

ASPIRIN USAGE FOR EARLY DETERRENCE OF CARDIOVASCULAR ATTACK

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Abstract :- Cardiovascular disease (CVD) is a major cause of morbidity and aspirin is a well-known medication strongly associated with CVD prevention. Aspirin has undeniable benefits in the role of secondary prevention of CVD, however, the benefits are ambiguous when associated with early prevention. The decision to start aspirin for primary prevention becomes complicated due to aspirin's effect on coagulation and the risk of gastric ulceration. Successful adoption of the 2016 USPSTF guideline on aspirin use for primary prevention of CVD by providers is the goal of this practice improvement project. The project began with education to providers and staff at the rural clinics regarding the USPSTF guideline and the ACC/AHA calculator. Following the educational session, implementation of the USPSTF guideline occurred for three months. Evaluation was performed through the use of a post-implementation survey. Results of the project demonstrated increased knowledge and usage of the guideline and a positive viewpoint related to implementation of the guideline with the providers in both of the communities having plans to sustain use in future practice. Data were also collected at a healthscreening fair in one of the rural communities to validate whether patients were taking aspirin per USPSTF guideline. Data gathered from the fair concluded only 59% of patients (41 out of 70) were taking, or not taking, aspirin appropriately according to the USPSTF guideline. Conclusively, primary care providers would be well served by using the ACC/AHA calculator and 2016 USPSTF guideline with all patients 40-79 years of age to determine appropriate use of aspirin for primary prevention of CVD.

Keywords: Cardiovascular disease, Aspirin, rural clinic practices

Introduction

Aspirin is an over-the-counter, nonsteroidal anti-inflammatory drug (NSAID) that has analgesic, anti-inflammatory, and antipyretic effects on certain cells in the body (Gaziano & Greenland, 2014). Aspirin is commonly used for the primary and secondary prevention of CVD due to aspirin's irreversible, anti-thrombotic effect on platelets, observed as a prolonged bleeding time (Casado-Arroyo, Sostres, & Lanas, 2013). Secondary prevention is preventing a recurrent cardiovascular event in patients with a known history of CVD (Tsai, 2016). Primary prevention is preventing a cardiovascular event from happening in patients with no history of disease (Tsai, 2016).

Aspirin is an irreversible cyclooxygenase (COX)-1 inhibitor, and COX-1 is responsible for producing

thromboxane A₂, which aggregates platelets (Gaziano & Greenland, 2014). Without thromboxane A₂, platelet aggregation is inhibited, which prevents the formation of a thrombus at a ruptured atherosclerotic plaque (Gaziano & Greenland, 2014). Without thrombus formation, the chance of vessel occlusion is decreased, thus preventing a cardiovascular event such as a myocardial infarction (MI) or stroke (Gaziano & Greenland, 2014).

Even with the evident benefits of aspirin for CVD prevention, the decision to start a patient on aspirin can be complicated for providers due to an increased bleeding risk. Platelet inhibition is beneficial to prevent vessel occlusion, but also has the potential to induce major vascular events, such as intracranial bleeding (Howard, 2014). As a COX inhibitor, aspirin can disrupt the mucosa

of the gastrointestinal (GI) tract, as the inhibited COX-1 enzyme is in charge of producing prostaglandins that protect the delicate GI mucosa (Bobbins-Domingo, 2016).

Without protection, the GI mucosa is vulnerable to damage capable of starting a major GI bleed (Bobbins-Domingo, 2016). A major GI bleed is defined as a bleed that requires transfusion, hospitalization, or leads to death (Bobbins-Domingo, 2016). A systematic review by Rodríguez, Martín-Pérez, Hennekens, Rothwell, and Lanas, (2016) found that long-term low-dose aspirin therapy led to an approximate 40% increased risk of having a GI bleed and 40% increased overall risk of having an intracranial hemorrhage. Thus, the benefit of aspirin is questioned with primary prevention, as the risk of developing a GI bleed or suffering a hemorrhagic stroke could offset the intended cardiovascular benefits (Casado-Arroyo et al., 2013).

The benefits of aspirin for secondary prevention are indisputable, as patients who have suffered from one or more CVD events are very high risk of having recurrent CVD events (Ittaman, VanWormer, &Rezkalla, 2014). Long-term aspirin therapy reduces the annual risk of having a subsequent CVD event by about 25% (Howard, 2014). However, the decision to place a patient on aspirin for primary prevention must be well thought out, as the benefits of preventing an initial CVD event may not outweigh the associated bleeding risks. There has to be a balance between the benefit of preventing a major vascular event and the risk of a having a major bleed (Gaziano& Greenland, 2014). The benefit versus risk of aspirin is dependent on a patient's risk for bleeding, personal preference about taking aspirin, baseline CVD risk, and age, and should be an individualized decision made between the provider and patient (Bobbins-Domingo, 2016).

Problem Statement

According to the Agency for Healthcare Research and Quality (2016), close to 40% of older adults (50 years and older) use aspirin for primary or secondary CVD prevention. A National Health and Nutrition Survey found that 59% of patients, who were eligible for aspirin therapy

for primary prevention, were not instructed by a healthcare provider to start taking aspirin (Agency for Healthcare Research and Quality [AHRQ], 2016). Also, an estimated 20% of patients taking a daily low-dose aspirin do so without a provider's recommendation due to aspirin's publicly perceived benefits, low cost, and over-the-counter availability, even though aspirin may not be appropriate for everyone (Howard, 2014). Low risk patients and patients not in the recommended age taking a daily aspirin is concerning, as taking a daily aspirin unnecessarily exposes them to the bleeding risks associated with the medication (Malayala& Raza, 2016). Patients not instructed to take aspirin when they are eligible is also concerning, as not taking aspirin puts them at risk of having a cardiovascular event, which may have been avoidable with a simple and inexpensive medication. In the 2016 USPSTF systematic evidence review of the major aspirin primary prevention clinical trials, aspirin was found to have reduced the incident of nonfatal MIs by 22%, cardiovascular mortality by 6%, and nonfatal strokes by 5% (Mora & Manson, 2016). Additionally, the U.S. Food and Drug Administration does not support the use of aspirin for primary prevention of CVD due to evidence from available data and aspirin's associated bleeding risks (Center for Drug Evaluation and Research, 2014). Therefore, the aspirin label does not provide any guidance for patients regarding aspirin's use for CVD prevention, which is a concern for patients taking the medication without a provider's recommendation or those with limited education regarding the pills' risks (Howard, 2014).

The net benefits and recommendations regarding aspirin use for secondary prevention are well-known, however, primary prevention guidelines and recommendations vary (Brotons, Benamouzig, Filipiak, Limmroth, & Borghi, 2015). Along with varying guidelines, an overall benefit versus risk of aspirin use for primary prevention is unclear for many providers (Brotons et al., 2015). Tools that identify patients who are eligible to take aspirin for primary prevention are recommended to prevent the under use and overuse of aspirin and simplify

clinical application (Guirguis-Blake, Evans, Senger, O'Connor, & Whitlock, 2016).

The USPSTF has a guideline in place regarding the use of low-dose aspirin for the primary prevention of CVD. In addition, the ACC and AHA developed a calculator to determine a patient's 10-year CVD risk. The calculator and guideline aid providers with the decision to start, stop, or continue aspirin for patients for primary prevention. However, despite the USPSTF's recommendations, many eligible patients do not receive a recommendation from their provider, and aspirin use remains suboptimal (Fiscella et al., 2014). Poor use of the USPSTF's recommendations may relate to lack of provider awareness, uncertainty of benefits, time restraints, and competing clinical demands (Fiscella et al., 2014). A study by Malayala and Raza (2016) found that providers are more likely to prescribe aspirin for primary prevention to patients of older age and who have obvious risk factors, rather than according to established guidelines.

Providers seem to overlook younger patients who may be eligible to take aspirin, which puts them at an increased risk of not receiving appropriate primary prophylaxis (Malayala & Raza, 2016). Additional education to providers is needed in regard to aspirin use for primary prevention, the ACC/AHA CVD risk calculator, and the USPSTF's guideline regarding aspirin use for primary prevention. Also, increased implementation of the USPSTF aspirin guideline is necessitated to properly guide providers when prescribing aspirin to patients for primary prevention.

Study Objectives

- I. Providers at AMC and FMC will report knowledge and usage of the current USPSTF guideline related to aspirin use for primary prevention of CVD and the cardiovascular risk calculator from the ACC/AHA by July of 2018.
- II. Providers at AMC and FMC will report a positive viewpoint related to implementation of the USPSTF guideline with plans to sustain usage in future practice by July of 2018.

- III. Data will be gathered from patients 40 years of age and older at AMC's health screening fair in April of 2018 to validate whether patients are taking aspirin per the USPSTF guideline.

METHODOLOGY

Data Analysis

The data collected from the post-implementation survey and health screening fair were analyzed quantitatively. Post-implementation survey data analysis consisted of simple statistical tests with mean scores for each of the six Likert scale responses on the survey. The health screening fair was analyzed with numbers, percentages, and statistical tests. An expert statistician from NDSU was consulted to further assist with data analysis and descriptive statistics from the health screening fair. An excel spread sheet used to collect and document data was sent to the expert statistician for further analysis. Help from an expert statistician ensured correctness and validity of the data analyzed.

Evaluation Model

The Diffusion of Innovation theory and the five stages of adoption guided the evaluation process of the providers at AMC and FMC. Each stage of the adoption process was included in the post-implementation survey and allowed for evaluation of the providers at AMC and FMC regarding their knowledge, viewpoint, usage and plans for sustained adoption of the USPSTF guideline. Wong, Soon, Zed, and Norman (2014) developed a survey to assess the acceptability of an innovative contraception practice among rural pharmacists and used the Diffusion of Innovations theory as a guide. In the survey provided to the rural pharmacists, they used the Diffusion of Innovation theory to address adoption, change, and acceptability (Wong et al., 2014). The survey was effective in using the Diffusion of Innovations theory as a guide, as there was internal reliability of questions reflecting the readiness to adopt the new innovation (Wong et al., 2014). I found the survey developed by Wong, Soon, Zed, and Norman to be effective in providing guidance in the development of the post-implementation survey used in

this project as they reported a similar process with use of the Diffusion of Innovation theory.

A logic model (see figure 3) was used to explain how interventions were used to meet the desired objectives. A prior situation of suboptimal use of the USPSTF guideline regarding aspirin use for primary prevention of CVD at AMC and FMC instigated use of the logic model. The logic model described the relationship between inputs, outputs, and short and long-term outcomes.

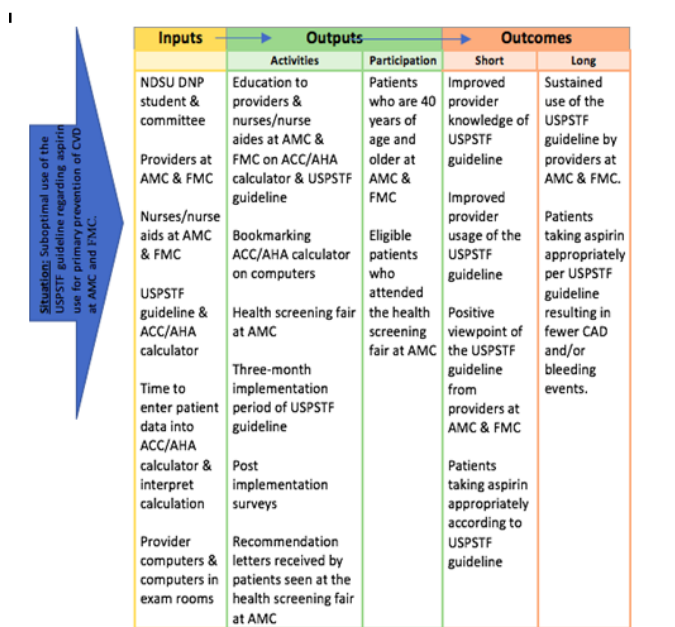


Figure 3. Logic Model

RESULTS

After implementation, the project was evaluated to determine whether the objectives were achieved. The project was implemented from April of 2018 to July of 2018. In July of 2018 the data were collected from both AMC and FMC. Data were collected from the health screening fair at AMC in April of 2018. Once the data were collected, analysis began. Quantitative data were analyzed to determine the results of the project. Two NPs at AMC and one NP and physician assistant at FMC completed the post-implementation survey. All providers were female with greater than four years of experience and work full-time at the rural clinics involved in the project.

Presentation of Findings

To recap, the objectives of the project include:

- I. Providers at AMC and FMC will report knowledge and usage of the current USPSTF guideline related to aspirin use for primary prevention of CVD and the cardiovascular risk calculator from the ACC/AHA by July of 2018.
- II. Providers at AMC and FMC will report a positive viewpoint related to implementation of the USPSTF guideline with plans to sustain usage in future practice by July of 2018.
- III. Data will be gathered from patients 40 years of age and older at AMC's health screening fair in April of 2018 to validate whether patients are taking aspirin per the USPSTF guideline.

A post-implementation survey was given to each provider who participated in the project to evaluate the results of implementing the 2016 USPSTF guideline at each clinic. All of the providers included in the project completed a survey. The post-implementation survey consisted of a four-point Likert scale composed of six questions related to the project objectives. The health screening fair was evaluated with labs and vital signs from the fair and information from patient charts. Data were collected from 70 patients over the age of 40 and were collected on an Excel spreadsheet to assist with analysis. The following sections include the project results presented in relation to the objectives they addressed.

Objective One

Objective one, to report knowledge and usage of the current USPSTF guideline and cardiovascular risk calculator from the ACC/AHA, was evaluated through use of the four-point Likert scale on the post-implementation survey. The statements provided on the survey to evaluate the first objective included:

- I. I am knowledgeable about the USPSTF's guideline related to aspirin use for primary prevention of CVD.

- II. I am knowledgeable about the cardiovascular risk calculator produced by the ACC/AHA.
- III. I applied the USPSTF guideline to all patients over the age of 40 during annual visits or hypertension, hyperlipidemia, and/or diabetes follow-up appointments.

Two (50%) of the providers stated they “agree” and two (50%) of the providers stated they “strongly agree” with “I am knowledgeable about the USPSTF’s guideline related to aspirin use for primary prevention of CVD.” Two (50%) of the providers stated they “agree” and two (50%) of the providers stated they “strongly agree” with “I am knowledgeable about the cardiovascular risk calculator produced by the ACC/AHA.” Lastly, three (75%) of the providers stated they “disagree” and one (25%) of the providers stated they “agree” with “I applied the USPSTF guideline to all patients over the age of 40 during annual visits or hypertension, hyperlipidemia, and/or diabetes follow-up appointments.” See table one for an illustration of these findings.

Objective Two

Objective two, to report a positive viewpoint related to implementation of the USPSTF guideline with plans to sustain usage in future practice, was evaluated through the use of the four-point Likert scale on the post-implementation survey. The statements provided on the survey to evaluate the second objective included:

- I. I feel that using the USPSTF guideline will benefit my practice and my patients.
- II. I plan to sustain use of the USPSTF guideline in my future practice.

Three (75%) of the providers stated they “agree” and one (25%) of the providers stated they “strongly agree” with the statement “I feel that using the USPSTF guideline will benefit my practice and my patients.” Two (50%) of the providers stated they “agree” and two (50%) of the providers stated they “strongly agree” with the statement “I

plan to sustain use of the USPSTF guideline in my future practice.” See table one for an illustration of these findings.

Table 1
Post-Implementation Survey Results

Statement	Strongly Disagree	Disagree	Agree	Strongly Agree
I am knowledgeable about aspirin use for primary prevention of CVD	0	0	2 (50%)	2 (50%)
I am knowledgeable about the USPSTFs’ guideline related to aspirin use for primary prevention of CVD.	0	0	2 (50%)	2 (50%)
I am knowledgeable about the cardiovascular risk calculator produced by the ACC/AHA	0	0	2 (50%)	2 (50%)
I applied the USPSTF guideline to all patients over the age of 40 during annual visits or hypertension, hyperlipidemia, and/or diabetes follow-up appointments.	0	3 (75%)	1 (25%)	0
I feel that using the USPSTF guideline will benefit my practice and my patients.	0	0	3 (75%)	1 (25%)
I plan to sustain use of the USPSTF guideline in my future practice.	0	0	2 (50%)	2 (50%)
Total Responses	0	3 (12.5%)	12 (50%)	9 (37.5%)

Objective Three

Objective three, to gather data from patients 40 years of age and older at the health screening fair to validate whether patients are taking aspirin per the USPSTF guideline, was evaluated by gathering labs and vital signs from the health screening fair and information from patient charts and applying them to the USPSTF guideline using the ACC/AHA calculator.

Results indicated seven (10%) of the patients were on aspirin and qualified, 24 (34%) of the patients were not on aspirin and did qualify, five (7%) of the patients were on aspirin and did not qualify, and 34 (49%) of the patients were not on aspirin and did not qualify. Seventy random patients were used for the project from the health screening fair. Forty-seven of the patients were female and 23 of the patients were male.

A chi-square test of independence was performed by an expert statistician to help with analyzing the data from the health screening fair results. A chi-square test of independence determines whether categorical variables are independent or related (Kent State University, 2018). The test of was performed to check for an association between aspirin use and status (qualify or does not qualify). Conclusively, there was not enough evidence to suggest an association between aspirin use and status and there was

no ability to identify the difference as statistically significant.

DISCUSSION AND RECOMMENDATIONS

Interpretation of Results

The purpose of the project was successful adoption of the 2016 USPSTF guideline on aspirin use for primary prevention of CVD by providers at AMC and FMC. The project included a co-investigator led educational session to providers and staff at AMC and FMC clinics regarding the USPSTF guideline and ACC/AHA calculator. Guideline implementation occurred over the following three months. All of the project objectives were achieved. Results of the project indicated increased knowledge and usage of the guideline and a positive viewpoint related to implementation of the guideline with plans to sustain use in future practice by the providers in both rural communities. Data were also collected at a health screening fair at AMC to validate whether patients were taking aspirin per the USPSTF guideline. Data gathered from the fair concluded only 59% of patients (41 out of 70) were taking aspirin appropriately according to the USPSTF guideline. The results of each objective are interpreted and discussed below.

Objective One

Objective one was for the providers at AMC and FMC to report knowledge and usage of the current USPSTF guideline and cardiovascular risk calculator from the ACC/AHA. The objective was evaluated through use of the four-point Likert scale on the post-implementation survey. All (100%) of the providers stated they either “agree” or “strongly agree” with “I am knowledgeable about the USPSTF’s guideline related to aspirin use for primary prevention of CVD. All (100%) of the providers stated they either “agree” or “strongly agree” with “I am knowledgeable about the cardiovascular risk calculator produced by the ACC/AHA.” However, three (75%) of the providers stated they “disagree” and one (25%) of the providers stated they “agree” with “I applied the USPSTF guideline to all patients over the age of 40 during annual visits or hypertension, hyperlipidemia, and/or diabetes

follow-up appointments.” Although majority of the providers stated they disagreed with the third statement of the first objective, each of the providers that stated they “disagree” with the statement made a comment after returning the survey that the words “all patients” in the statement made them choose “disagree”, as they utilized the guideline on many patients, but not all. One provider wrote “not all” under the statement on the survey indicating her reason for choosing “disagree”. From the results on the post-implementation survey for objective one, a conclusion can be reasonably made that the providers at AMC and FMC reported knowledge and usage of the current USPSTF guideline related to aspirin use for primary prevention of CVD and the cardiovascular risk calculator from the ACC/AHA by July of 2018, and that objective one was met.

Objective Two

Objective two was for providers to report a positive viewpoint related to implementation of the USPSTF guideline with plans to sustain usage in future practice. The objective was evaluated through the use of the four-point Likert scale on the post-implementation survey. All (100%) of the providers stated they “agree” or “strongly agree” with the statement “I feel that using the USPSTF guideline will benefit my practice and my patients.” All (100%) of the providers stated they “agree” or “strongly agree” with the statement “I plan to sustain use of the USPSTF guideline in my future practice.” From the results on the post-implementation survey for objective two, a conclusion can be reasonably made that the providers at AMC and FMC reported a positive viewpoint related to implementation of the USPSTF guideline with plans to sustain usage in future practice by July of 2018, and that objective two was met

Objective Three

Objective three was to gather data from patients 40 years of age and older at the health screening fair to validate whether patients are taking aspirin per the USPSTF guideline. The objective was evaluated by gathering labs and vital signs from the health screening fair and information from patient charts and applying them to

the USPSTF guideline using the ACC/AHA calculator. Results from the health screening fair indicated only 59% of patients (41 out of 70) were taking aspirin appropriately according to the USPSTF guideline and 41% of patients (29 out of 70) were not taking aspirin appropriately according to the USPSTF guideline. From the data gathered from the health screening fair a conclusion can be reasonably made that object three was met. Data were gathered from patients 40 years of age and older at the health screening fair and the data validated whether patients were taking aspirin per the USPSTF guideline.

Project results from the health screening fair at AMC were consistent with literature reporting suboptimal aspirin use for primary prevention of cardiovascular disease despite the USPSTF's recommendations (Fiscella et al., 2014). A National Health and Nutrition Survey found that 59% of patients eligible for aspirin therapy for primary prevention were not instructed to start taking aspirin by their provider (AHRQ, 2016). Consistently, results from the health screening fair found that 34% of patients who attended the health screening fair at AMC may be eligible for aspirin therapy for primary prevention but are not currently taking aspirin. With continued use of the ACC/AHA calculator and USPSTF guideline by the providers at AMC, the co-investigator anticipates the number of eligible patients not taking aspirin for primary prevention to decrease.

Limitations

There were a few limitations identified during the course of this project. The first limitation, and probably most significant, was not having the capabilities of embedding the ACC/AHA calculator and USPSTF guideline into the EHRs at each clinic. The providers had to open an Internet Explorer window and type the patient information into the ACC/AHA calculator to get the calculated CVD risk and then apply the risk score to the USPSTF guideline. There is a time and click burden for providers manually entering in data to complete the calculation and determine the appropriate patient recommendation (Scheitel et al., 2017). One of the issues the providers noted was not being able to apply the

guideline to all eligible patients due to time restraints and competing clinical demands. Having the calculator and guideline embedded into the EHRs would minimize the limitation of provider time restraints, as the computer would automatically calculate the patient's 10-year CVD risk for each patient and place the calculated result in the patient's chart. Having the CVD risk score automated would decrease the time needed to incorporate the guideline into daily practice, as the provider would only have to take the time to compare the CVD risk to the USPSTF guideline. A study completed by Scheitel et al. (2017) found that clinicians saved three minutes and 38 seconds of time and improved accuracy from 60.61% to 100% for the risk score calculation and guideline treatment recommendation with use of an informatics-based clinical decision support tool used to deliver automated cardiovascular risk scores and guideline-based treatment recommendations based on data in the EHR.

The second limitation of the project was that usage of the ACC/AHA calculator and USPSTF guideline was not tracked after the implementation period to determine the impact of the project with the providers at AMC and FMC. Chart audits were not performed due to the clinics differing EHRs and lack of capabilities.

The third limitation was use of the words "all patients" in the fourth statement on the post-implementation survey. The statement was "I applied the USPSTF guideline to all patients over the age of 40 during annual visits or hypertension, hyperlipidemia, and/or diabetes follow-

up appointments." The providers felt they needed to select "disagree" on the survey, as they were unable to practically apply the guideline to "all patients" over the age of 40 during annual visits, hypertension, hyperlipidemia, and/or diabetes follow-up appointments. To avoid this limitation, the wording should have been changed to "most patients" to make the statement more practical.

The last limitation was from the health screening fair. The limitation stems from not having contact with each of the patients to specifically ask them about their use of

aspirin and other patient history questions and having to manually enter patient data into the ACC/AHA calculator.

Recommendations

Use of the ACC/AHA calculator and USPSTF guideline related to aspirin use for primary prevention of cardiovascular disease is recommended to be continued at AMC and FMC based on positive project outcomes and supporting literature. To simplify clinical application and prevent the overuse and under use of aspirin, tools are recommended to be used by providers to help identify patients who are eligible to take aspirin for primary prevention of cardiovascular disease (Guirguis-Blake et al., 2016). The ACC/AHA calculator and USPSTF guideline serve as tools for providers to identify patients who are eligible for aspirin therapy for primary prevention and also provides recommendations based on the patients' results. With sustained use of the ACC/AHA calculator and USPSTF guideline, providers at AMC and FMC would improve their practice by properly guiding patients in their use of aspirin for primary prevention.

Each clinic is recommended to obtain EHRs capable of having the ACC/AHA calculator and USPSTF guideline embedded into patient charts or request an update of their current EHRs to include the calculator and guideline. Having the ACC/AHA calculator and USPSTF guideline embedded into patient charts with automatic population of data would not only improve accuracy in CVD risks scores but would save time and increase provider productivity (Scheitel et al., 2017). Also, with the calculator and guideline embedded into the EHRs, the provider's risk judgement and usage when prescribing would improve (Fiscella et al., 2014).

Implications for Future Research

As discussed earlier, CVD and aspirin therapy are widely conversed topics in healthcare. Even though research is abundant within the topics of CVD and aspirin therapy, there are always topics up for deliberation. The project, aspirin use for primary prevention, could be expanded in many ways. First off, an increase in the number of rural clinics included in the project would increase the amount of feedback received from providers

and further validate the projects' outcomes. Of particular interest would be a comparison of rural clinics with EHR capabilities versus clinics without EHR capabilities similar to the clinics included in this project. Second, a retrospective chart audit on the providers included in the project could further measure the impact of the project on participating providers. However, limited EHR capabilities hinder the ability to do such audits on the providers in these two clinics. Although prohibitively time consuming, charts could be randomly reviewed manually if adherence to the guideline were to be improved.

Lastly, the inclusion of bleeding risk scores within the project could simplify clinical application for providers, as there is limited guidance available for providers estimating the benefit/risk of aspirin for primary prevention (Mora et al., 2016). Although a statement was already made that there have not been any clinically validated resources to determine a patient's bleeding risk, a mobile app called "Aspirin-Guide" and an algorithm flow chart have been created to help providers with the decision to place patients on aspirin for primary prevention (Mora et al., 2016). The app and algorithm combine the ACC/AHA CVD score and GI bleeding risk score based on published studies and the USPSTF evidence synthesis to provide guidance to whether a patient should be placed on aspirin (Mora et al., 2016). Furthering research on bleeding risk would be of great benefit to providers making the decision to start, stop, or continue patients on aspirin for primary prevention of CVD.

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