

Use of Visual Decision Aids in Physician–Patient Communication: A Pilot Investigation

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Abstract

Introduction: A risk calculator paired with a personalized decision aid (RC&DA) may foster shared decision-making in primary care. We assessed the feasibility of using an RC&DA with patients in a primary care outpatient clinic and patients' experiences regarding communication and decision-making. **Methods:** This pilot study was conducted with 15 patients of 3 primary care physicians at a clinic within a tertiary medical center. An atherosclerotic cardiovascular disease (ASCVD) risk calculator was used to generate a personalized RC&DA that displayed absolute 10-year risk information as an icon array graphic. Patient perceptions of utility of the RC&DA, preferences for decision-making, and uncertainty with risk reduction decisions were measured with a semi-structured interview. **Results:** Patients reported that the RC&DA was easy to understand and knowledge gained was useful to modify their ASCVD risk. Patients used the RC&DA to make decisions and reported low uncertainty with those decisions. **Conclusions:** Our findings demonstrate the feasibility of, and positive patient experiences related to using, an RC&DA to facilitate shared decision-making between physicians and patients in an outpatient primary care setting.

Keywords

decision aid, risk calculator, clinical decision support, shared decision-making

Introduction

Patient involvement in medical decision-making is increasingly seen as important to good clinical care and is part of patient-centered care as proposed by Gerteis et al (1) and described and encouraged by the Institute of Medicine (2). Federal support signals that this trend will most likely continue to increase (3-5). One example is the shared decision-making model, a beneficiary engagement and incentive model being tested in participating Accountable Care Organizations by the Centers for Medicare and Medicaid Innovation, whereby financial incentives are provided to implement structured steps for shared decision-making in clinical practice (6). A key element of patient-centered care is a shared responsibility between physicians and patients for managing the patient's health. To accomplish this, patients need enough information to make informed decisions and the opportunity to express their preferences and contribute to decision-making (7-9).

An important aspect of shared decision-making is the communication of risk information to patients. Risk calculators (RCs) estimate the chance of a specific event occurring, personalized to each individual patient (10). Risk calculators typically present risk information numerically,

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sometimes using statistics and graphical plots. Although there are notable exceptions, relatively few of these prediction models have been incorporated into clinical decision support tools for use in routine clinical practice, even though statistical prediction models are more accurate in predicting outcomes than other alternatives, including clinical judgment, and can improve medical decision-making (11).

However, potential barriers exist to using RCs. Many patients possess low numeracy skills, (12) and health professionals also can find risk information difficult to understand and accurately present (13-15). Additionally, using RCs may not be feasible in busy outpatient clinics. Therefore, creating a clinical decision support tool that pairs the output from a RC with a visual decision aid (DA) may foster shared decision-making by making risk information easier to interpret and utilize in clinical practice.

Importantly, DAs are frequently used to encourage patient involvement in decision-making (16). Clinical trials demonstrate DAs to be more effective than usual care in reducing decisional conflict, increasing patient participation in shared decision-making, and improving patient knowledge about treatment options and their outcomes (16-20). Decision aids can help illuminate patients' preferences and clarify their values in regard to treatment goals (21-23).

In 2013, the American College of Cardiology (ACC)/American Heart Association (AHA) Joint Task Force on Practice Guidelines published guidelines for the treatment of blood cholesterol to reduce ASCVD in adults (24). We paired an RC, the ASCVD risk estimator based on the 2013 ACC/AHA guidelines, with a DA (25) and conducted a pilot study to test its use in clinical interactions between doctors and patients. We assessed the feasibility of using the risk calculator and decision aid (RC&DA) in a primary care outpatient clinic and elicited patient perspectives on their experiences using the aid.

Methods

Study Design and Participants

This pilot study tested the feasibility of using an RC, paired with a DA, in a primary care practice. The study was designed to evaluate how the tools would be used in a real-world clinical setting, from a qualitative perspective. Specifically, we recruited 15 patients from the practices of 3 primary care physicians (S.J., M.M., and N.V.) at our hospital's main campus. All physicians utilized the RC&DA with these patients, and their medical appointments were audio-recorded. The investigators interviewed patients after the use of the RC&DA to assess their perspectives on the usefulness of the tool. Details of the qualitative analyses are provided below. Feedback from the 3 physician coinvestigators was elicited by group discussion after the completion of patient data collection to obtain informal clinician perspectives.

Recruitment and informed consent. All patients with upcoming appointments with participating physicians were reviewed for study eligibility. Patients were eligible if they were 40 to 79 years of age and had had their cholesterol tested within a year of their appointment. Patients who were previously prescribed cholesterol medication (eg, "statin") or had a history of ASCVD were ineligible because the ASCVD RC was not designed for these populations. The study was limited to non-Hispanic whites and non-Hispanic African Americans due to potentially less accurate predictions for other racial/ethnic groups (22).

One hundred twenty-two patients were identified as eligible and participating physicians provided permission to recruit 103 of them into the study. Letters were sent to notify patients that a researcher would contact them by telephone to recruit them to the study. Of the 103 patients for whom a letter was sent, 34% (n = 35) were reached by telephone for recruitment. Of the 35 patients contacted, 17 (49%) verbally consented to participate in the study. Fifteen patients completed written consent in person prior to their appointment, and 2 patients who missed their scheduled appointments were not enrolled. Data were collected between October 1, 2014, and January 7, 2015. Of the 15 patients consented, complete data were available for 14 due to audio-recording failure during 1 appointment.

The research protocol was approved by the institutional review board of Cleveland Clinic prior to study initiation. All patients provided written informed consent.

Intervention

The ASCVD RC predicts a person's risk of coronary death or nonfatal myocardial infarction or fatal or nonfatal stroke in the next 10 years and over their lifetime. We focused on the 10-year risk, which is used to guide recommendations for treatment with a statin medication (24).

Upcoming appointment data were extracted by a systems analyst, and a research nurse then manually extracted the necessary medical data points, entered the data into the ASCVD RC, and copied the results into the electronic health record before the patient's appointment. Data points entered into the RC were total and high-density lipoprotein cholesterol, systolic blood pressure, smoking status, age, race, ethnicity, diabetes status, gender, and use of medication to treat high blood pressure. Although the ACC/AHA guideline provides the risk equation parameters to permit integration into the electronic health record, we elected not to do this for a small pilot study.

A personalized DA using an icon array graphic was then created for each patient, employing a side-by-side display (26). This pictograph (Figure 1) was generated by inputting a patient's absolute 10-year risk information produced by the ASCVD RC into a graph generator at the icon array website (27). The left panel of Figure 1 depicts the patient's absolute 10-year risk based on their current medical data, and the right panel depicts reduced risk due to improvements in



Figure 1. Example of an icon array generated when data from the atherosclerotic cardiovascular disease (ASCVD) risk calculator are entered. Specifically, colored icons show the frequency of those at risk of an ASCVD event (coronary death or nonfatal myocardial infarction or fatal or nonfatal stroke in the next 10 years), and uncolored icons show the frequency of those not at risk of an ASCVD event. Image created by Iconarray.com. Risk Science Center and Center for Bioethics and Social Sciences in Medicine, University of Michigan. Accessed September 02, 2016.

cholesterol, blood pressure, and diabetes. For patients who meet the criteria for statin use based on the 2013 ACC/AHA guidelines, the reduction of risk depicted in the right panel would be due to the addition of a statin.

Procedures and Main Measures

After providing consent, enrolled patients proceeded with their appointment. During the appointment, the physician spoke with the patient about his or her cardiovascular risk and management options, using the DA generated specifically for that individual patient. Patients viewed a paper copy of the RC&DA. The researcher was in the examination room during the appointment to operate the audio recorder and observe behaviors not otherwise apparent in an audio file. An observation checklist was used to capture nonverbal communication between the physician and patient and nonverbal components of the appointment. The checklist included details about the positioning of the patient and physician as well as information about how the RC&DA was used. Details of the checklist are shown in Online Appendix 1.

Audio recording. Audio recordings provide important information related to content of the clinical encounter in terms of informed and shared decision-making (28-34). Therefore, we collected first-hand data by audio-recording the communication between patients and their physicians to assess how the RC&DA was used within the clinical encounter.

Patient interviews. A semi-structured postappointment interview (Online Appendix 2) was conducted with each patient to assess the perceived effectiveness and quality of the RC&DA. Using standardized inventories and open-ended questions, we assessed user experience and decision-making. Patients were also asked to complete the Decisional Conflict Scale (35) to measure the uncertainty they experienced when considering options to reduce their ASCVD risk. Patient preferences for their role in clinical decision-making were assessed using the Control Preferences Scale (36).

Appointment and interview audio files were transcribed verbatim and reviewed by a study team member for accuracy. Data from validated scales and the observation research checklist were entered into the REDCap electronic data capture tool hosted at Cleveland Clinic (37).

Analyses

Quantitative measures. Descriptive statistics are provided for patient and appointment characteristics. The Decisional Conflict Scale (35) and the Control Preferences Scale (36) produce quantitative assessments. A Decisional Conflict Scale score is computed by summing the 16 items, dividing by 16 and multiplying by 25. Scores can range from 0 to 100 (no decisional conflict to extremely high conflict) (38).

Scores and descriptive statistics were computed using SPSS version 19 (39).

Qualitative measures: Patient appointments. We adapted the Roter interaction analysis system (RIAS) (40), whereby pieces of dialogue are matched with predefined codes to assess patient-physician communication. This method of coding generates frequency data of each predefined code (eg, physician asks for patient's opinion, patient asks open-ended question), which describes characteristics of physician-patient dialogue. The system was modified to code specific content, such as dialogue related to the tool versus other dialogue. Broadly, text was coded based on who was speaking and the nature of the phrase or statement (eg, question, statement of agreement, giving medical information, etc).

Two analysts independently coded 2 transcripts using a preliminary coding framework. They evaluated levels of agreement, reconciled discrepancies, and reformatted the coding framework to better fit the data. Each transcript was then independently coded with the final coding framework, and agreement was evaluated using the κ statistic (41). The analysts reconciled their use of codes, which resulted in moderate to substantial agreement (0.54-0.77). Code frequencies were computed, which enabled description of various characteristics of the patient-physician dialogue about the RC&DA and comparisons to other dialogue during the appointment.

Qualitative measures: Patient interviews. Content analysis was used to analyze patient interview data. Five interviews were selected for data immersion to identify themes in patient responses. Two analysts subsequently created a preliminary coding checklist, tested it with the 5 selected interviews, and revised it to better fit the data. Each interview transcript was independently coded by both analysts who then generated a consensus coding checklist after comparison and discussion. The consensus coding checklists were entered into SPSS to compute descriptive statistics.

Feedback from physician coinvestigators. The 3 primary care physicians who utilized the RC&DA with their patients served as coinvestigators of the study and thus were not study participants. Yet, their perspectives on the tool were important to inform its future use in research and clinical practice. Therefore, we gathered this information during an informal group discussion after we completed data collection with patients.

Results

Fifteen patients participated in this pilot study. Most patients (73%) had established relationships with their physician. The mean age of patients was 54, 53% were male, and 60% were African American. Patient and appointment characteristics are presented in Table 1.

Table 1. Description of 15 Patients and Their Clinical Appointments.

Patient Demographic Information	Mean (SD, Range) or n (%)
Age	54.4 (8.6, 40-69)
Sex	
Male	8 (53%)
Female	7 (47%)
Ethnicity	
Not Hispanic	15 (100%)
Race	
White	6 (40%)
Black or African American	9 (60%)
Tobacco user	
Yes	2 (13%)
Never	5 (33%)
Quit	7 (47%)
Missing	1 (7%)
Appointment information	
Type of appointment	
Follow-up	12 (80%)
Physical	3 (20%)
Relationship with physician	
Established	11 (73%)
New	4 (27%)
Appointment duration (minutes)	33.7 (19.6, 14-80)

Table 2. Behaviors Observed and Recorded Using the Observation Checklist During Clinical Appointments for 15 Patients.

Observed Behaviors	Yes, n (%)
Physician referred to the paper RC&DA	15 (100%)
Physician gave patient RC&DA	12 (80%)
Physician asked patient to read RC&DA ^a	5 (36%)
Patient appeared to read RC&DA	15 (100%)
Patient referred to RC&DA during appointment	11 (73%)
Patient took the RC&DA at end of appointment	11 (73%)
During presentation of RC&DA, physician was positioned:	
Across from patient	11 (73%)
Beside patient	4 (27%)

^aN = 14.

Observation Checklist

Table 2 shows the results of the observation checklist (Online Appendix 1) that the researchers filled out during the patient visit. Physicians referred to the RC&DA in all patient encounters and gave patients their RC&DA 80% of the time (Table 2). All patients appeared to read their RC&DA and most (73%) referred to it during their appointment. The majority of patients (73%) took a copy of their RC&DA at the conclusion of their appointment.

Patient Postvisit Interview: Validated Scales

With regard to the Control Preferences Scale, more than half of the patients reported that their decision-making

Table 3. Patient Responses (N = 15) to the Control Preferences Scale.

Item	N (%)
I prefer to:	
Make the final selection about which treatment I will receive	1 (7%)
Make the final selection after seriously considering my doctor's opinion	4 (27%)
Have my doctor and I share responsibility for deciding what treatment is best	8 (53%)
Have my doctor make the final decision but consider my opinion	2 (13%)
Leave all decisions regarding my treatment to my doctor	0

preference was to share responsibility with their physician for deciding which treatment is best (n = 8, 53%). Approximately one-third of patients (n = 5, 34%) reported that they would prefer to make the final selection about their treatment. The remaining 13% of patients expressed a preference to have their physician make the final treatment decision (Table 3).

The distribution of data from the Decisional Conflict Scale is presented in Table 4. The mean score is 12.4 (standard deviation = 12.2; range = 0-42; n = 13), indicating the patients had low decisional conflict, that is, low uncertainty about their decision to reduce ASCVD risk.

Patient Postvisit Interview: Qualitative Data

Perceptions of the RC&DA. Patient experiences with the RC&DA were positive overall (Table 5). Patients reported that the RC&DA was easy to understand and useful. It improved patients' understanding of their current health, they gained knowledge on how to modify their ASCVD risk, and they used the RC&DA to make decisions to reduce ASCVD risk. Most patients (n = 13/15; 87%) reported that they would recommend the RC&DA to family members and friends.

Approximately 30% (n = 4) of patients suggested recommendations to improve the RC&DA. Recommendations included changing the colors to maximize impact (n = 2), using same-day patient data instead of what was last recorded in their electronic medical record (n = 2), adding more visual cues (n = 1), emphasizing the main risk factor (n = 1), and providing additional explanation within the RC&DA (n = 1). When queried, patients offered no recommendations for how the physician should present the RC&DA to patients.

Recall of RC&DA Discussion. Patients provided a variety of information when recalling the discussion of the RC&DA with their physician. Most (n = 13, 87%) recalled their ASCVD risk factors, compared their current risk to future reduced risk, and actions they can take to reduce their risk. Three-quarters of patients (n = 11, 73%) recalled statistics

Table 4. Patient Responses (N = 15) to the Decisional Conflict Scale.

Item	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
I know which options are available to me	7	7	0	1	0
I know the benefits of each option	6	7	1	1	0
I know the risks and side effects of each option ^a	5	5	3	1	0
I am clear about which benefits matter most to me ^a	10	3	1	0	0
I am clear about which risks and side effects matter most to me ^a	8	6	0	0	0
I am clear about which is more important to me (the benefits or risks)	10	4	1	0	0
I have enough support from others to make a choice	8	6	1	0	0
I am choosing without pressure from others	11	4	0	0	0
I have enough advice to make a choice	10	4	0	1	0
I am clear about the best choice for me ^a	9	4	0	1	0
I feel sure about what to choose	8	7	0	0	0
This decision is easy for me to make	7	7	0	1	0
I feel I have made an informed choice	11	4	0	0	0
My decision shows what is important to me	9	5	1	0	0
I expect to stick with my decision	8	7	0	0	0
I am satisfied with my decision	8	7	0	0	0

^aResponse was missing for 1 patient.

that were presented in the RC&DA, 60% recalled their physician's assessment of their risk (n = 9), and 40% explained the RC&DA in detail (n = 6). Five patients reported that the RC&DA affected their communication about risk with their physician. Of those, 4 stated that it improved communication and 1 stated that it both improved and worsened communication (this patient found it challenging to simultaneously listen to his physician and look at the RC&DA).

Decisions to reduce ASCVD risk. All patients commented on their risk of ASCVD. The majority (n = 14, 93%) stated actions or goals to modify their risk, 8 (53%) mentioned the need to reduce their risk, and 6 (40%) commented on their ability to reduce their risk. Furthermore, all patients made a decision to reduce their ASCVD risk. Most (n = 11, 73%) decided to initiate behavior change to reduce risk, such as healthy eating, exercise, weight loss, and quit smoking.

Characteristics of Physician–Patient Dialogues

Audio-recorded physician–patient dialogues were available for 14 of 15 patient appointments. These dialogues were coded using the RIAS method adapted for our study. Totalling the 14 appointment dialogues together, patients and physicians spoke a total of 28 866 words. Physicians spoke more than patients (16 371 words vs 12 495). When not talking about the RC&DA, physicians spoke slightly less than patients (9564 vs 10 401, respectively). However, when discussing the RC&DA, physicians spoke more than patients (6807 vs 2094 words, respectively). This corresponds to the finding that when discussing the RC&DA, physician statements involved giving information (eg, information about medical condition, therapeutic regimen, and lifestyle/psychosocial).

An examination of code frequencies within patient–physician dialogues generated comparative findings. Physicians asked for understanding from their patients about as frequently when discussing the RC&DA as during other discussions (31 vs 30, respectively). Furthermore, they asked for a decision or opinion from their patients just as frequently when talking about the RC&DA as when not (9 vs 9, respectively). Also, physicians counseled patients about their medical condition and therapeutic regimen about as frequently when talking about the RC&DA as when not (29 vs 28, respectively).

Patients asked questions of their physician versus giving information to their physician at a ratio of approximately 0.167 when not talking about the RC&DA. However, when talking about the aid, they asked more questions versus giving information, with a ratio of 0.681. Overall, there were few expressions of confusion or uncertainty in the dialogue between physicians and patients regardless of whether they were discussing the RC&DA or not. Seven patients expressed confusion or uncertainty, with 3 instances occurring while discussing the RC&DA and 8 instances occurring during other discussions.

Feedback from physician coinvestigators is presented in the discussion of recommendations to improve the tool and its use in clinical care, given that they are coauthors on this article and their perspectives are not considered study data.

Discussion

We conducted this pilot study to assess the feasibility of physicians using a clinical decision support tool consisting of an ASCVD RC paired with a personalized DA with their patients at a primary care outpatient clinic. In addition, we assessed patients' experiences, specifically their perceptions related to the utility of the RC&DA and its perceived effect

Table 5. Patient Perceptions (N = 15) of the RC&DA.

Perception	n (%)	Illustrative Quote
RC&DA was easy to understand	15 (100%)	"I think it is very clear." (DA12) "It's pretty easy; plus I am probably going to take it home and go over it again myself to actually get a better understanding of it too. Because a lot of times it is hard for me to catch on to certain things right away, but I will understand it." (DA06)
Qualities that made RC&DA understandable		"It was just easier I guess to interpret and internalize when you see the data presented in a visual graphic way." (DA05)
Visual presentation of information	9 (60%)	
Physician's explanation of DA	9 (60%)	"I think it gives you a broader scope on expectations of what can happen and what you can prevent from happening by having the visual aid." (DA10)
Side by side comparison of risk	8 (53%)	
Shaded figures	2 (13%)	
Utility		"I think it helps him [physician] to prove the point . . . I think it just helps you see what your goals need to be." (DA04)
Knowledge to modify risk	12 (80%)	
Impacted current decision-making	12 (80%)	"Because if I am able to actually see what he is talking about, he kind of helped me understand more and make me want to do what I need to do. Because it is like he is showing me everything and what can happen if I don't do certain things. It will make me want to work harder to do the right thing." (DA11)
Could impact future decision-making	10 (67%)	
Improved understanding of health	10 (67%)	
Reinforced current healthy behaviors	6 (40%)	
Recommend decision aid to family and friends	13 (87%)	"I: Would you recommend this to a friend or family member? P: "Yes, sometimes seeing it is much better than hearing it." (DA03)

Abbreviations: DA, decision aid; RC&DA, risk calculator and decision aid.

on communication and decision-making. Our findings suggest that it is feasible to utilize an RC paired with a personalized DA in primary care practice and patients will find it useful to inform decisions.

Consistent with previous research, the vast majority of patients wanted at least some involvement in the treatment decisions around ASCVD prevention and most would recommend the RC&DA tool to family or friends. Findings from behaviors observed during the appointment also demonstrate that both physicians and patients engaged the RC&DA when discussing ASCVD risk. Physicians used the tool with all of their patients, and most gave the hard copy to their patients. Furthermore, all patients appeared to read the RC&DA, and the majority of them referred to it during their appointment. Analysis of physician-patient dialogues indicate that physicians were equally engaged with their patients regardless of whether they were discussing the RC&DA or not and patients asked more questions during discussions about the RC&DA than during other discussions. These findings suggest that a personalized DA may focus physicians' and patients' efforts to communicate risk information and facilitate shared decision-making.

All patients found the RC&DA easy to understand. Patients responded favorably to the visual presentation of information, the side-by-side comparison of risk, and the physician's explanation of the RC&DA. Furthermore, they found it useful in terms of knowledge of current health status and knowledge to modify ASCVD risk, contributing to a positive shared decision-making experience. These findings suggest that an RC paired with a personalized DA facilitates effective communication and comprehension of risk information.

Importantly, most patients reported that the RC&DA impacted the decisions they made to modify their ASCVD

risk and reported low uncertainty about those decisions. These findings are consistent with other studies that have demonstrated that DAs reduce decisional conflict, improve knowledge, and increase patient participation in health-care decisions (16-20). A recent randomized controlled trial of a DA paired with a personalized fracture risk tool found that the tool was acceptable to patients and physicians and feasible for use in primary care practice (42). Furthermore, patients' decisional conflict was lower among those who received the intervention compared to those in the control group (42).

Feedback from our study's physician coinvestigators provides insight into the utility of the RC&DA and its feasibility for use in primary care practice. They perceived the RC&DA as a helpful tool to enhance patients' understanding of their ASCVD risk and suggested changes that would increase its utility and feasibility. One recommendation is to embed the RC&DA into the electronic health record to improve access and utility for physicians. This would also enable the tool to be dynamic so that physicians could adjust risk factors and then visualize immediate changes in the DA. These capabilities would enhance its use during dialogue with patients. Another recommendation is to integrate the tool into the MyChart patient portal to improve patient access to personalized ASCVD risk information outside of the clinical setting. Finally, they perceived that the RC&DA might be most useful during annual physical examinations rather than follow-up appointments due to time constraints. This would allow a more seamless integration of the tool into clinical workflow. We are exploring these possibilities in our current health-care system. However, additional studies are needed to assess the impact of utilizing an ASCVD RC&DA in primary care compared to standard methods to communicate risk information to patients.

Although this study provides valuable preliminary data on the feasibility and utility of the use of an RC paired with a personalized DA in an outpatient primary care practice, there are limitations to acknowledge. First, the ACC/AHA calculator is not specifically designed to evaluate a change in risk after modifications to individual risk factors. It is possible that some of the variables included in the calculator are correlated with other variables, and therefore, making a change to an individual variable is unlikely to occur in isolation. In addition, the ACC/AHA calculator does not provide estimates for the expected reduction in risk potentially conferred by a statin on an individual patient. The authors are unaware of any existing tools that accurately estimate the personalized risk reduction of a statin medication on ASCVD risk. Despite the limitations of the current study, the results indicate that patients and physicians are interested in the information that the tool attempts to provide.

The study sample was drawn from patients scheduled with 3 physicians during a 3-month period at 1 primary care practice within a tertiary medical center. Our response rate was moderate; however, this is not surprising given that the study was potentially burdensome (required audio recording of patients' visits and required additional time to complete the postinterview). However, it is important to note that this is an exploratory qualitative study to ascertain feasibility and to enhance patients' experience with decision-making, and the goal is not to produce generalizable findings.

The quality of medical decision-making suffers because predictions are not tailored to individual patients facing complex decisions. Providing bedside predictions from statistical models, through improving accuracy relative to the current approaches to risk assessment (eg, risk stratification), would represent important progress. Improved predictions would facilitate medical decision-making and especially treatment choice. Risk calculators paired with a DA, such as the one we studied, have the potential to fundamentally change the practice of medicine in many different fields. Complex medical decisions, where trade-offs are involved, stand to benefit from a refined ability to predict the outcomes at stake. Physicians will benefit because they can make better treatment recommendations; patients will benefit because they will better understand, and be better able to place value on, the harms and benefits of the various options.

Future research should include the creation of tools built explicitly to estimate the impact of individual interventions on specific patients. These tools need to be validated head-to-head with existing tools like the ACC/AHA calculator used in this study. Additional research is also needed to assess the use of the paired RC&DA in a larger population of patients and providers and over a longer period of time. The use of control patients would also be important to assess the difference in prescribing patterns between the patients who were presented the RC&DA versus those in the usual care group.

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Declaration of Conflicting Interests

The author(s) declared the following potential conflicts of interest with respect to the research, authorship, and/or publication of this article: Alex Milinovich and Mike Kattan both have financial relationships with Novo Nordisk and Merck. However, none of these financial relationships are related to this project, and these authors did not have access to the data, nor were they involved with data analyses.

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Supplemental Material

Supplemental material for this article is available online.

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