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INTEGRATING CARDIOVASCULAR DISEASE RISK CALCULATORS INTO PRIMARY CARE

This brief guide is designed for practice facilitators and primary care practices who may be interested in adding CVD risk calculation into routine preventive care.

Why CVD Risk Calculation Is So Important

Cardiovascular disease (CVD) is a leading cause of death for men and women across most racial and ethnic groups in the United States. The problem is immense: nearly two out of every three Americans will develop CVD in their lifetime[1] and more than 600,000 Americans die from heart disease each year – accounting for one in every four deaths nationwide.[2] However, because CVD takes years to develop, there is an enormous opportunity in primary care to identify patients with risk factors and prevent heart attacks and strokes before they occur.[3]

To identify who can benefit the most from the primary prevention of CVD, national groups including the U.S. Preventive Services Task Force (USPSTF) and the American College of Cardiology/American Heart Association (ACC/AHA), recommend that primary care clinicians calculate the 10-year atherosclerotic cardiovascular disease (ASCVD) risk for asymptomatic adults ages 40-75 (USPSTF)[4] or ages 40-79 (ACC/AHA).[5] This calculation estimates a person's risk of having a heart attack or stroke over the next 10 years.

Unfortunately, most primary care practices do not have a systematic approach for calculating CVD risk scores as a routine part of care – resulting in missed opportunities to prevent CVD for many patients. Barriers reported by practices include limited time during patient visits, lack of easy access to CVD calculators – particularly when they are not integrated into the practice's electronic health record (EHR) – minimal buy-in from clinicians and other clinical staff, and lack of clinic workflow for integrating risk calculation into a clinic visit.[6,7]

This brief guide includes practical information and resources to help primary care practices overcome existing barriers and add CVD risk calculation into care.

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CVD Risk Calculators Can Improve Care

Clinicians can estimate CVD risk based on cholesterol and blood pressure results alone or by counting known risk factors – but studies have found that these types of estimates are not very accurate.[3,8] Risk estimates improve when additional information is considered, such as a person's age, sex, total HDL and LDL cholesterol, blood pressure, history of diabetes and smoking, and current treatment with cholesterol and blood pressure medicines. To improve accuracy and reduce burden on clinicians, calculators have been developed that estimate individuals' CVD risk based on clinical trial outcomes and population-level risk modeling.

CVD Calculators

The **American College of Cardiology's (ACC)** **ASCVD Risk Estimator Plus** is widely used for ASCVD risk assessment in the U.S.[9] This calculator estimates the 10-year absolute risk of an initial heart attack or stroke for asymptomatic men and women between 40 and 79 years of age. The pooled equations used by this calculator have been validated for estimating ASCVD risk with the general U.S. clinical population. Find the app at Apple Store and Google Play.

There are other publicly available tools that can be useful for estimating CVD risk in specific populations.[10] Examples include the Framingham risk score, which measures hard coronary heart disease in white adults 30-79, the Reynolds risk score for women over 45, and the China-PAR for Chinese populations.

CVD Risk Calculators help primary care clinicians estimate a patient's risk of having a heart attack or stroke over the next 10 years.

Limitations: All risk estimation tools have limitations. It is important to note that the ACC risk calculator is most accurate for estimating risk in non-Hispanic whites and may overestimate risk in some groups, including Blacks, while underestimating it in others.[11, 9] Differences in CVD risk estimates between races could represent social rather than biological factors, such as limited healthcare access and structural racism.[11,12] Even given these limitations, using a risk calculator provides the most accurate data available to support a clinician's judgement and shared decision-making discussions between clinicians and patients.

CASE EXAMPLE | Heart Health **NOW!**

**Research has shown it is possible for practices — including small, rural practices —
to overcome barriers and improve the heart health of patients using CVD risk calculation.**

Heart Health NOW!, a cooperative in North Carolina that participated in the Agency for Healthcare Research and Quality (AHRQ) EvidenceNOW: Advancing Heart Health initiative, conducted an implementation study with 219 small primary care practices. The practices each received practice facilitation support for quality improvement along with a CVD dashboard that incorporated output from a risk calculator to highlight unmet treatment opportunities for adult patients. After this change, the research team observed a large and clinically significant reduction in 10-year ASCVD risk scores that was unlikely to be due to other factors. The intervention was found to be responsible for a 4% absolute risk reduction among the 146,826 patients in the study – equivalent to the prevention of 5,800 cardiovascular events over 10 years.

Adding Risk Calculation into Routine Practice

Obtaining buy-in from clinicians and administrators to follow a consistent approach for CVD risk calculation increases the success of practice-wide implementation. The best approach for effectively integrating systematic CVD risk calculation into each practice will be different – depending on EHR and health IT resources, staffing, and current practices.

Options for Calculating Risk

Automating ASCVD risk calculation eliminates the need to enter patients' data into a calculator and makes risk calculation less time-consuming. This can be accomplished by integrating a CVD risk calculator directly into the EHR using dot phrases, templates, and other techniques, and then developing alerts or population lists for clinicians to clearly identify patients at high risk.

For practices without advanced EHR capabilities there are good alternatives, such as adding a risk calculator onto the computers in clinical areas or having clinicians use a risk calculator app on a phone or tablet.

Select an Approach to Calculating CVD Risk

A practice can decide to estimate patients' CVD risk using an individual patient approach (e.g., screening each patient when they come in), or a population approach (e.g., calculating CVD risk across the whole patient panel). Depending on the approach chosen, practices will need to consider who on their team will be responsible for each step and when these steps will take place. Medical assistants (MAs) can play an important role in completing CVD risk calculation activities.

For illustrative purposes, we share three possible approaches a practice might consider – ranging from an individual patient approach to a practice population approach. Note that if a CVD risk calculator is integrated into the practice's EHR, the first steps of calculating the CVD risk score would be eliminated.

‣ **Systematic Individual Patient Approach.** During rooming for routine clinic appointments, an MA calculates CVD risk using a phone or computer app for all patients eligible for CVD screening. The MA alerts the clinician before they enter the room if the patient is high-risk. After the visit the front desk staff schedules a follow-up visit in a month or two to assess the chosen treatment approach and make adjustments as needed. *This approach is relatively easy to implement but will miss screening patients without a routine appointment, and there is no easy way to track patients identified as high-risk over time.*

‣ **Building a High-Risk List Approach.** In addition to following the approach outlined above, the MA or clinician enters a diagnostic code into the EHR to indicate the patient is at high risk for CVD. The practice uses this code to create a list or registry of high-risk patients. The clinical team queries and reviews this list during a huddle before each clinic session to identify high-risk patients for monitoring. *This approach helps track patients at high risk for CVD, but still misses high-risk patients without a clinic appointment.*

‣ **Practice Population Approach.** The practice manager creates a list of everyone in the patient panel who is eligible for CVD risk screening. Practice staff (MAs or others) use existing data in the EHR to calculate their CVD risk and enter the risk score in a structured field in the EHR. The staff adds a diagnostic code into the EHR for all patients with a CVD risk score of 10% or higher, and a flag is added so the risk will be addressed at the next clinic visit. If a patient identified as high-risk does not have a clinic visit already scheduled within the next 3 months, the practice schedules one. *This approach identifies patients at high risk for CVD even if they are not scheduled for an appointment and provides a way to track them over time.*

TIP: Patients with missing information should be flagged so those labs or vitals can be obtained or ordered.

However, while you're waiting for results, you can use the CVD risk calculator app to identify if the patient is high-risk due to other factors: simply enter normal results (e.g., total cholesterol=150, HDL=20) into the calculator where data are missing.

Role of Practice Facilitators and Coaches

Practice facilitators and coaches can assist a practice with selecting an approach and designing an efficient workflow based on that approach. An example workflow for integrating CVD risk calculation into routine primary care is included below under CVD Risk Calculation Resources for Practices, along with resources for developing a new workflow. Facilitators and coaches can also help practices clearly define the role of each team member, pull data from the EHR to assess needs and monitor implementation over time, and develop training and job aids to support implementation (for more on developing trainings and job aids, see *Helping Practices Scale Up Improvements* on the AHRQ Practice Facilitation Training Modules page).

## Don't Forget: Risk Estimation Is Just a First Step

Calculating CVD risk is just a starting point to improve patients' heart health.[13] After ASCVD risk scores are calculated, clinicians need to communicate the risk clearly, along with the benefits (e.g., statin medicines decrease CVD risk by 25%) and risks (e.g., potential side effects of the medicine) of treatment options. Clinicians then engage patients in a shared decision-making discussion to select the preferred approach – which could include medicine, lifestyle changes (e.g., smoking cessation, improved diet, and increased exercise), or watchful waiting.[9] Depending on the result of the discussion, clinicians may prescribe medicine and/or engage patients in action planning to make lifestyle changes. See an example of a shared decision-making discussion for CVD risk calculation in the video on the next page.

TIP: Each intervention (including statins to reduce cholesterol, blood-pressure-lowering medicines, and lifestyle changes) independently help to reduce CVD risk. Because of this, high-risk patients can see important reductions quickly!

CVD Risk Calculation Resources for Clinical Practices
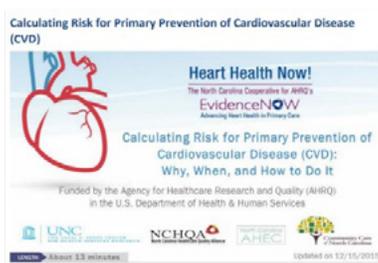
▶ **Slides**, developed by *Heart Health Now*!, an EvidenceNOW: Advancing Heart Health cooperative, demonstrate the value of using a risk calculator and how to integrate its use into practice routines.
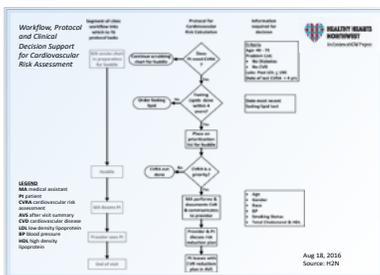
▶ An **example workflow** for CVD risk assessment, developed by *Healthy Hearts Northwest*, an EvidenceNOW: Advancing Heart Health cooperative, shows one way to build assessment of ASCVD risk into a practice workflow. Find other examples and learn more about how to develop your own workflow maps from AHRQ's Primary Care Practice Facilitation Curriculum Module 5: Mapping and Redesigning Workflow and the interactive training module on Process Mapping.

▶ A **7-minute online video**, also developed by *Healthy Hearts Northwest*, demonstrates how to integrate cardiovascular risk calculation into office visits and engage patients in improving their heart health.

REFERENCES:

1. Greenland P, Alpert JS, Beller GA, Benjamin EJ, Budoff MJ, Fayad ZA, Foster E, Hlatky MA, Hodgson JM, Kushner FG, Lauer MS, Shaw LJ, Smith SC Jr, Taylor AJ, Weintraub WS, Wenger NK, Jacobs AK; American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines. 2010 ACCF/AHA guideline for assessment of cardiovascular risk in asymptomatic adults: a report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines. Circulation. 2010 Dec 21;122(25):e584-636. doi: 10.1161/CIR.0b013e3182051b4c. Epub 2010 Nov 15. PMID: 21098428.

2. Heart Disease Facts. https://www.cdc.gov/heartdisease/facts.htm. Accessed January 27, 2022.

3. Greenland P, Alpert JS, Beller GA, Benjamin EJ, Budoff MJ, Fayad ZA, Foster E, Hlatky MA, Hodgson JM, Kushner FG, Lauer MS, Shaw LJ, Smith SC Jr, Taylor AJ, Weintraub WS, Wenger NK, Jacobs AK, Smith SC Jr, Anderson JL, Albert N, Buller CE, Creager MA, Ettinger SM, Guyton RA, Halperin JL, Hochman JS, Kushner FG, Nishimura R, Ohman EM, Page RL, Stevenson WG, Tarkington LG, Yancy CW; American College of Cardiology Foundation; American Heart Association. 2010 ACCF/AHA guideline for assessment of cardiovascular risk in asymptomatic adults: a report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines. J Am Coll Cardiol. 2010 Dec 14;56(25):e50-103. doi: 10.1016/j.jacc.2010.09.001. PMID: 21144964.

4. US Preventive Services Task Force. Statin Use for the Primary Prevention of Cardiovascular Disease in Adults: US Preventive Services Task Force Recommendation Statement. JAMA. 2016;316(19):1997–2007. doi:10.1001/jama.2016.15450

5. Arnett DK, Blumenthal RS, Albert MA, Buroker AB, Goldberger ZD, Hahn EJ, Himmelfarb CD, Khera A, Lloyd-Jones D, McEvoy JW, Michos ED, Miedema MD, Muñoz D, Smith SC Jr, Virani SS, Williams KA Sr, Yeboah J, Ziaeian 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. 2019 Sep 10;140(11):e596-e646. doi: 10.1161/CIR.0000000000000678. Epub 2019 Mar 17. Erratum in: Circulation. 2019 Sep 10;140(11):e649-e650. Erratum in: Circulation. 2020 Jan 28;141(4):e60. Erratum in: Circulation. 2020 Apr 21;141(16):e774. PMID: 30879355; PMCID: PMC7734661.

6. Tuzzio L, O'Meara ES, Holden E, Parchman ML, Ralston JD, Powell JA, Baldwin LM. Barriers to Implementing Cardiovascular Risk Calculation in Primary Care: Alignment With the Consolidated Framework for Implementation Research. Am J Prev Med. 2021 Feb;60(2):250-257. doi: 10.1016/j.amepre.2020.07.027. Epub 2020 Dec 3. PMID: 33279368.

7. Cykert S, Keyserling TC, Pignone M, DeWalt D, Weiner BJ, Trogdon JG, Wroth T, Halladay J, Mackey M, Fine J, In Kim J, Cene C. A controlled trial of dissemination and implementation of a cardiovascular risk reduction strategy in small primary care practices. Health Serv Res. 2020 Dec;55(6):944-953. doi: 10.1111/1475-6773.13571. Epub 2020 Oct 13. PMID: 33047340; PMCID: PMC7704467.

8. Poulter NR. Benefits and pitfalls of cardiovascular risk assessment. J Hum Hypertens. 2000 Oct;14 Suppl 2:S11-6. doi: 10.1038/sj.jhh.1001071. PMID: 11086631.

9. Lloyd-Jones DM, Braun LT, Ndumele CE, Smith SC Jr, Sperling LS, Virani SS, Blumenthal RS. Use of Risk Assessment Tools to Guide Decision-Making in the Primary Prevention of Atherosclerotic Cardiovascular Disease: A Special Report From the American Heart Association and American College of Cardiology. Circulation. 2019 Jun 18;139(25):e1162-e1177. doi: 10.1161/CIR.0000000000000638. Epub 2018 Nov 10. Erratum in: Circulation. 2019 Jun 18;139(25):e1188. PMID: 30586766.

10. Wilson PWF. Atherosclerotic cardiovascular disease risk assessment for primary prevention in adults: Our approach. https://www.uptodate.com/contents/atherosclerotic-cardiovascular-disease-risk-assessment-for-primary-prevention-in-adults-our-approach. Accessed January 18, 2022.

11. Vasan RS, van den Heuvel E. Differences in estimates for 10-year risk of cardiovascular disease in Black versus White individuals with identical risk factor profiles using pooled cohort equations: an in silico cohort study. Lancet Digit Health. 2022 Jan;4(1):e55-e63. doi: 10.1016/S2589-7500(21)00236-3. PMID: 34952676; PMCID: PMC8715354.

12. Vyas DA, James A, Kormos W, Essien UR. Revising the atherosclerotic cardiovascular disease calculator without race. Lancet Digit Health. 2022 Jan;4(1):e4-e5. doi: 10.1016/S2589-7500(21)00258-2. PMID: 34952675.

13. American College of Cardiology. ASCVD Risk Estimator Plus. https://tools.acc.org/ASCVD-Risk-Estimator-Plus/#!/content/about/. Accessed January 18, 2022.