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Stroke Prophylaxis for Atrial Fibrillation? To Prescribe or Not to Prescribe—A Qualitative Study on the Decision-Making Process of Emergency Department Providers

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Abstract

Author Contributions:

BK and BC conceived the study, designed the study, and obtained research funding. BK, TA , and CR supervised the conduct of the study and data collection. BK, JL, and TA undertook recruitment of providers with the CRISP research assistants. JL conducted provider interviews/collected data. CR BC and TA contributed to the design of the study, contributed to analysis and interpretation of the data, drafted the initial manuscript, revised the manuscript, and approved the final manuscript as submitted. CR managed the data, coded the data with BK, and analyzed the data with BK. Bk drafted the manuscript, and all authors contributed substantially to its revision. BK takes responsibility for the paper as a whole.

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Study Objective: Although clinical guidelines recommend oral anticoagulation (OAC) for atrial fibrillation (AF) patients at high risk of stroke, emergency department (ED) physicians inconsistently prescribe OACs to newly diagnosed AF patients. We interviewed ED physicians to gain insight into themes influencing prescribing of OACs for patients discharged from the ED with new-onset AF.

Methods: From September 2015 to January 2017, we conducted semi-structured qualitative interviews with a purposeful sampling of 18 ED attending physicians who had evaluated a patient with new-onset AF within the past 30 days. Interview prompts examined physicians' attitudes towards prescription of OAC therapy and current clinical guidelines. We used a constructivist grounded theory approach to analyze data and develop a theory on prescribing practices among ED physicians.

Results: Three broad domains emerged from our analyses.

OAC prescribing practice: Underlying themes affecting OAC prescribing from the ED included physician practice patterns, beliefs, and barriers (including experience and comfort, and insurance coverage), and patient factors (including comorbidities, bleeding risk, and social concerns). Ultimately, these themes indicated physician discomfort and a sense of futility in prescribing OACs for AF.

Guideline usage for OAC prescribing: Regardless of experience, most ED physicians did not report using clinical guidelines when treating patients.

Recommendations for improved prescribing: Physicians recommended the development of a validated, reliable, simple, accessible, and population-specific guideline that considers patient social factors.

Conclusions: The decision to prescribe OACs in the ED is complex. Improving guideline adherence will require a multifaceted approach inclusive of system-level improvements, physician education, and the development of ED-specific tools and guidelines.

INTRODUCTION

Background

Atrial fibrillation (AF) affects more than 2 million people in the US and is the most common arrhythmia evaluated in the emergency department (ED),[1,2] and its prevalence is rising in tandem with the aging U.S. population.[2] Patients with AF are at increased risk of stroke and resulting disability and death compared to their non-AF counterparts.[3] Clinical guidelines by the American Heart Association, Heart Rhythm Society, and European Cardiology Society all strongly recommend oral anticoagulation (OAC) treatment to prevent stroke.[4-6] Despite being an important modifiable factor in improving outcomes in AF patients, stroke prophylaxis (OAC treatment) remains under-prescribed in multiple clinical settings, including the ED.[7]

Importance

Up to 25% of new diagnoses of AF are made in the emergency department (ED);[8] however, prescribing of OACs for ED patients is inconsistent, ranging from 20-60% for high stroke

risk patients.[9-12] Furthermore, more than one-third of ED patients diagnosed with new-onset AF do not follow-up within 30 days, delaying potentially lifesaving treatment. Thus, therapy management at ED discharge could determine the trajectory of care and influence critical clinical outcomes.

Currently, little is known about how emergency physicians view their role in OAC prescribing—do they have a role, and if so, what are the potential barriers and facilitators to OAC prescribing? Are ED physicians aware of guidelines for OAC prescribing, and do they perceive that these guidelines apply to their patients? Other than editorials, there have been no studies that directly investigate physician thought processes about prescribing OAC.[13-16] A more nuanced understanding of decision-making factors can aid in the development of sustainable interventions.

Goals of This Investigation

We sought to understand better the factors influencing prescribing stroke prophylaxis for patients with AF, including guideline adoption and applicability, and perceived responsibilities of an ED physician. Quantitative methods do not often reveal underlying fears, biases, or factors in decision-making. Similar to other studies that have used qualitative methods to understand physician decision-making,[17-23] our goal was to use a qualitative approach to examine ED physician thought processes and identify themes that prevent or support OAC prescribing for new-onset AF.

METHODS

Study Design and Setting

This was a qualitative study using semi-structured interviews with ED physicians from a single, urban, tertiary care academic hospital with an annual ED volume of 50,000 patients. We used purposeful sampling to identify all patients seen in the ED with a discharge diagnosis of new-onset AF and the attending physicians who evaluated and treated at least one of these patients. The research team consisted of four women (B.K., T.A., C.R, and J.L.) and one man (B.S.). The interviewer (J.L.) was a resident physician skilled in qualitative interviewing techniques who trained and practiced in Australia for 6 years before returning to the United States. At study initiation, the interviewer was a volunteer research assistant and had limited prior interaction with participants. We applied a modified, constructivist grounded theory approach to both data collection and analysis.[24] The Oregon Health & Science University Institutional Review Board approved the study protocol. We used the Consolidated Criteria for Reporting Qualitative Research to guide reporting of interview data.[25]

Study Participants

Study participants were selected through purposeful sampling. Participants were board-eligible/board-certified attending physicians who treated and discharged at least one patient with a primary diagnosis of new-onset AF within the previous 30 days. Sampling was designed to identify all cases of new-onset AF regardless of the physician. Between September 2015 to December 2016, research assistants screened records of adult patients

(18 years and older) seen in the ED with a discharge diagnosis of new-onset AF. Research assistants received a 1-hour initial protocol training in inclusion and exclusion criteria and used a uniform data collection tool on all screened charts. Investigators (B.K. and T.A.) verified the records for study inclusion criteria. Once research assistants identified a patient with new-onset AF, they approached the diagnosing physician to obtain in-person consent for study participation. The interviewer emailed each physician to schedule a telephone interview. Physicians expressed a preference for telephone interviewing due to campus logistics and ED shift scheduling. Each physician was interviewed once regardless of how many subsequent patients they treated for new-onset AF during the study period and whether other patients were admitted or discharged. Interviews with attending physicians were conducted from September 2015 to January 2017. Patients who agreed to participate in the study were interviewed concurrently. Results from patient interviews will be analyzed and reported separately.

We interviewed a total of 18 ED physicians with post-residency experience ranging from 1 to 30 years. Approximately 75% of the ED attending physicians at our facility participated in this study, and all physicians eligible to participate agreed to be interviewed. One-on-one interviews were conducted by telephone to increase participant recruitment. The interviewer conducted the interviews from her home and workspace; the physicians participated from their offices or homes based on convenience. Our sample was predominantly white and male as illustrated in the physician characteristics described in Table 1 and is comparable to the demographics of ED physicians at our institution.

Data Collection and Processing

Investigators developed a semi-structured interview guide based on their knowledge of the literature and what our clinical experience indicated would be most relevant. Three of five investigators (B.K., B.S., T.A.) had knowledge of OAC prescribing patterns in the ED gained by both clinical experience and extensive literature reviews, which sensitized them to potential important topics for exploration. We developed and piloted the interview guide with an internal advisory group consisting of three EM attending physicians, a Ph.D. Professor of Family Medicine specializing in qualitative research, and the non-clinician (T.A.) and non-emergency medicine members of the research team (C.R., J.L.). The guide was iteratively refined during the study (see appendix for initial and final guides). The interviewer asked questions in the guide of each physician and then used further open-ended probing questions to foster more discussion. Each physician participated once; there were no repeat interviews. Interviews were digitally audio-recorded, transcribed verbatim, and uploaded into Atlas.ti (version 7; Atlas.ti Scientific Software Development GmbH, Berlin, Germany) for coding and analysis. We documented decisions and thoughts that influenced the research process.

As part of the constructivist grounded theory process, we revised interview questions to better answer our developing hypotheses; early participants may have answered differently if they were proposed these questions. We conducted transcription, coding, and analysis simultaneously and iteratively until no new concepts were identified (data saturation).[16,17] Methods to ensure rigor included the use of a multidisciplinary investigative team to foster

reflexivity. The interviewer conducted member checks throughout each interview. Audio recordings and transcripts were compared by multiple investigators (B.K., C.R., T.A.) to ensure accuracy.

Primary Data Analysis

First, investigators developed a coding scheme from a subsample of initial interview data using open coding techniques to identify, describe, and categorize the transcribed ideas. The core categories derived from open coding were used to develop the initial coding dictionary. Two analysts, a licensed nurse and a researcher with a graduate degree in qualitative research and coding (C.R.), and an emergency medicine physician with postdoctoral training in qualitative coding (B.K.), independently coded a subset of six transcripts. Coded transcripts were compared side-by-side to identify any discrepancies and achieve consensus in coding. Once consensus was achieved, transcripts were coded line-by-line, with constant comparative analysis,[15] utilizing and revising the code dictionary as appropriate. Initial themes were considered in advance but were primarily emerged from the data analysis. Codes were organized into major themes and subsequently identified subthemes. For clarity, the major themes were further organized into domains. Representative quotations were selected for each theme and subthemes from de-identified interview participants.

RESULTS

Interview length averaged 30 minutes (range 20-40 minutes). The major themes were organized into three domains: 1) Beliefs and considerations leading to OAC prescribing practices, 2) The use of current clinical guidelines and decision-making tools for AF and barriers to use, and 3) Recommendations for improved OAC prescribing in the ED. The key subthemes and representative quotes within each of the themes and domains are described in Tables 2-4, respectively.

Domain 1: Beliefs and considerations leading to OAC prescribing practices for new-onset AF at ED discharge (Table 2)

Many considerations and beliefs affect OAC prescribing practices. Among them included the physician's own beliefs, confidence and practice patterns, continuity of care, and patient factors. Patient factors affecting prescribing practices and disposition, as perceived by the physician, included the ability to follow up with a long-term physician, social support, insurance status, and comorbidities/risk factors.

Theme: Practice Patterns—We found an association between physician confidence and their years of experience. Physicians with less than 10 years of experience more commonly indicated that they would consult a cardiologist to gain concordance of opinion ("I tend to not get into the world of anticoagulation unless they have a very high CHADS score, in which case usually a cardiologist [is] consulted, and then we discuss whether we want to send them out on an anticoagulation strategy"), whereas those with greater than 10 years reported more comfort with prescribing OACs absent a cardiology consult.

Subtheme: Cardiology Consult: Participants discussed decision-making in their practice surrounding OACs. Physicians frequently reported that they consulted with cardiology when deciding to prescribe OAC or discharge a new-onset AF patient from the ED. This self-reported practice of consulting with cardiology corresponded to the physicians' years of experience post-residency, with those with less than ten years of experience more likely to state this as their approach.

Theme: Physician Beliefs—Participants expressed beliefs influencing their prescribing practices related to the burden of OAC on the patient and a lack of ability to communicate with primary care physicians (PCPs) to establish continuity of care for their patients. Despite these concerns, physicians considered OAC prescribing for new-onset AF at ED discharge as important for adherence to stroke prevention therapy.

Sub-theme: Burden of OAC on the Patient: Several physicians voiced concerns regarding the burden that OAC prescribing places on their patients. They described the difficulties of educating patients about enoxaparin/heparin bridging and concern for the frequent serum draws, increased risk of bleeding, and dietary restrictions that come with prescribing warfarin. ("Taking something like warfarin is incredibly taxing on people…with weekly or at least biweekly INR checks…"). Some physicians believe that non-vitamin K oral anticoagulation [novel oral anticoagulation (NOAC), e.g…, apixaban, dabigatran, rivaroxaban] reduce these burdens and may be a desirable alternative to traditional OACs, however, they describe individual insurance and prescription coverage for NOAC as a significant barrier for many patients.

Sub-theme: Lack of Treatment Continuity and Communication with Outpatient Physicians: Interviewees commonly expressed concern with a lack of communication and continuity between ED and primary care physicians (PCPs). They felt that if the PCP was not of the same mindset, developing a treatment plan or prescribing OACs was a futile activity. ("One of the biggest problems we have is a lack of communication, too many chefs in the kitchen…it's a waste of my time to do all the research…then to send them to somebody who feels uncomfortable with my plan"). Physicians frequently cited barriers within the healthcare system, such as the ability to electronically share patient charts, insurance coverage, and availability of follow-up as contributors to this belief.

Subtheme: Initiating OAC in the ED Can be Beneficial to Medication Adherence: Although some physicians did not think OAC initiation was an ED physician's responsibility, there were others who thought the ED could influence clinical outcomes, "… there is a potentially real impact from [initiating OACs]."

Theme: Patient Clinical Characteristics and Social factors—Participants considered patient characteristics as heavily influencing their prescribing practice, including co-morbidities, bleeding risk, social factors such as family support systems and ability to pay for medications, access to follow-up care, and patient preference.

Subtheme: Bleeding Risk: Multiple physicians were concerned about the risk of bleeding and distinguished between the ability to reverse with warfarin versus the NOACs. They also acknowledge that NOACs may be more effective and safer.

Subtheme: Patient Social Status/Support: Participants often expressed concern for patient social support in how they would manage anticoagulation with one physician indicating that "…you have to [be] a fairly organized person or at least have a strong family system plus a good PCP who can manage all that stuff for you." Furthermore, physicians were concerned about the affordability of the medications and if their insurance would cover their medications.

Sub-Theme: Follow-up Care: ED physicians expressed a concern that patients would not receive ongoing care for the management of AF and OAC. Moreover, the ability of a patient to follow-up with a specialist or primary care physician after being discharged from the ED was a primary consideration when prescribing OACs. ("We are not…equipped in the ED to deal with chronic disease, so there are a lot of barriers that have to do with ongoing medical management and its dynamic situation. So there really is a crucial need for follow-up with these patients in an appropriate setting").

Theme: Barriers to Prescribing—Participants described barriers to prescribing OAC at ED discharge that related to their personal experience in and comfort with prescribing and systems level concerns regarding patient insurance coverage and the associated treatment costs if insurance coverage proved to be inadequate.

Subtheme: Physician Experience and Comfort: Additionally, the extent of a physician's experience with prescribing novel medications and their comfort level discharging a patient on an anticoagulant was found to be a primary barrier. Some physicians have not used NOACs in their practice and are hesitant to do so because they are not well versed on the literature regarding use and reversal mechanisms ("…I'm not as familiar or comfortable with initiating those medications [NOACs]. [A]t this point in my practice, I'm sticking with aspirin or coumadin depending on their CHADS score"); whereas others felt confident in prescribing NOACs but felt limited by insurers.

Physician characteristics associated with differences in prescribing practices and guideline use included years of practice post-residency, familiarity with clinical guidelines, and familiarity with various oral anticoagulant options.

Subtheme: Health Insurance Coverage: Physicians expressed the desire to prescribe NOACs for patients, citing fewer treatment-associated inconveniences to patients and lower bleeding risk, but felt restricted by a patient's health insurance status and coverage ("… another issue is the ability to pay for certain medications due to insurance issues"). Many physicians would discover that their patients could not fill their prescriptions because their insurance did not cover NOACs (as they would return the ED for a new prescription or leave a phone message for the physician in the ED).

Domain 2: Guideline Usage for OAC Prescribing for New-Onset AF at ED Discharge (Table 3)

Physicians cited the use of various clinical guidelines and decision-making tools, or none when prescribing OAC for new-onset AF at ED discharge. Additionally, respondents described multiple barriers to using them, or a lack of awareness of the guidelines altogether.

Theme: Use of Guidelines and Decision-Making Tools—When stratified by years of experience, the more experienced ED physicians cited CHADS, $CHADS_2$, and CHA_2DS_2-VASc in their decision-making process ("I base [anticoagulation need] on the CHADS score…, and often times, they can just go home on an aspirin"). Less experienced physicians more often cited American Heart Association recommendations, Medline, Up-to-Date, and peer-reviewed literature as their resources for clinical decision-making for AF.

Theme: Barriers to Use of Guidelines and Decision-Making Tools—Physicians discussed multiple barriers to the current available tools and guidelines, including a perceived lack of consistent recommendations, they are lengthy and challenging to use, are not ED-specific, and do not consider comorbidities and individualized patient care

Subtheme: Lack of Consistency in Information and Recommendations: ("I feel like there's a lot of different information out there from a lot of different sources. The EM literature and the cardiology literature, [for example], I almost feel like the two aren't necessarily aligned with each other").

Physicians who reported concerns about the reliability and validity of guidelines attributed their concerns to a conflict between recommendations by the American Heart Association and emergency medicine literature.[26] This concern was reiterated by multiple physicians and has resulted in apparent uncertainty regarding which guidelines to use. Participants expressed apprehension that guidelines and tools were created for cardiology for the care of chronic illness and not specifically for the acute/ED setting ("…If you ask a cardiologist to manage it, their approach is very different than an ED physician because they look at the long-term follow-up piece. Our issue is short term…is there data to support what we do and is it safe?…) and ("…The challenge becomes creating a rule which is actually ED pertinent. The problem with the CHADS score is that it's not ED pertinent, it's a cardiologist score"). There was no obvious consensus on what they believe works best, nor evidence of consistent use of these resources.

Subtheme: Difficult to Use or Lengthy: Some physicians expressed difficulty in using current guidelines or decision-making tools due to their length. ("I find… the decision tools where it's …very lengthy, and there is a lot to remember, I don't use those as much. I don't think a lot of people use those as much").

Subtheme: Not ED-Specific: A primary concern by multiple physicians was the issue of guidelines being created without the ED acute-care setting in mind and lacking ED physicians on the guideline committee. ("I think the challenges remains that …if you ask a cardiologist to manage it, their approach is very different than an ED physician because they look at the long-term follow-up piece. Our issue is short-term and the question is in the short

term, is there data to support what we do and is it safe? …When you start to put all those things together, I think the challenge becomes creating a rule which is actually ED pertinent. So the CHADS score is really not ED pertinent and that's the problem with the CHADS score, it's a cardiologist score.")

Subtheme: Lack of Consideration of Comorbidities and Individualized Treatment: Physicians were also concerned that the guidelines and decision-tools do not account for the individual patient, such that their patient is unique and that they may cause harm, "…so you have to use some judgment, it's not a universally applicable one-size fits all decision tool." Similarly, others expressed that they "don't believe in cookie cutter guidelines for everybody because I think that's robotic care and I think that takes away the art of medicine."

Subtheme: Awareness: Multiple participants reported a lack of education as to which guidelines or decision-making tools are relevant and applicable to the new-onset AF patient population.

Domain 3: Recommendations for Improved OAC Prescribing (Table 4)

A common recommendation was for a tool that was validated, reliable, and population-specific while being simple to use, easily accessible, *and* generalizable to all populations including those with social vulnerabilities or lack of insurance coverage sufficient to cover a necessary treatment. ("The challenge, unfortunately, is medicine isn't a perfect business so you're going to struggle with rules that should apply to the majority of the population. So it has to be something that doesn't just target the 20-40-year-old with a certain type of afib—it really has to apply globally"). While physicians expressed wanting a tool that applied to a broad range of patient circumstances, they were clear that it needed to be relevant and specific to the ED

Theme: Validated, Reliable, and Population-Specific—While physicians wanted a practical tool, they also wanted it to be properly derived, validated, and unbiased. ("It depends on how rigorous the decision tool is… And if it was sponsored by the pharmaceutical industry or not. That would be the two things that would influence me. I would still use it if they're fully sponsored by the pharmaceutical industry but it would need to be shown that it was non-biased.…").

Theme: Ease of Use—In addition, the tools must be easy to use and be part of workflow procedures. Physicians expressed skepticism about the practicality of a new tool stating, "If it's going to improve patient care, if it's going to improve efficiency and cost efficiency? Sign me up. But if you're making me add one more thing in my chart that is going to do nothing but cause more headache, don't put me through that misery."

Theme: Accessibility—However, if created, they preferred the tool be accessible in the electronic medical record where it could incorporate social factors such as insurance type—an important consideration as it would inform physicians of covered therapies. Additionally, physicians desired an aid that would facilitate support for shared decision-making, including

patient education and communication with the PCP, not just for their clinical decision-making.

Theme: Inclusion of Social Factors and Insurance Status—Similar to other medical decision-making that occurs in the ED, the patient's clinical and social situation, and insurance status all become factors in a physician's decision. Physicians recommended that such factors be included in guidelines and tools. ("…a lot of the decision is based on social factors and insurance factors.")

A Futile, "No-Win" Situation—Physician interviews indicate a paradigm where physicians believe that the multifaceted challenges of the healthcare system, patient social factors, as well as their own discomfort, lends to a role of not prescribing. If the patient has follow-up care, physicians believe they should defer the plan to the outpatient physician and, as a result, will not prescribe. If the patient does not have follow-up care or continuity of care available, many physicians are less likely to prescribe. This paradigm likely signals a sense of futility[27] among physicians, and a perspective that EDs do not have a role in OAC initiation. When physicians *do* prescribe, they may receive negative feedback from patients when insurers do not cover their prescriptions or from PCPs and cardiologists who disagree with the treatment plan. This cycle of negative feedback results in the decreased likelihood of a future OAC prescription.

LIMITATIONS

This study was conducted at a single site, urban academic medical center with an average annual volume of ED visits. The participant demographic profile was primarily white males, which may limit the transferability of our findings to practices with different ED volumes and physician demographics. Access to consultation with specialty services, hospital type (community vs academic), ED patient volume, and location (urban, suburban, rural), are factors that may influence physician decisions in OAC prescribing.[28] However, the ED physicians interviewed were trained nationwide including at higher volume and community sites. Many of the themes that arose from this study are likely to apply to other settings. Our sample size was small but sufficient to achieve saturation and for themes to emerge. Physician race (White) and sex (male) were homogenous while the patient population is more variable, which may influence prescribing practices in relation to other sites with more or less diverse patient populations. Finally, in part due to limited study resources and volumes of discharged patients with new-onset AF at this site, physicians were interviewed only once. Physician practice over time may change based on the number of new-onset AF patients treated. We also did not track the number of new-onset AF patients each attending physician in our study had treating during the prior 30 days, but the frequency and/or severity of AF patients they treated may have influenced their decisions and views on treatment. The interviewer's complex medical training may have introduced bias because attending physicians interviewed after she became a resident physician might have felt compelled to give the 'right' answer rather than express their true beliefs. Also, the lack of transcript validation by participants for comment or correction may have affected the reflexivity of the study.

DISCUSSION

To our knowledge, this study is the first that directly interviews emergency medicine physicians about the factors that influence their decision to prescribe stroke-prophylaxis for AF when discharging patients from the ED. Barriers to prescribing are multifactorial and include patient characteristics such as access to follow-up care, health insurance coverage, and perceived social circumstances/support. Physicians also cited uncertainty of the interpretation of multiple and at times conflicting guidelines, and the belief that stroke-prophylaxis is an outpatient issue. Ultimately, an overall theme of physician discomfort and sense of futility emerged concerning prescribing of OACs at ED discharge for patients with AF.

Interestingly, physicians with more experience discussed more confidence in prescribing of OACs—this begs many questions including if they have had negative feedback, are their biases different from less experienced participants, have personal experiences with stroke and disability influenced their prescribing, or does more experience result in a greater sense of responsibility for more comprehensive care? Little ED data exists that correlate physician experience and quality metrics. A recent study showed that hospitalized Medicare patients cared by older general internists had higher mortality compared to younger physicians, except for those physicians with high patient volumes.[29] Thus, among hospitalists, the years of experience and patient treatment volumes can have a meaningful impact on patient outcomes. For our findings, further research is needed to understand how participant years of experience and patient treatment volumes affect ED patient care and physician confidence in OAC prescribing.

The ED has traditionally operated as an acute care entity where the role of the ED physician ends at discharge or admission. Thus, a long-term medication prescription for OAC whereby the benefits are measured in years,[30-32] is outside of the ED's comfort zone. However, acute presentations allow for a "teachable moment" when patients are most receptive to medical or behavioral interventions.[33-36] For example, of AF patients prescribed the OAC, warfarin, by an ED physician, 25 of 34 (73.5%) were still receiving warfarin at one year after discharge, compared to 34 of 104 (35.6%) among those not *prescribed* by the ED.[37] Thus, the ED can have an impact on the trajectory of care and important clinical outcomes by potentially decreasing the risk of stroke and mortality with longer-term OAC use.

Yet, our results indicate that there is little buy-in from ED physicians on guidelines that would guide physicians on initing thromboprophylaxis for patients with AF. Current stroke-risk stratification scores[32,38,39] were created from outpatient chronic care populations rather than acute ED populations with episodic care who tend to be a more ill population with greater co-morbidities. Research on this acute care population is needed to fill this critical gap. Furthermore, professional US guidelines[4,6,40-42] that inform thromboprophylaxis of patients with AF were written for and by cardiologists and internists and did not include other specialties involved in potential OAC management and treatment on the writing committees. Lastly, the interpretation of the guidelines is unclear to ED physicians. Constantino et al. showed multiple conflicts in a side-by-side comparison among the major international guidelines.[26] Reconciliations of these issues will require a multidisciplinary

committee to gain insight into how management and evaluations should operate in different clinical settings as well as achieve consensus among the major international and national professional groups on the standards of care for management of AF.

One group often excluded from guideline committees due to a potential for conflict of interest, but has a significant influence on treatment and management in the US, are the insurers. The lack of clear NOAC coverage by insurers and the need for prior authorization are significant barriers in the time-pressured setting of an ED. Nonetheless, if a NOAC is covered *and* follow-up is not available, it could be construed as imprudent to provide long-term OAC given the potential for significant side effects, contributing to that sense of futility.

An option for providing optimal stroke prophylaxis proposed by Barrett et al. is a “default short-term anticoagulation therapy" policy for those with high stroke risk without contraindications to anticoagulation with follow-up with primary care physicians, anticoagulation specialists, or cardiologists.[13] Such a policy will require intra-hospital to outpatient stakeholder collaboration—with a willingness to implement guidelines and *empower* emergency physicians, as well as other specialties, to appropriately prescribe OACs with the knowledge that follow-up will be available. For example, one southern California ED has included an ED pharmacist to provide a shared-decision making discussion with patients about stroke prophylaxis, and then an ED physician prescribes the medications.[43] An agreement with their hospital’s cardiology groups allows follow-up for all patients. The creation of such clinical pathways and team-based management may empower emergency physicians to adhere to guidelines.

Additionally, physicians participating in this study offered ways to increase guideline use with simple decision support tools integrated into the electronic medical record system. There are an increasing number of platforms (websites/apps) with risk-calculators (e.g., MDCalc.com) as well as display pictograms of stroke-risk vs. bleeding-risk with stroke prophylaxis recommendations (e.g., healthdecision.org). Ensuring that these tools have an ED-specific component, or have ED clinicians involved in their development, will also be crucial to uptake. Such tools are useful in shared decision-making conversations when discussing with patients their disease, prognosis, risk, and recommendations.[44]

In order to help design these tools and potential interventions to improve appropriate stroke prophylaxis, future steps include a multi-site, mixed-method study to understand better the quantitative factors that may also be influencing decision-making, such as physician admission rates for AF and treatment volumes, as well how other health systems and site-specific culture factors that affect physician decision-making. Also, we will also study how patients perceive OAC prescribing for AF from the ED, education about the risks for AF and OAC, and barriers to optimal management at and after discharge from the ED.

In summary, the decision to prescribe OACs is complex and multifocal and involves the transition of care of patients with a chronic condition from the episodic ED care to the outpatient setting. Improving guideline adherence will require a multifaceted approach: educating EM physicians about the indications, risks, and benefits of anticoagulation, ED-specific guideline development and dissemination with active engagement with EM leaders

to emphasize the shared responsibility of stroke prophylaxis, improvement of the healthcare delivery system to ensure patients receive appropriate follow-up from the ED, and empowerment of physicians to make confident, evidence-based decisions. Such a paradigm shift could result in added value to ED evaluations—not only by moving outpatient/inpatient guidelines to ED settings and improving the transition in care of AF patients discharged from the ED, but also by making a clinical difference by reducing adverse events.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1:

Characteristics of Sample (N=18)

Characteristic	**N (%)**
Sex	
Male	14 (78%)
Ethnicity	
White	15 (83%)
Asian	2 (11%)
Other	1 (5.5%)
Years of Practice After Residency	
≤ 10 years	9 (50%)
> 10 years	9 (50%)

Table 2:

Domain 1: Themes, subthemes, and representative quotations from ED Physicians about their beliefs and considerations leading to OAC prescribing practices for new-onset AF at ED discharge

Theme	Subtheme	Representative Quotation
Practice Patterns	Cardiology Consult	Interviewer: Do you discharge patients on warfarin from the ED? Physician: Not without a specialty consultation. [If] they feel that they can see the [patient] to complete their workup and discharge and arrange post follow up—I would, but only after getting that specialty consultation on a new onset AF. In terms of anticoagulation, usually I talk to the cardiologist who will be involved with the patient to try and figure what kind anticoagulation to do for the patient. Whether they need an echocardiogram prior to starting the anticoagulation or [anticoagulation] prior if they wanted to cardiovert them or something. I tend to not get into the world of anticoagulation unless they have a very high CHADS score, in which case usually a cardiologist has been consulted, and then we discuss whether we want to send them out on an anticoagulation strategy.
Beliefs	Burden of OAC on the Patient	Taking something like warfarin is incredibly taxing on people. They have to have weekly or at least biweekly INR checks and they have to follow a strict diet and they have to take medicines that don't interact with their warfarin. I mean, you're really comparing coumadin versus the novel oral anticoagulants and its sort of a no-brainer for compliance. I mean coumadin is very difficult to take because it's very sensitive to diet, other medications, it can go up or down, [and] it needs to be monitored very carefully. You have none of these issues with the new medications, so it's pretty easy.
	Lack of Treatment Continuity/ Communication with PCP	I think one of the biggest problems we have is a lack of communication, too many chefs in the kitchen. I also think it's a waste of my time to do all the research and try to do the right thing and then to send them to somebody who feels uncomfortable with my plan. Anticoagulation—I leave [it] entirely up to the consultants because they'll be the ones who are managing it long term and once we get someone stabilized, well anticoagulation is good, [but] it's not like if we don't give it the next hour or two, they get progressively worse.
	Initiating OAC in the ED can be beneficial to medication adherence	I think we make an impact after discharge if we start the anticoagulation. I think that there is a potentially real impact from that and a number of patients that are going to take the medication and continue to take the medication.
Barriers	Experience & Comfort	Lack of [a] reversal agent for GI bleed and intracranial hemorrhage is a major downside. With the elderly population, who often have atrial fibrillation—I think that's the biggest consideration, for me at least— just the risks of falls and the fact that the novel anticoagulants don't have a reversal agent. So that's my sort of uncomfortableness with that. I'm more comfortable with coumadin but I am becoming comfortable with the novel anticoagulants. I've prescribed them before. I feel that I have a lot more comfort with coumadin; and the new ones you can't really monitor it too much, unless you [measure] a factor Xa. I think I'm more open to start a novel anticoagulant in AF for stroke prevention, clot prevention whatever, than I am for someone who has an actual clot. So I think that that would be my ideal patient because like I had mentioned before, I'm not as familiar or comfortable with initiating those medications. [A]t this point in my practice, I'm sticking with aspirin or coumadin depending on their CHADS score.
	Insurance Coverage	The problem is that, you know, [NOACs] are really costly. Some insurance companies will not cover that. So it really depends on what you know about their insurance status. I'd rather know one way or the other [about their insurance coverage],…[rather] than just write someone a script and then have them find out the next morning, "Oh, I can't fill this," and then days would go by without anything, right? [For example]…the conversation really revolved around whether or not her insurance would cover rivaroxaban [a NOAC] because I've had the personal experience of seeing other patients bounce back that had been given a prescription for rivaroxaban but then they came back saying, "My insurance doesn't pay for this" and "can you put me on another drug?" If insurance was not an issue, I would just go to rivaroxaban or the [other] novel oral anticoagulants because the risk of dangerous bleeding is less and you don't have the monitoring issues that you have with coumadin, but this whole issue of coverage is really important because it makes no sense to give a prescription to a patient when they can't, if they're not covered and they can't afford it.
Patient Factors	Co-Morbidities	So if they have CHF, high blood pressure, endstage diabetes, previous history of stroke and then, you'll [consider] whether or not you're going to [put] somebody on aspirin versus busting out some more aggressive anticoagulation.
	Bleeding Risk	The thing I like about warfarin is that there are ways to reverse it. If you start bleeding on warfarin, there are certainly good ways to reverse it. [With] other newer novel anticoagulation agents, there aren't great reversal agents. With a lot of the new or novel oral anticoagulants, or NOAC medications, they're thought to be, at least in some trials, a little bit more effective and a little bit safer. [If] somebody is at high risk of falling, then [we] maybe just want to do aspirin because the risk of them having a major bleeding episode after a fall may be too high. But at that point it's much more of a discussion

Theme	Subtheme	Representative Quotation
		with the patient and their family regarding … what they feel is acceptable for them given the risks and benefits of their current situation.
	Follow-Up Care	[I]t's not practical to start people on stuff that needs chronic follow-up. That's not what the ED typically does. I feel like we do tend to admit a lot of these people because we're uncomfortable with them because they don't have good follow-up. I definitely need to have somebody follow [a patient] up if I'm going to discharge them home, you know, for atrial fibrillation. I won't discharge them if they don't have a primary care doctor in general. Very good follow-up first and foremost because warfarin necessitates INR measurements, and [a] regular physician, or at least access to anticoagulation clinic to do those measurements and to kind of follow [and] make recommendations about dosage adjustments. We are not very well equipped in the ED to deal with chronic disease so a lot of the barriers have to do with ongoing medical management and its dynamic situation. So there really is a crucial need for follow-up with these patients in an appropriate setting.
	Social Status and Support	You have to [be] a fairly organized person or at least have a strong family system plus a good PCP who can manage all that stuff for you. [I]f we're going to send them out on Lovenox and coumadin, are they going to be able to administer those medications, do they have insurance that is going to be able to cover it, or can they afford those medications? [T]here are some patients that might have an elevated [CHADS] score but have another reason that we might not want to anticoagulate them, and there is also sometimes a follow-up issue; that is that they don't have primary care physician, the ability to pay for certain medications, there are some social insurance and follow up issues that differ patient to patient.
	Preferences	I think a decision aid could be [helpful]…if it proposed an oral anticoagulant that is not cost prohibitive,… could help in a shared decision-making discussion on patient preferences, increased compliance with an oral anticoagulant, and if the inclusion criteria included the study group [I] always have [a] shared decision-making conversation, but I think I would say that more often than not, that patients are okay with [NOACs] and they prefer not having to have their INR checked.

Table 3:

Domain 2: Guideline usage for OAC prescribing for new-onset AF at ED discharge

Theme	Subthemes	Representative Quotation
Use of Guidelines & Decision-making Tools		I use the $CHADS_2$ score for starting people on anticoagulation if they're going to be discharged home. That's a definitely major one that I use, and other than that, I don't use any other scoring system. I base [anticoagulation] on the CHADS score on whether or not they need to be anticoagulated, and often times, they can just go home on an ASA [aspirin] [My decision is] based on my reading of the literature and in part, some of the guidelines from the American Heart [Association]
Barriers to Use	Lack of Consistency in Information and Recommendations	I feel like there's a lot of different information out there from a lot of different sources. [For example,] the EM literature and the cardiology literature. I almost feel like the two aren't necessarily aligned with each other. I think if there was consensus of the American [College] of Emergency Physicians with the cardiologists that said…"we support ER doctors who feel that a patient falls under this category, then that is standard of care."
	Difficult to Use/ Lengthy	I find… the decision tools where it's …very lengthy, and there is a lot to remember, I don't use those as much. I don't think a lot of people use those as much. Sometimes institutional protocols can be helpful. Although I think some see them as a bit of hindrance.
	Not ED Specific	I think the challenges remains that …if you ask a cardiologist to manage it, their approach is very different than an ED physician because they look at the long-term follow-up piece. Our issue is short-term and the question is in the short term, is there data to support what we do and is it safe? …When you start to put all those things together, I think the challenge becomes creating a rule which is actually ED pertinent. So the CHADS score is really not ED pertinent and that's the problem with the CHADS score, it's a cardiologist score.
	Lack of Consideration of Comorbidities & Individualized Treatment	[W]e're using protocols, but nobody is thinking outside of the box and when you don't think outside the box, you are not giving good care. I mean we were taught to think. [T]here are usually a fair number of exclusions when they're deriving and validating decision tools but by that I mean that every patient is a unique event and so your patient that is in front of you may or may not fit the population from which the assistant tool was derived. So you have to use some judgement, it's not a universally applicable one-size fits all decision tool, usually. I'll use research or use a guidline depending on the patient because every patient is different. So I don't believe in cookie cutter guidelines for everybody because I think that's robotic care and I think that takes away the art of medicine.
	Awareness	I don't use guidelines…probably due to a lack of awareness. I don't feel that the patients that I have deviated significantly from the care that I'm used to or am already delivering. A barrier? It would be my education. Not knowing.… My lack of knowing. My lack of reading about it.

Table 4:

Domain 3: Recommendations for guidelines and decision-making tools in the treatment of AF.

Theme	Representative Quotation
Validated/ Reliable & Population Specific	If it was validated [decision aid] and … easy to use. I mean everything has to be practical, it can't be something that, I mean the time pressures of the business that we live in are sometimes forgotten. You have to do a lot of things in a very short time and the expectation is that people want everything fast, fast, fast—which all means that if you try to make decisions, they have to be tools that are really easy to use. It depends on how rigorous the decision tool is… if it was proven fully or not. And if it was sponsored by the pharmaceutical industry or not. That would be the two things that would influence me. I would still use it if they're fully sponsored by the pharmaceutical industry but it would need to be shown that it was non-biased. I think its basically has to be properly derived, properly validated. Tested in a large number of the different populations to make sure that it works. If [the decision aid came from a study with a large derivation set and if it were validated by another group in another setting, as well as validated by the group that derived the set. In other words, in different settings and in different patient populations like, you know, tertiary center versus a county hospital versus a community setting. I think if it were validated in different settings with a large number of patients, I think we'd be more likely to use it.
Ease of Use	It would have to be simple enough to apply the tool in a very [straight]forward manner. …[A]nd again it would have to be based on [a] standard for baseline risk of bleeding and a comparison of what that particular agent we are going to use for the anticoagulation. If it's going to improve patient care, if it's going to improve efficiency and cost efficiency? Sign me up. But if you're making me add one more thing in my chart that is going to do nothing but cause more headache, don't put me through that misery. It's about the patient. I think what we can best hope for is a reliable way to identify low-risk patients who would …be appropriate for outpatient management of initial or acute onset of AF and then have guidelines suggestive of "if-then" as far as indications for different medications. Ease of use certainly. Since a lot of what we talked about has to do with patient education. I think if there are accompanying documents to physically hand the patients that may answer a lot of their frequently asked questions or provide them with telephone numbers or clinic information about places to get additional information or follow-up, that would be extremely useful.
Accessibility	[Use would depend on] how easily accessible it was. I use most of my calculation through MDCalc, so I guess if it was on MDCalc, then that would make me more likely to do it because it's where I get my other scores. But I think if it was available online easily that would be fine because [I] usually have access to internet during my shift. I think ideally you'd have an EMR (electonic medical record) that... has guidelines built into it and when the rhythm was identified, there would be the ability to import that guideline and essentially follow it.
Inclusion of Social Factors and Insurance Status	I think a barrier is that a lot of the decision is based on social factors and insurance factors. [It] would be helpful to have in a decision tool … all their insurance information at the same time. Because going through all that work and then talking to [patients] about the medication, and then finding out that their insurance doesn't cover it—its pretty frustrating.