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Shared Decision-Making as the Future of Emergency Cardiology

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Abstract

Shared decision-making is playing an increasingly large role in emergency cardiovascular care. Although there are many challenges to successfully performing shared decision-making in the emergency department, there are numerous clinical scenarios where it should be used. In this paper, we explore new research and emerging decision aids in the following emergency care scenarios: 1) low-risk chest pain, 2) new-onset atrial fibrillation, and 3) moderate-risk syncope. These decision aids are designed to engage patients and facilitate shared decision-making for specific treatment and disposition (admit versus discharge) decisions. We then offer a 3-step, practical approach to performing shared decision-making in the acute care setting, based on broad stakeholder input and prior conceptual work. Step 1 involves simply acknowledging that a clinical decision needs to be made. Step 2 involves a shared discussion about the working diagnosis and the options for care in the context of the patient's values, preferences, and circumstances. The third and final step requires the patient and provider to agree on a plan of action regarding further medical care. The implementation of shared decision-making in emergency cardiology has the potential to shift the paradigm of clinical practice from paternalism towards mutualism and improve the quality and experience of care for our patients.

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Keywords

Shared Decision-making; Emergency Cardiology

Introduction

Shared decision making (SDM) is an essential component of patient engagement. It has been defined as a joint deliberation whereby patients and clinicians consider the risks and potential benefits of various medical options to come to a mutual agreement on how to proceed.[1, 2] It involves a bidirectional exchange of information with the clinician sharing research evidence and clinical expertise, and the patient sharing his/her values, preferences, and past experience. While there are many potential benefits to SDM, the fundamental goal is to improve the quality of care by promoting patient-centeredness.[3] The 2001 Institute of Medicine report on quality in healthcare defined patient-centered care as "care that is respectful of and responsive to the individual patient preferences, needs, and values".[4] In emergency cardiovascular care, the increasing numbers of diagnostic and therapeutic options call for the use of SDM. Meeting this responsibility can be difficult in the emergency care setting: time constraints limiting meaningful conversations, lack of reliable evidence resulting in uncertainty between benefits and harms, variable patient decision-making ability, lack of training and tools to support SDM, all challenge the implementation of this approach in practice.[5] Decision aids are "evidence-based tools designed to help patients make specific and deliberated choices among healthcare options".[6] They serve to support conversation that explores how various options make practical, intellectual, and emotional sense to patients and can help facilitate the implementation of SDM in clinical practice.[7, 8]

Determining whether SDM is appropriate for a particular emergency care decision depends on three factors: 1) clinical equipoise, 2) patient decision-making ability, and 3) time (see Figure 1).[9] If any of these criteria are not met, then other approaches should be used such as physician-directed decision-making, compassionate persuasion, or the more standard, provision of informed consent. There are many clinical scenarios in emergency cardiology that met these three criteria. In this paper, we focus our discussion on the following three decisions: i) the disposition decision (admit versus discharge) after a negative diagnostic evaluation for low-risk chest pain, ii) choice of anticoagulation for patients with new-onset atrial fibrillation (AF), and iii) the disposition decision (admit versus discharge) after a negative diagnostic evaluation for isolated syncope. For each scenario, we discuss the recent research in these areas and SDM tools that are emerging. Finally, we propose a practical three-step approach on how to perform SDM in the emergency department (ED) (see figure 2).

Shared decision-making for low-risk chest pain

Chest pain is the one of the most common reason patients seek emergency care in North America, accounting for over 6 million ED visits in the United States (US) and over 500,000 in Canada each year.[10, 11] Among these US visits, only 6–8% of patients experience a cardiac event within 30 days.[12, 13] Despite the relatively low frequency of acute coronary

syndrome (ACS), chest pain accounts for over 25% of US hospital admissions, 85% of which are not ultimately diagnosed with ACS.[14]

Current clinical evaluation, electrocardiogram (ECG), and cardiac troponin testing available in the US miss approximately 1.5% of patients with ACS, resulting in adverse medical consequences for the patient and medicolegal risk for the clinician.[15] Aware of these risks, clinicians frequently admit patients at low risk for ACS for further observation and testing, leading to discordance between the magnitude of disease risk and the intensity of evaluation, unnecessary downstream procedures, and substantial healthcare expenditures.

To safely improve the value of emergency care for patients presenting with potential ACS, several investigators have developed risk stratification tools to guide clinical decision-making.[16, 17] Unlike risk scores used to prognosticate outcomes among hospitalized patients with diagnosed acute myocardial infarction,[18–20] these risk tools were developed and validated for use in ED patients with chest pain possibly due to ACS after other potential life-threatening causes of chest pain such as pulmonary embolism, Boerhaave's syndrome, and aortic dissection have been ruled out. Some of these risk scores have been tested and implemented in practice and have shown to safely decrease the rate of unnecessary testing.[21, 22] However, to date, none of these have explicitly educated patients regarding their short-term risk for ACS and engaged them in the decision of whether to pursue additional observation and cardiac testing during the index visit or to follow-up as an outpatient for further evaluation.

In order to both tailor the rate of testing to disease risk and to engage patients in their own healthcare decisions, we designed a decision aid, Chest Pain Choice.[23] The decision aid was designed to facilitate SDM in patients with a negative initial cardiac evaluation (no life threatening non-ACS causes of chest pain identified, no ischemic changes on ECG, negative initial cardiac troponin) who were being considered for observation unit admission for further cardiac testing or referral for urgent outpatient evaluation (Appendix A). The first section describes the rationale for and results of initial cardiac testing and seeks to reassure the patient that there is currently no evidence of acute myocardial infarction. The second section describes the potential need for further cardiac testing such as stress testing or coronary CT angiography to refine prognosis, and the third section presents the patient's 45-day risk for ACS (generated from the quantitative pretest probability instrument derived and validated by Kline and colleagues)[24, 25] using prose, natural frequencies with a common denominator, and a pictogram. Finally, the fourth section lists the available management options based on these considerations, i.e. observation admission versus two forms of outpatient follow-up.

We tested the efficacy of the decision aid on decision quality (patient knowledge, decisional conflict, engagement, satisfaction) and resource use in a single center pilot trial (n=201) and found that use of the decision aid increased patient knowledge and engagement and decreased the rate of observation unit admission for cardiac testing without an increase in adverse events.[26] Based on these pilot data, we subsequently tested the effectiveness of the decision aid in a larger population of patients with greater socioeconomic and geographic diversity.[27] In this trial of 898 patients (451 decision aid arm, 447 usual care arm), we

observed a similar magnitude and direction of effect of the decision aid. Based on these data supporting the effectiveness of the decision aid, we are currently planning an implementation study that seeks to routinize SDM in the context of a HEART score pathway[21] for emergency chest pain evaluation and measure its impact on patients' experience of care, safety, and healthcare utilization. To our knowledge, there are currently no other tools designed to facilitate SDM for ED chest pain patients.

Shared decision-making for anticoagulation for atrial fibrillation

Atrial fibrillation (AF) is a common reason for ED visits,[28, 29] accounting for over 750,000 visits in the US annually.[30] Recent studies using data from the Canadian provinces of Ontario and Alberta indicate that roughly 0.5% of all ED visits are related to atrial fibrillation/flutter.[31, 32] The ED is often the point of a patient's first diagnosis and provides an ideal opportunity to initiate guideline-indicated treatment. Many patients, however, leave the ED without appropriate anticoagulation,[33] and, within this frenzied clinical environment, patient education can be challenging.[34] Nonetheless, dedicated programs that engage ED providers in patient education at the time of discharge have been demonstrated to decrease AF-related complications at one year of follow-up.[35] These studies underscore the need for systematic care for such patients.

The most recent American College of Cardiology/American Heart Association/Heart Rhythm Society (AHA/ACC/HRS) guidelines[36] recommend that "in patients with AF, antithrombotic therapy should be individualized based on ***shared decision making*** after discussion of the absolute and relative risks of stroke and bleeding and the patient's values and preferences." A challenge, however, is that many emergency providers may not be comfortable in guiding such SDM discussions because they may not have readily available stroke and bleeding risk estimates or may be not be comfortable initiating a potentially lifelong medication with significant risks. Indeed, such decisions are typically made by clinicians who have a longitudinal relationship with patients.

Structured tools, or decision aids, can be valuable in supporting these conversations. Many investigators have developed such tools that are currently being tested in various clinical practice settings (See table).[37–40] For instance, the computerized antithrombotic risk assessment tool (CARAT), an online decision-support algorithm that aggregates patient stroke and bleeding risk, was developed and tested at two hospitals in Sydney, Australia. Among the 195 patients in the study, the tool recommended a change in therapy in more than half of patients, suggesting that such intervention could provide additional information to usual care.[41] Similarly, the Atrial Fibrillation Decision Support Tool (AFDST) was developed by researchers at the University of Cincinnati and tested against a retrospective cohort of 1,585 adults with non-valvular AF. In comparison to usual care, the tool recommended care that was discordant to usual care in more than a third of women and elderly patients, suggesting that such a tool could improve guideline-adherent therapy in these groups.[42] However, other work has shown that while AF treatment decision aids may reduce decision conflict, they may also reduce uptake of recommended therapies among hospitalized patients.[40] These tools are designed to support clinicians but do not explicitly engage patients. Another interactive, online tool developed by Kasier et al., incorporated

input from patients with AF and clinicians with experience treating such patients using well-established decision aid standards.[38] This tool, although evidence-based, was sponsored by Janssen, a pharmaceutical company that produces rivaroxaban, an anticoagulant used in the treatment of AF. This funding source creates the potential for an actual or perceived conflict of interest. Other tools from Healthwise©, freely available online, are designed to be used by both patients and clinicians in the context of atrial fibrillation and coronary artery disease but do not provide personalized risk estimates, only generic ones. These were not designed for use in the acute care setting and may be too time-intensive to be successfully adopted by emergency clinicians. The AF tool created by Health Decision©, is freely available online and does provide personalized risk estimates with graphical presentation of stroke and bleeding risks. However, it contains little patient-directed educational content and was not designed for the acute care setting.

We are currently developing and validating a SDM tool and are testing it in the ED setting. After structured observation of many patient-provider anticoagulation discussions, we designed a digital tool that helps communicate risk estimates that patients and clinicians can use to work through, in a shared manner, the balance of risks that accompanies the decision to begin or forgo life-long anticoagulation. In brief, the tool allows a provider to enter a patient's stroke risk factors in order to calculate a CHA_2DS_2-VASc score[43] in accordance with current international practice guidelines.[44–46] This score is then translated to one- and five-year stroke risks which are displayed visually (depiction of 100 people in icon form). The reduction in stroke risk with initiation of oral anticoagulation, approximately two-thirds with warfarin[47] or non-vitamin K oral antagonists (NOACS),[48] is depicted in Appendix B. Alternatively, the tool could be adapted for use in Canada by incorporating the CHADS2 score, as per the Canadian Cardiovascular Society guidelines for anticoagulation in AF.[49] The provider then advances through the tool to explore issues surrounding anticoagulation (cost, frequency of monitoring, dosing considerations, reversibility, activity limitations) as well as average and individualized bleeding risk (based on the HAS-BLED score[50, 51]). After reviewing the pertinent data, the patient and provider select a treatment option that is in keeping with the patient's goals and wishes. We anticipate that use of such a tool will increase patient engagement in the decision-making process and, ultimately, improve adoption and long-term adherence, when appropriate, to this important therapy.

For several reasons, we believe emergency providers are in an excellent position to have these discussions. First, AF is so commonly seen in the ED that to ignore this opportunity would be to leave many patients without the chance to initiate appropriate anticoagulation. Second, the initial AF diagnosis can serve as a sentinel time point, during which patients are 'primed' to engage in learning about the condition that has brought them to medical attention. Third, many patients may have incomplete or delayed follow-up making the ED their only contact with the medical system. Incorporating SDM in the routine ED workflow for these patients may facilitate the delivery of high-quality, patient-centered care.

Shared decision-making for moderate-risk syncope

Syncope is defined as a transient loss of consciousness, associated with an inability to maintain postural tone followed by complete, spontaneous recovery.[52] It is a common reason

patients seek medical care and accounts for approximately 1% of all ED visits in the US and Canada.[53, 54] The etiology of syncope is often benign but can be due to an occult serious cardiac cause such as a malignant arrhythmia that may not be uncovered during the ED evaluation.[55] As a result, ED syncope patients are often admitted to the hospital. Admission rates are quite variable from one provider, hospital, or region to another.[56] Admission rates in the US are approximately 32%,[53] while in Canada they are closer to 13%,[54] potentially due to differences in financial incentives, risk tolerance among clinicians, and availability of follow-up.

The diagnostic evaluation for ED syncope patients typically involves a thorough history and physical examination, and an ECG. For some patients, basic laboratory testing, including cardiac markers (such as troponin), may be ordered. Guided by the history, physical exam, and initial testing, advanced imaging may be pursued. Despite a relatively thorough work-up, the ED evaluation is often non-diagnostic. Undifferentiated syncope patients should then be risk-stratified to guide the disposition decision. This can be done using a three-tier categorization. Younger, healthier patients without concerning clinical features will generally be considered low risk and discharged with outpatient follow-up. Older patients with significant co-morbidities will generally be considered high risk and will often be admitted, either to the hospital or the observation unit, for further monitoring and inpatient testing. This leaves a moderate risk group who may be appropriate for either inpatient or outpatient work-up. Alternatively, a more formal, numerical risk-stratification may be performed using recently published tools such as the Canadian Syncope Risk Score. This score uses nine clinical variables to determine a patient's 30-day risk of serious adverse events after an ED visit for syncope.[55] Although the derivation of the Canadian Syncope Risk Score was methodologically rigorous, it is important to note that this score has not yet been externally validated.

For those patients where no serious diagnosis has been identified in the ED and who are considered moderate risk, the risks and benefits of inpatient versus outpatient evaluation may be roughly in balance. The equipoise surrounding this decision make it appropriate for SDM, assuming the patient is willing and able to participate in the decision-making process and time allows.[9]

The patient's values, preferences, and circumstances should be incorporated into this decision. For example, how disruptive would an overnight admission be for this patient? What is their risk tolerance? Who do they live with and do they feel safe going home? Do they have ready access to a primary doctor or cardiologist with whom they could follow up with? What are the cost implications of being admitted for an observation stay? All of these questions should be considered when engaging patients in a shared decision around admission and further evaluation.

At the end of this process, a mutual decision should be reached through open dialogue between the patient and provider. An ED-based decision aid, named "SynDA," has been developed for this scenario using input from emergency physicians, cardiologists, and ED syncope patients (See Appendix C). This paper-based decision aid is designed to stimulate discussion and facilitate SDM for the disposition decision for moderate-risk syncope

patients who have had a negative ED evaluation. It consists for four sections. The first section explains why syncope, or fainting, occurs and then aims to reassure the patient by stating that no evidence of stroke or heart attack has been uncovered. The second section explains the possible underlying conditions that could have precipitated the syncopal event. The third section provides a 30-day personalized risk estimate based on the Canadian Syncope Risk Score.[55] This risk estimate is presented both as a natural frequency and in a color-coded 100-person pictogram. The fourth and final section presents four options for future care including follow-up with the patient's own primary physician, follow-up with a cardiologist, observation stay for monitoring and possible further testing, and an option to defer the decision to the emergency physician. A pilot randomized controlled trial is currently underway to assess the effect of the SynDA tool on patient knowledge and satisfaction as well as assess the acceptability of the tool to patients and providers.[57] To our knowledge, there are currently no other tools designed to facilitate SDM for ED syncope patients.

Practical Approach

For the emergency clinician to successfully engage a patient in SDM, s/he must create a safe space where the patient feels relaxed and sufficiently empowered to ask questions, express preferences, and meaningfully engage in the decision-making process. If a patient feels anxious or is intimidated by the clinician, this will hinder their ability to truly engage in SDM. Every effort must be made to speak in clear language and avoid medical jargon to maximize patient understanding. A common misunderstanding of the application of SDM is to think that the critical challenge in determining the best treatment for the patient is a lack of information or certainty. Our experience in developing and testing decision aids has led us to understand that providing patients with information or choice alone isn't sufficient to support SDM. The challenge lies in generating, meaningful dialogue to discover what is best for the patient based on his/her informed preferences. Once the clinician has recognized the appropriateness of SDM for a clinical scenario, the process, should include the following three steps:

Step 1) Acknowledge that clinical decision needs to be made with the patient.

Step 2) Engage in conversation with the patient to both share information about the current clinical scenario and options for future care, while exploring the patient's values, preferences, and circumstances.

Step 3) Reach an agreement regarding the best plan of action based on the patient's informed preferences.

The above approach is based on input from various stakeholders (ED patients, clinicians, researchers, designers) and prior conceptual work.[9, 58, 59] The medium where SDM actually occurs is the conversation. If a genuine conversation is launched, the clinicians will be able to learn about the whole person they are caring for, both explicitly and implicitly. Step 2 typically happens in a dynamic, circular fashion fluidly through conversation. Exploring values and preferences is often challenging for clinicians since it requires adopting the role of *listener* instead of questioner/educator. For example, different patients may value time, money, and certainty differently depending on their personality and circumstances. Various

questions can be asked to elicit these values. Due to social conditioning, even after being invited to join the decision-making process, patients may shy away, making statements such as the all-too-common, “I don’t know, doctor. What would you do?” Allowing the patient to process the information and contemplate the options alone for a few minutes, and then returning later to close the discussion is often helpful. The practice of SDM has been described as an “awkward dance,” but one well worth having.[58]

Conclusion

Shared decision-making is an effective means to improve the quality of emergency cardiovascular care by promoting patient-centeredness. There are several clinical scenarios in emergency cardiology which are potentially appropriate for SDM. In this paper, we have reviewed recent research and emerging SDM tools for three common scenarios: low-risk chest pain, new-onset atrial fibrillation, and moderate-risk syncope. These tools, with the exception of Chest Pain Choice, are still in the early stages of development and will require rigorous evaluation prior to widespread implementation. Published data indicate that these tools have the potential to improve patient satisfaction, adherence, and engagement, while decreasing low-value care.[26, 27] Finally, we propose a three-step practical approach to SDM in the ED. Although the time-pressures ED clinicians face (with only minutes to spend with each patient and frequent interruptions) can make SDM difficult, we believe it is both feasible and morally indicated to pursue such an approach in select, appropriate scenarios. As an essential component of patient engagement, SDM has the potential to improve patient knowledge and decision quality, while safely leading to more sensible care. The implementation of SDM in emergency cardiology will shift the paradigm of clinical practice and improve the quality and experience of care for our patients.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Brief Summary

In this paper, the authors discuss recent research in the area of shared decision-making in emergency cardiology. Three clinical scenarios are examined: 1) low-risk chest pain, 2) new-onset atrial fibrillation, and 3) moderate-risk syncope. Finally, the authors propose a simple 3-step approach to shared decision-making in emergency care. Implementation of shared decision-making in emergency cardiology has the potential improve the quality and experience of care for our patients.

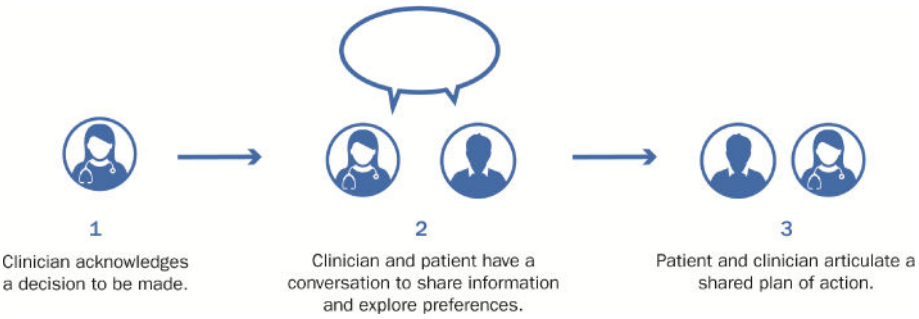

Figure 1.
When is Shared Decision-Making appropriate in the Emergency Department?

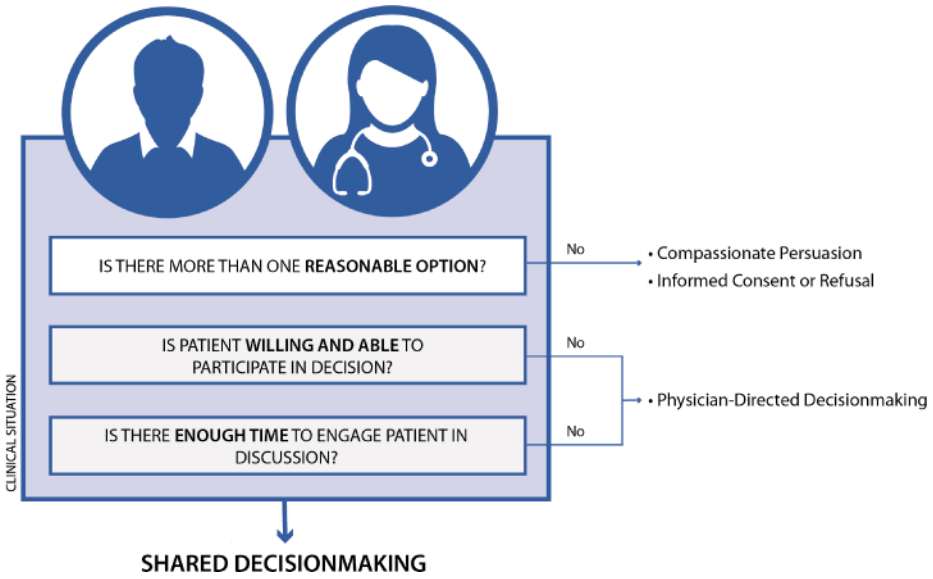

Figure 2.
A Three-Step Practical Approach to Shared Decision-Making

Table 1

Summary of decision tools for cardiac care.

Tool Name	Target Condition	Format	Key Features	Stakeholders Engaged	Developmental Stage	Limitations
Emergency Care Decision Tools						
Chest Pain Choice (2015)	Disposition for low-risk chest pain	Paper-based, 11 × 17 inches, color	Personalized risk estimate using the quantitative pretest probability of ACS instrument.	Patient and caregiver representatives, cardiologists, ED clinicians, payer representatives	Late: single and multi-center RCTs completed	-Currently English only -Not embedded in EHR
Afib Choice (2016)	Anticoagulation for new-onset atrial fibrillation	Digital, tablet-based	Personalized risk assessment using CHA_2DS_2-VASc and HAS-BLED score	Clinicians who prescribe OAC for AF, patients with AF	Early: Ongoing validation study	-Currently English only -Not embedded in EHR -randomized data pending
SynDA (2016)	Disposition for isolated syncope	Paper-based, 11 × 17 inches, color	-Personalized risk assessment using the Canadian Syncope Risk Score	-ED syncope patients -ED providers -ED nurses -interaction designer	Early: Feasibility testing underway	-English only -Not embedded in EHR -randomized data pending
Out-patient Decision Tools						
Atrial Fibrillation Tool: Health Decision (2015)	Anticoagulation for Non-valvular atrial fibrillation	-Online -Paper -Potential for EHR integration	Personalized risk assessment using CHA_2DS_2-VASc and HAS-BLED score	-Cardiology clinicians and researchers -SDM researchers	Final version available online	-No published randomized data
Atrial Firbillation Tool: Computerized antithrombotic risk assessment tool (CARAT 2016)	Anticoagulation for Non-valvular atrial fibrillation	-Online	Personalized risk assessment	Clinicians who prescribe OAC for AF, patients with AF	Tested in a prospective observational cohort study	-NOACs not included -Not patient-facing
Atrial Fibrillation Tool: AF decision support tool (AFDST 2017)	Anticoagulation for Non-valvular atrial fibrillation		Personalized risk assessment	Clinicians who prescribe OAC for AF, patients with AF	Tested in a retrospective cohort study	-NOACs and warfarin not distinguished -Not patient- facing
Atrial Fibrillation Tool: Healthwise (2017)	Anticoagulation for Non-valvular atrial fibrillation	-Online -Paper	-Generic clinical information -Embedded quiz	-Cardiology, internal medicine, and family medicine clinicians	Final version available online	-No published randomized data -No personalized risk assessment
Coronary Artery Disease: Healthwise (2016)	Angioplasty for stable coronary artery disease	-Online -Paper	-Generic clinical information -Embedded quiz	-Cardiology, internal medicine, and family medicine clinicians	Final version available online	-No published randomized data -No personalized risk assessment
Coronary Artery Disease: Healthwise (2016)	Angiogram for stable coronary artery disease	-Online -Paper	-Generic clinical information -Embedded quiz	-Cardiology, internal medicine, and family medicine clinicians	Final version available online	-No published randomized data

Tool Name	Target Condition	Format	Key Features	Stakeholders Engaged	Developmental Stage	Limitations
Emergency Care Decision Tools						
						-No personalized risk assessment

ACS: Acute Coronary Syndrome. AF: Atrial Fibrillation. ED: Emergency Department. EHR: Electronic Health Record. OAC: Oral Anti-Coagulant. NOAC: Non-Vitamin-K Oral Anti-Coagulant. RCT: Randomized, Controlled Trial. SDM: Shared Decision-Making.