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# Barriers to implementing cardiovascular risk calculation in primary care: alignment with the Consolidated Framework for Implementation Research

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## Abstract

**Introduction:** Cardiovascular disease (CVD) risk calculators can inform and guide preventive strategies and treatment decisions by clinicians and patients. However, their uptake in primary care has been slow despite recommendation in national CVD prevention guidelines. Identifying barriers to implementation of CVD risk calculators is essential to promoting their adoption.

**Methods:** The authors qualitatively analyzed structured physician-educator notes written during an outreach education intervention with 44 small- to medium-sized primary care clinics that participated in the Agency for Healthcare Research and Quality-funded EvidenceNOW Healthy Hearts Northwest trial. The authors coded barriers to implementation of CVD risk calculation and aligned them to the Consolidated Framework for Implementation Research (CFIR).

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**Results:** The authors identified 13 barriers from the physician-educators' notes. The majority (n=8, 62%) mapped to the CFIR *Inner Setting* domain. The five most commonly noted barriers were: 1) time constraints to use a calculator (n=23 clinics); 2) limitations to accessing a calculator or the necessary information to use a calculator (n=22 clinics); 3) no or minimal buy-in from clinicians or staff to use a calculator (n=19 clinics); 4) reported patient fear of side effects from statin medications and/or patient dislike of taking medications per the guidelines (n=17 clinics); and 5) lack of documented clinic workflow for using a calculator (n=16 clinics).

**Conclusions:** To improve the uptake of CVD risk calculation in primary care, future CVD prevention and implementation research should consider tailoring interventions to the common barriers to implementing CVD risk calculation.

### Keywords

primary care; cardiovascular disease; risk assessment; prevention; quality improvement

## Introduction

Despite the availability of effective primary prevention approaches, cardiovascular disease (CVD) continues to be the leading cause of morbidity and mortality in the United States. Many individuals who are at high risk for CVD are not identified and provided preventive therapies such as statin medications that can reduce their risk of adverse health outcomes.[1,2] CVD risk calculators, such as the one promoted by the American College of Cardiology/American Heart Association (ACC/AHA), can inform and guide preventive strategies and treatment decisions by clinicians and patients.[3–6] However, uptake of these calculators in primary care has been slow[7,8] despite recommendation in national CVD prevention guidelines.[3]

Identifying barriers to implementation of CVD risk calculators in primary care is an essential step to promoting their use.[9–11] In a national sample of primary care physicians (n=952), only 41% reported that they calculate CVD risk in clinic. Among those in this national sample who were not conducting CVD risk calculation and one other study, common reasons were that use of a calculator was time consuming during a visit, understanding and explaining absolute CVD risk to patients was difficult, access to guideline-concordant risk communication tools was inadequate, and a calculator was not integrated into electronic health record (EHR) software.[7,12] To our knowledge, no studies have focused on barriers to implementation of CVD risk calculation within smaller primary care practices, which have fewer resources and staff to implement practice innovations such as risk calculators.[13] In addition, the barriers have not been mapped to an implementation framework in a manner that would inform efforts to improve uptake and adoption of CVD risk calculation in primary care. Mapping to an established implementation framework helps researchers and practitioners increase their chances of appropriately implementing effective interventions by helping them understand and remove barriers to improvement.

We use data from the Agency for Healthcare Research and Quality (AHRQ)-funded EvidenceNOW Healthy Hearts Northwest (H2N) trial to address these gaps. For this study we conducted a qualitative analysis of physician-educators' notes taken during

educational outreach visits, identifying barriers to implementing CVD risk calculation in smaller primary care clinics, and mapping those barriers to the Consolidated Framework for Implementation Research (CFIR).

## Methods

The goal of the EvidenceNOW initiative was to build quality improvement (QI) capacity and help reduce CVD risk among patients receiving care in small- and medium-sized primary care clinics.[14–16] The H2N trial compared the effectiveness of using practice facilitation in primary care clinics vs facilitation plus external, enhanced practice support strategies (i.e., a shared learning opportunity through a site visit to an exemplar primary care clinic, educational outreach) in reaching its goals. This study is focused on the barriers to CVD risk calculation that were documented during the educational outreach intervention. The trial protocol and primary outcomes based on a clinic survey, staff member survey, and CVD clinical quality measures have been published elsewhere.[16–18]

### Study setting

The H2N trial included 209 primary care clinics based in urban and rural settings in Washington, Oregon and Idaho with 10 or fewer full-time equivalent providers. Most of the clinics (53%) were considered small (2–5 physicians), 44% were rural, and 46% were independent physician-owned practices.[17]

### Educational outreach intervention

Half of the practices (n=104) were randomized to receive an educational outreach visit (EOV) between September 2016 and February 2017.[17,18] The webinar-based/telephonic EOV intervention was designed using academic detailing principles, which are effective approaches to modifying professional behavior by a trained external expert who delivers evidence-based educational messages.[19–22] The EOV intervention was developed in collaboration with an advisory group of practicing clinicians and a physician content expert in CVD risk reduction. Details about the design of the intervention have been published.[17] Briefly, five physicians with experience in medical education and training of peers, residents, and medical students (physician outreach educators) conducted 30-minute EOVs through virtual webinar discussions with members of care teams. It was at the clinics' discretion who they included, such as physicians, nurse practitioners, medical assistants. The discussions included a review of a "detailing aid" which outlined three key messages about 1) CVD risk calculation guidelines, 2) shared decision making with patients, and 3) when to initiate statin medications, as well as eliciting and addressing potential barriers or objections to implementations of CVD risk calculation in the clinic. Immediately after the EOV each educator recorded structured notes using a template. These notes reflected the responses of those in the clinic who participated in the visit, the physician outreach educator's perception of how the clinic was currently using a CVD risk calculator, and the barriers to the clinic in using a calculator that the study participants reported during the call.[16] These structured notes were the source of data for this analysis.

### Data analysis and barrier classification

Two coders trained in qualitative analysis (LT, EH) reviewed and coded the physician-educators' notes using an inductive open-coding approach. Codes describing barriers to CVD risk calculation emerged from the data.[23] The analysts developed a code list by consensus and coded the same notes until they reached agreement, then evenly split the rest of the notes to complete coding. The analysts then confirmed that the codes reflected the data by debriefing with the QI expert (JP) and the lead physician educator (LMB), who also reviewed the notes. The analysts used Atlas.ti, a qualitative data management software program, for coding and analyzing the data.[24]

Next, four of the authors (LT, LMB, MP, JR) engaged in an exercise to align the barriers to the constructs in the Consolidated Framework for Implementation Research (CFIR). The CFIR is a commonly used conceptual framework designed to classify contextual implementation factors related to adoption of health service innovations. The CFIR constructs fit within five domains: *intervention characteristics* (e.g., evidence strength and quality); *outer setting* (e.g., economic, political and social context); *inner setting* (e.g., culture, leadership engagement); *characteristics of individuals*; and *process or activities* (e.g., plan, evaluate and reflect).[25] Three authors (LT, LMB, MP) independently matched each barrier to Waltz et al.'s description of contextual barriers for each CFIR construct.[26] One of the authors (JR) then facilitated a consensus discussion with the other three authors to develop agreement on a final matching of the barrier codes to CFIR constructs. The goal of the alignment exercise was to organize the barriers according to a well-operationalized taxonomy as a guide for researchers and practitioners in understanding the common barriers to implementing CVD calculation in primary care. This study was reviewed and approved by the Kaiser Permanente Washington Health Research Institute's Institutional Review Board as research without human subjects.

## Results

Of the 104 clinics that were randomized to the EOV intervention, 44 clinics agreed to participate. These 44 clinics had diverse ownership types (independent clinic, part of a hospital or health care system, Federally Qualified Health Center (FQHC), or Indian Health Service/tribal clinic), sizes (solo, small-, or medium-sized practice), and locations (urban or rural) (Table 1). Practices that participated in the EOV intervention were mostly small- (2–5 providers, 43.2%) or medium-sized (≥6 providers, 40.9%), independent (38.6%) or part of a health/hospital system (43.2%), and in an urban setting (61.4%). Family medicine was the specialty for most practices (84.1%) and the majority of patients (61.6%) were covered by either Medicare or Medicaid insurance. Compared to nonparticipating clinics, the participating clinics were somewhat more likely to be in Washington (vs Oregon or Idaho), have medium (vs small or solo) size, and have more patients on Medicare and Medicaid (vs other insurance types or no insurance). In total, the personnel who participated in the visits included: 46 physicians, 7 physician assistants, 8 nurse practitioners, 18 nurses, 15 medical assistants, 3 pharmacists, 1 community health worker and 1 medical technologist. For the majority of the visits, there was a physician or nurse practitioner in attendance.

Through the qualitative analysis we identified 13 barriers from the physician-educators' notes. There was at least one barrier noted at each clinic. Table 2 describes the barriers and ranks them from most to least frequently mentioned in the notes. The table provides an operational definition of each barrier, example descriptions from the notes, and the CFIR domain and construct that the authors aligned with each barrier. The five most commonly noted barriers in the clinics were: 1) time constraints or competing demands for clinicians and/or staff to use the calculator (n=23 practices); 2) limitations to accessing a calculator or the information necessary to use the calculator (e.g., a calculator was not integrated into the electronic health system) (n=22 practices); 3) no or minimal buy-in from clinicians or staff to use or promote use of a calculator (n=19 practices); 4) reported patient fear of side effects from statin medications and/or patient dislike of taking medications per the guidelines (n=17 practices); and 5) lack of documented clinic workflow for using a calculator (n=16 practices).

The majority of the barriers (n=8, 62%) mapped to the CFIR *Inner Setting* domain. Thirty-one percent of the barriers (n=4) mapped to the *Characteristics of the Intervention* domain, 15% of the barriers (n=2) mapped to the *Outer Setting* domain, *Process* domain, and *Characteristics of the Individuals* domain of the CFIR model. Eight barriers aligned with only one CFIR domain, four barriers aligned with two CFIR domain constructs, and one barrier aligned with three CFIR domain constructs.

## Discussion

There are limited studies in the literature that describe barriers to implementation of CVD risk calculation in smaller clinics. This study identified 13 distinct barriers to implementing CVD risk calculation in small- and medium-sized primary care clinics. Of the 13 barriers, "time constraints" and "accessibility limitations" were experienced by about half of the practices, and over a third reported one or more of the following three barriers: "no or minimal buy-in" from clinicians or staff, "patient fear of side effects from medications," and "lack of workflows." Several of the identified barriers are similar to those in previously published studies (e.g., time constraints and accessibility of the calculator in the EHR).[7,12] However, some of the barriers mentioned by primary care providers in smaller clinics have not previously been reported, including patient fears, a lack of documented workflows in the clinic, clinic staffing issues, concerns about patient out-of-pocket costs and inadequate communication within the team.

We were able to align each barrier with a CFIR construct. Of note, four of the five most commonly mentioned barriers align with the *Inner Setting* domain of the CFIR. This finding suggests that internal resources, time, and clinical team members who can implement CVD risk calculation may be necessary conditions within smaller practices to be able to benefit from external support implementation strategies such as those employed in this study (e.g., academic detailing, practice facilitation). However, external facilitation and academic detailing may not be able to overcome the resource constraints (e.g., lack of staff to change and improve clinic workflows, limited health information system) often present in smaller primary care practices to implement CVD risk calculation.[27,28] These

inner setting resource constraints might influence whether an evidence-based intervention will be feasible, acceptable and adopted into practice.

Our findings might help researchers and practitioners prioritize which barriers to focus on when designing interventions to overcome the challenges to effectively implementing evidence-based practices in community health care settings.[29] For example, to address time constraints an intervention might build CVD calculation into existing workflows or integrate technical solutions to improve accessibility such as develop dot phrases, standard text or links to be available within the EHR to automatically fill in information to make it more efficient for the provider to do CVD calculation.[30] Powell and others suggest that researchers and practitioners should select and tailor interventions to address the unique needs and barriers of the setting.[30] Assessing the presence or absence of the barriers described here might be an initial step in tailoring implementation support to a given setting. Such tailoring could build in flexibility for different settings to implement the intervention and enable clinics to adjust the interventions as barriers change over time.

Some limitations deserve mention. The number of participating clinics was limited to 44 of the 104 randomized to this arm of the study. In addition to experiencing major disruptions such as turnover in staff, many of these smaller clinics expressed limitations in their capacity to participate in the support offered. One H2N practice facilitator noted in their field notes: “Clinic feels overwhelmed by randomization arm … even though I explained that it was simply an added learning opportunity....”[17] If these 44 practices were more likely to engage because they had the capacity to do so, these findings might only be generalizable to practices that are in the early to middle adopter stage within the diffusion of innovation spectrum. Second, the frequency of common barriers might vary if more practices were represented. Third, if we understood the barriers from the perspective of the clinics through interviews instead of through the lens of the educator, and if we assessed the barriers at more than one point in time, our results might be different. Last, we had a small group of experts who mapped the barriers to CFIR concepts. A larger, more diverse group with different experiences might have mapped the barriers to CFIR concepts differently.

This study’s strengths include its focus on small and medium-sized clinics across both urban and rural settings in three states. Another strength is that the perspectives represented in the field notes used for analysis include those of medical providers (e.g., physicians, nurse practitioners) as well as other clinic personnel (e.g., medical assistants, quality improvement personnel, clinic managers). This underscores the relevance of these real-world pragmatic findings.

## Conclusion

It is critical to identify and understand barriers to implementing evidence-based preventive care interventions such as CVD risk calculation if we are to improve the use of evidence-based tools.

Future research on CVD prevention using risk score calculation should consider assessing the barriers identified here, especially those in a clinic's Inner Setting, and tailoring and testing interventions to them.

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## References

1. Murphy SL, Kochanek KD, Xu J, Arias E. Mortality in the United States, 2014. NCHS Data Brief. 2015;229(229):1–8. doi:
2. Kottke TE, Faith DA, Jordan CO, Pronk NP, Thomas RJ, Capewell S. The comparative effectiveness of heart disease prevention and treatment strategies. Am J Prev Med. 2009;36(1):82–88. doi: 10.1016/j.amepre.2008.09.010. [PubMed: 19095166]
3. Goff DC Jr., Lloyd-Jones DM, Bennett G, et al. 2013 ACC/AHA guideline on the assessment of cardiovascular risk: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. Circulation. 2014;129(25 Suppl 2):S49–73. doi: 10.1161/01.cir.0000437741.48606.98. [PubMed: 24222018]
4. Goff DC Jr., Lloyd-Jones DM, Bennett G, et al. 2013 ACC/AHA guideline on the assessment of cardiovascular risk: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. J Am Coll Cardiol. 2014;63(25 Pt B):2935–2959. doi: 10.1016/j.jacc.2013.11.005. [PubMed: 24239921]
5. Bibbins-Domingo K, Grossman DC, Curry SJ, et al. 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. [PubMed: 27838723]
6. Chan WV, Pearson TA, Bennett GC, et al. ACC/AHA special report: clinical practice guideline implementation strategies: a summary of systematic reviews by the NHLBI Implementation Science Work Group: a report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. J Am Coll Cardiol. 2017;69(8):1076–1092. doi: 10.1016/j.jacc.2016.11.004. [PubMed: 28132746]
7. Shillinglaw B, Viera AJ, Edwards T, Simpson R, Sheridan SL. Use of global coronary heart disease risk assessment in practice: a cross-sectional survey of a sample of U.S. physicians. BMC Health Serv Res. 2012;12:20. doi: 10.1186/1472-6963-12-20. [PubMed: 22273080]
8. B Sussman J, Holleman RG, Youles B, Lowery JC. Quality improvement and personalization for statins: the QUIPS quality improvement randomized trial of veterans' primary care statin use. J Gen Intern Med. 2018;33(12):2132–2137. doi: 10.1007/s11606-018-4681-6. [PubMed: 30284172]
9. Lewis CC, Scott K, Marriott BR. A methodology for generating a tailored implementation blueprint: an exemplar from a youth residential setting. Implement Sci. 2018;13(1):68. doi: 10.1186/s13012-018-0761-6. [PubMed: 29769096]
10. Flottorp SA, Oxman AD, Krause J, et al. A checklist for identifying determinants of practice: a systematic review and synthesis of frameworks and taxonomies of factors that prevent

or enable improvements in healthcare professional practice. Implement Sci. 2013;8:35. doi: 10.1186/1748-5908-8-35. [PubMed: 23522377]

11. Karmali KN, Lloyd-Jones DM. Implementing Cardiovascular Risk Prediction in Clinical Practice: The Future Is Now. J Am Heart Assoc. 2017;6(4). doi: 10.1161/jaha.117.006019.
12. Bonner C, Fajardo MA, Doust J, McCaffery K, Trevena L. Implementing cardiovascular disease prevention guidelines to translate evidence-based medicine and shared decision making into general practice: theory-based intervention development, qualitative piloting and quantitative feasibility. Implement Sci. 2019;14(1):86. doi: 10.1186/s13012-019-0927-x. [PubMed: 31466526]
13. Landon BE, Normand SL. Performance measurement in the small office practice: challenges and potential solutions. Ann Intern Med. 2008;148(5):353–357. doi: 10.7326/0003-4819-148-5-200803040-00006. [PubMed: 18316754]
14. Shoemaker SJ, McNellis RJ, DeWalt DA. The capacity of primary care for improving evidence-based care: early findings from AHRQ's EvidenceNOW. Ann Fam Med. 2018;16(Suppl 1):S2–s4. doi: 10.1370/afm.2227. [PubMed: 29632218]
15. Cohen DJ, Balasubramanian BA, Gordon L, et al. A national evaluation of a dissemination and implementation initiative to enhance primary care practice capacity and improve cardiovascular disease care: the ESCALATES study protocol. Implement Sci. 2016;11(1):86. doi: 10.1186/s13012-016-0449-8. [PubMed: 27358078]
16. Meyers D, Miller T, Genevro J, et al. EvidenceNOW: balancing primary care implementation and implementation research. Ann Fam Med. 2018;16(Suppl 1):S5–s11. doi: 10.1370/afm.2196. [PubMed: 29632219]
17. Parchman ML, Anderson ML, Dorr DA, et al. A randomized trial of external practice support to improve cardiovascular risk factors in primary care. Ann Fam Med. 2019;17(Suppl 1):S40–s49. doi: 10.1370/afm.2407. [PubMed: 31405875]
18. Parchman ML, Fagnan LJ, Dorr DA, et al. Study protocol for "Healthy Hearts Northwest": a 2 × 2 randomized factorial trial to build quality improvement capacity in primary care. Implement Sci. 2016;11(1):138. doi: 10.1186/s13012-016-0502-7. [PubMed: 27737719]
19. Soumerai SB, Avorn J. Principles of educational outreach ('academic detailing') to improve clinical decision making. JAMA. 1990;263(4):549–556. doi: [PubMed: 2104640]
20. Division of Pharmacoepidemiology & Pharmacoeconomics [DoPE], Department of Medicine at Brigham & Women's Hospital. National Resource Center for Academic Detailing [NaRCAD]. https://www.narcad.org/. Accessed May 24, 2020.
21. Avorn J, Soumerai SB. Improving drug-therapy decisions through educational outreach. A randomized controlled trial of academically based "detailing". N Engl J Med. 1983;308(24):1457–1463. doi: 10.1056/nejm198306163082406. [PubMed: 6406886]
22. Avorn J, Soumerai SB, Everitt DE, et al. A randomized trial of a program to reduce the use of psychoactive drugs in nursing homes. N Engl J Med. 1992;327(3):168–173. doi: 10.1056/nejm199207163270306. [PubMed: 1608408]
23. Crabtree BF, Miller WL. Immersion/Crystallization. In: Crabtree BF, Miller WL, eds. Doing qualitative research. Thousand Oaks, CA: Sage Publications; 1999:163–177.
24. Muhr T. ATLAS ti. Berlin, Germany: ATLAS ti Scientific Software Development GmbH; 1993.
25. Damschroder LJ, Aron DC, Keith RE, Kirsh SR, Alexander JA, Lowery JC. Fostering implementation of health services research findings into practice: a consolidated framework for advancing implementation science. Implement Sci. 2009;4:50. doi: 10.1186/1748-5908-4-50. [PubMed: 19664226]
26. Waltz TJ, Powell BJ, Fernandez ME, Abadie B, Damschroder LJ. Choosing implementation strategies to address contextual barriers: diversity in recommendations and future directions. Implement Sci. 2019;14(1):42. doi: 10.1186/s13012-019-0892-4. [PubMed: 31036028]
27. Nutting PA, Crabtree BF, McDaniel RR. Small primary care practices face four hurdles--including a physician-centric mind-set--in becoming medical homes. Health Aff (Millwood). 2012;31(11):2417–2422. doi: 10.1377/hlthaff.2011.0974. [PubMed: 23129671]
28. Taylor EF, Peikes D, Genevro J, Meyers D. Creating capacity for developing a quality improvement infrastrucutre: The case for developing a quality improvement infrastructure. 2013; https://www.ahrq.gov/ncepcr/tools/capacity/brief1.html. Accessed May 24, 2020.

29. Powell BJ, Beidas RS, Lewis CC, et al. Methods to improve the selection and tailoring of implementation strategies. J Behav Health Serv Res. 2017;44(2):177–194. doi: 10.1007/s11414-015-9475-6. [PubMed: 26289563]

30. Pronovost PJ. Enhancing physicians' use of clinical guidelines. JAMA. 2013;310(23):2501–2502. doi: 10.1001/jama.2013.281334. [PubMed: 24310916]

31. Fernandez ME, Walker TJ, Weiner BJ, et al. Developing measures to assess constructs from the Inner Setting domain of the Consolidated Framework for Implementation Research. Implement Sci. 2018;13(1):52. doi: 10.1186/s13012-018-0736-7. [PubMed: 29587804]

**Table 1:**

Characteristics of Practices Randomized to the Educational Outreach Visit (EOV) Intervention

| | Practices randomized to EOV intervention | | | |
|---|---|---|---|---|
| | Participated | | Did not participate | |
| | N | % | N | % |
| **Total** | **44** | **100.0** | **60** | **100.0** |
| **State** | | | | |
| Idaho | 5 | 11.4 | 8 | 13.3 |
| Oregon | 16 | 36.4 | 34 | 56.7 |
| Washington | 23 | 52.3 | 18 | 30.0 |
| **Specialty** | | | | |
| Family Medicine | 37 | 84.1 | 52 | 86.7 |
| Internal Medicine | 2 | 4.5 | 2 | 3.3 |
| Mixed | 5 | 11.4 | 6 | 10.0 |
| **Ownership type** | | | | |
| Independent | 17 | 38.6 | 25 | 41.7 |
| Health/Hospital system | 19 | 43.2 | 28 | 46.7 |
| FQHC | 5 | 11.4 | 4 | 6.7 |
| IHS/Tribal | 3 | 6.8 | 3 | 5.0 |
| **Size** | | | | |
| Solo | 7 | 15.9 | 10 | 16.7 |
| Small (2–5 providers) | 19 | 43.2 | 36 | 60.0 |
| Medium (6–10 providers) | 18 | 40.9 | 14 | 23.3 |
| **Location** | | | | |
| Rural | 17 | 38.6 | 27 | 45.0 |
| Urban | 27 | 61.4 | 33 | 55.0 |
| | **N** | **Mean %* (SD)** | **N** | **Mean %* (SD)** |
| **Payer mix in patient population** | 37 | | 43 | |
| Medicare | | 29.0 (18.8) | | 21.5 (15.6) |
| Medicaid | | 28.1 (20.1) | | 21.2 (18.9) |
| Dual Medicare & Medicaid | | 4.5 (6.4) | | 4.1 (8.3) |
| Commercial | | 30.9 (20.4) | | 40.6 (22.8) |
| Other | | 1.8 (6.8) | | 2.8 (5.9) |
| No insurance | | 5.7 (7.0) | | 9.9 (14.3) |
| Unknown payer mix | 7 | | 17 | |

*Mean % sums to 100 for each practice

**Table 2.**

Barriers Aligned with CFIR Domain and Relevant Examples from Physician-Educator Notes

| Barrier and operational definition | Number of practices with barrier (%) | CFIR domain and construct | Examples from educators' notes |
|---|---|---|---|
| **Time constraints:** Time constraints/ competing demands for clinicians and/or staff to use calculator | **23 (52.3)** | **Inner setting** Readiness for implementation: Available resources **Inner setting** Implementation Climate: Relative Priority | • *Nursing/MAs don't currently have the prep time to go in and out of lab results, finding them.* (Clinic 2) • *Too time consuming to fit into agenda on visits that are not well-adult visits.* (Clinic 5) • *Competing demands from different groups placing special demands for attention.* (Clinic 6) • *Can't find a way to fit it into a really busy agenda of 5 other issues/problems to be addressed during a typical patient visit.* (Clinic 1) |
| **Accessibility to risk calculator/EHR integration:** Technology limitations - No, slow, or limited access to calculator. Calculator or other information needed for calculator are not integrated into EHR or EHR lacks capacity to fully support the calculator. | **22 (50.0)** | **Inner setting** Readiness for implementation: Available resources | • *Current EHR makes it hard to find the information to plug into the calculator.* (Clinic 2) • *Doesn't like to use the calculator on the desktop, because it takes an extra 15 seconds to switch screens – instead accesses calculator on his phone.* (Clinic 3) • *The calculator is not a resident application within the Epic environment and it requires either using a hand-held device or logging into a different internet site to activate the calculator.* (Clinic 34) • *Computers are not in the exam rooms due to restriction on wireless for security reasons.* (Clinic 36) • *The clinic has the calculator embedded in Epic, but it is cumbersome to use. Have to go back and forth in the chart to get the data to input into the calculator.* (Clinic 38) |
| **Buy-in:** No, minimal or inconsistent buy-in from providers or staff or awareness of which tools to use or spread use of calculator | **19 (43.2)** | **Characteristics of individuals** Individual stage of change **Inner setting** Readiness for implementation: Access to knowledge and information **Intervention characteristics** Relative advantage | • *Less than half of the clinicians are aware of the tools to assess cardiovascular* risk. (Clinic 4) • *There appear to be no significant barriers to using it, only inertia.* (Clinic 35) • *Provider or administration needs to feel the change is important and authorize from top down. Goal of change needs to be clear.* (Clinic 37) |
| **Patient fears:** Patients fear side effects from statin medications and/or doesn't like to take medications | **17 (38.6)** | **Outer setting** Patient needs and resources | • *Patients push back on why they need to be on a medication for which there is no diagnosis or medical problem.* (Clinic 5) • *The physician expressed interest in using the [CVD] tool on a "case-by-case basis," which she saw as pertaining primarily to patients for whom a statin was clearly indicated but were resistant to taking a statin.* (Clinic 6) • *Patient concerns about safety and side effects of statins…The doctor did not want to have to take a lot of time in the visit to address patient concerns.* (Clinic 7) • *She says her major struggle is overwhelming patient resistance to statin use, she is struggling with evidence she can give patients about risk of cognitive side effects.* (Clinic 8) • *Patients not interested in taking prescription drugs for cholesterol. They prefer supplements and lifestyle changes.* (Clinic 24) |
| **Documented workflow:** Calculator is not integrated into clinic or team workflow. No documented workflow or protocol (for clinic or team) that shows the steps to use the calculator. | **16 (36.4)** | **Inner setting** Readiness for implementation: Access to knowledge and information **Process** Planning | • *They have not been successful in focusing organized effort on modifying workflow and practice patterns to improve outcomes.* (Clinic 6) • *Not having a systemic, organized approach to calculating risk.* (Clinic 21) • *They do not have a workflow for using the risk calculator and lack a standardized protocol.* (Clinic 26) • *Unable to delegate a lot of clinical tasks to non-clinician team members because of…politics. The practice faces some challenges using teams focused on changing care processes, authorizing teams to make changes in work processes, delegating tasks to non-clinicians.* (Clinic 36) |

| Barrier and operational definition | Number of practices with barrier (%) | CFIR domain and construct | Examples from educators' notes |
|---|---|---|---|
| **Trust in guidelines:** Clinician lack of confidence in evidence/guidelines (e.g., who to prescribe statins to, dose) | **12 (27.3)** | **Intervention characteristics** Evidence strength and quality | • *ACC/AHA guidelines don't talk about the role of niacin.* (Clinic 2)<br>• *Lots of conflicting opinions about the use of statins – hard to know whether prescribing statins for this group is a worthwhile thing to do.* (Clinic 3)<br>• *Lack of confidence in current guidelines about who should be on a statin.* (Clinic 11)<br>• *Had questions about value of statins in those over 75 with high CVD risk but no CVD or DM.* (Clinic15)<br>• *Concern with the guidelines being developed and driven by pharma* (Clinic 24)<br>• *The doctor places a very strong emphasis on encouraging patients to make lifestyle changes to reduce their risk and is generally skeptical of using medications when they can be avoided.* (Clinic 33) |
| **Calculator training:** No or minimal training or indication of lacking knowledge in using calculator | **8 (18.2)** | **Inner setting** Readiness for implementation: Access to knowledge and information **Characteristics of individuals** Self-efficacy | • *Have never been trained to do these kinds of calculations. Would need to be trained.* (Clinic 2)<br>• *I have a shared decision-making conversation: what do I say when the score is high? What if they are not interested?* (Clinic 14)<br>• *Barrier to Medical Assistants calculating risk would be if there is too much decision making for Medical Assistants related to the calculation.* (Clinic 21)<br>• *The ACC/AHA calculator only has White and African-American. How do you enter data for other races/ethnicities?* (Clinic 39) |
| **Patient population:** Lacking enough patients at risk to make it enough of a value-add to use | **5 (11.4)** | **Intervention characteristics** Relative advantage | • *As an Internal Medicine practice, have many patients who fit the old guidelines – CVD, DM, LDL >190, so calculator wouldn't apply.* (Clinic 9)<br>• *The doctor is unsure that the CVD calculations are valid for her patients* (Clinic 33)<br>• *Many patients not in age range for primary prevention guidelines (55% of patients are over 80)* (Clinic 39) |
| **Staffing issues:** Lack of staff, retention issues | **4 (9.1)** | **Inner setting** Readiness for implementation: Available resources | • *Their team structure is limited to an MD/MA team-let. If she had more resources in the practice, for example a nurse that could call patients and do the assessment over the phone it would help.* (Clinic 6)<br>• *They do not have people on site able to run the reports in Epic to be able to see the impact of their workflow changes on HTN or percent of patients on statins and aspirin.* (Clinic 34) |
| **Patient issues with costs of medications:** Patient is unable or unwilling to pay for medications (statins) | **3 (6.8)** | **Outer setting** Patient needs and resources | • *Cost of medications is barrier to patients.* (Clinic 2)<br>• *Patients object to statin costs, even those with higher risks.* (Clinic 3) |
| **Clinical champion:** No clinical person (MD, RN) who is influential in implementing these guidelines/leading use of calculator within clinic | **3 (6.8)** | **Inner setting** Readiness for implementation: Leadership engagement **Process** Engaging: Champions & Opinion leaders | • *There was not a clear sense that the clinic strategy for CVD prevention includes providing information or skills training, using opinion leaders for change, providing power to authorize changes, customizing implementation of preventive care changes, or designing care improvements that reduce clinician workload.* (Clinic 34)<br>• *Some concerns about leadership and sense of teamwork* (Clinic 37) |
| **Team communication:** No or minimal huddles, recurring meetings, opportunities to discuss patients for whom guidelines suggest use of calculator | **2 (4.6)** | **Inner setting** Networks and communications | • *No morning huddles* (Clinic 1) |
| **Results vary by calculator:** Different calculators provide different results | **2 (4.6)** | **Intervention characteristics** Evidence strength and quality | • *Why are there variations with percentages per calculator?* (Clinic 31)<br>• *They've talked to user groups and although there is a Framingham calculator already inside their EHR, he doesn't want to use it because it gives different results from the AHA/ACC calculator the* |

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|---|---|---|---|
| | | | *cardiologists are using and in cases where patients are co-managed it is confusing for patients.* (Clinic 35) |