SCREENING FOR ATRIAL FIBRILLATION IN CANADIAN PHARMACIES IS COST-EFFECTIVE

Jean-Eric Tarride PhD, Lisa Dolovich PharmD MSc, Gordon Blackhouse MSc, MBA, Jason Guertin PhD, Natasha Burke MSc, Veena Manja MD MSc, Alex Grinvalds BSc, Ting Lim MSc, Jeff Healey MD MSc, Roopinder Sandhu MD MPH

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Disclosure

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Outline

- Background and objectives
- Methods and cost effectiveness results
- Discussion and conclusions
- Questions and Answers
BACKGROUND AND OBJECTIVES
AF is a major public concern

- More than 25% of Canadians aged 75 years and older will develop atrial fibrillation (AF), an abnormal rhythm of the heart.
- AF is a leading cause of strokes with an estimated 15% of all strokes due to AF.
- AF-related strokes are preventable with oral anticoagulation therapy (OAC).
- AF is often unrecognized or known.
Canadian Stroke Prevention Intervention Network

Goal
The Canadian Stroke Prevention Intervention Network (C-SPIN) will develop actionable strategies that will make Canada a global leader in clinical stroke research; ensure sustainability of these efforts through strategies to recruit, train, support, and retain clinical scientists; and, in collaboration with other networks, government, and stakeholder groups, implement strategies to reduce the incidence of embolic stroke in Canada by 10% within ten years.

Health burden addressed
Atrial Fibrillation (AF), an abnormal rhythm of the heart, is an ongoing epidemic with a clear relationship to stroke and dementia. AF causes 15% of the 50,000 strokes suffered in Canada each year. The prevalence of AF and the proportion of strokes attributable to AF increases substantially with advancing age and more than 25% of Canadians over age 75 will develop AF, making AF-associated stroke a critical public health issue and a burden for patients and their families.

Approach
C-SPIN brings together a nation-wide multidisciplinary team of cardiologists, neurologists, cardiac surgeons, emergency room physicians, family practitioners, pharmacists, statisticians, methodologists, knowledge translation (KT) experts, and population scientists to pursue a common goal of a major reduction in stroke by means of shared expertise, resources, and harmonized research efforts. C-SPIN will also support the recruitment and retention of the next generation of Canadian clinical researchers in this field. C-SPIN will answer challenging questions that will revolutionize our understanding of AF and stroke, improve healthcare strategies, and reduce the rate of stroke among Canadians.

Key Investigators

<table>
<thead>
<tr>
<th>Name</th>
<th>Role in C-SPIN</th>
<th>Main Affiliation</th>
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<tbody>
<tr>
<td>Dr. Jeff Healey</td>
<td>PI and Chair of the Canadian Stroke Prevention Intervention Network (C-SPIN)</td>
<td>McMaster University and Hamilton Health Sciences</td>
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<tr>
<td>Dr. Stuart Connelly</td>
<td>Executive Committee, Theme Leader (Clinical)</td>
<td>McMaster University and Hamilton Health Sciences</td>
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<td>Dr. Richard Whitlock</td>
<td>Theme Leader (Clinical)</td>
<td>McMaster University and Hamilton Health Sciences</td>
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<td>Dr. Robert Hart</td>
<td>Theme Leader (Clinical)</td>
<td>McMaster University and Hamilton Health Sciences</td>
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<tr>
<td>Dr. Robby Nieuwlaat</td>
<td>Theme Leader (Health Services and Systems)</td>
<td>McMaster University and Hamilton Health Sciences</td>
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C-SPIN TRIALS: 3 AF screening trials and 2 stroke prevention in AF trials

AF Screening

- PIAFF Pharmacy
  - Spring 2015
- PIAFF Home
  - 2016
- PIAFF Family Practice
  - 2016

C-SPIN ECONOMIC MODELS

Stroke Prevention in AF

- ARTESiA
  - Spring 2019
- C-CUSP (ED)
  - 2016
1,131 seniors were screened for AF, diabetes and hypertension in 30 pharmacies in Alberta and Ontario

Prevalence of ‘Actionable’ AF = 2.5%.

96% were new AF (2.4%).

“Actionable AF” defined as those with (i) previously unrecognized AF and (ii) known AF but not taking OAC medication.
What is the economic value of screening for AF in pharmacies?

- To better inform decision-makers about the value of screening AF in Canadian pharmacies, we conducted an economic evaluation of the PIAAF-Pharmacy Study.
METHODS
Study Overview

- Decision analytic techniques were used to estimate the short- and long-term costs and effects associated with screening AF in pharmacy compared to no AF screening.
- This cost-utility analysis was conducted over a lifetime horizon from a payer perspective (e.g. physician, hospitalization and drug costs).
- Costs and Quality Adjusted Life Years (QALYs) were used to compare screening versus no screening.
  - QALYs combine quantity of life with quality of life expressed on a 0-1 scale (0=death and 1= full health)
- Sensitivity analyses were conducted to test the robustness of the results.
Abbreviations: AF-atrial fibrillation, ICH-intracranial hemorrhage, OAC-oral anticoagulants. ICH was further divided into hemorrhagic stroke and non-hemorrhagic stroke.
COST-EFFECTIVENESS RESULTS
Expected Costs per Screened Individual

- AF screening in pharmacy is almost cost-saving compared to no screening
  - Additional cost of screening ($65/pt) and associated OAC treatment costs ($49/pt) are mostly offset by a reduction in the costs of IS (-$144/pt) and increase in ICH ($20/pt) and bleeding ($11).

<table>
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<tr>
<th></th>
<th>Screening</th>
<th>OAC</th>
<th>Ischemic stroke</th>
<th>ICH</th>
<th>Major bleeds</th>
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<td>$168</td>
<td>$53</td>
<td>$21</td>
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<tr>
<td>No Screen</td>
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<td>$0</td>
<td>$312</td>
<td>$33</td>
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<td>Incremental</td>
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<td>$49</td>
<td>-$144</td>
<td>$20</td>
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Abbreviations:
PIAAF-Pharmacy = Program for the Identification of ‘Actionable’ Atrial Fibrillation: in the Pharmacy Setting, OAC = oral anticoagulants, ICH = intracranial hemorrhage
## Cost-Effectiveness Results

- AF screening in pharmacies results in better outcomes compared to no screening in terms of LYs and QALYs.
- The incremental cost ($2) per QALY gained (0.0039) is $375

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Costs</th>
<th>LYs</th>
<th>QALYs</th>
<th>Incremental $/LY gained</th>
<th>Incremental $/QALY gained</th>
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</tr>
<tr>
<td>No Screen</td>
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<td>7.493</td>
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<td>$428</td>
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**Abbreviations:**
- PIAAF-Pharmacy = Program for the Identification of ‘Actionable’ Atrial Fibrillation: in the Pharmacy Setting, LYS = Life Years, QALYs = Quality Adjusted Life Years
Cost-effectiveness acceptability curve

The probability that AF screening is cost-effective is 93% and 95% if the willingness to pay for a QALY gained is $50,000 or $100,000, respectively.
Additional analyses

Following review by CMAJ, 3 changes in model assumptions:

1. Assume that 3% of undiagnosed AF will be detected every year without screening
2. Assume 10% annual discontinuation rate with OACs (Aristotle study: 25% of apixaban patients and 27% of warfarin patients had discontinued treatment after 30 months of treatment; NEJM 2011)
3. Include cost of confirmatory 12-lead ECG and Holter

New ICER: $7,480/QALY gained
DISCUSSION AND CONCLUSIONS
Discussion

- Results robust against changes in key assumptions (i.e. AF screening in pharmacy is dominant or cost-effective).

- Findings consistent with CE of an Australian pharmacy AF screening program of individuals 65 years or older (AUD$5,988/QALY gained or CAN$5,928/QALY gained).

- Limitations: non-comparative study and short period of follow-up (e.g. extrapolations over time)

- Additional benefits of screening such as detection of diabetes and blood pressure were not included, resulting on an underestimation of the benefits.
Conclusions

- Results support that screening for AF among high-risk patients in Canadian pharmacies is feasible and cost-effective.

- Efforts should be made by provincial governments and pharmacies to implement such pharmacy-based programs in Canada (for example during Flu season).