



What does it really take to change clinical practice? Exploring the uptake of oral anticoagulation prescription in the emergency department



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Research Question

Does a multidisciplinary emergency department (ED)-based intervention, using patient educational materials and oral anticoagulation (OAC) toolkits with immediate F/U by a community-based clinic dedicated to the care of atrial fibrillation (AF), improve emergency physician prescription of new OAC for patients presenting to the ED with AF?

Study Design and Population

- Prospective multicenter cohort study with a 'before-after' design
- 5 Canadian EDs - patients who present to the emergency department (ED) with atrial fibrillation (AF)

Setting:

- EDs in BC (Lions Gate), NB (Moncton) and NS (three EDs in Halifax)
- Patients who present with AF to the ED

Study Population

- Patients presenting to the ED with ECG-confirmed atrial fibrillation

Exclusion criteria:

- Unable to provide informed consent
- Life expectancy of < 6 months
- Known rheumatic heart disease
- Prosthetic or mechanical mitral or aortic valve
- Would be admitted to hospital
- Metastatic malignancy
- Resides outside of the community served by the participating ED

Study Intervention

Four phases over 19 months:

Phase 1: Control Data Collection

- Retrospective ED chart review of patients discharged with a diagnosis of AF to determine OAC utilization. 120 consecutive patients per site.

Phase 2: Low-intensity KT Intervention, 6 months

- Educational toolkit given to patient in ED
- OAC prescription in ED using tool provided to ED physicians
- Family physician letter

Phase 3: High-intensity KT Intervention, 6 months

- Phase 2 plus AF clinic

Phase 4 (Knowledge uptake and change in practice): Uptake, 6 months

- ED chart review of patients discharged with a diagnosis of AF to determine OAC utilization

Tool for ED Physicians

1

Oral Anticoagulation (if pt on OAC, skip to step 2)

If **any** of the following are present, prescribe oral anticoagulation:

- Age \geq 65
- Hypertension
- Diabetes
- Heart failure
- Prior stroke/TIA

If any of the following are present, do **not** prescribe a DOAC*, warfarin may be considered, see below:

- Age > 80
- Platelets < 110
- INR > 1.5 (or known cirrhosis)
- Alcoholism
- Creatinine \geq 100 μ mol/L (Cr clearance \leq 40 mL/min)
- Any bleeding resulting in hospitalization or transfusion



If one inclusion is met **and** no exclusions are present, then begin one of the following*:

- Rivaroxaban 20 mg po od (15 mg po od if Cr clearance 40-50 mL/min)
- Apixaban 5 mg po bid
- Dabigatran 150 mg po bid (110 mg po bid for age >75 with an additional risk for bleeding)

* Warfarin may be considered in those who meet criteria for oral anticoagulation but have an exclusion for a DOAC without a high risk of bleeding (normal platelets, INR and no bleeding resulting in hospitalization or transfusion, no alcoholism).

2

Give AF education kit to patient

3

Verbal Consent

Briefly discuss the C-CUSP ED Study and ask if the patient agrees to be contacted about the study.

- Patient agreed → complete below & continue to step 4, 5. Patient declined → go to step 5

Physician Signature: _____

Print Family Physician's name: _____ No family physician

4

Your Rx:

- None ASA _____ mg po od Warfarin _____ mg po od
 Dabigatran _____ mg po bid Rivaroxaban _____ mg po od Apixaban _____ mg po bid

Unable to prescribe DOAC (no drug plan) Not applicable, pt already on OAC

Rate/rhythm control: _____

5

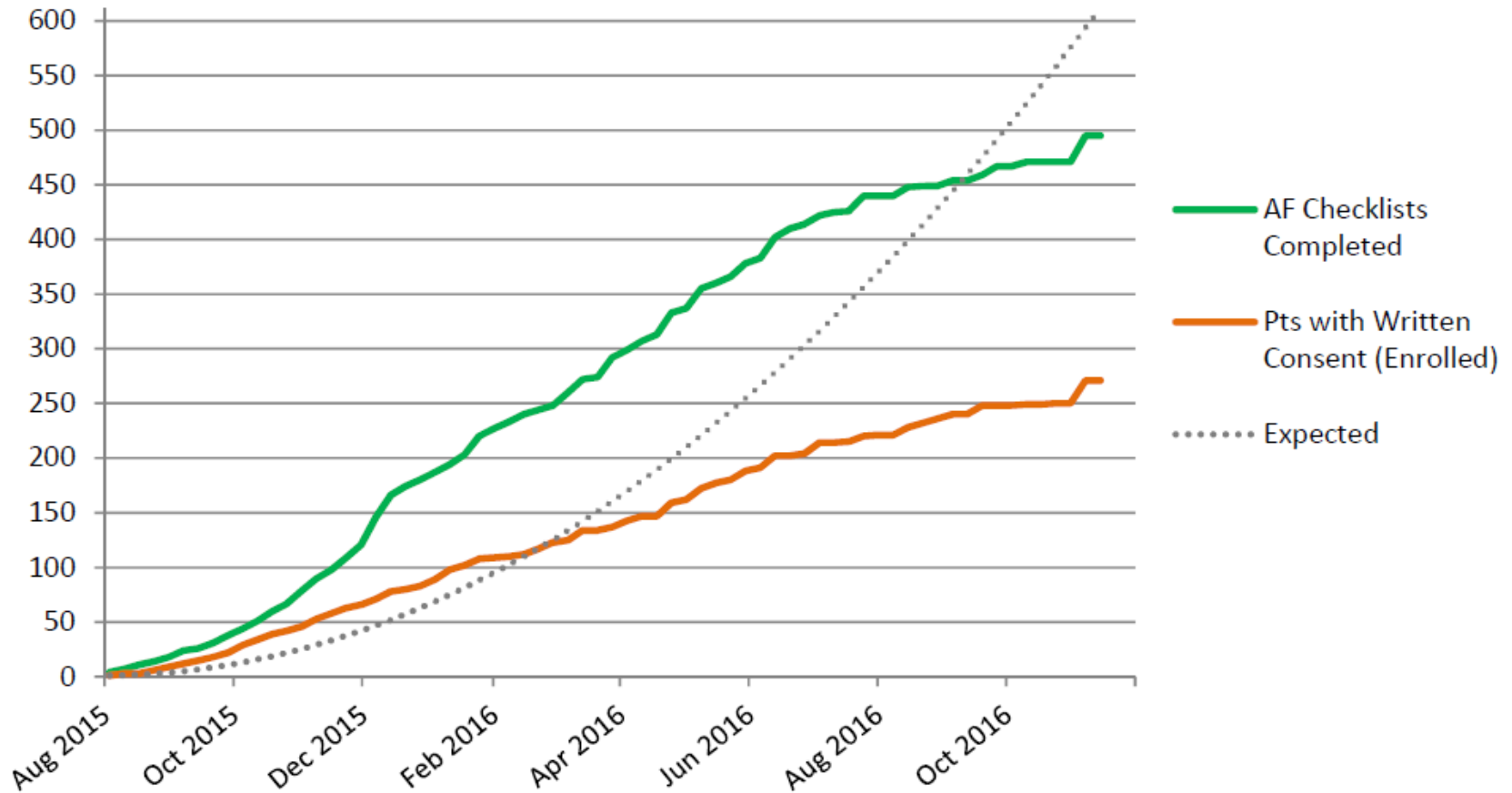
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Outcomes

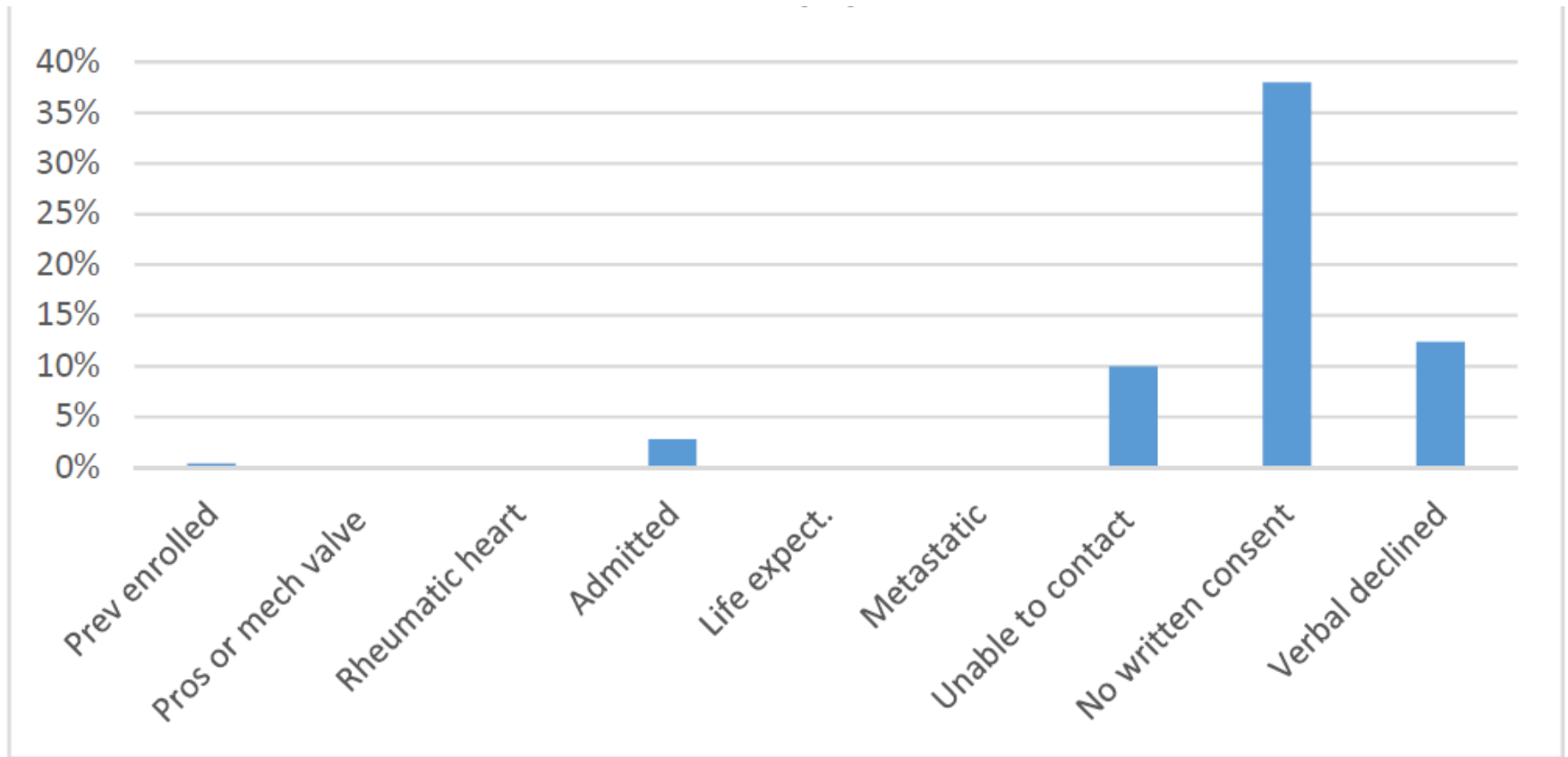
- **Rate of new OAC prescriptions at ED discharge in AF patients who are OAC eligible, but not on OAC at ED presentation**
- Comparison between Phase 1 and Phase 3 for the primary analysis
- Other:
 - Feasibility: uptake of AF education in the ED
 - Patient outcomes: knowledge transfer, quality of life
 - ED Physician outcomes: focus groups pre and post, feedback on intervention
 - Family Physician feedback

Recruitment

C-CUSP ED Study: Recruitment Overall, Phase 2 & 3 Combined



Reasons not enrolled



Baseline Characteristics

Total population

	Phase 1 (n=360)	Phase 2 (n=146)	Phase 3 (n=126)	P value
Age (years) - mean±SD	70.8±15.1	66.6±11.8	67.4±12.6	0.003
Gender (male), n(%)	199 (55.3)	64 (43.8)	69 (54.8)	0.044
BMI (kg/m ²) – median (IQR)	-	27.4 (24.2,31.4)	28.7 (25.0, 33.3)	0.15
Primary diagnosis of AF, n(%)	236 (65.6)	130 (89.0)	113 (89.7)	<0.001
Heart rate (bpm) - mean±SD	107±30	116±31	113±33	<0.001
New onset of AF, n(%)	81 (22.5)	69 (47.3)	60 (47.6)	<0.001
CHADS ₂ score – median (IQR)	1.0 (0,2)	1.0 (0,2)	1.0 (0,2)	0.665
Hypertension, n(%)	168 (46.7)	90 (61.6)	79 (62.7)	<0.001
Heart failure, n(%)	36 (10.0)	8 (5.5)	7 (5.6)	0.122
Diabetes, n(%)	46 (12.8)	24 (16.4)	18 (14.3)	0.555
Stroke/TIA, n (%)	38 (10.6)	15 (10.3)	16 (12.7)	0.770
Vascular disease, n(%)	47 (13.1)	8 (5.5)	10 (7.9)	0.025
Alcohol, n(%)	16 (4.4)	9 (6.2)	10 (7.9)	0.314

Baseline Characteristics

age \geq 65 and/or CHADS₂ \geq 1

	Phase 1 (n=120)	Phase 2 (n=74)	Phase 3 (n=72)	P value
Age (years) - mean \pm SD	74.7 \pm 12.4	68.2 \pm 10.7	69.7 \pm 9.3	<0.001
Gender (male), n(%)	62 (51.7)	29 (39.2)	37 (51.4)	0.194
BMI (kg/m ²) – median (IQR)	-	27.6 (24.0,32,0)	28.8 (25.1, 32.3)	0.402
Primary diagnosis of AF, n(%)	88 (73.3)	69 (93.2)	68 (94.4)	<0.001
Heart rate (bpm) - mean \pm SD	112 \pm 28	121 \pm 31	115 \pm 29	0.139
New onset of AF, n(%)	56 (46.7)	51 (68.9)	47 (65.3)	0.003
CHADS ₂ score – median (IQR)	1.0 (1,2)	1.0 (1,2)	1.0 (1,2)	0.830
Hypertension, n(%)	64 (53.3)	57 (77.0)	52 (72.2)	0.001
Heart failure, n(%)	8 (6.7)	3 (4.1)	3 (4.2)	0.733
Diabetes, n(%)	20 (16.7)	15 (20.3)	13 (18.1)	0.818
Stroke/TIA, n (%)	14 (11.7)	5 (6.8)	7 (9.7)	0.535
Vascular disease, n(%)	9 (7.5)	3 (4.1)	6 (8.3)	0.580
Alcohol, n(%)	8 (6.7)	4 (5.4)	7 (9.7)	0.577

AF checklist Uptake in the ED: Target 50% - Not Achieved

Phase 2

Site	Total AF patients in ED	AF checklists received
Halifax area (all 3 EDs)	271	130 (47.9%)
Moncton	267	79 (29.5%)
Lions Gate	778	50 (6.4%)
TOTAL	1,316	259 (19.7%)

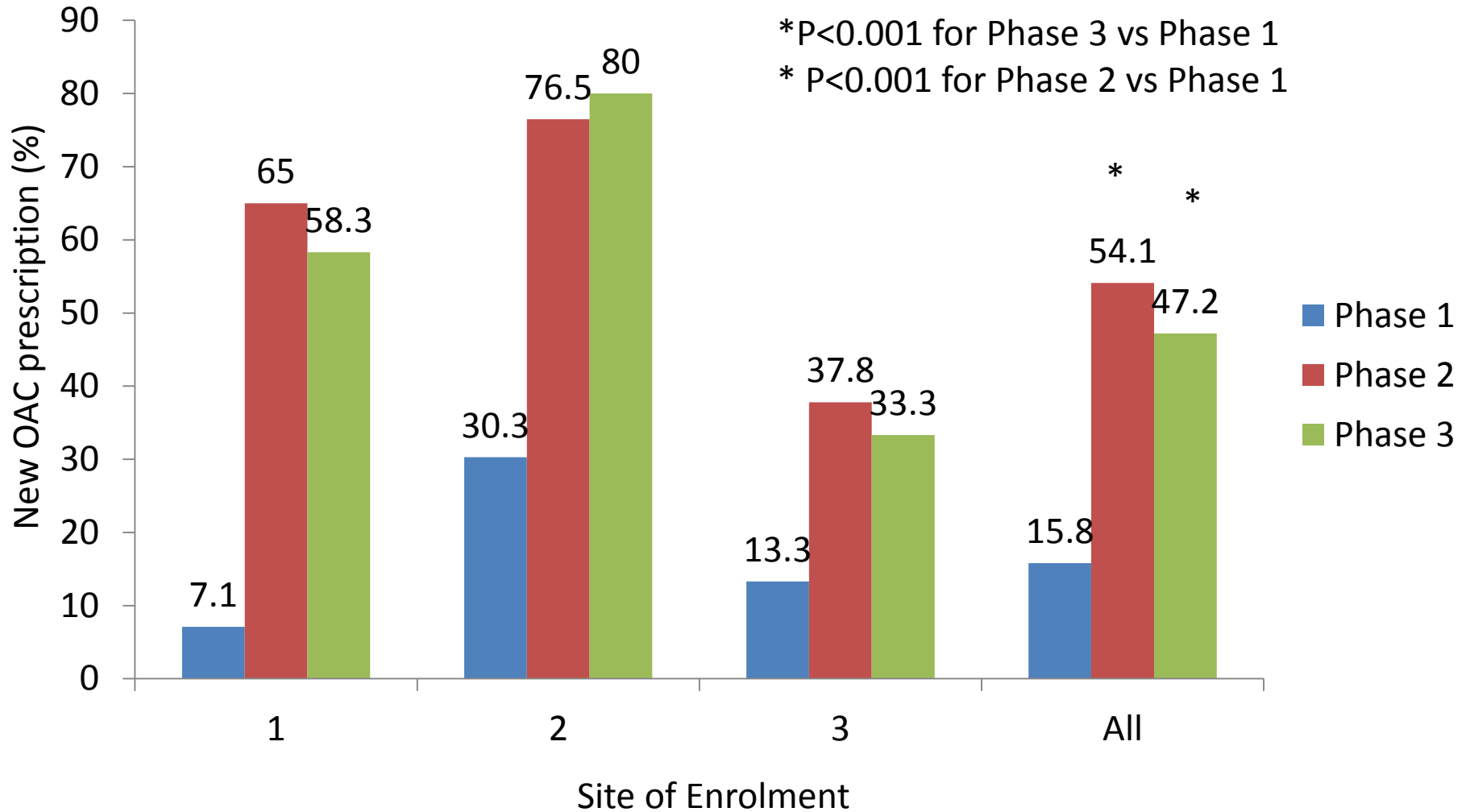
Phase 3

Site	Total AF patients in ED (phase 3)	AF checklists received (phase 3)
Halifax area (all 3 EDs)	396	119 (30.0%)
Moncton (2 EDs)	384	47 (12.2%)
Lions Gate	1,146	70 (6.1%)
TOTAL	1,926	236 (12.2%)

Process Outcomes

	Phase 2 & 3	Target for success (%)
Received AF education kit, n(%)	150 (94.9)	75
Report reading AF education kit		75
Completely, n(%)	129 (81.6)	
Partially, n(%)	8 (5.1)	
Did not read, n(%)	14 (8.9)	
Seen and referred to AF clinic (phase 3)	115/119 (96.6)	85
Attended educational presentation (phase 3)	20/115 (17.4)	50

New OAC prescription rate in ED by group



Adjusted Analysis

- Model adjusted for age, gender, components of CHADS₂ and CHA₂DS₂-VaSc, prior risk of bleeding and primary diagnosis of AF
- Phase 3 vs 1: OR 8.03 95% CI(3.5,18.29), p<0.001
- Phase 2 vs 1: OR 10.01 95% CI (4.38,22.86), p<0.001
- Phase 3 vs 2: OR 0.80 95% CI (0.39,1.65), p=0.55

Follow up data

	Phase 2 n/N (%)	Phase 3 n/N (%)	Unadjusted OR (95% CI) p value	Adjusted OR (95% CI) p value
OAC medication before ED visit n (%)	0/145 (0.0)	0/126 (0.0)	--	--
OAC medication after ED visit n(%)	40/145 (54.1)	34/126 (47.2)	--	--
OAC at 1 month	43/68 (63.2)	48/67 (71.6)	1.59 (0.76-3.33), p = 0.218	1.57 (0.68-3.61), p = 0.292
OAC at 6 month	46/65 (70.8)	44/55 (80.0)	2.29 (0.93-5.64), p = 0.071	3.12 (1.11-8.79), p = 0.031



**So what changed and
what didn't ... and WHY?**

Unpicking Practice Change

- Pervasive challenges
 - 60% of healthcare decisions are not rooted in an appropriate evidence-base
 - 25% of patients receive unnecessary or potentially harmful care
 - Investment in research that does not reflect ‘real world’ context or practice environments
 - Lengthy delays in the translation of knowledge (17 years)
 - Implementation science
 - Behavior change

Unpicking Practice Change

- Implementation
 - Site orientation
 - Educational sessions on best practices and study procedures
 - Weekly meetings with local lead investigators
- Opportunity to examine perceptions of practice and practice change.

C-CUSP ED Focus Groups

- ED physicians from C-CUSP ED study sites
- Focus group one:
 - 4-16 per focus group
 - Six focus groups in total
- Data collection: Before (Phase I)/After (Post-Phase III)
- Semi-structured interviews
 - Perspectives
 - Behavior change
 - Feedback on intervention
- Thematic analysis
 - Theoretical Domains Framework

Theoretical domain	Definition [21]
Knowledge	An awareness of the existence of something
Skills	An ability or proficiency acquired through practice
Social/professional role and identity	A coherent set of behaviours and displayed personal qualities of an individual in a social or work setting
Beliefs about capabilities	Acceptance of the truth, reality, or validity about an ability, talent, or facility that a person can put to constructive use
Optimism	The confidence that things will happen for the best or that desired goals will be attained
Beliefs about consequences	Acceptance of the truth, reality, or validity about outcomes of a behaviour in a given situation
Reinforcement	Increasing the probability of a response by arranging a dependent relationship, or contingency, between the response and a given stimulus
Intentions	A conscious decision to perform a behaviour or a resolve to act in a certain way
Goals	Mental representations of outcomes or end states that an individual wants to achieve
Memory, attention and decision processes	The ability to retain information, focus selectively on aspects of the environment and choose between two or more alternatives
Environmental context and resources	Any circumstance of a person's situation or environment that discourages or encourages the development of skills and abilities, independence, social competence, and adaptive behaviour
Social influences	Those interpersonal processes that can cause individuals to change their thoughts, feelings, or behaviours
Emotion	A complex reaction pattern, involving experiential, behavioural, and physiological elements, by which the individual attempts to deal with a personally significant matter or event
Behavioural regulation	Anything aimed at managing or changing objectively observed or measured actions

Cane, J., O'Connor, D., & Michie, S. (2012). Validation of the theoretical domains framework for use in behaviour change and implementation research. *Implementation science*, 7(1), 37.

Theoretical Domains Framework

CORE DOMAINS:



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graph TD; A[CORE DOMAINS:] --> B[Knowledge]; B --> C[Context and Resources]; C --> D[Social/Professional Role and Identity]; D --> E[Behavioral Regulation];
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Knowledge

Context and
Resources

Social/Professional
Role and Identity

Behavioral
Regulation

ED Physician Perspectives

- Morphing roles
 - AF management was perceived as routine
 - Concerns about starting anticoagulation
 - Chronic disease management versus emergency care

“there was a study a long time ago that showed that people who started warfarin ... immediately in the Emerg room were much more likely to be on Warfarin long-term. So, it was about inertia momentum. And if you start it right away, you’re much more likely to end up with a population who’s on it.”

“there’s so many prime diseases either as an ongoing problem or newly diagnosed, Like hypertension, COPD, asthma. I don’t know about you but I’m not routinely deciding ... ‘you need to start Flovent for your asthma and this is going to be your starting dose. I leave that to the family doctor. And this is very much a similar thing. It’s a chronic disease that needs someone else”

“Everyone’s made the same conclusion that it’s increasingly looking like that probably is our role, our job to do that.”

“knowing there’s a positive outcome or if there’s a negative impact and then what we can do differently ... it would be great information to have”

ED Physician Perspectives

- Decision-making in the ED can be complex
 - Making decisions in isolation
 - Unclear follow up and lines of accountability
 - Anticoagulant use requires reliable and timely follow up

“When I’ve started somebody on warfarin, I don’t think I’ve slept a night”

“if I started NOAC, I’m confident they’ll be anticoagulated but not confident that they won’t have a life-threatening bleed and then if I start warfarin and they don’t have a family doctor and I have no follow up, I’m not confident they’re ever going to be therapeutic to even prevent the stroke. So, you’re kind of stuck in two situations where without follow up, you don’t have the confidence you’re actually doing the best for the patient”.

“what the cardiologists and neurologists think we do is completely, they think they know what we do and we think we know what they do and both of us are wrong. So, it’s easy for both of us to say ‘oh you know you guys see a lot of atrial fib, you guys should do this. But he’s never spent a day in my underpants”.

“we have followed a standard to which the group adheres, therefore we are essentially automatically protected”

ED Physician Perspectives

- Past experiences were influential
 - Commission-Omission tension
 - Perceived lack of ED-specific clinical guidelines for AF
 - Trusted systems of follow up
- “That person could come back in tomorrow or later on that same day with a fatal or a near fatal bleed and you’re going to be questioning yourself, but if the data supported it, it was a correct decision, they just happen to be one of the people that had an adverse outcome. Everything you do has pros and cons to risk”**

“I feel like I see more strokes than I do bleeds ... so that gives me the sense that I probably should be doing this”

“we have followed a standard to which the group adheres, therefore we are essentially automatically protected”

Key Barriers/Enablers

- Education
 - Time constraints
 - Variable supports (e.g. pharmacy)
 - Informed consent
- Patient literacy
 - Poor literacy
 - Limited resources
 - Leveled patient education



“when we’re in the ER and it’s busy, when it becomes complex, I just don’t feel well equipped to have the discussion and I feel that that’s where the real problem lies.

BCIII/52 “it’s very difficult. But even with folks that are native English speakers, just trying to have a sensible discussion when they’re sick”.

Key Barriers/Enablers

- Decision-aids/Tools
 - Standardize their approach
 - Assess risks and benefits quickly
 - Integrated into EMR

“it’s cognitively unnerving. I don’t have to think, I just tick tick tick”

Exploring patient perspectives of an educational KT-intervention to relieve barriers to guideline-indicated AF care in the ED

Rationale

- To explore patient perspectives related to an educational KT-intervention aimed to promote greater uptake of OAC adherence among patients with AF within an ED context
 - Facilitate the development of more responsive educational interventions and tools



Methods

- Brief descriptive survey
 - Phase 2 (n=368)
 - Phase 3 (n=311)
- Focused semi-structured telephone interviews (n=209)
 - audio-recorded and transcribed verbatim
 - analyzed using qualitative data analysis software, NVIVO11

	Phase 2 n/N (%)			Phase 3 n/N (%)		
	Baseline	1 month visit	6 month visit	Baseline	1 month visit	6 month visit
Aware of AF risk	142/145 (97.9)	107/116 (92.2)	-	104/121 (86.0)	95/100 (95.0)	-
Satisfaction with personal understanding of AF						
Very satisfied	99/142 (69.7)	76/116 (65.5)	82/107 (76.6)	89/121 (73.6)	77/100 (77.0)	66/90 (73.3)
Somewhat satisfied	40/142 (28.2)	39/116 (33.6)	22/107 (20.6)	22/121 (18.2)	21/100 (21.0)	22/90 (24.4)
Not satisfied	3/142 (2.1)	1/116 (0.9)	3/107 (2.8)	10/121 (8.3)	2/100 (2.0)	2/90 (2.2)
Satisfaction with medical care received						
Very satisfied	128/145 (88.3)	94/116 (81.0)	87/107 (81.3)	109/121 (90.1)	86/100 (86.0)	69/90 (76.7)
Somewhat satisfied	15/145 (10.3)	17/116 (14.7)	16/107 (15.0)	10/121 (8.3)	12/100 (12.0)	16/90 (17.8)
Not satisfied	2/145 (1.4)	5/116 (4.3)	4/107 (3.7)	2/121 (1.7)	2/100 (2.0)	5/90 (5.6)
Received AF information Kit	141/145 (97.2)	-	-	111/121 (91.7)	-	-
Read the information provided						
Completely	119/141 (84.4)	-	-	92/111 (82.9)	-	-
Partially	10/141 (7.1)	-	-	12/111 (10.8)	-	-
Did not read	12/141 (8.5)	-	-	7/111 (6.3)	-	-
Satisfaction with kit						
Very satisfied	111/129 (86.0)	-	-	100/103 (97.1)	-	-
Somewhat satisfied	16/129 (12.4)	-	-	3/103 (2.9)	-	-
Not satisfied	2/129 (1.6)	-	-	0/103 (0.0)	-	-
Viewed the video	-	-	-	21/109 (19.3)	-	-

Knowledge and Education

“It explained things. The thing is I think you’ve got to remember too that when you’re sending those to the average person, if you start to use too many medical terms, they don’t understand what it is and then they just turn it off.” (P0041)

“Actually I found that the handout was very simple. Like no large words that you had to contend with. It was all written as if someone in grade 9 and 8 could read it. Not that I find that insulting. I think that’s great because these big words you guys all learn to use, we’re looking at you going what is that?” (P0257)

“I didn’t find it that helpful. But the only thing is that it referred me to another website which I went into and read a little bit from there.” (P0139)

Positive Experiences

“Well, the doctor that I mentioned to you, I found very helpful. She was gentle with my spirit, which is something that I need. And she treated me like I was a partner in this, which is also something that I need. I don't want to be treated like a 4-year-old and don't appreciate when that happens. Which is my difficulty with my family doctor. So yeah, so I tend not to go to her for much of anything.” (P0031)

“Oh gosh, yes, even the drugstore, the pharmacist. Because I've been going there for years. And they were very helpful. You know, asking me how I was and did I need any help.” (P0057)

“The nurse who gave the public information session...I found her to be extremely helpful. She presented in a very good way that made it perfectly clear, and gave adequate time for questions, answered everything. She was absolutely an expert, you could tell. Which was very helpful.” (P0201)

Challenges of having AF and OAC

“You know, Pharmacare doesn’t cover. And for those of us that doesn’t have private insurance, it’s a bit much - \$103.” (P0043)

“I’m still getting used to the medication. I’m having a hard time... Not a hard time but to me, the medicine is...it has more of an effect on me than the atrial fibrillation itself. So my body is still adjusting to it ... it makes me tired.” (P0091)

“I’m embarrassed too because out of the trips, so it might have been more than 5. Two of them, by the time I got in there, everything had settled down on their own. And so that was rather embarrassing to be in there. But they at least knew that I do have a problem with that. So that sort of made me hesitant too to go in again.” (P0022)

Key Messages

Changing practice is complex

- Implementation considerations
- Professional considerations
- Practical considerations

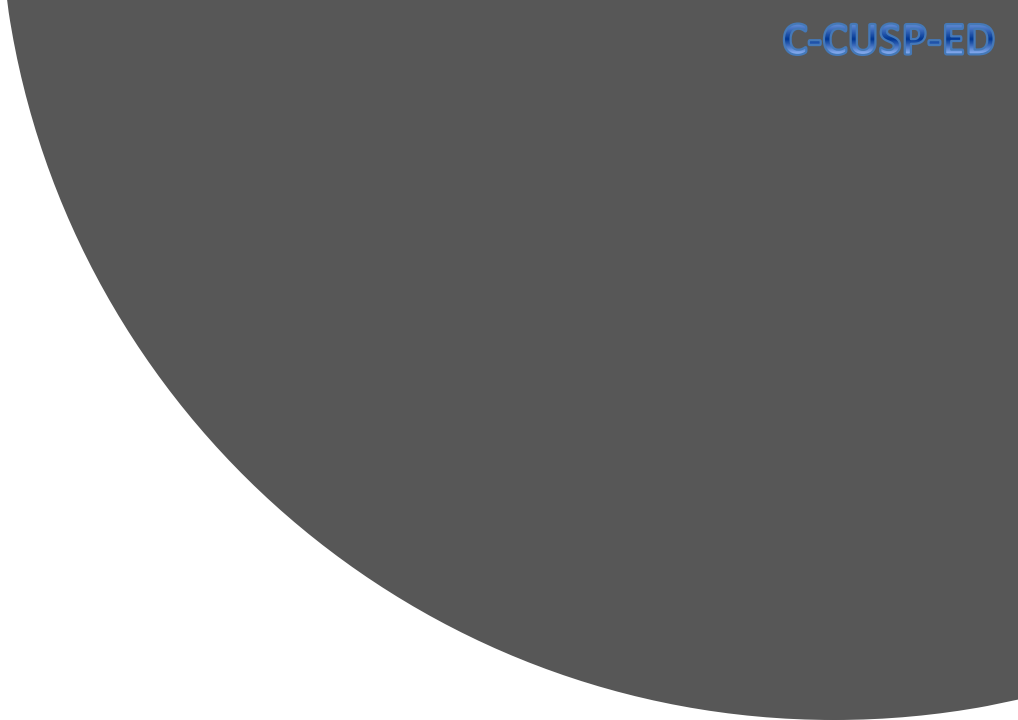
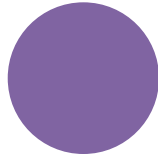
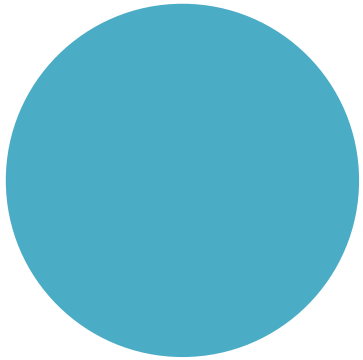
Key Messages



Simple KT interventions
can be effective in
fostering evidence-
based practice



Multi-prong approach
to patient education



More information?
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