

# Factors Associated With Patient Engagement in Shared Decision-Making for Stroke Prevention Among Older Adults with Atrial Fibrillation



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## ABSTRACT

### Objective

To examine the extent of, and factors associated with, patient engagement in shared decision-making (SDM) for stroke prevention among patients with atrial fibrillation (AF).

### Methods

We used data from the Systematic Assessment of Geriatric Elements-Atrial Fibrillation study which includes older ( $\geq 65$  years) patients with AF and a CHA<sub>2</sub>DS<sub>2</sub>-VASc $\geq 2$ . Participants reported engagement in SDM by answering whether they actively participated in choosing to take an oral anticoagulant (OAC) for their condition. Multiple logistic regression was used to assess associations between sociodemographic, clinical, geriatric, and psychosocial factors and patient engagement in SDM.

### Results

A total of 807 participants (mean age 75 years; 48% female) on an OAC were studied. Of these, 61% engaged in SDM. Older participants ( $\geq 80$  years) and those cognitively impaired were less likely to engage in SDM, while those very knowledgeable of their AF associated stroke risk were more likely to do so than respective comparison groups.

### Conclusions

A considerable proportion of older adults with AF did not engage in SDM for stroke prevention with older patients and those cognitively impaired less likely to do so. Clinicians should identify patients who are less likely to engage in SDM, promote patient engagement, and foster better patient-provider communication which may enhance long-term patient outcomes.

**Key words:** atrial fibrillation, patient engagement, shared decision-making, stroke, anticoagulation

## INTRODUCTION

Atrial Fibrillation (AF) is the most common irregular cardiac rhythm, affecting approximately 5.2 million Americans, 350,000 Canadians, and many more worldwide. The incidence of AF in Canada doubles with every decade of life after 55 years of age.<sup>(1-3)</sup> The most serious complication of AF is cardioembolic stroke which is responsible for approximately one-fifth of all ischemic strokes.<sup>(4)</sup>

Despite the availability of highly effective oral anticoagulant (OAC) therapy, major gaps exist between AF-associated stroke prevention and the treatment of eligible patients.<sup>(4)</sup> Among AF patients with guideline indications for the receipt of OAC, a relatively small proportion are receiving this therapy (66% in North America and 11% in China).<sup>(5,6)</sup> While the use of various AF treatment approaches has been shown to be better in the United States than in other countries, the proportion of patients with AF who have been treated with OAC is still suboptimal.<sup>(6)</sup>

Shared decision-making (SDM) interactions between patients and their health-care providers have been shown to improve health outcomes and result in higher patient satisfaction.<sup>(7-9)</sup> New tools are being developed and adopted to improve physician-patient conversations about OAC treatment options for patients with AF.<sup>(10-13)</sup> Although several studies have shown a mixed patient preference to be part of shared decision-making,<sup>(14,15)</sup> and AF treatment guidelines support shared OAC decision-making,<sup>(16)</sup> little is known about the factors associated with patient engagement in SDM for stroke prevention among older men and women with AF.

Using data from the ongoing SAGE (Systematic Assessment of Geriatric Elements)-AF study,<sup>(17,18)</sup> we examined the extent to which older men and women with nonvalvular AF (NVAf) were engaged in the decision-making process to take OAC for stroke prevention. We hypothesized that patient engagement in SDM would be modest, with a need for better patient engagement, and that advancing age would be inversely related with being part of this process.

## METHODS

### Study Population

As part of an ongoing prospective study, adults aged 65 years and older with AF were recruited from five medical centers in Massachusetts and Georgia between 2015 and 2018.<sup>(17,18)</sup> The eligibility criteria for enrollment in SAGE-AF included: a) having a CHA<sub>2</sub>DS<sub>2</sub>-VASc (congestive heart, failure, hypertension, age [ $>75$  years], diabetes, stroke, vascular disease, age [65 to 74 years], female gender)<sup>(19)</sup> score  $\geq 2$ , and b) having a scheduled ambulatory care visit at any of the study clinic sites. Participants were not included in this study if they were unable to provide written informed consent, had a documented contraindication to OAC therapy (i.e., history of intracranial hemorrhage, mechanical heart valve, end-stage renal disease) or were on OAC for different indications other than AF, had a scheduled procedural intervention that was associated with an increased risk for bleeding, were non-English speakers, or were prisoners. The institutional review boards at the University of Massachusetts Medical School, Boston University, and Mercer University approved all study protocols. Prior to formal study enrollment, all eligible participants provided written informed consent.

Participants' medical charts were reviewed at baseline, and data about their demographic characteristics (age, race, sex), level of education, marital status, smoking behavior, provider type, and medical history, including, but not limited to, their clinical, therapeutic, and investigational profile (body mass index, stroke risk factors, type of AF, time since AF diagnosis, medications, lifestyle practices, relevant medical history, and INR findings) were collected using standard methods by trained study staff. The annual stroke and bleeding risk were predicted in all participants using the CHA<sub>2</sub>DS<sub>2</sub>-VASc and HAS-BLED (hypertension, abnormal renal/liver function, stroke, bleeding history or predisposition, labile INR, elderly, drugs) scoring systems, respectively.

Participants completed a comprehensive geriatric evaluation, including frailty assessed by the Cardiovascular Health Survey (CHS) frailty scale,<sup>(20)</sup> cognitive function assessed by the Montreal Cognitive Assessment Battery,<sup>(21)</sup> social isolation assessed by the Social Support Scale and Social Network Scale,<sup>(22,23)</sup> depressive symptoms assessed by the Patient Health Questionnaire (PHQ-9),<sup>(24)</sup> and anxiety symptoms assessed by the Generalized Anxiety Disorder Scale (GAD-7).<sup>(25)</sup> Participants self-reported sensory deficits such as vision and hearing impairments, and whether or not they had a fall

in the past six months. Participants were interviewed to assess AF related quality of life using the Atrial Fibrillation Effect on Quality-of-life (AFEQT) questionnaire.<sup>(26)</sup> Patient satisfaction with their anticoagulation therapy was examined using the Anticoagulation Treatment Satisfaction (ACTS) scale.<sup>(27)</sup> Perceived Efficacy in Patient-Physician Interactions (PEPPI) was used to examine participants' perceived self-efficacy about their physician interactions.<sup>(28)</sup>

Enrolled subjects returned for a one-year follow-up where geriatric variables (i.e., frailty, cognitive function, social support, depression, and anxiety), patient-reported outcomes (AFEQT, ACTS, AF knowledge), as well as physical and cognitive function were reassessed. Knowledge about AF was assessed using the Jessa Atrial fibrillation Knowledge Questionnaire (JAKQ). JAKQ assesses patients' knowledge of their AF by asking questions regarding the purpose of anti-coagulants, definition of AF, symptoms of AF, and aspects of common AF medications.<sup>(29)</sup> Participants also self-reported bleeding events, and their knowledge regarding AF-associated stroke risk at the one-year follow-up interview.

### Patient Engagement and Patient Preference Questionnaire

To assess patient engagement in the decision-making process, study participants who were on OAC therapy were asked at the one-year follow-up examination, "Did you participate actively in choosing to take an OAC?" The binary response options included "Yes" or "No". Participants were considered to be engaged in a shared decision-making (SDM) process if they responded affirmatively to the first question. To assess patient preference, participants on OAC were then asked, "Would you like to be more involved in deciding to choose to take an OAC?" The responses were: "Yes", "No", or "Unsure". Participants who answered "Yes" to the second question were considered to have greater preference to be more involved in the decision-making process of choosing to take an OAC.

### Statistical Analysis

We compared participants who reported being engaged in the decision-making process for stroke prevention treatment with those who did not engage in SDM according to their baseline sociodemographic, psychosocial, and clinical characteristics, and participant reported outcomes. We also examined and compared the baseline characteristics of participants who did not engage in SDM but wanted to be more involved and those who did not want to be involved in the decision-making process. Continuous variables were summarized as means and standard deviations when normally distributed and as medians and interquartile ranges when skewed. Unpaired *t*-tests were used for group comparisons for continuous variables, and chi-square tests for categorical variables. Multivariable logistic regression modeling was used to examine factors associated with patient engagement in SDM for stroke prevention.

To understand the impact of different patient characteristics on patient engagement in SDM, we used a model-building approach by including groups of variables in the regression

models. These variables were selected based on their clinical relevance, if their  $p$  value was  $< .1$ , and on their statistical association with patient engagement in bivariate models. In Model 1, we adjusted for all the potentially confounding demographic, clinical, and geriatric variables. In Model 2, we additionally controlled for patient reported outcomes (i.e., patient-physician interaction, knowledge of AF, and knowledge of AF associated stroke risk) which can also influence patient engagement in SDM. Analyses were performed using SAS v9.4 (SAS Institute Inc., Cary, NC, USA).

## RESULTS

A total of 807 SAGE-AF participants on OAC provided self-reports of their engagement in the decision-making process for stroke prevention. The mean age of our study sample at baseline was 75 years old, nearly half were women, and two-fifths had a college degree or higher. The mean CHA2DS2-VASc score was 4.3. Approximately 44% of participants ( $n=357$ ) received AF care from cardiologists. Nearly 60% of our study sample had paroxysmal AF, and 18% and 10% had a history of bleeding and stroke, respectively.

Overall, 61% ( $n=494$ ) of study participants reported being engaged in the decision regarding OAC therapy initiation. Among the 313 participants who reported not being engaged in this process, 60 participants reported that they would want to be more involved in the decision process to utilize OAC therapy for their AF.

Older individuals, those who had a history of heart failure, major bleeding, anemia, and renal disease, those who were cognitively impaired, and those who had symptoms of depression or anxiety were less likely to engage in SDM for stroke prevention than respective comparison groups. Non-Hispanic whites, married participants, those who had at least a college degree, and those who were not frail were more likely to engage in the decision-making process for stroke prevention (Table 1).

Participants who had a lower knowledge of AF and those who reported no, little, or some knowledge about AF associated stroke risk were less likely to engage with their provider in SDM for stroke prevention (Table 2).

Among participants who did not engage in SDM, those who had paroxysmal AF, those who had a fall in the past six months, and those who had higher AFEQT and ACTS burden scores were more likely to prefer being more involved in the decision-making process. Similarly, among those who did not engage in SDM, non-Hispanic whites, those who were married, and those who had high confidence in their physician interaction (PEPPI) were significantly less likely to prefer being more involved in SDM for stroke prevention (Table 3).

As shown in Table 4, older participants ( $\geq 80$  years) were 47% less likely than younger participants to engage in the decision-making process for stroke prevention (adjusted OR = 0.53; 95% CI = 0.31-0.89). Cognitively impaired participants were less likely to engage in SDM for stroke prevention than their respective comparison group after adjusting for other

potentially confounding variables (Table 4; adjusted OR = 0.69; 95% CI = 0.48, 0.99). Participants who reported being very knowledgeable of AF associated stroke risk were three times more likely to engage in SDM for stroke prevention after adjusting for other covariates (Table 4; adjusted OR = 3.06; 95% CI = 1.59, 5.90).

## DISCUSSION

In our contemporary cohort of older adults with NVAf, we observed that approximately two out of every five patients did not engage in the decision-making process for stroke prevention. Patient engagement in SDM was less likely to occur among older patients and the cognitively impaired, but more likely to occur among those who were very knowledgeable of their AF associated stroke risk. In the present contemporary era focused on improving patient engagement in their health care, our findings highlight important areas for improvement in patient engagement in SDM for stroke prevention.

Shared decision-making is an essential component of patient-centered care, which enhances patients' understanding of their disease and often results in improvement in the quality of patient-provider communication regarding various treatment options.<sup>(30)</sup> The SDM process is characterized by several features including: (1) engagement of both health-care professionals and patients in partnership conversations; (2) two-way conversation to discuss patient-specific risk of stroke and bleeding; (3) consensus-seeking towards the favored treatment option; (4) reaching an agreement on the treatment plan; and (5) reviewing the plan at regular intervals during follow-up.<sup>(29)</sup> Patient engagement is one vital feature of the SDM process in ensuring adequate balance of risks and optimizing health outcomes, especially among patients with AF who are about to initiate long-term treatment for stroke prevention.<sup>(31)</sup> Patients with AF benefit significantly from engaging in SDM, given the various treatment options available, the presence of stroke and bleeding scores that need to be calculated, the importance of patient preferences and values, and the importance of owning one's decisions that require patient action and follow-up (INR scheduled monitoring).<sup>(32)</sup>

To the best of our knowledge, limited studies have examined the magnitude of patient engagement in SDM or the factors associated with patient engagement in decisions regarding OAC therapy initiation among patients with AF. In a cross-sectional study of 1,006 patients from an outpatient AF registry in the US (ORBIT II), participants were asked who made the treatment decision when choosing their blood thinner(s). Approximately three-quarters of participants reported that they were not part of a SDM process to choose an antithrombotic therapy.<sup>(33)</sup> In a second small descriptive qualitative study of 25 patients with AF for whom OAC therapy was indicated, decision-making regarding OAC use was assessed using semistructured in-depth interviews. None of the participants were involved in the decision-making process regarding OAC use.<sup>(34)</sup> In contrast to the results of these studies, the majority (61%) of participants in our study

TABLE 1.

Baseline characteristics of SAGE-AF participants according to patient engagement in shared decision-making for stroke prevention

<i>Baseline Characteristics</i>	<i>Patient Engagement</i>		<i>P value</i>
	<i>Yes (N=494)</i>	<i>No (N=313)</i>	
<i>Sociodemographic</i>			
Age, mean, years (SD)	74 (6)	76 (7)	<.001
Female Sex (%)	236 (48)	147 (47)	.83
Married (%)	294 (60)	168 (54)	.03
Non-Hispanic White (%)	444 (90)	260 (83)	<.01
College graduate or higher (%)	230 (47)	117 (38)	.01
Income (\$) (%)			
< 20,000	57 (13)	47 (18)	.13
20,000–49,999	133 (31)	92 (35)	
50,000–100,000	149 (35)	79 (30)	
>100,000	88 (21)	43 (17)	
<i>Clinical</i>			
Mean Body Mass Index (BMI), kg/m <sup>2</sup>	31 (6)	30 (7)	.42
Type of AF (%)	301 (61)	169 (54)	.15
Paroxysmal	152 (31)	105 (34)	
Persistent-Permanent			
Time since AF Diagnosis, mean, years (SD)	5 (4)	5 (5)	.75
Type of AC (%)			
Warfarin	265 (56)	180 (59)	.4
Direct Oral Anticoagulants	206 (44)	123 (41)	
Medical History (%)			
Alcohol Use	169 (34)	103 (33)	.70
Anemia	138 (28)	111 (36)	.03
Asthma/COPD	117 (24)	85 (27)	.27
Diabetes	125 (25)	86 (27)	.49
Heart Failure	157 (32)	130 (42)	<.01
Hypertension	442 (89)	286 (91)	.38
Major Bleeding	78 (16)	67 (21)	.04
Myocardial Infarction	99 (20)	58 (19)	.60
Peripheral vascular disease	67 (14)	45 (14)	.74
Renal Disease	116 (23)	103 (33)	<.01
Stroke/TIA	49 (10)	30 (10)	.88
Risk Scores (M, SD)			
CHA <sub>2</sub> DS <sub>2</sub> -VASC	4.3 (1.6)	4.5 (1.5)	.08
HAS-BLED	3.1 (1)	3.3 (1)	.07
Charlson Comorbidity Index (M, SD)	6 (2)	6 (2)	0.07
<i>Psychosocial and Geriatric</i>			
Frailty (%)	200 (40)	86 (28)	<.001
Not frail	257 (52)	175 (56)	
Pre-frail	37 (7)	52 (17)	
Frail	154 (31)	146 (47)	<.001
Cognitive Impairment (MOCA ≤23) (%)	56 (11)	43 (14)	.31
Social Isolation (%)			
Depression (PHQ-9 ≥ 5) (%)	112 (23)	99 (32)	<.01
Anxiety (GAD-7 ≥5) (%)	100 (20)	82 (26)	.05
Fall in Past 6 Months (%)	94 (19)	72 (23)	.17
Sensory Deficits (%)			
Visual Impairment	150 (30)	112 (36)	.12
Hearing Impairment	160 (32)	11 (36)	.40
<i>Health Behavior (%)</i>			
Current smoker	12 (2)	7 (2)	.46
<i>Provider Type (%)</i>			
Internist	7 (1)	8 (3)	.19
Cardiologist	229 (46)	128 (41)	
EP Specialist	258 (52)	177 (57)	

COPD = Chronic Obstructive Pulmonary Disease; TIA = transient ischemic attack; CHA<sub>2</sub>DS<sub>2</sub>-VASC = stroke risk assessment; HASBLED = bleeding risk assessment; MOCA = Montreal Cognitive Assessment; PHQ-9 = Patient Health Questionnaire-9; GAD-7 = General Anxiety Disorder-7.

TABLE 2.  
Participant reported elements according to engagement in shared decision-making for stroke prevention

<i>Patient Reported Outcomes</i>	<i>Patient Engagement</i>		<i>P Value</i>
	<i>Yes (N=494)</i>	<i>No (N=313)</i>	
<i>AFEQT</i>			
Score (M, SD)	81 (17)	79 (17)	.20
<i>ACTS</i> (M, SD)			
Burden Score	17 (5.5)	17 (5.8)	.80
Benefit Score	11 (4)	11 (4)	
<i>Confidence in Physician Interactions (PEPPI<math>\geq</math>45) (%)</i>	341 (70)	195 (64)	.08
<i>JAKQ Score (M, SD)</i>	0.7 (0.2)	0.6 (0.2)	<.001
<i>TTR (warfarin), mean, time (SD)</i>	0.5 (0.4)	0.6 (0.4)	.49
<i>Knowledge of AF Stroke Risk (%)</i>			
No knowledge	23 (5)	43 (14)	<.001
Little/Some knowledge	253 (52)	188 (60)	
Very knowledgeable	215 (44)	81 (26)	
<i>Self-Reported Bleeding (%)</i>	34 (7)	22 (7)	.97

AFEQT = Atrial Fibrillation Effect on Quality-of-life; ACTS = Anticoagulation Treatment Satisfaction; PEPPI = perceived efficacy in patient-physician interactions; JAKQ = Jessa Atrial fibrillation Knowledge Questionnaire; TTR = time in therapeutic range.

reported that they had engaged in the decision regarding OAC therapy initiation. Differences between these studies and ours could be explained by differences in sample size, sociodemographic and clinical characteristics of the respective study populations, and the approach used to assess patient engagement regarding OAC therapy.

We observed that older participants were less likely to engage in the decision regarding OAC therapy initiation. Our finding is similar to other studies in varying patient populations that have shown that older patients are less likely to engage in SDM and are more likely to defer to their provider in decisions regarding OAC management.<sup>(35)</sup> It is important to note that health-care providers often face challenges when engaging older patients in SDM due to their multiple chronic comorbid conditions and higher likelihood of polypharmacy.<sup>(36)</sup> In addition, older patients prefer to play a passive role in the decision-making process.<sup>(37)</sup> Since the prevalence of AF increases with advancing age,<sup>(38)</sup> health-care providers should more actively focus on including older adults in the decision-making process for OAC therapy initiation. Despite the paternalistic approach in therapy that may be used when dealing with older adults, SDM remains the best approach in treating patients with AF.<sup>(16)</sup>

Our findings also showed that cognitively impaired patients with NVAf were less likely to engage in SDM, results which are consistent with the literature.<sup>(39)</sup> While physicians may be skeptical to engage these patients in the decision-making process, the use of decision aids may be helpful.<sup>(40)</sup> To optimize prescribing for older adults with cognitive impairment, it is important for providers to pursue SDM in this patient population, as most SDM encounters are initiated by the provider.<sup>(41)</sup>

In the present study, participants who reported being very knowledgeable of their AF associated stroke risk were

more likely to engage in SDM for stroke prevention. In the ORBIT II study, patients who self-reported understanding the different blood thinner options available were also more likely to be part of a SDM process.<sup>(33)</sup> Patient preference to be involved in the decision-making process has been shown to be influenced by the amount of knowledge that patients have about their medical condition.<sup>(42)</sup> In addition, it remains unclear whether the process of engagement occurs mainly with highly knowledgeable participants or that the process itself increases knowledge, since SDM improves patients' understanding of the disease to provide the means for optimal decision-making.<sup>(43)</sup> It is important to note that the level of education may not always translate to being knowledgeable about one's condition. Providers may need to use simple terms, avoid medical jargon, and spend more time assessing patient's knowledge of their disease.

Patient decision tools have been shown to improve patient knowledge of OAC therapy and help patients make definitive choices regarding which OAC to take.<sup>(11,44)</sup> Patient-provider communications need to be fostered to improve patient engagement in their OAC treatment decision-making process. In our study, nearly all participants (97%) were still on OAC therapy at the Year 1 follow-up; this increased level of OAC adherence, coupled with a largely medically literate patient population, may help explain the high level of engagement observed.

We observed that two out of every five study participants did not engage in the SDM process and this gap in the treatment approach for stroke prevention is of considerable concern. We also found that among those who did not engage, nearly one-third desired to be more involved, which places the onus on clinicians to make greater efforts to engage these patients. It is also worth investigating why two-thirds of those

TABLE 3.  
Baseline characteristics of participants who reported no patient engagement  
in shared decision-making according to their desire to be involved (Yes vs. No)

<i>Baseline Characteristics</i>	<i>Want to be more involved (N= 60)</i>	<i>Don't want to be more involved (N=141)</i>	<i>P Value</i>
<i>Sociodemographic</i>			
Age, mean, years (SD)	75.4 (6)	77.3 (7)	.06
Female Sex (%)	30 (50)	64 (45)	.55
Married (%)	21 (35)	83 (59)	<.01
Non-Hispanic White (%)	42 (70)	117 (83)	.04
≥College graduate	20 (34)	46 (33)	.86
Income (\$) (%)			
< 20,000	8 (16)	24 (20)	.55
20,000–49,999	18 (37)	48 (40)	
50,000–100,000	12 (25)	32 (27)	
>100,000	11 (23)	16 (13)	
<i>Clinical</i>			
Mean Body Mass Index (BMI), kg/m <sup>2</sup>	29 (7)	30 (7)	.53
Type of AF (%)			
Paroxysmal	41 (68)	65 (46)	.02
Persistent-Permanent	14 (23)	53 (38)	
Time since AF Diagnosis, mean, years (SD)	5 (5)	5 (4)	.56
Type of AC (%)			
Warfarin	31 (54)	86 (63)	.25
DOAC	26 (46)	50 (37)	.38
<i>Medical History</i>			
Alcohol Use	17 (28)	50 (36)	.32
Anemia	27 (45)	44 (31)	.06
Asthma/COPD	16 (27)	36 (26)	.87
Diabetes	17 (28)	34 (24)	.53
Heart failure	28 (47)	63(45)	.80
Hypertension	52 (87)	126 (89)	.59
Major Bleeding	16 (27)	29 (21)	.34
Myocardial Infarction	8 (13)	31 (22)	.14
Peripheral vascular disease	7 (12)	20 (14)	.63
Stroke/TIA	5 (8)	18 (13)	.37
Renal Disease	18 (30)	58 (41)	.14
<i>Risk Scores (M, SD)</i>			
CHA <sub>2</sub> DS <sub>2</sub> -VASc	4.4 (2)	4.6 (2)	.37
HAS-BLED	3.3 (1)	3.4 (1)	.68
Charlston Comorbidity Index (Mean, SD)	6 (2)	6 (3)	.12
<i>Psychosocial and Geriatric</i>			
<i>Frailty (%)</i>			
Not Frail	15 (25)	33 (23)	.91
Pre-frail	35 (58)	81 (57)	
Frail	10 (17)	27 (19)	
Cognitive Impairment (MOCA ≤23) (%)	26 (43)	72 (51)	.32
Social Isolation (%)	5 (8)	19 (13)	.39
Depression (PHQ-9 ≥ 5) (%)			
Anxiety (GAD-7 ≥ 5) (%)	23 (38)	44 (31)	.33
Fall in Past 6 Months	17 (28)	33 (23)	.46
Sensory Deficits (%)	18 (30)	24 (17)	.04
Visual Impairment			
Hearing Impairment	18 (30)	51 (36)	.42
<i>Knowledge of AF Stroke Risk</i>			
No knowledge	10 (17)	22 (16)	.47
Little-Some knowledge	35 (58)	71 (51)	
Very knowledgeable	15 (25)	47 (34)	

TABLE 3. Continued

<i>Baseline Characteristics</i>	<i>Want to be more involved (N= 60)</i>	<i>Don't want to be more involved (N=141)</i>	<i>P Value</i>
<i>Psychosocial and Geriatric (continued)</i>			
AFEQT	72 (20)	81 (17)	<.01
Score (M, SD)			
ACTS (M, SD)	18 (7)	16 (6)	.05
Burden Score	10 (3)	11 (4)	.09
Benefit Score			
Confidence in Physician Interactions (PEPPI $\geq$ 45)	30 (53)	99 (72)	.01
<i>Health Behavior</i>			
Current smoker	0 (0)	4 (3)	.06
<i>Provider Type</i>			
Internist	2 (3)	3 (2)	.44
Cardiologist	20 (33)	60 (43)	
Electrophysiologist Specialist	38 (63)	78 (55)	

COPD = Chronic Obstructive Pulmonary Disease; TIA = transient ischemic attack; CHA2DS2-VASc = stroke risk assessment; HASBLED: bleeding risk assessment; MOCA = Montreal Cognitive Assessment; PHQ-9 = Patient Health Questionnaire-9; GAD-7 = General Anxiety Disorder-7; AFEQT = Atrial Fibrillation Effect on Quality-of- life; ACTS = Anticoagulation Treatment Satisfaction; PEPPI = perceived efficacy in patient-physician interactions.

who did not engage in SDM for OAC therapy did not want to be more involved in this process. Understanding factors that affect patient preference can help providers involve more patients in the guideline directed treatment approach for optimal patient care. Time constraints in the clinic setting, language barriers, and negative attitudes of providers (patriarchal, judgmental) may negatively impact patient engagement and need to be addressed to the extent possible. Interestingly, patients' increased knowledge of OAC has been shown to have a positive influence on adherence to OAC.<sup>(45)</sup> That being the case, we emphasize the need to increase guideline directed approaches for engaging patients in the decision-making process for stroke prevention which may improve medication adherence and consequently decrease the risk of stroke associated with AF.

### Study Strengths and Limitations

Our study has several strengths. We enrolled a large number of older men and women with NVAF in an ongoing multicenter prospective cohort study. In addition, our study used standardized, validated, and publicly available tools for a thorough assessment of patient-reported factors that may be associated with patient engagement. However, the results of our study should be considered in light of some potential limitations. First, our study consists mainly of Non-Hispanic white participants, which limits the generalizability of our findings to individuals with more cultural diversity as one's culture may influence how patients engage with their health-care providers. Second, the measure used to assess SDM addresses one of the key steps of SDM which is engaging patients in the decision-making process. This measure has not been validated in other patient populations, and the questionnaire may perform differently in other patient populations with NVAF. Lastly, our onetime

measurement of patient engagement may not be reflective of contemporary changes in patient-provider communication and dynamics. Future longitudinal studies should evaluate the extent of patient engagement in SDM over an extended period of follow-up, to understand changes that may occur over time as patients engage with the health-care system.

### CONCLUSIONS

A considerable proportion of older patients with NVAF did not engage with their providers regarding OAC therapy initiation for stroke prevention. Older age and cognitive impairment were associated with lower likelihood of engagement, and being knowledgeable of AF-associated stroke risk was associated with a greater likelihood of engagement in SDM for stroke prevention. Our findings suggest the need for improved and sustained efforts by health-care providers to ensure better engagement in SDM of older adults with NVAF, especially those expressing interest in a greater level of engagement. Future longitudinal studies should assess the extent to which a lack of patient engagement may impact long-term patient-centered and clinical outcomes.

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### CONFLICT OF INTEREST DISCLOSURES

The authors declare that no conflicts of interest exist.

TABLE 4.  
Factors associated with patient engagement in shared decision-making for stroke prevention

<i>Characteristics</i>	<i>Patient Engagement</i>	
	<i>Model 1<sup>a</sup></i>	<i>Model 2<sup>b</sup></i>
	<i>Adjusted OR (95% CI)</i>	<i>Adjusted OR (95% CI)</i>
<i>Sociodemographic</i>		
Age (yrs)	Reference	Reference
<70	0.78 (0.53, 1.16)	0.85 (0.56, 1.29)
70–79	0.44 (0.27, 0.72)	0.53 (0.31, 0.89)
80+	0.90 (0.62, 1.29)	1.01 (0.69, 1.47)
Sex (Male vs. Female)	1.00 (0.71, 1.41)	1.04(0.73, 1.49)
Married (No vs. Yes)	1.34 (0.82, 2.20)	1.36(0.81, 2.27)
Non-Hispanic White (Yes vs. No)	1.19 (0.86, 1.66)	1.03(0.73, 1.47)
College Graduate (Yes vs. No)		
<i>Clinical</i>		
Body Mass Index (BMI)	1.01 (0.98, 1.03)	1.00 (0.98, 1.03)
Type of AF		
Paroxysmal	Reference	Reference
Persistent	0.89 (0.62, 1.30)	0.93 (0.63, 1.36)
Permanent	0.89 (0.46, 1.74)	0.91 (0.46, 1.81)
Time since AF Diagnosis	1.00 (1.00, 1.00)	1.00 (1.00, 1.00)
Type of AC (warfarin vs. other)	0.90 (0.65, 1.26)	0.87 (0.61, 1.23)
Medical History		
Stroke	0.94 (0.51, 1.70)	0.86 (0.46, 1.59)
Heart Failure	0.80 (0.53, 1.20)	0.79 (0.52, 1.20)
Bleeding	0.75 (0.47, 1.18)	0.78 (0.49, 1.25)
Anemia	0.87 (0.61, 1.24)	0.85 (0.59, 1.22)
Renal Disease	0.78 (0.51, 1.18)	0.84 (0.55, 1.30)
Risk Scores		
HAS-BLED	1.01 (0.82, 1.24)	0.98 (0.80, 1.22)
CHA <sub>2</sub> DS <sub>2</sub> -VASc	1.13 (0.98, 1.32)	1.19 (1.02, 1.39)
<i>Geriatric Elements</i>		
Frailty		
Not Frail	Reference	Reference
Prefrail	0.87 (0.61, 1.25)	0.88 (0.61, 1.27)
Frail	0.58 (0.32, 1.06)	0.61 (0.33, 1.16)
Cognitive Impairment	0.69 (0.49, 0.98)	0.69 (0.48, 0.99)
Depression	0.88 (0.58, 1.32)	0.83 (0.54, 1.27)
Anxiety	0.70 (0.46, 1.07)	0.75 (0.49, 1.16)
<i>Provider Type</i>		
Electrophysiologist	Reference	Reference
Cardiologist	1.20 (0.86, 1.67)	1.07(0.76, 1.51)
Internist	0.51 (0.16, 1.56)	0.51 (0.16, 1.61)
<i>Patient Reported Outcomes</i>		
Knowledge of Stroke Risk		
No knowledge		Reference
Little-Some knowledge		1.82 (0.99, 3.35)
Very knowledgeable		3.06 (1.59, 5.90)
AF Knowledge (JAKQ Score)		2.32 (0.72, 7.44)
Confidence in Physician Interactions (PEPPI $\geq$ 45)		1.19 (0.84, 1.68)

<sup>a</sup>Adjusting for sociodemographic, clinical elements, geriatric elements, and provider type.

<sup>b</sup>Model 1+ PEPPI, JAKQ, and Knowledge of Stroke Risk.

JAKQ = Jessa Atrial fibrillation Knowledge Questionnaire; PEPPI = perceived efficacy in patient-physician interactions.



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