2016).

One case-control study was analyzed. The purpose of this study was to determine the relationship between patients with continued use of low dose aspirin therapy and risk of bleeding after endoscopic submucosal dissection for colorectal tumors. The results of this study concluded no significant bleeding differences amongst the continuation or stopping of low dose aspirin therapy (Ninomiya et al., 2015).

One systematic review and meta-analysis study was analyzed. This review was performed to distinguish the influence on preoperative aspirin administration to patients undergoing cardiac surgery. The conclusion of this study identified there was not an increased need for chest re-exploration or increase red blood cell transfusions. They did identify that with any dose associated with preoperative aspirin administration there was, however, a decreased

mortality and acute kidney infection along with decreased preoperative myocardial infarction, thus recommending the continuation of aspirin therapy (Aboul-Hassan et al., 2017).

The final article of which was analyzed was an antithrombotic medication guideline. This article's purpose was to distinguish sufficient information on whether antithrombotic medications should be discontinued preoperatively for oral surgery. These evidence-based guidelines in comparison to this topic, recommend the continuation of aspirin therapy in doses of 75mg-100mg prior to oral surgeries (American Psychological Association, 2013).

Although many articles were critically analyzed and reviewed, only one specific article within the past five years and of English language was found to discuss total knee arthroplasty and preoperative aspirin therapy. This article pertained predominantly to this specific case of a 62-year old Caucasian female for this outpatient, preoperative physical exam for a left total knee arthroplasty. This female was at high-risk due to her comorbidities and tobacco abuse, making it necessary for secondary prevention of aspirin therapy. Current practice and guidelines of the American Academy of Orthopedic Surgeons suggest the discontinuation of aspirin 5-14 days prior to elective orthopedic surgery; in which was recommended by her surgeon (Meier et al., 2016). This is not only current practice for orthopedic surgery but amongst all routine surgical procedures as seen in previous articles analyzed. Although each study and guideline reviewed suggested no significant harm with the continuation of perioperative aspirin, they all remained a consensus of the need for larger randomized control trials for further investigation as some studies recognized higher risk for cardiovascular complications in patients who discontinued aspirin preoperatively (Meier et al, 2016).

### **Learning Points**

In conclusion, thrombolytic events are a devastating and life-changing situation that affects the patient, the entire family and medical staff involved in patient care. Through analyzing the literature through this review process, the conclusion that further clinical research studies are in need to be performed with larger study groups to be certain the continuation of low dose aspirin therapy preoperatively is safe. This conclusion resulted after performing a systemic review of the literature and obtaining knowledge on the following outcome learning points:

- Research literature concluded there was not a significant increased amount of blood loss within total hip, total knee, ankle amputation, foot amputations, spinal, microlaryngeal, laparoscopic cholecystectomy, colorectal cancer dissection, coronary artery and cardiac surgeries performed with the continuation of low dose aspirin therapy.
- There was not an increase in length of surgery time thus, there was no additional anesthesia in any of the surgical studies performed nor was there a significant change in chest re-exploration with coronary artery surgery with the continuation of low dose aspirin therapy.
- There was also no increase in red blood cell transfusion indicated within each of the studies with the continuation of low dose aspirin therapy.
- Each study reviewed, suggested the need for more research involving larger study populations in order to further distinguish the safety of continuation versus discontinuation of low dose aspirin therapy.

Therefore, as healthcare professionals, it is important to be aware of the rapid change in guidelines, literature and increasing comorbidities and surgeries being performed. Utilizing the suggested evidence-based practice to provide an effective change in practice helps decrease the

incidence of cardiovascular risk preoperatively. However, with inconclusive results due to small study populations, the topic of interrupting low dose aspirin therapy preoperatively is still under research and remains controversial.

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