

**Implementation of Routine Cardiovascular Risk Scoring and Patient Education in**

**Primary Care: A Quality Improvement Project**

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### **Abstract**

Atherosclerotic cardiovascular disease (ASCVD) remains the leading cause of death for all genders and most ethnicities in the United States. Providers are urged to utilize research-based approaches toward enhancing health outcomes and integrate strategies aimed at reducing disease risk. The purpose of this project was to improve the current use of ASCVD stratification tools, enhance risk documentation within medical records, and to streamline patient education and shared decision-making processes. The population included providers in an urban Midwest primary care office, who were given information regarding the project plan and subsequently coached screen all qualified patients for 10-year and lifetime ASCVD risk. Providers integrated appropriate objective data, including modifiable and non-modifiable factors as per the ACC/AHA guidelines for ASCVD risk stratification using a risk calculator tool. Data compiled were assessed for frequency of risk stratification, documentation of score, regularity of patient education, and rate of shared decision-making. A three-phase quality improvement project with emphasis on provider education was carried out to determine baseline, intervention, and post-intervention implementation and documentation of risk, as well as use of streamlined patient education and shared decision making. Baseline results determined that processes were not standardized for either risk stratification or patient education. Following education, providers more frequently utilized the EPIC embedded risk calculator (60%), as well as incorporated the EPIC After Visit Summary education worksheets (92%) for lifestyle changes based on patient's risk at the conclusion of each surveyed annual wellness visit. The post-intervention phase demonstrated a slight drop in all of the measured tasks, which indicates continual need for provider counseling, support, and an ongoing assessment of limitations that create barriers to following the ACC/AHA guidelines for cardiovascular screening.

## **Implementation of Routine Cardiovascular Risk Scoring and Patient Education in Primary Care: A Quality Improvement Project**

The United States (US), despite possessing a progressive healthcare industry, remains burdened with one of the highest chronic disease rates in the world. As residents of the US continue to age, advanced healthcare providers must shift their focus from reactive treatment to proactive prevention of chronic diseases (Benjamin, 2011). The practice of preventative medicine conserves resources and provides patients with first-rate care, as well as improved opportunities for reaching and maintaining an optimum state of health. Cardiovascular health, a substantial component of healthcare, significantly impacts the overall condition of an individual's wellbeing. Consequently, it is imperative that healthcare professionals be mindful of the risk involved with heart health when managing the cardiovascular wellness of their patients.

### **Background**

According to the World Health Organization (WHO), one out of every six individuals in the world will be age 60 or older by the year 2030 (World Health Organization, 2021a). Because the number of individuals aging in the US continues to rise, atherosclerotic cardiovascular disease (ASCVD) has evolved into a matter of great concern for healthcare providers across the country. Roughly 18 million individuals over the age of 20 have been diagnosed with coronary artery disease, the most common cause of ASCVD (CDC, 2022a). According to the Centers for Disease Control and Prevention (CDC), ASCVD is the leading cause of death for all genders and most ethnic groups residing in the US, with one person dying from heart disease every half minute (2022).

### **Morbidity and Mortality**

According to the Million Hearts initiative, approximately one in every three deaths are the result of cardiovascular disease, with 20% of those deaths occurring in individuals younger than age 65 (n.d.). Deaths that occur younger than age 70 are considered premature, and many of these premature deaths are the result of preventable causes (WHO, 2021b). It is estimated that over 80% of deaths worldwide could be attributed to non-communicable diseases, such as diabetes and ASCVD (Foreman et al., 2018). The WHO maintains that ASCVD is a preventable disease, which can be avoided when medical professionals intentionally educate their patients about the consequences of poor health and life choices, including obesity, hypercholesterolemia, inactivity, and recreational substance abuse (WHO, 2021b).

According to the 2019 National Vital Statistics Report, a study conducted by the US Department of Health and Human Services (USDHHS), 659,041 individual deaths were caused by some form of cardiovascular disease (Division of Vital Statistics, 2021). At just over 23% of total deaths, these numbers support the fact that cardiovascular disease remains the top cause of death for people in the US (Division of Vital Statistics, 2021). Several predictors of ASCVD have been established, including diabetes, hypertension, and hyperlipidemia, rendering providers with a more straightforward means of risk identification for treatment or prevention of heart disease.

Lifestyle choices play a significant role in an individual's physical wellbeing, as mentioned. Among these factors, tobacco abuse, poor diet, obesity, and cardiorespiratory fitness are included as key predictors for development of ASCVD (Kaminsky et al., 2021). Lack of preventative medicine practice in the outpatient setting can negatively impact heart health (Bodai et al., 2018). When necessary, focusing on inhibiting or regulating, comorbidities such as hypertension, obesity, and hyperlipidemia are critical approaches to management and prevention

of ASCVD and other chronic diseases. Furthermore, Bodai et al. (2018) emphasized that one of the most significant explanations for poor outcomes relative to chronic diseases is largely due to misinformation and deficiencies in adequate patient education. Patients who are not offered sufficient instruction on disease prevention or treatment could negatively impact their overall health, which can be costly for both the patient and the economy.

### **Social and Economic Burden**

By the year 2035, the American Heart Association (AHA) has projected that ASCVD will cost the US healthcare system \$1.1 trillion dollars in medical expenses, which is a staggering upsurge from \$555 billion in the year 2015 (American Heart Association, 2017). According to the CDC, heart disease cost the US nearly \$363 billion dollars in 2016, a sum that not only includes total spent on healthcare services and treatments, but also resultant productivity loss (CDC, 2022b). Medicare and Medicaid paid over half of those fees, followed by private insurance and self-pay, with approximately \$80 billion being spent on ischemic heart disease, \$71 billion on hypertension, and \$24 billion on hyperlipidemia, (Birger et al., 2021).

Additionally, those who are expected to care for individuals suffering from ASCVD are also affected by the high costs associated with the disease. Informal caregiving is defined as “home care that is provided without payment by family members or friends of the care recipient” (Dunbar et al., 2018, para. 6). Dunbar et al. (2018), in their study, concluded that expenses involved with informal caregiving of ASCVD patients would rise from \$61 billion in 2015, to \$128 billion in 2035. This information further substantiates the fact that ASCVD influences more than just healthcare expenditures, as it also impacts finances on a personal level.

Individuals with diagnosed risk factors for ASCVD spend more on associated healthcare costs than those without causative factors. For example, obesity, often instigated by insufficient

lifestyle choices including inactivity and poor diet, cost the US \$1.4 trillion in 2020 (Lopez & Bendix, 2020). A study performed by Zhang et al (2017), using a two-part model to determine both national and personal expenses linked to hyperlipidemia, revealed that individuals spent \$1105 and national expenditures reached \$15.47 billion per year. Most of these disbursements were associated with prescription medications used to treat elevated lipids (Zhang et al., 2017). Likewise, patients with hypertension spend close to \$2000 per year more annually on healthcare fees than those who do not have elevated blood pressure (Kirkland et al, 2018). These numbers support the need to identify risk early on and incorporate preventative medicine during annual wellness exams in the outpatient setting.

### **Implications for Advanced Practice Nursing**

Due in part to the growing population of high-risk individuals in the US, providers must be diligent in screening for chronic diseases (Cameron, 2019). Nurse practitioners must be proactive in determining which of their patients are most at risk during both wellness and acute visits. By assessing each patient's history, and by quantifying a potential for developing issues secondary to cardiovascular disease, providers can establish a lead on improving patient outcomes and impeding the development of subsequent preventable diseases.

There are many specialized tools available for providers to apply in the outpatient setting that assist with calculating cardiovascular disease risk for patients who meet certain specifications. Scores are measured based on established criteria. Analyzing a stratified risk percentage, while also considering other factors such as weight, socioeconomic status, and family history of hyperlipidemia and heart disease, can help prompt practitioners to determine individualized goals and treatments for those who are more susceptible to ASCVD (Halloran, 2013). The American College of Cardiology (ACC) created a risk assessment tool for providers

to incorporate into their practice, which estimates an individual's 10-year ASCVD risk based on objective factors such as age, race, gender, blood pressure, total cholesterol, high-density lipoproteins (HDL-C), low density lipoproteins (LDL-C), history of diabetes, tobacco use, hypertension, and use of statin or aspirin therapy (American College of Cardiology, n.d.). By incorporating non-modifiable objectives with modifiable lifestyle habits and health an individual's health history, providers are presented with a calculated score that can be used as a guide for treatment or prevention. The use of measurement methods, however, must be streamlined into daily practice on all patients who qualify, and those measurements must be implemented in tandem with appropriate patient education.

Because ASCVD prevention and treatment has become an integral component of healthcare, providers are accountable for remaining diligent with identification of patients who are vulnerable to developing heart disease. As a result, they must pay considerable attention to those with associated risk factors. Awareness of cardiac health has become a substantial issue of concern leading to establishment of policies and practices that work toward advancing disease prevention processes and aim to slow progression of potentially fatal conditions. ASCVD and cardiovascular health are significant aspects of healthcare agenda that continue to hold the interest of national, state, and local initiative makers.

### **Significance**

Heart disease does not always present with obvious symptoms; therefore, the probability of disease must be identified early on. Because of the silent yet potentially fatal nature of ASCVD, multiple health related organizations have intensified their focus on prevention or improvement of the many comorbidities that lead to heart disease. The work of these

organizations has generated processes that aid medical professionals in the identification of populations of patients who are at risk for developing ASCVD.

### **National Healthcare Agenda**

To promote cardiovascular health and research nationwide, the AHA launched the Million Hearts Collaboration to Prevent Heart Disease and Stroke (MHC) initiative (Million Hearts, n.d.-a). Founded in 2015, the MHC has educated providers by encouraging collaborative relationships between those providers and supportive organizations at the local, state, and federal level. (Million Hearts, n.d.-a). The MHC functions as a system of support for both providers and their healthcare organizations by introducing policy initiatives and by establishing clinical guidelines for care of populations who are at risk for developing cardiovascular or cerebrovascular disease (Million Hearts, n.d.-b). In fact, over the last 70 years, the AHA has devoted just under \$5 billion in research funding, allocating a portion of that research directly toward cardiovascular disease prevention (American Heart Association, n.d.).

By integrating research-based care guidelines for practice, the aim of the MCH initiative is to promote methods of detection and prevention of cardiovascular disease to be put into place in the care setting, with the goal of reducing the number of deaths secondary to CVD (Million Hearts, n.d.-a). In addition to financially supporting cardiovascular health research, the MHC initiative provides guidelines that promote routine monitoring of cholesterol levels to safeguard the heart health of patient populations (n.d.-b).

The United States Department of Health and Human Services (USDHHS) published the next Healthy People 2030 agenda, a report that contains a multitude of objectives that support healthy lives for US residents (Healthy People 2030, n.d.-a). One of the goals include reduction in incidence of heart disease and stroke by improving nutrition and healthy eating with the intent

to reduce cholesterol level in adults aged 20 and older (Healthy People 2030, n.d.-b). According to this goal, the most recent data collected by the National Health and Nutrition Examination Survey found that cholesterol levels currently average out to 190.9 mg/dL, while the target cholesterol level for individuals is 186.4 mg/dL (Healthy People 2030, n.d.-b). According to this data, the agenda advocates for a decrease in the cholesterol totals for adult patients (Healthy People 2030, n.d.-b). Keeping this program in mind, various other US organizations have created avenues for providers to be able to reach these goals for their patient populations.

### **Clinical Guidelines and Policies**

There are barriers to achieving positive patient outcomes involving both assessment methods and patient education. A systematic assessment of cardiovascular health measurement tools by Muthee et al. (2020) found that there are factors that influence the use of such tools in the primary care setting. Their review of previous studies revealed the presence of a knowledge gap involving proper use of the tools, as well as variances in level of understanding of the results (Muthee et al., 2020). Additionally, poor outcomes for those with chronic diseases stem from the issue of non-compliance, a complication that can be assuaged by adequate education. According to Gold and McClung (2006), “Increasing knowledge and clarifying misconceptions are particularly important for patients with asymptomatic conditions...to highlight the urgent need for treatment and the consequences of poor compliance” (p. 33S). Use of proper tools to stratify risk should coincide with patient education to enhance an individual’s health results.

The ACC and the AHA created a task force to design and implement additional recommendations for primary prevention of cardiovascular disease in the outpatient and public health settings. According to Arnett et al. (2019), clinical practice guidelines were published as a user-friendly online resource for providers to make use of. These guidelines are presented with

succinct summaries, tables of recommendations, flow charts, diagrams, and hyperlinked references for easy access to evidence-based practice support (Arnett et al., 2019). One of the more vital objectives of the work of this task force includes the importance of promoting healthy lifestyle choices focused on improvements in tobacco cessation, diet, and exercise (Arnett et al., 2019). By concentrating on these factors, ASCVD risk reduction would be a feasible aim for healthcare providers and their patients. Ultimately, providers should explore and implement methods into practice that make the most sense for achieving successful health outcomes in their patient populations.

One of the primary agendas of the MHC includes providing providers with easy access to guidelines that pinpoint modifiable and nonmodifiable risks geared towards ASCVD. One of the main topics of concern includes control of serum cholesterol levels. An article shared by the MCH offers a robust explanation of guidelines on statin therapy and atherosclerotic cardiovascular disease treatment and prevention, framed by the ACC/AHA Task Force on Clinical Practice Guidelines. According to the article, the ACC and AHA have incorporated evidence-based practice approaches toward enhancing heart health outcomes since 1980 and have used these scientifically supported methods as a basis for cardiovascular care for those both at risk and diagnosed with ASCVD (Grundy et al., 2018). Also of note, the task force encourages providers to utilize the ASCVD risk application provided by the AHA to estimate 10-year risk of developing cardiovascular disease based on the patient data entered into the calculator function (Grundy et al., 2018). Following computation of the stratified risk, the application provides evidence-supported guidelines on how to treat the patient based on the patient's score (American College of Cardiology, n.d.).

### **State Initiatives for Cardiovascular Disease**

While ASCVD is a substantial matter of national concern, consideration of heart health is also an important issue in the regional setting. Stakeholder members of the Title V MCH/CYSHCN Block Grant Needs Assessment Committee, as noted in the Nebraska Department of Health and Human Services (NDHHS) website, published an issue brief regarding cardiovascular disease, specifically focused on racial disparities found in diagnoses of diabetes, hypertension, and obesity. The brief discussed the importance of targeting those at risk for ASCVD, as well as identified the significance of implementing healthy lifestyle adjustments for younger generations aimed at evading ASCVD diagnoses in future generations (Title V MCH/CYSHCN Block Grant Needs Assessment Committee, 2020).

Many of Nebraska's largest health systems have aligned with regional health departments and missions sponsored by the AHA with the goal of improving cardiovascular health at the local level. In 2019, the University of Nebraska Medical Center (UNMC) established the Center for Heart and Vascular Research (CHVR). The goal of this assembly of scientists, a group individuals summoned from health centers and universities across the state of Nebraska, was to "...synergistically facilitate collaborative translational and clinical research that develops the team into an innovative and leading heart and vascular research center and improves the cardiovascular health of our communities" (UNMC, n.d., para. 2). The CHVR's purpose is to function as a resource for providers who intend to incorporate cardiovascular health focused evidence-based medicine into their daily practice. With the help of the CHVR, providers are presented with clinically researched mechanisms and guidelines that aid in prevention and treatment of ASCVD (UNMC, n.d.).

### **Catholic Health Initiatives Cardiac and Primary Care**

In 2011, Catholic Health Initiatives (CHI) in Lincoln, Nebraska joined forces with Nebraska Heart Institute. The alliance between the two entities, operating as CHI Health Clinic Heart Institute, was put into place to provide enhanced heart health services to the capital city and its surrounding communities. The institute maintains its focus on providing their patients with support in making lifestyle choices to optimize cardiac health, as well as act as a consultant in diagnosing, managing, treating, and preventing cardiac diseases (CHI, n.d.). As an aid to the public, a direct link to the Heart Aware<sup>®</sup> survey can be found on the organization's website. Individuals are encouraged to fill out the questionnaire online and receive a detailed report of their adjusted heart age based on criteria such as age, gender, body mass index, health history, family history, level of physical activity, and so on (CHI, n.d.). This is one way CHI attempts to educate members of their community about heart health. Likewise, as affiliates of the CHI health clinic organization, the primary care providers at CHI Health Steven's Creek Family Medicine are expected to evaluate their patients' cardiovascular health and work towards prevention or treatment of ASCVD. Providers at this clinic are also required to provide documentation demonstrating adequate assessment and patient education concerning cardiovascular health by following guidelines and policies established by ACC and the AHA.

Prevention of ASCVD, while a paramount issue nationally, must begin in the outpatient setting. Under the guidance of a knowledgeable healthcare provider, positive patient outcomes can be accomplished when risk is established early on, and modalities of preventative medicine are tailored to meet individual needs. It is essential for providers to utilize research-based methods for stratifying ASCVD risk at each annual wellness visit and on an as needed basis for their patient cohorts. As a follow up, it is vital that providers deliver adequate education to their patients on the subject of cardiovascular health and wellness.

### **Problem Statement**

Due to the growing number of cases of ASCVD in the US, providers must be keenly attentive to identifying those at risk, and either implement methods of prevention or adequately treat the disease to avert poor outcomes. Practice of risk stratification, preventative medicine, and adequate disease-focused education provides patients with excellent care and enhances the likelihood patients can reach and maintain an optimum state of health; however, these methods of evaluation have been deficient in some healthcare settings. Discrepancies have been observed in these practices, especially in continuity of risk stratification and in streamlined patient education processes.

### **Synthesis of Evidence**

Shared decision making (SDM) between patients and their providers leads to improved outcomes, as patients are given the opportunity to participate in their care and demonstrate autonomy in reaching and maintaining their health goals. In addition to SDM, incorporating the electronic medical record (EMR) under the guidance of clinical decision support systems (CDSS) in measuring risk for, preventing, and treating ASCVD is also an option for providers to implement into their patient care routine. Finally, shortcomings concerning documented utilization of ASCVD risk stratification methods, as well as patient education and behavioral counseling in relation to ASCVD can be observed throughout the literature. These topics have been thoroughly investigated and results from previous research demonstrate there is a need for solutions that are appropriately supported by evidence-based practice.

### **Search Process**

A literature search was completed using Google Scholar, the Cumulative Index to Nursing and Allied Health Literature (CINAHL), Clinical Key, Google Scholar, and PubMed for

publications. A combination of phrases including “shared decision making” AND “cardiovascular disease”, “cardiovascular disease” AND “risk stratification”, “patient education” AND “cardiovascular disease”, and “electronic health records” OR “clinical decision support systems” AND “cardiovascular disease”, and “behavioral counseling” AND “cardiovascular disease” were entered into the respective search engines. These search engines generated various articles, to include analyses, randomized trials, as well as cohort and pilot studies focused on individuals within the community and outpatient care settings with or at risk of developing cardiovascular disease. Articles between the years 2009 and 2022 were selected based on relevance of data presented and modernness of research methods utilized by the authors.

## **Literature Review**

### ***Shared Decision Making***

Okunrintemi et al. (2021) implemented a retrospective cohort study in an outpatient setting by utilizing data from the Medical Expenditure Panel Survey 2006 – 2015 to evaluate SDM processes between providers and patients previously diagnosed with ASCVD. Elements of assessment included history of hospitalizations, prescription compliance, healthcare expenses, and self-rating of health status (Okunrintemi et al., 2021). Two-part econometric model and regression models were implemented to evaluate the degree of SDM on preset outcome measures based on survey results (Okunrintemi et al., 2021). Consequently, individuals with quality SDM opportunities reported stricter medication regimen compliance, less emergency department admissions, and more positive viewpoints regarding quality of their health status (Okunrintemi et al., 2021). The results of this study imply that well-coordinated SDM between patients and their providers leads to improved patient outcomes (Okunrintemi et al., 2021).

Case et al. (2019) performed a single-center randomized controlled pilot study in an outpatient cardiology clinic by implementing a web-based patient decision aid (PDA) tool that provided patients with information about ASCVD screenings with the intention of enabling patients to make more informed decisions regarding implementation of diagnostic testing. The PDA tool was broken into five sections, which consisted of basic information about screening and diagnostic tests as recommended by the AHA, definitions, symptoms, and mortality information related to ASCVD, a more thorough and precise explanation of diagnostic testing and screenings, risk versus benefit of test completion, and expectations regarding results (Case et al., 2019). The fifth section directed patients to follow the steps to calculate their personal risk for developing ASCVD or a cardiac event and allowed patients to recalculate their risk contingent on the results of their diagnostic tests, whether they be positive or negative (Case et al., 2019). The results of this study concluded that patients in the PDA group appreciated the use of the PDA, as well acknowledged a more enhanced readiness in making an informed medical decision (Case et al., 2019). Web-based interactive tools correlate to an improved level of understanding and decreased stress in the decision-making process in relation to CVD testing (Case et al., 2019).

Enabling patients to participate in SDM is largely effective to reaching desired outcomes, however, interaction during this process works best when a patient's knowledge of their personal health, diseases, or treatments are evaluated before decisions are made. A study by Poon et al. (2019) demonstrated that patient activation, meaning a patient's assessment of their personal understanding of and ability to manage their health, lays the foundation for quality SDM. The authors implemented a Patient Activation Measure (PAM), as well as the CollaboRATE self-assessment tool as a means to quantify patient activation (Poon et al., 2019). A total of 1,222

patients with ASCVD, either with or without diabetes, were surveyed at baseline and again at their one year follow up (Poon et al., 2019). Results concluded that SDM was much more productive when a patient's baseline knowledge and skill were targeted and their strengths were emphasized early on (Poon et al., 2019). Essentially the findings revealed that, while SDM is an important aspect of healthcare, patients would receive more benefit from shared conversations if providers advocated for patient activation by focusing on interventions that emphasize a patient's extent of comprehension regarding their health (Poon et al., 2019).

Findings from these studies demonstrate support of the shared decision-making process. Patients who participate in discussions focused on achieving common goals with their providers are more likely to reach those targets than patients who are not engaged in their care. According to the above discussed articles, healthcare providers who tailor office visits to amplify patient involvement and who individualize discussions based on patient's level of understanding are more likely to have patients who follow their medical plans and adhere to prevention and treatment regimens.

#### ***Utilization of CVD Risk Calculators in Primary Care***

Yadlowski et al. (2018) published a population-based study designed to validate pooled cohort risk equations, which are commonly used as prevention guidelines for ASCVD and implemented in determining risk for development of a atherosclerotic disease or secondary related event. The clinical question posed for this study focused on probability of the stratification tools misestimating risk due to lack of consideration for race and gender subgroups (Yadlowski et al., 2018). For example, this analysis found that 33% of qualified black individuals had extreme risk estimations, equating to either less than 70% or greater than 250% of Caucasian adults with an equal probability for development of ASCVD (Yadlowski et al., 2018).

Essentially, the authors assert that data currently integrated within risk calculators are outdated (Yadlowski et al., 2018). Findings from their study support the need to revise the equations by incorporating updated data and modern statistical methods with the intent to improve ASCVD stratification accuracy, especially amongst the various subcategories of patients (Yadlowski et al., 2018).

Crykert et al. (2020) instituted and evaluated use of ASCVD risk-stratified management dashboard combined with interventions centered on risk reduction for susceptible patients in primary care settings. This randomized trial study featured participation of 219 primary care offices during a one-year intervention timeline (Crykert et al., 2020). Patients aged 40 to 79 years with previous history of ASCVD risk and who had unfulfilled treatment goals were entered into a dashboard style application, followed by organized outreach and intervention measures, including tobacco cessation counseling, escalation of statin-therapy, blood pressure control, focused patient engagement, and so on (Crykert et al., 2020). Of the 437,556 individuals assessed, 146,826 presented with a 10-year ASCVD risk of  $\geq 10\%$ , based on elements of probability (Crykert et al., 2020). Post-intervention, there was an absolute risk reduction of 6.3% within this population, substantiating that risk stratification and close supervision of susceptible patients, coupled with deliberate patient engagement, leads to improved disease outcomes (Crykert et al., 2020).

While calculating risk for ASCVD is an essential part of wellness assessments, providers must also consider other factors that influence health outcomes and recognize how those factors can affect disease progression. Nguyen et al. (2020) implemented a study using the Cardiovascular Health Study for 4,249 adults aged 65 years or older living independently within four US cities. Research was performed to determine if competing risk altered standardization

and accuracy of cardiac risk assessment (Nguyen et al., 2020). Previously measured 10-year ASCVD risk scores were analyzed by employing calculations and predictors supplied by the Pooled Cohort Equations Work Group (Nguyen et al., 2020). Severity of individual frailty for each participant was reported by measuring baseline criteria of exhaustion, low physical activity, slowness, weakness, and shrinking (Nguyen et al., 2020). In addition to this and in an effort to reveal evidence of multimorbidity, presence of one or more of nine chronic conditions, including kidney or lung disease, diabetes mellitus, depression, arthritis, cancer, hypertension, osteoporosis, and cognitive dysfunction, were also evaluated by questioning participants (Nguyen et al., 2020). Findings demonstrated that ASCVD prediction was reliable in the experimental groups, however, it was noted that the highest category for predicted risk did reveal some misestimation of scores (Nguyen et al., 2020). While this is of some concern, providers' decision making regarding primary prevention treatments were not distorted by risk scores and the presence of multiple comorbidities or frailty (Nguyen et al., 2020).

In summary, the conventional risk tool and methods of prediction for ASCVD are reliable but are not without error. Evidence based practice demonstrates that providers must cue in on outliers and special populations of patients that may not meet criteria or whose scores do not seem accurate. Use of dashboards or prompt-style reminder systems that guide interventions for treatment and prevention of ASCVD are effective as an adjunct to risk measurement and assist with reaching positive patient outcomes.

### ***Electronic Medical Records and Clinical Decision Support Systems***

Use of EMRs in the healthcare field has become a dependable and straightforward means to gather and retain patient data over the last 20 years. With the expansion of technology, providers have become more dependent on the EMR. Creators of EMRs implemented CDSSs to

use as reminders, either as alerts or messages within a patient's chart, to notify providers of upcoming screenings or treatment recommendations based on age, lab results, and so on.

McKie et al. (2020) evaluated the effect CDSS has on recommended therapies for hyperlipidemia, atrial fibrillation, and congestive heart failure across a total of 16,310 outpatient appointments. Individuals assessed included 109 primary care providers were cluster-randomized into an intervention group with access to CDSS alerts within the EMR, and a control group without EMR alerts (McKie et al., 2020). Patients attending clinic visits were evaluated for the presence of heart failure, hyperlipidemia, or atrial fibrillation, and providers in the intervention group were subsequently sent an EMR alert identifying any discrepancies in recommended treatments for these diagnoses (McKie et al., 2020). Results were gathered by self-reported use of decision assistance and efficiency, as well as by monitoring prescribing patterns (McKie et al., 2020). Study outcomes revealed that overall usage of the CDSS was low (19%), and the clinical decision tool essentially only influenced adherence to treatment recommendations for heart failure and not the other two conditions (McKie et al., 2020).

Another study by Felton et al. (2022) evaluated EMR prompted order sets intended to improve screening for cardiovascular disease and stroke for high-risk individuals. Providers at a tertiary care center were randomized into intervention and control groups, with the experimental group receiving an EMR alert prompting the provider to initiate a set of AHA guideline substantiated orders dependent on a patient's individualized risk score, while the control group use the EMR as normal (Felton et al., 2022). Felton et al.'s research exposed similar results, in that EMR notifications for CDSS did not increase use of the preprogrammed order set going so far as to assert that frequency of provoked messages could be correlated with some level of alert fatigue and subsequent disregard (Felton et al., 2022).

Normalization of EMR use in healthcare has improved efficiency in documentation, as well as accuracy in individualized care planning. CDSS and other prompts embedded in EMRs function to assist providers with determining what interventions should be considered based on certain diagnoses. While these programmed triggers were developed with good intention, much work is to be done in sustaining regular use in patient care. Providers who prefer to treat patients without regard to specific guidelines and providers who suffer from alert fatigue will likely continue to oppose use of a CDSS within an EMR, thus creating considerable challenges with consistency.

### ***Behavioral Counseling and Cardiovascular Disease***

A final element in management of CVD includes behavioral counseling centered on lifestyle adjustments and treatment compliance. Omura et al. (2018) analyzed incidence of provider discussions focused specifically on physical activity, frequency of referral to intensive behavioral therapy for patients with high-risk of developing ASCVD, and barriers to counseling. Data from DocStyles 2015, a web enabled survey of 1,251 primary care providers, were collected and subsequently analyzed to determine regularity of physical activity dialogue between provider and patient (Omura et al., 2018). Results indicated that over half (58.6%) of providers promoted increased physical activity for their at-risk patients, with just under 14% of those providers referring their patients to rigorous behavioral therapy (Omura et al., 2018). Barriers to having these vital conversations stemmed from providers' self-reported disbelief in counseling, which affected initiation of discussions and consequent lack of referrals (Omura et al., 2018). Based on this, adjustments in attitudes regarding patient counseling must occur in order to increase both the fruitfulness and frequency of physical activity in relation to ASCVD prevention (Omura et al., 2018).

Valero-Elizondo et al. (2019) examined gaps in provider-led lifestyle counseling and how that counseling impacted adherence to treatment plans among obese patients with either prediabetes or diabetes. The National Health Interview Survey 2016-2017 was used as a screening tool for lifestyle behaviors, including physical activity, diet changes, and weight loss (Valero-Elizondo et al., 2019). In this survey, patients were asked if they had been referred to a weight-loss program or if they had been encouraged by their primary provider to increase their exercise habits or improve their diet (Valero-Elizondo et al., 2019). This study demonstrated the presence of inconsistencies in patient education. According to the authors' findings, two out of every three individuals with some level of obesity reported discrepancies in both referral and advice of weight loss focused assistance programs (Valero-Elizondo et al., 2019). Furthermore, the odds of suitable lifestyle counseling taking place were lowest among patients with public insurance, individuals who smoke, the female gender, and those of lower socioeconomic status (Valero-Elizondo et al., 2019).

A study investigating individuals with either stage one hypertension or untreated hypertension who were at risk for developing ASCVD was performed by Maruther et al. (2009) in an effort to determine strength of relationship between patient counseling and intervention. The authors randomized 810 subjects into three different groups, including an "advice only" group, an "established" group who incorporated advice with the addition of incorporating recommended CVD risk reduction interventions (increased exercise, reduced sodium intake, and weight loss) group, and an "advice-plus-dietary approaches to stop hypertension (DASH)" group (Maruther et al., 2009). The goal was to determine the degree of improvement in overall 10-year CVD risk scores between each group with follow-up data collection performed at 6-month and 18-month intervals (Maruther et al., 2009). Blood pressure, weight, fasting glucose, total

cholesterol, and HDL-C levels, smoking status, as well as medication use were measured at both the six and 18-month visits using sex-specific Framingham risk equations (Maruther et al., 2009). Data revealed a substantial decrease in median 10-year ASCVD risk for both the “established” and “advice-plus-DASH” groups, improving scores by approximately 12% and 14% (Maruther et al., 2009).

With regard to patient education on behavior modifications, challenges were demonstrated in the areas of provider’s personal beliefs about lifestyle coaching. Inconsistencies were also revealed in which subcategories of patients were offered instructions and recommendations on lifestyle changes. When optimal patient education is performed consistently, regardless of social determinants of health, more favorable outcomes are readily achieved as overall reach is expanded to larger groups of patients.

### **Current State of Knowledge**

The current state of knowledge of ASCVD has significantly advanced over the last decade and remains a mainstay element of concern in preventative medicine. A variety of evidence-based tools and techniques are accessible to providers for use in the care of individuals who have or are at risk of developing ASCVD. Ultimately, research has demonstrated that risk stratification, coupled with shared decision-making, clinical decision support systems and electronic health records, and behavioral counseling directly impact patients and their health outcomes. Despite there being challenges to all of the above, providers who are intentional in planning and executing methods of prevention and treatment of ASCVD are well suited to help their patients live longer, healthier lives. Positive results can be accomplished by determining the level of cardiovascular risk, utilizing electronic health records, and clinical decision support systems to guide therapy. In addition, keeping the patient educated and as engaged as possible in

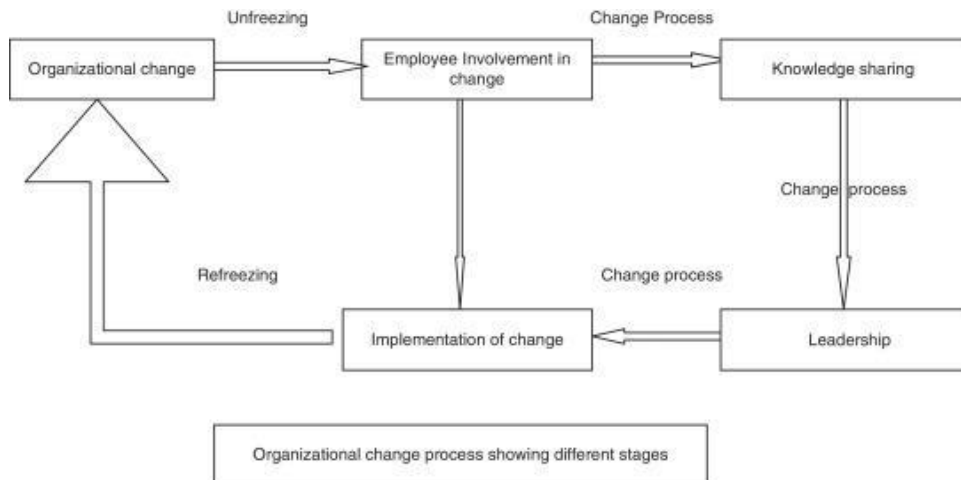
all aspects of their personal healthcare with the use of shared decision-making tools and behavioral coaching.

### **Theoretical Framework**

Transformation within a system, whether minor or large scale, is best carried out when the process is supported by predetermined objectives and focused strategies. According to Pierce et al. (2002), organizational change is "...the movement of an organization from its current state to some future and hopefully more effective state" (p. 628). Organizational change, especially within the healthcare setting, is necessary to meet the needs of an environment that is constantly shifting. Much work has been done to find methods of patient care delivery that support innovation while also remaining on a manageable timeline with appropriate oversight. A commonly applied theoretical framework in healthcare is Lewin's Change Theory (figure 1), created in the 1940's by highly revered social psychologist Kurt Lewin. This particular theory suitably addresses the needs of this particular quality improvement (QI) project, as the main focus was to determine a baseline for current practice, pause and adjust to meet standard of care requirements, and sustain this change in patient care routines.

#### **Figure 1**

*Lewin's Change Theory*



*Note.* This model demonstrates Lewin's Change Theory as a three-step process. From Hussain, S. T., Lei, S., Akram, T., Haider, M. J., Hussain, S. H., & Ali, M. (2018). Kurt Lewin's change model: A critical review of the role of leadership and employee involvement in organizational change. *Journal of Innovation & Knowledge*, 3(3), p. 126 ([https://https://doi.org/10.1016/j.jik.2016.07.002](https://doi.org/10.1016/j.jik.2016.07.002))

Lewin's Change Theory is a step-by-step model that consists of three stages of change: unfreezing, change process, and refreezing, and has generally been well received as a successful method to revolutionize healthcare (Hussain et al., 2018). To start, the status quo of an environment must be disrupted before a habit or a behavior can be stopped, altered, or replaced by a new behavior (Sarayreh et al., 2013). This step, which Lewin refers to as unfreezing, is the first phase of a change process (Sarayreh et al., 2013). Components of the unfreezing process involve identification of an issue, determining what practice or process needs to be changed, followed by motivating others to participate in necessary modifications (Shirey, 2013). Stimulating others within an organization to contribute to change is advantageous to reaching successful outcomes.

Hussain et al. (2018) discuss the value of engaging and empowering employees in the process of organizational change, asserting that staff participation is an effective strategy that promotes high quality change. For this project, not only did primary care providers participate in data collection, but their medical assistants also contributed to gathering patient information. The goal of involving medical assistants was to validate their status as an important part of the healthcare team, and also to promote overall staff acceptance of the project. The more individuals in a setting who are involved and willing to champion normalizing a process as a cohesive multidisciplinary team, the better the results.

The next stage, the transition or change phase, is the point at which new processes or adjustments in care are implemented and plans of action are executed (Shirey, 2013). This stage heavily involves persistent provider coaching and reinforcement, as change can be met with apprehension due to unfamiliarity or, at times, resistance (Shirey, 2013). Implementation of consistent identification of patients who are appropriate for stratification based on current recommendations, ASCVD risk calculator use and documentation, as well as dissemination of patient education regarding prevention and treatment was the focus during the second stage of Lewin's change theory implementation. Providers were educated on the importance of following the AHA guidelines, specifically concentrated on distinguishing who was appropriate to calculate risk and for who to fulfill standard of care requirements based on risk score and other modifiable and non-modifiable patient characteristics.

The third stage of Lewin's theory is referred to as refreezing, a phase in which providers normalize the new change and work toward it becoming a standardized process in patient care delivery (Shirey, 2013). Despite this being the final stage, refreezing requires continued support and prompts to maintain consistency with the identified adjustments until doing so becomes

routine. Subsequently, the success and sustainability of the change must be systematically assessed. Evaluations should be aimed at ensuring the process remains effective in reaching positive patient outcomes. Should new issues arise during the maintenance period, adjustments may be required to meet the needs of the clinic, providers, and their patients. Situations of this nature would call for the change process to either start over with unfreezing or find a means to make the necessary adjustments before refreezing can begin again. The goal is always to implement the most suitable processes to achieve positive outcomes and provide excellent patient care. This project required the champion provider(s) to continue to use and document ASCVD scores consistently in order to promote sustainability within the clinic.

### **Purpose Statement and Aims**

The purpose of this quality improvement (QI) project was focused on determining baseline use of the CVD risk stratification tool, improving provider use of this assessment in patients who qualify during annual wellness visits, improving documentation of risk percentage within the patient's EMR, and streamlining patient education and shared decision-making in the primary care setting.

### **Aims**

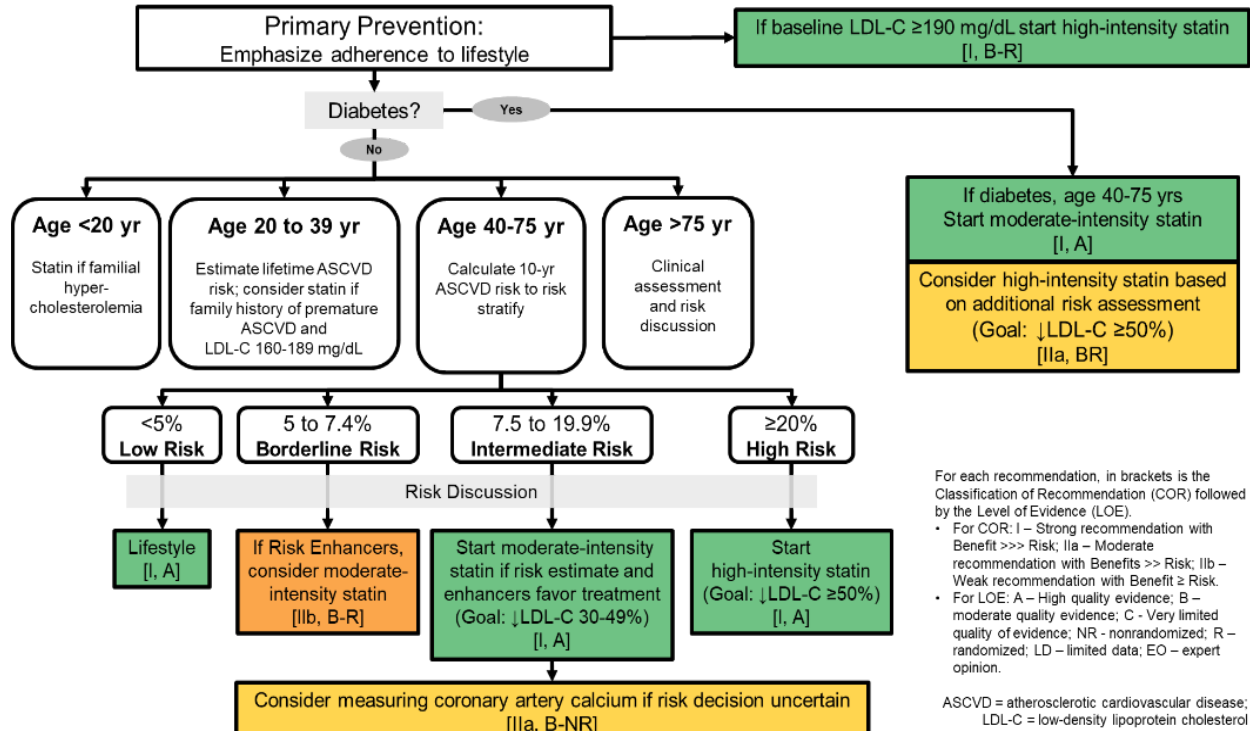
1. Increase provider utilization of the ASCVD risk stratification tool within the EPIC documentation system and follow the ACC/AHA cholesterol guideline recommendation for primary prevention (figure 2).
2. Standardize documentation of scores in the patient EMR for those who qualify based on age, personal health history, and family health history as determined by the ACC/AHA guidelines using the embedded EPIC Dot Phrase (.ASCVDRisk) more frequently than another means of calculation.

3. Enhance patient education regarding lifestyle changes and behavior modifications using the readily accessible Lifestyle Changes, Elevated Cholesterol, and/or Statin Medication Education sheets populated in EPIC and added into the patient care summary handout to be given to each patient as deemed appropriate.
4. Improve shared decision making between patients and providers with regard to care planning and ASCVD prevention and treatment and document as such within the EMR.
5. Maintain sustainability of the above objectives in daily practice for patients who qualify based on individual need.

The intended outcome of this project was to determine baseline level of consistency, improve current methods of screening, promote regularity in documentation of risk stratification, intervention, patient education, and utilization of methods of shared decision making using the EMR, and subsequently sustain these assessment, intervention, and documentation processes as part of each participating providers' routine daily practice.

**Figure 2**

*ACC/AHA Guideline on the Primary Prevention of CVD*



*Note.* This figure demonstrates a decision model for ASCVD risk measurement and intervention guidelines. From Arnett, D. K., Blumenthal, R. S., Albert, M. A., Buroker, A. B., Goldberger, Z. D., Hahn, E. J., Himmelfarb, C. D., Khera, A., Lloyd-Jones, D., McEvoy, J. W., Michos, E. D., Miedema, M. D., Muñoz, D., Smith Jr, S. C., Virani, S. S., Williams Sr, K. A., Yeboah, J., & Ziaean, B. (2019). ACC/AHA guideline on the primary prevention of cardiovascular disease: a report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. *Circulation*, 140(11), 596–e646. <https://doi.org/10.1161/CIR.0000000000000678>

## Methods

### Project Design

As established by the background, quantifying risk for development of CVD is an essential component of primary prevention. Primary care providers are obligated to measure risk assessment for various chronic diseases. Annual wellness visits are set up to ensure patients are

participating in appropriately individualized primary and secondary means of disease prevention. The way in which providers choose to act on a calculated risk is imperative to ensuring the patient reaches positive health outcomes. In response, this QI project was designed to determine baseline use and documentation of the ASCVD risk stratification tool and to streamline the providers' response to the risk score with the use of available patient education. The project was carried out in three stages, consistent with Lewin's Change Theory, by executing pre-intervention freezing, intervention unfreezing, and post-intervention refreezing phases.

### **Site and Sample**

The project took place at a Midwest primary care family practice clinic within the Catholic Health Initiatives (CHI) network that provides acute-based or wellness-based care to newborn through geriatric patients in southeast Nebraska. The sample for this project targeted primary care providers practicing at this CHI clinic with a goal to increase or further amplify their knowledge about cardiovascular risk calculation and incorporating risk measurement screening documentation into qualified patients' charts during appointments. The timeframe for data collection for this project took place in a seven-week period of time between the dates of November 1, 2022, and January 6, 2023. The pre-intervention phase included a retrospective chart review over two weeks, followed by the intervention phase for three weeks, and then a post-intervention phase with retrospective chart review lasting two weeks.

### **Recruitment**

Recruitment for this project was performed at the commencement of the QI project. A lunch meeting was set up with the office care team, at which time the staff were presented with information pertaining to the purpose of this QI project and a request was made for their participation. Physicians, nurse practitioners, and their medical assistants (MA) were all invited

to attend this education session. Subsequent to teaching and description of the timeline for this project, the providers were presented with the survey data collection materials and were informed of what areas of documentation they were responsible for. At this time, proper patient screening of patients who qualified for ASCVD risk management was highlighted, including inclusion and exclusion criteria. Providers determined which patients to screen by using their discretion and by incorporating appropriate objective data, with particular focus on patient age, personal health history, and family health history as per the ACC/AHA guidelines for ASCVD risk stratification. In addition, the MA was informed of their role in the data collection process with emphasis on what portion of the survey they were responsible to complete during the rooming of the patient.

### **Ethical Considerations**

Approval was received from the Institutional Review Board (IRB) of Creighton University, from CommonSpirit Health IRB, as well as the leadership at the primary care clinic prior to initiation of the project. There was no risk or harm to participants, as data collection was performed by both retrospective chart review, as well as by providers' self-surveyed input. Evaluation, as mentioned, was based on objective patient characteristics and non-invasive measurement of health, including weight and vital signs. Regulations set forth by the Health Insurance Portability and Accountability Act (HIPAA) Privacy Rule were closely adhered to by those individuals responsible for participating in data collection, as well as the project lead. The intent of the project was disseminated to the appropriate clinic staff to generate understanding, as well as to ensure that data collection and all associated tasks would be completed as efficiently as possible. Data collection surveys were sealed in envelopes in a secured desk drawer within each

provider's private offices. The survey materials were concealed to safeguard information and keep surveys out of the view of patients and other unauthorized persons.

### **Measurement Methods**

Measurement of a patient's both 10-year and lifetime risk of cardiovascular disease related events was completed by using either the EPIC embedded Dot Phrase or the ASCVD Risk Estimator Plus application. Dot phrases have been created as a shorthand template that automatically pulls structured data into an EMR contingent on previously recorded patient information. The EPIC embedded ASCVD Dot Phrase is an expedient tool that pulls present and retrospective objective information from the patient's EMR to compute the risk score, while the ASCVD Risk Estimator Plus application, created by the ACC, can be downloaded, and used on a mobile device. Both of these methods follow the ACC/AHA algorithm for risk calculation. The EPIC method documents all necessary information directly into the progress note with use of the Dot Phrase .ASCVDRisk (Figure 3). Alternatively, the Risk Estimator Plus device application requires the provider to input the required data and analyzes the risk based on what information was keyed in. The latter option inevitably requires manual documentation of the risk score result within the patient's office visit progress note, as the estimation is not computed within the patient's chart.

### **Figure 3**

*.ASCVDRisk Dot Phrase Auto Populated Patient Information and Calculated Risk Score*

The 10-year ASCVD risk score (Amett DK, et al., 2019) is: xyz%

Values used to calculate the score:

Age: (auto populated from most recent entry)

Sex: (Male or Female)

Is Non-Hispanic African American: (Yes or No)

Diabetic: (Yes or No)

Tobacco smoker: (Yes or No)

Systolic Blood Pressure: (auto populated from most recent entry) mmHg

Is BP treated: (auto populated from medication list)

HDL Cholesterol: (auto populated from most recent lab result) mg/dl

Total Cholesterol: (auto populated from most recent lab result) mg/dl

Objectives used for primary prevention screening for ASCVD risk include race, gender assigned at birth, age, systolic and diastolic blood pressure, and results of lipid panel lab work, which include the total cholesterol, HDL-C and LDL-C levels. Other information submitted into the risk calculator algorithm include history of diabetes, tobacco use, as well as current pharmacologic treatment for hypertension, use of a previously prescribed statin drug, or currently on an aspirin therapy regimen. Screening was only used for those not already diagnosed with ASCVD, as those individuals would not qualify for this risk assessment. The mobile risk calculator allows providers to add their email, in which case summaries of calculations, treatment recommendations, and recorded patient information can be submitted into the progress note or EMR.

### ***Intervention Measures***

- Utilization of the ASCVD risk stratification tool with subsequent standardization of EMR documentation, patient education, and utilization of shared decision-making processes
  - Aim #1: Increase provider utilization of the ASCVD risk stratification tool embedded within the EPIC system
  - Aim #2: Standardize documentation of scores in the patient EMR for those who qualify based on age, personal health history, and family health history

- Aim #3: Utilize readily available education resources within the After Visit Summary print out and give appropriate information sheets to patients at the end of wellness visits.
- Aim #4: Improve shared decision making between patients and providers with regard to care planning and ASCVD prevention and treatment
- Measure project sustainability
  - Maintain continuity of the project intent and objectives in providers' daily practice for patients who qualify based on individual need

***Aim #1 Increase provider utilization of the ASCVD risk stratification tool embedded within the EPIC charting system.***

Provider instruction pertaining to the ASCVD stratification tool is vital to maintaining consistent and appropriate use. To start, information sheets furnished with evidence-based support of risk calculator use, patient behavior modification, and other components of ASCVD prevention or treatment were distributed to the providers (Appendix A). These information sheets were handed out upon commencement of the QI project at the initial lunch meeting and were also posted in various places throughout the office to allow for easy access and quick viewing. An audit form listing necessary data to be collected was created and dispersed to each of the MA charting stations. Initial objective data was scribed on the top portion of the survey forms at the start of the visit (Appendix B). The provider was then instructed to fill out the bottom of the form by writing the patient's ASCVD 10-year risk score and share which tool was used to quantify the risk score. The next step was to fill out the box confirming documentation of the ASCVD risk score in the patient's progress note in the EMR and check which interventions they chose to perform or omit based on patient need. The forms clearly identified which portion

of the survey the MA was responsible for, and which portion the provider was responsible for with regard to data collection. Data collection forms were placed face down in an easily accessible paper tray in the provider's office and were routinely tracked on a weekly basis by the project lead.

***Aim #2 Standardize documentation of scores in the patient EMR for those who qualify based on age, personal health history, and family health history by using the EPIC Dot Phrase within the EMR.***

Application of the ASCVD risk stratification system and proper documentation of findings within the patient's EMR was monitored. During the initial lunch and learn meeting, a power point was presented detailing the importance of proper documentation of ASCVD 10-year risk, as well as reiteration of which patients would be candidates for risk evaluation. The power point focused on the specifics of the ACC/AHA cardiovascular risk guidelines for stratification and recommendations on either prevention or treatment interventions. Use of the EPIC EMR charting system Dot Phrase for cardiovascular risk stratification was also discussed, and providers were encouraged to use this method of documentation as the benchmark for risk measurement and documentation. A small but visible sticky note with the Dot Phrase was placed at each provider workstation as a gentle reminder to use when documenting in each progress note. The ACC/AHA guidelines algorithm was also supplied as a visual aid for providers to incorporate into patient care, which was used as the standard process for risk calculation and intervention recommendations.

***Aim #3 Enhance patient education regarding lifestyle changes and behavior modifications using the readily accessible Lifestyle Changes, Elevated Cholesterol, and/or Statin Medication***

***Education sheets populated in EPIC and added into the patient care summary handout to be given to each patient as deemed appropriate at the completion of wellness visits.***

The EPIC After Visit Summary (AVS) consists of essential information for patients, including updated medication lists, new prescription information, and follow up appointment dates and times. This summary also can include valuable education resources, which is readily available for providers to offer their patients. The AVS can be tailored to specifically focus on CVD risk, prevention, and treatment. These educational materials can be constructed to feature current recommendations on preventative lifestyle changes and information on initiating formal treatment for those requiring lipid lowering therapy. Based on which interventions the provider chose, the AVS handouts were given to the patients during or at the cessation of the office visit. The providers checked on the survey data collection form whether or not the handouts were distributed to the patient as a means of tracking patient education.

***Aim #4 Improve shared decision making between patients and providers with regard to care planning and ASCVD prevention and treatment***

As mentioned in the previous aim, usage of the AVS was tracked in order to establish a degree of regularity in patient education and promoted SDM on the subject of ASCVD prevention and overall health maintenance. The process of SDM, a critical component of all primary care office visits, was tracked by coaching the providers to check either yes or no on the survey form depending on if the patient was invited to ask additional questions regarding decisions, or if they were given treatment or prevention options. If a provider checked the no box, common options were available for the provider to select as the reasoning why SDM was not performed, including *not enough time*, *patient unwilling to participate*, or *other*. A space for a short explanation statement was also provided should another reason need to be specified.

*Aim #5 Maintain sustainability of the above objectives in daily practice for patients who qualify based on individual need*

At the termination of the real-time data collection segment of the QI project, a survey was given to the participating providers with questions that focused on their perception of the project and its sustainability (Appendix C). The questionnaire was completed as a means to measure the continuity of the project, but also to gather their thoughts on the overall experience. Furthermore, surveying the providers was vital to identify if they feel their practice changed as a result of reinforcement of implementation of the ASCVD risk calculator.

**Data Collection Process**

As detailed above, data collection for this project transpired during a seven-week period of time between the dates of November 1, 2022, and January 6, 2023. During the pre-intervention phase, a retrospective chart review of 25 total charts occurred during the initial two weeks. The intervention phase followed with a total of 25 patients surveyed in the clinic by the participating providers, which took place during the next consecutive three-week period. Immediately after this, a post-intervention phase consisting of a retrospective review of an additional 25 charts transpired over the final two weeks of the project to determine continuity of risk stratification. At the completion of the three-week intervention phase, the post project survey was administered to the sample of providers.

Inclusion criteria for chart review and for intervention surveys included males and females between 40 to 75 years old. Within that age group, the process of screening for patients seen by providers for annual wellness exams, Medicare initial or subsequent exams, and individuals establishing care who met criteria for a physical health exam were evaluated. Regardless of age or reason for visit, individuals who were previously diagnosed with ASCVD

were excluded from the data collection process. Data from each provider survey during each of the phases were given a random number to establish anonymity and any patient identifiers were removed in order to honor confidentiality. Information gathered was entered and organized into an Excel spreadsheet.

## **Results**

During the seven-week data collection period, pre-intervention data were analyzed and compared to determine baseline use of ASCVD risk stratification and documentation of patient score, education, and SDM and were compared to these factors during the intervention phase. The purpose of measurement between the first and second phases was to distinguish the incidence of an increase in screening for ASCVD risk, increased use of the EPIC Dot Phrase for documentation of risk, and improved percentage of relevant patient education and SDM. In the consecutive two-week period following the intervention phase, the same number of charts were retrospectively reviewed by the project lead. Data were compared to the intervention phase to determine sustainability of practice of risk stratification, intervention, patient education, and utilization of SDM.

During the timeframe of November 1 through January 6, 2023, a total of 578 patients over age 40 years were seen in the CHI clinic for annual wellness exams. Between the four employed providers, these visit reasons were labeled general wellness, physical complex, and either Medicare initial, welcome, or subsequent exams. Of the 578 patients, 91% were aged 40 to 75 years old. During the intervention phase, which fell between the dates of November 28 to December 16, a total of 259 patients visited the clinic for any one of the five above mentioned visit reasons. Of those patients, 25 surveys were completed by the participating providers and were turned in for data collection. This sum equates to a survey return rate of 9%.

Ultimately, 75 surveys were completed between the pre-intervention, intervention, and post-intervention stages. The project lead performed the retrospective chart reviews in both the pre- and post-intervention phases, while the three contributing providers, a group made up of a physician and two nurse practitioners, independently filled out and turned in their screening surveys during the intervention phase. Over half of the patients surveyed were male (66%) (Table 1). Additionally, the average number of patients screened was 55 years old. The oldest documented patient was age 73 and the youngest screened patient was age 44 between both genders (Table 2).

**Table 1**

*Gender Categories*

	Gender Total	%
M	50	66.6666666
F	25	33.3333333
Total	75	

**Table 2**

*Age Statistics for Surveyed Patients*

	AGE
Mean	55.5466666
SD	7
SE	8.299
95% CI	0.95828597
Median	7
Max	1.87824051
Min	5
	45
	73
	44

The data collected were used to answer three major questions. Prior to, during, and after the intervention, which screening tools were being used to measure ASCVD risk, did this QI project increase ASCVD EMR documentation, and did this project increase the frequency of patient education given using shared decision-making tactics. Subsequent to intervention, it was also necessary to identify if there was an increase or maintenance of documentation and patient education post-intervention. Each of these questions were quantified in an effort to determine a baseline for risk assessment intervention and documentation, as well as determine the outcome of how intervening by educating providers to ensure that proper tools were being both implemented and documented (Table 3)

**Table 3**

*Pre-Intervention, Intervention, and Post-Intervention Data*

	ASCVD Dot Phrase Used	ASCVD Risk Documented	Patient Education Documented	Shared Decision Making Documented
<b>Pre-Intervention</b>	0% (0/25)	28% (7/25)	32% (8/25)	100% (25/25)
<b>Intervention</b>	60% (15/25)	84% (21/25)	92% (23/25)	100% (25/25)
<b>Post-Intervention Phase</b>	32% (8/25)	68% (17/25)	68% (17/25)	100% (25/25)

The screening tool of provider choice was analyzed using descriptive statistics with 95% confidence interval estimates. Alternatively, in order to determine an increase in patient education and EMR documentation, data were analyzed using a 3-way binomial generalized linear model regressing ASCVD on phase (pre-intervention vs intervention vs post-intervention), with ASCVD as the dependent variable and phase as the independent variable. According to data collected, it was determined that both ASCVD and EMR documentation were perfectly correlated, so this method was not performed on EMR documentation.

Evidence demonstrated that during the intervention period, the majority of provider documentation was done using the EPIC embedded tool (Table 4). However, after the intervention period the quality of data received from the provider was not sufficient to determine the preferred method of EMR documentation. The retrospective chart review did not clearly ascertain if a phone application was utilized, as it was difficult to denote this mode of stratification aside from counting incidences of use of the EPIC Dot Phrase with auto populated documentation data.

**Table 4**

*Tool Used*

<b>Phase</b>		<b>Frequenc</b>	<b>Percen</b>	<b>Prop 95%</b>	<b>Percent 95%</b>	<b>Percent</b>	<b>Percen</b>
		<b>y</b>	<b>t</b>	<b>CI</b>	<b>CI</b>	<b>Upper</b>	<b>t</b>
							<b>Lower</b>
Intervention	EPIC	15	60	0.192039996	19.20399958	79.20	40.80
	NA	4	16	0.143709574	14.37095738	30.37	1.63
	PHON						
	E	6	24	0.167416587	16.7416587	40.74	7.26
Total		25	100				
Post	EPIC	8	32	0.182858651	18.28586514	50.29	13.71
	NA	17	68	0.182858651	18.28586514	86.29	49.71
	Total	25	100				

With regard to EMR attestation of ASCVD screening, the results demonstrated an increase in frequency during the intervention phase. The change was significant in the rate of ASCVD documentation as a result of this QI project (Wald  $\chi^2 = 15.08$ ,  $df = 2$ ,  $p < .001$ ). ASCVD documentation increased significantly from 28% during the pre-intervention period to 84% during the intervention period. ASCVD documentation was maintained at 68% during the

post-intervention period, but this was not significantly less than the intervention period and was still significantly greater than the pre-intervention period (Table 5).

**Table 5**

*ASCVD Documentation*

Phase	Response	Frequency	Percent	Prop 95% CI	Percent 95% CI	Percent Upper	Percent Lower
Intervention	N	4.00	16.00	0.14370957 4	14.37095738	30.37	1.63
	Y	21.00	84.00	0.14370957 4	14.37095738	98.37	69.63
	Total	25.00	100.00				
Post	N	8.00	32.00	0.18285865 1	18.28586514	50.29	13.71
	Y	17.00	68.00	0.18285865 1	18.28586514	86.29	49.71
	Total	25.00	100.00				
Pre	N	18.00	72.00	0.17600756 3	17.60075635	89.60	54.40
	Y	7.00	28.00	0.17600756 3	17.60075635	45.60	10.40
	Total	25.00	100.00				

Pertaining to patient education, yet another increase in frequency was demonstrated during the intervention phase of this project (Wald  $\chi^2 = 15.57$ ,  $df = 2$ ,  $p < .001$ ). There was, however, a considerable decline in the rate of documented occurrences after the intervention phase was completed (Table 6). Education given increased significantly from 32% during the pre-intervention period to 92% during the intervention period. Education given dropped to 68% during the post-intervention period, which was significantly lower than the intervention period. Nevertheless, the post-intervention incidences of patient education remained higher than that of the findings from the pre-intervention period.

**Table 6**

*Patient Education*

<b>Phase</b>		<b>Frequenc y</b>	<b>Percen t</b>	<b>Prop 95% CI</b>	<b>Percent 95% CI</b>	<b>Percen t Upper</b>	<b>Percen t Lower</b>
Interventio n	N	2	8	0.10634693 4	10.63469341	18.63	-2.63
	Y	23	92	0.10634693 4	10.63469341	102.63	81.37
	Tota l	25	100				
Post	N	8	32	0.18285865 1	18.28586514	50.29	13.71
	Y	17	68	0.18285865 1	18.28586514	86.29	49.71
	Tota l	25	100				
Pre	N	17	68	0.18285865 1	18.28586514	86.29	49.71
	Y	8	32	0.18285865 1	18.28586514	50.29	13.71
	Tota l	25	100				

At the conclusion of the project, a provider self-assessment was distributed to evaluate probability of provider’s continued application of the EPIC embedded ASCVD tool, sustained documentation of screening risk for all qualified patients, as well as use of the readymade education toolkits found within the patient’s AVS. All three participating providers stated that they were aware of the EPIC embedded ASCVD Dot Phrase screening tool prior to this project. One provider stated that they would not continue to use the ASCVD embedded tool, as they preferred to use their phone application and independently document the screening score within the progress notes, citing this method as their preferred approach to risk evaluation. The other two acknowledged they would use the tool more frequently following this project. Each of the three providers admitted that the education toolkit would be useful in their continued practice,

and all three disclosed that use of the embedded risk calculator and documentation of risk score and interventions for all qualified patients was a sustainable practice.

### **Implications for Practice**

As ASCVD cases continue to rise, providers have been charged with the authority to determine which of their patients need to be assessed based on their potential for probability of developing a cardiovascular disease or secondary event. Practice of risk stratification, preventative medicine, and adequate disease-focused education provides patients with excellent care and enhances the likelihood patients can reach and maintain an optimum state of health. These methods of evaluation have been deficient in some healthcare settings.

Discrepancies were observed in these practices at a midwestern CHI primary care clinic, with special focus on continuity of ASCVD risk stratification tools used, documentation of those scores in the EMR, and in streamlined patient education processes. A three-stage QI project was completed to determine a baseline and examine providers' responses to an adjustment in current practice. The intervention highlighted the importance of utilizing the EPIC embedded Dot Phrase ASCVD risk tool, appropriately screening all qualified patients at wellness visits, and being consistent with documentation of risk score, intervention, patient education, and shared decision making. The central purpose of the project was to increase utilization and understanding of each of the abovementioned duties by encouraging use of easily accessible screening tools and patient education forms. During and shortly after the completion of the intervention phase, each of the five original aims were met during the seven-week period of data collection.

**Aim #1 Increase provider utilization of the ASCVD risk stratification tool embedded within the EPIC charting system.**

This QI project demonstrated success in increased use of the ASCVD EPIC embedded Dot Phrase during the intervention period of data collection. Retrospective chart review during the pre-intervention phase revealed that 0% of progress notes out of 25 patients included the EPIC ASCVD risk calculator score. During the intervention phase, a 60% increase (15/25) of EPIC utilization was noted. Post-intervention, however, there was a drop in frequency of use with Dot Phrase documentation only accounting for 32% (8/25) of ASCVD risk screening in chart reviews. While this number was less than the intervention phase, it still demonstrated an improvement over zero screenings documented in the pre-intervention phase.

Involvement of the project lead during the initial unfreezing phase, prior to the change process, included formal education regarding intent of this QI project with the multidisciplinary team, application of the Dot Phrase sticky notes at each provider workstation, and distribution of the ACC/AHA ASCVD risk screening algorithms. Each of these tasks conceivably played a role in the increase in screening utilization. Additionally, a heavier presence of the project lead during the intervention phase presumably attributed to enhanced participation by the providers, thus an increase in utilization of the screening tool. The post-intervention period of time, when only chart review data collection took place with a lesser amount of time the project lead was present in the office, demonstrated a notable drop in frequency of use.

Implications for clinical use of a customized Dot Phrase for screening emphasize a reduced probability of data entry error, as the information populated from the template is pooled from previous EMR documentation. As described by Lau et al. (2013), "EPIC's Dot Phrase feature facilitates providers' rapid and efficient retrieval of information stored in the EHR by simply typing a few characters from within a relevant screen. Dot Phrases may be programmed to retrieve many types of information, including, for example, a patient's past medical history, vital

signs, or current medication list” (p. 479). Use of a phone or other application raises risk for error by way of a provider mistyping or inputting incorrect information. While the results are just as significant with use of a credible screening application, inadvertent mistakes and human error could alter the screening score for a patient. Erroneous scores could lead to unnecessary intervention or lack of treatment for a patient who truly needs it.

***Aim #2 Standardize documentation of scores in the patient EMR for those who qualify based on age, personal health history, and family health history by using the EPIC Dot Phrase within the EMR.***

The second aim was to examine both the application of the ASCVD risk stratification system and proper documentation of findings within the patient’s EMR. During the pre-intervention phase, it was noted that 28% (7/25) patients had an ASCVD score documented in the EMR, which was clearly done using a tool other than the EPIC embedded calculator as discussed in the first aim. During the intervention phase, a sharp uptick of documentation was observed, with 84% (21/25) of charts demonstrating a documented ASCVD screening score. Again, this could be attributed to the presence of the project lead. During the intervention phase, the providers were acutely aware that their screening and documentation numbers were being closely monitored, especially as they filled out surveys based on patients of their choice and those they deemed appropriate to screen. Throughout the course of the final post-intervention period, there was a slight decline in the number of screening results, with a total of 68% (17/25) patients noted to have documented ASCVD risk scores in their clinic visit progress notes.

Future implications of practice, considering the deficiencies in the number of documented ASCVD screening results, could place emphasis on the need for provider education regarding the ACC/ACA guidelines and recommendations. One potential area of quality improvement could

explore more in depth the reasons for the shortcomings of screening techniques. Another would be to find improved approaches to flag providers, so they are privy to which patients are appropriate to screen and in need of annual ASCVD risk stratification each clinic day. For example, this could be done by creating and implementing a Best Practice Advisory alert, much like what is done for colon cancer and women's health screening recommendations within a patient's EMRs. Ancker et al. (2015) investigated the correlation between EMR alerts as CDSSs and quality care. Their work found that clinically customized best practice alerts were synchronous with meeting high-quality measures such as tobacco cessation, cancer screening, and eligible vaccinations (Ancker et al., 2015). Notifications directly on the EMR are straightforward methods to catch the attention of providers, which prompt both intervention and documentation of recommended health screenings and methods of prevention.

***Aim #3 Enhance patient education regarding lifestyle changes and behavior modifications using the readily accessible Lifestyle Changes, Elevated Cholesterol, and/or Statin Medication Education sheets populated in EPIC and added into the patient care summary handout to be given to each patient as deemed appropriate at the completion of wellness visits.***

Incorporation of the AVS, a document that could be printed directly from the patient's EMR at the end of each office visit, consists of essential information for patients. The AVS consists of updated medication lists, new prescription information, and follow up appointment dates and times. Providers have the opportunity to tailor the patient education portion of the AVS to meet each individual need. These materials were designed to focus on whatever topics the providers indicate as necessary to give to their patients. For this project's third aim, summaries focused on the subjects of healthy lifestyle, diet change recommendations, and treatment options were targeted to educate the patient depending on their ASCVD risk score or other objective

factors. During the intervention phase, the providers were instructed to check on the survey data collection form whether or not the AVS handouts were distributed to the patient at the end of their wellness visit. During the pre- and post-intervention phases, the project lead reviewed the patients' EMRs to measure the number of charts that had one of the abovementioned instruction titles listed within the office visit summary.

During pre-intervention, 32% (8/25) of patients had an AVS education title within their EMR summary. The intervention phase demonstrated an increase in education, with 92% (23/25) patients being given formal education sheets at the end of their wellness visits. Finally, the post-intervention phase chart review demonstrated that 68% (17/25) patients received a customized AVS that focused on ASCVD prevention or treatment. While there was a decline between the intervention and post-intervention phases, over half of surveyed patients were given education sheets, which was still an improvement of over half of what was originally documented in the initial stage of data collection.

Accordingly, recommendations for providers would be geared toward utilization of available education materials and incorporation of these materials into the end of each wellness visit. Pathak et al. (2020) performed a cross-sectional survey of AVS use amongst a panel of patients in a west coast Internal Medicine clinic. Of the individuals who were provided with an AVS, 96% acknowledged that the information was clearly explained, and 94% found the materials to be useful (Pathak et al., 2020). Findings from this study indicated that the AVS is a valuable tool in the patient and provider relationship and, when used appropriately with continued modification, this method of patient education provides a means of clarity for populations of patients who are at risk of misunderstanding their care plans (Pathak et al., 2020).

***Aim #4 Improve shared decision making between patients and providers with regard to care planning and ASCVD prevention and treatment***

SDM, a crucial element of all wellness visits in a primary care clinic, was tracked in an effort to ensure that all patients were given the opportunity to participate in their healthcare decisions. Interestingly, despite this topic being raised as a concern to be evaluated by this QI project, it was found that 100% (75/75) of the patients in the pre-intervention, intervention, and post-intervention phases were granted the opportunity to ask questions regarding their care, their health screening, and their treatment plans based on wellness visit progress note documentation by the surveyed providers.

***Aim #5 Maintain sustainability of the above objectives in daily practice for patients who qualify based on individual need***

At the termination of the real-time data collection segment of the QI project, a survey was given to the participating providers with questions that focused on their perception of the project and its sustainability (Appendix C). The questionnaire was completed as a means to measure the continuity of the project, but also to gather their thoughts on the overall experience. Furthermore, surveying the providers was vital to identify if they feel their practice changed as a result of reinforcement of implementation of the ASCVD risk calculator. While all three of the participating providers stated that they were aware of the EPIC embedded ASCVD Dot Phrase screening tool prior to this project, it was interesting that not one was found to have incorporated this application into their patient's EMRs during the pre-intervention phase. Each of the providers admitted that they feel ASCVD screening is a sustainable process, but two of the providers commented that they will continue to use the risk application on their mobile device as it is what they prefer to use.

Bearing this in mind, it became apparent that lab work was customarily ordered and drawn at the conclusion of the wellness visit. Accordingly, lipid panels were often not resulted until the following day, which caused the most up to date ASCVD risk score documentation to be completed as an EMR addendum. Risk scores can change from year to year, especially as a consequence of changes in lifestyle, medications, and other factors. In order to obtain an accurate screening outcome, providers would have to wait up to 24 hours if they desired to use the most current lab findings.

Post visit labs impact opportunity for real-time, in person patient education. For example, a higher ASCVD screening score calculated using a lab draw that was drawn after a visit would prompt the provider to have to either use the EPIC patient portal to communicate with their patient or initiate a phone call with the updated information. An implication for future practice could include trialing pre-visit lab work, either day of or on a day prior to the wellness appointment.

Specific to this implication, an AMA Moving Medicine (2018) podcast episode summarized how pre-visit labs are beneficial for both the provider and the patient, both in the areas of efficiency and effectiveness. According to the interviewed physician, Dr. Sinsky, completing labs before office appointments innately permits the patient an opportunity to ask questions of their provider, as well as gives providers the prerogative to interpret the results, discuss them with their patient, and engage the patient in creating a care plan based on their findings (AMA Moving Medicine, 2020). The process change of pre-drawn and resulted labs could be attempted to determine if patient education would be more effective. It would also be interesting to determine if this saves the provider time from having to make additional phone calls or send additional messages, which could hypothetically lead to cost-savings as a result of

improved time management. Regardless, each of the three providers acknowledged that the education toolkit would be valuable in future practice, and all three felt that use of the embedded risk calculator and documentation of risk score and interventions for all qualified patients was a sustainable practice.

While each of the aims for this project were met, it became evident that there is a greater opportunity for continued work toward optimizing ASCVD risk stratification, documentation, and patient education. Streamlining these tasks in such a way that all providers incorporate the same tools and education materials within a primary care office setting as a standardized process leads to excellent patient care overall, as well as improved outcomes.

### **Limitations**

Despite the positive results noted during the timeline of the project, there were limitations that affected the statistical significance and quantity of data collected. To start, the low number of provider surveys during the intervention phase affected generalizability of the results and information gathered. Follow through and stakeholder buy-in was difficult to obtain, as this particular office was coming off of a national EPIC downtime that heavily impacted documentation for nearly three weeks during the month of October 2023.

During the forced downtime, providers were extremely limited with ways in which patient information could be obtained or entered into the EMR. Following this interruption in care, providers were expected to retrospectively enter payment and office visit codes into EPIC for all patients seen during the downtime event. The providers were not allotted additional time for this expectation, which meant providers had to enter these codes and notes in between seeing current patients, come in early, or stay late at the end of their day. Consequently, schedules were

restricted, and providers were encumbered with time constraints above and beyond what would be considered a normal shift.

### **Conclusion**

Preventative medicine provides patients with excellent care and improves opportunities for reaching and maintaining an optimum state of health. Cardiovascular wellness, a significant element of medicine, has a great impact on individuals who are susceptible to developing a condition or life altering event secondary to ASCVD. Accordingly, healthcare professionals must remain well informed of who is appropriate to stratify and when, especially those who may be vulnerable to the effects of ASCVD or another related disease. Following this QI project, the providers were more well informed of the ACC/AHA guidelines for ASCVD screening, as well as which tools were readily available to incorporate into daily practice and wellness visits. The clinical significance and impact of a project such as this, placing emphasis on the obvious deficits in streamlined processes, provided positive results both in the providers' practice and awareness of available tools and guidelines that are instrumental in enhancing patient care and outcomes. A foundation for future implications in both evaluating sustainability of risk stratification practices and streamlined patient education has been established, and continued mentorship and provider support is key to maintaining these processes as part of normal practice.

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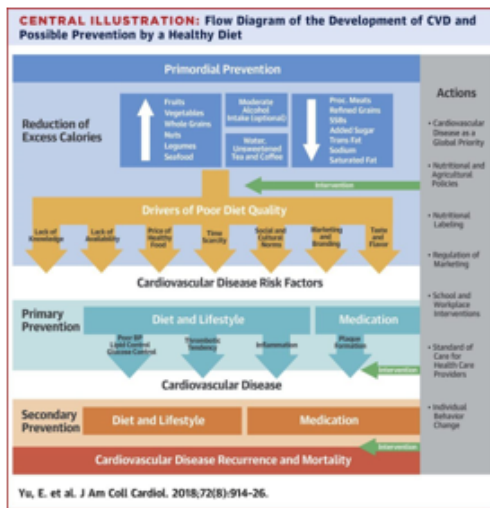
Cardiovascular disease status in US adults. *Medical Care*, *55*(1), 4-11. <https://doi.org/>

[10.1097/MLR.0000000000000663](https://doi.org/10.1097/MLR.0000000000000663)

Appendix A

Provider education sheet highlighting specific aspects of CVD prevention and treatment

CARDIOVASCULAR DISEASE PREVENTION AND TREATMENT
Provider Education Sheet

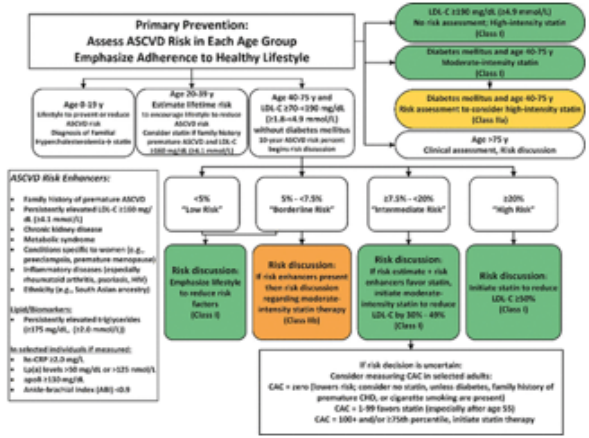


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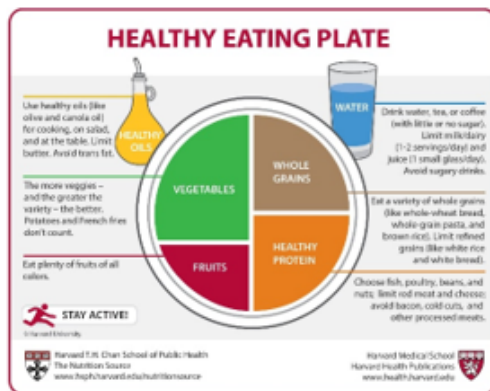
https://www.hsph.harvard.edu/nutritionsource/healthy-eating-plate/



https://doi.org/10.1161/01.cir.0000437738.63853.7a



https://www.ahajournals.org/doi/10.1161/CIR.0000000000000678



https://www.hsph.harvard.edu/nutritionsource/healthy-eating-plate/

**Appendix B**

*Provider audit form for ASCVD risk calculation and intervention tracking*

<b>MA/NURSE TO FILL OUT THE FIRST 5 BOXES AT THE TOP</b>		
<b>MRN:</b>	<b>DATE:</b>	
<b>BP:</b>	<b>AGE:</b>	<b>GENDER: M / F</b>
<b>PROVIDER TO FILL OUT BELOW INFORMATION</b>		
<b>ASCVD RISK SCORE:</b> _____	<b>WAS THE RISK SCORE DOCUMENTED IN THE EMR? Y / N</b> <b>WHICH RISK CALCULATOR DID YOU USE? (Mark correct circle)</b> <ul style="list-style-type: none"> <li><input type="radio"/> EPIC EMBEDDED TOOL</li> <li><input type="radio"/> APPLICATION ON PHONE OR OTHER DEVICE (non-EPIC)</li> <li><input type="radio"/> OTHER: _____</li> </ul>	
<b>PROVIDER INTERVENTION</b>		
<b>NEW STATIN RX? Y / N (if YES, which Rx: _____)</b> <b>WAS THERE A DOSE CHANGE OR ADDITION TO CURRENT LIPID LOWERING THERAPY? Y / N (if YES to addition, what medication(s): _____)</b> <b>LIFESTYLE CHANGES EDUCATION MATERIALS PROVIDED? Y / N</b> <b>WEIGHT REDUCTION EDUCATION MATERIALS PROVIDED? Y / N</b> <b>DIET/EXERCISE EDUCATION MATERIALS PROVIDED? Y / N</b>		
<b>WAS SHARED DECISION MAKING UTILIZED? Y / N</b> <b>IF NO, WHY? (Mark correct circle)</b> <ul style="list-style-type: none"> <li><input type="radio"/> NOT ENOUGH TIME</li> <li><input type="radio"/> PATIENT NOT INTERESTED IN ENGAGING</li> <li><input type="radio"/> OTHER: _____</li> </ul> _____ _____ _____		

**Appendix C**

*Provider survey distributed post-project to determine sustainability of ASCVD risk stratification, documentation, and patient education practice*

<b>PROVIDER POST-SURVEY</b>	<b>YES</b>	<b>NO</b>
<b>Did you use the embedded ASCVD risk calculator in EPIC prior to this project?</b>		
<b>Do you feel that you will use the embedded risk calculator more frequently following this project?</b>		
<b>Do you feel the patient education toolkit will be useful in your continued practice?</b>		
<b>Do you feel the use of the embedded ASCVD risk calculator, and the documentation of risk score and interventions for all qualifying patients is a sustainable practice?</b>		
<b>Additional comments or suggestions:</b>		