

RECONNECTING THE PIECES TO OPTIMIZE CARE IN **ATRIAL FIBRILLATION:**

A White Paper on the management of AF
patients in Ontario

Centre for Innovation in Complex Care, University Health Network

Dante Morra, Sacha Bhatia, Kori Leblanc, Nazanin Meshkat, Christine Plaza,
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MEET FRANK:

Frank is a 74 year old retired high school principal who lives with his wife and their golden retriever in Smalltown, Ontario. During his annual physical, an electrocardiogram showed that he was in atrial fibrillation. Other than being "more tired than usual", he didn't really feel any symptoms and his heart rate was 95bpm. At that time, his hypertension seemed to be under reasonable control on 3 medications.

His family doctor changed his amlodipine to diltiazem, to help keep his heart rate under control, and he told Frank that he would arrange for him to be seen by a heart specialist and they would contact him with the appointment and since it is not urgent, that it would likely take 8-12 weeks. His family doctor mentioned that he needs an ultrasound of his heart but that the specialist would probably just repeat the test anyway since he wouldn't be able to see the images if the test was done locally, so that could wait as well.

Frank filled his new prescription at his regular pharmacy. The pharmacist asked him why his medication was changing and he replied that it had something to do with his heart rhythm. The pharmacist asked whether his doctor discussed any other medications such as blood thinners with him. Frank replied that he did not, but that he was going to see a specialist. The pharmacist filled his new prescription, explained how to use it and Frank went home.

THE BURDEN OF ATRIAL FIBRILLATION (AF)

AF is the most common cardiac arrhythmia, the incidence of which is growing as the population ages. This disease is a cause of significant mortality and morbidity. Patients with AF account for 15% of all strokes, and are at a significantly increased risk of death due to stroke and heart failure¹.

Of all Ontarians experiencing a stroke related to AF, 60% will be discharged with a new disability while 20% will die². Furthermore, it is estimated that 70-80% of AF patients are admitted to hospital at some point in the course of their disease³. AF is one of

the leading cardiac causes of visits to the Emergency Rooms (ERs) of Ontario hospitals, and from **1993-2004, the number of ER visits specifically related to AF increased by 88%⁴.** Because of the nature of the symptoms of AF, as well as the need for anticoagulation monitoring, this illness can also have a significant negative impact on a patient's quality of life. AF frequently leads to reduced functional capacity, dyspnea, palpitations, fatigue, tachycardia-induced cardiomyopathy, heart failure, and angina. In a study of 152 Ontario patients with intermittent AF using validated quality of life questionnaires, substantially worse quality of life was reported than for healthy control subjects⁵.

AF patients also have significant comorbidities that make their management even more challenging. AF is a disease of age, and as such, AF patients often have other age-related comorbidities, other cardiac problems, and if they have suffered a stroke, may also have neurological problems. Many suffer from diabetes, respiratory disease and other chronic conditions. They often see many specialists, take multiple medications and interact with the healthcare sector at many points.

Five weeks after his appointment, Frank starts to feel a funny fluttering feeling in his chest. He tells his wife that he also is feeling a bit lightheaded. He tries to lie down for an hour but his symptoms don't improve. As it is Saturday night at 10pm, his wife insists that he go to the emergency room but Frank does not want to have to "wait for hours to see a doctor who will just send me home anyway". Three hours later, his symptoms have not changed so he reluctantly visits the local ER.

In the ER his heart rate is 138bpm and all other parameters are stable. After full assessment, the ER MD prescribes an intravenous dose of diltiazem which helps to decrease his heart rate, followed by an increase in his oral medication. He is monitored in ER for 4 hours during which time his heart rate decreases to 92bpm and he is feeling better. The ER MD inquires about whether his family MD discussed blood thinner medication with him. The patient tells him that he is waiting for a specialist appointment. The ER MD then suggests he at least take coated aspirin daily until he sees the specialist who may change it. He explained that his heart problem might increase Frank's chance of experiencing a stroke so Frank should really follow up with his family doctor to determine if he needs other medication.

Given the high mortality and morbidity, AF is an extremely resource-intensive disease to manage. A recent systematic review of the cost of AF care revealed that the overall average annual cost to support the system to manage one AF patient is \$7,226 to \$6,228 with a range of estimated costs as high as just over \$10,000. While these costs are substantial they represent only about one quarter of the entire health system costs for patients with AF. Two studies estimated the entire system cost for all care for patients with AF to range between \$20,616 to \$40,170 per patient per year. Assuming the estimates of the Ontario Health Technology Assessment Committee (OHTAC)

that just under 100,000 Ontarians have AF, **in Ontario, AF costs the healthcare system about \$700 million/year**⁶.

Not surprisingly, any hospitalization was the most important determination of total cost (55%) in the analysis. These may result from management of the overall rhythm problem, or any stroke or bleeding as a result of under- or over-anticoagulation. Other cost drivers include outpatient (16%), pharmacy (12%) and physician (8%). About one third of these costs could be attributed to anti-coagulation management. Emergency department visits were included in two studies with one study reporting 8% of total AF-costs attributable to ED visits⁷. In a review of ER utilization rates for AF from three hospitals **in Ontario, 54.7% of patients were referred from the ED to inpatient consulting services, and 69% of those referred were ultimately admitted**⁸. These are ER visits that may be prevented through improvements to the system of care for these patients.

The day after his ER visit, Frank calls the Telehealth resource to ask for more information about atrial fibrillation. He explains that he is concerned about having a stroke. The operator provides some basic information about the relationship between heart rhythm problems and strokes and finishes the call by providing Frank with a list of stroke symptoms he should watch out for while he waits for his family doctor to follow up with him.

About two weeks later, Frank is working in the garden when he experiences some lightheadedness after standing up suddenly. He sat down in a lawn chair to rest. His lightheadedness seemed to improve a little bit, but he felt that his vision was blurry in his right eye and, although he couldn't be sure, he thought he might have felt some numbness on the right side of his face. Since these were signs that he was warned about, he was very concerned that he was having a stroke. He called 911 and was taken to the nearest ER. He was admitted for a CT, and was consulted on by an Internal Medicine specialist and a Neurologist. He spent 4 days in the hospital and thankfully, there was no evidence of a stroke nor did the physician team think this was a TIA. Frank was discharged home on warfarin and advised to stop the aspirin but to continue the rest of his medications. He stopped by his pharmacy to pick up his new prescription. The pharmacist asked if he was provided with any information about warfarin to which he replied that they told him what it was for and that he would have to see his family doctor this week for a follow up blood test. Otherwise, he was hoping that she could give him more information.

The good news is that we know how to improve the lives of those patients living with AF, through a combination of medications, lifestyle interventions and other new minimally invasive therapies. We know, for example, that effective anti-coagulation reduces the risk of stroke in AF patients by almost

two thirds^{9,10}. We also have a number of both existing and newer medications that reduce the cardiac complications and bothersome symptoms of AF. Finally, there are catheter-based procedures that can “cure” AF in select patients. The bad news is that despite all of the advances in medical technology and research, we know that many AF patients in Ontario are not getting optimum care. For example, of all patients at high risk of experiencing a stroke related to AF, only 51% receive any anticoagulation, and less than half of those patients have their anticoagulation effectively managed^{11,12}. This leaves a significant number of Ontarians with AF at risk of experiencing a stroke when one could be prevented.

Four months after his last admission to the hospital, while walking his dog with his wife, Frank slurs his speech and develops right arm and leg weakness. He falls on the ground and his wife calls 911. He is taken to the nearest ER, where a CT scan of his brain shows a stroke. His blood-work shows an INR of 1.6. His wife explains that Frank missed his last monthly INR check because he wasn't feeling well. Frank is informed by the emergency doctor that he has had a stroke. Frank is left with permanent right sided weakness and speech impediment. After a three week admission to the hospital, Frank is transferred to a rehabilitation facility where physiotherapists and speech pathologists continue to work to help Frank with his new disability.

This care gap for AF patients is not any one person's fault. Rather, it is caused by a combination of complex patient care needs and a lack of a coordinated, system wide approach to these patients.

We must do better.

WHAT IS INNOVATE AFIB?

Innovate AFIB is an exciting project undertaken by the Centre for Innovation in Complex Care (CICC) at the University Health Network (UHN) that hopes to serve as a model for system approaches to chronic disease management. The goal of this project is to improve the system of care for atrial fibrillation to improve patient outcomes and reduce system costs, and to enhance the quality of life for those who suffer from AF.

CURRENT STATE OF AF CARE IN ONTARIO

The current state of atrial fibrillation care in Ontario presents a number of challenges to both patients and the clinicians who care for them. To better characterize and understand the nature of these challenges, the Innovate AFIB project utilized a multi-pronged approach (see Figure 1):

- 1) Interviews with clinicians across the spectrum of care for AF patients
- 2) Systematic review of current literature regarding cost of AF care
- 3) Value stream mapping with key stakeholders

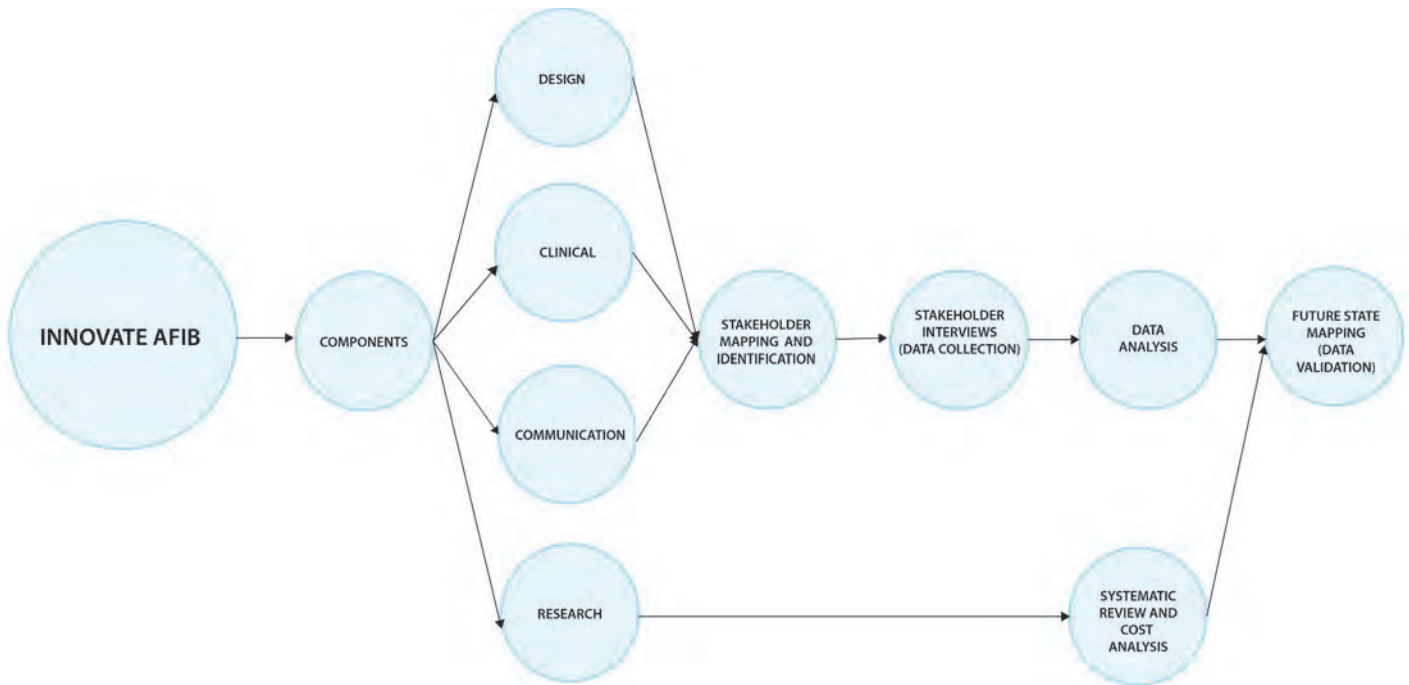


Figure 1. Project Methodology

INTERVIEWS

Interviews were conducted with approximately 60 thought leaders representing a variety of perspectives (see Appendix A). Common themes regarding the challenges with provision of AF care in the current system emerged (see Appendix B for details):

- Fragmented delivery of care
- Poor communication between providers
- Lack of follow-up
- Non-standardized care
- Confusing guidelines and lack of consensus quality indicators
- No clear portal of entry
- Operational issues (wait times, access to new therapies) within the current system
- Patient education
- Difficulty for patient self-management
- Challenges with patient adherence to therapy
- Complexity of anti-coagulation management

In addition to, and as a result of these challenges, the AF patient often experiences a confusing, chaotic pathway to achieve relief of their symptoms and prevention of further disease or deterioration (see Figure 2).

This current state of how patients are managed through the system also results in increased utilization of resources, such as ER services, stroke rehabilitation services etc and associated healthcare expenditures.

VALUE STREAM MAPPING EVENT

On June 11 2010, we held a future state mapping event at the Toronto General Hospital site of the University Health Network with top thought leaders in AF care and research.

The goal of this event was to validate the challenges of the current state, to explore opportunities for improvement and to begin designing an ideal future state of care for atrial fibrillation patients.

Twenty thought leaders were organized into two teams with a variety of and balanced perspectives on each team (see Appendix D for details).

Through team discussion and the facilitation of the various perspectives represented by the thought leaders, the themes obtained through our expert interviews were validated. The thought leaders agreed with and endorsed the series of challenges that patients and clinicians are facing in the current system.

In addition, the participants were given a presentation on value-based care principles as a context for the development and validation of themes to provide a framework for the future design of an ideal system of care (see Appendix C).

Furthermore, the participants developed models of care to support these themes of optimized AF care in Ontario. An expert panel was invited to review and comment on each team's designs. Members of the panel included:

- Tom Closson, President & CEO, Ontario Hospital Association
- Bob Bell, President & CEO, University Health Network
- Ben Chan, CEO, Ontario Health Quality Council
- Tai Huynh, Strategic Alignment Branch, Health System Strategy, MOHLTC
- Kevin Smith, President & CEO, St. Joseph's Healthcare

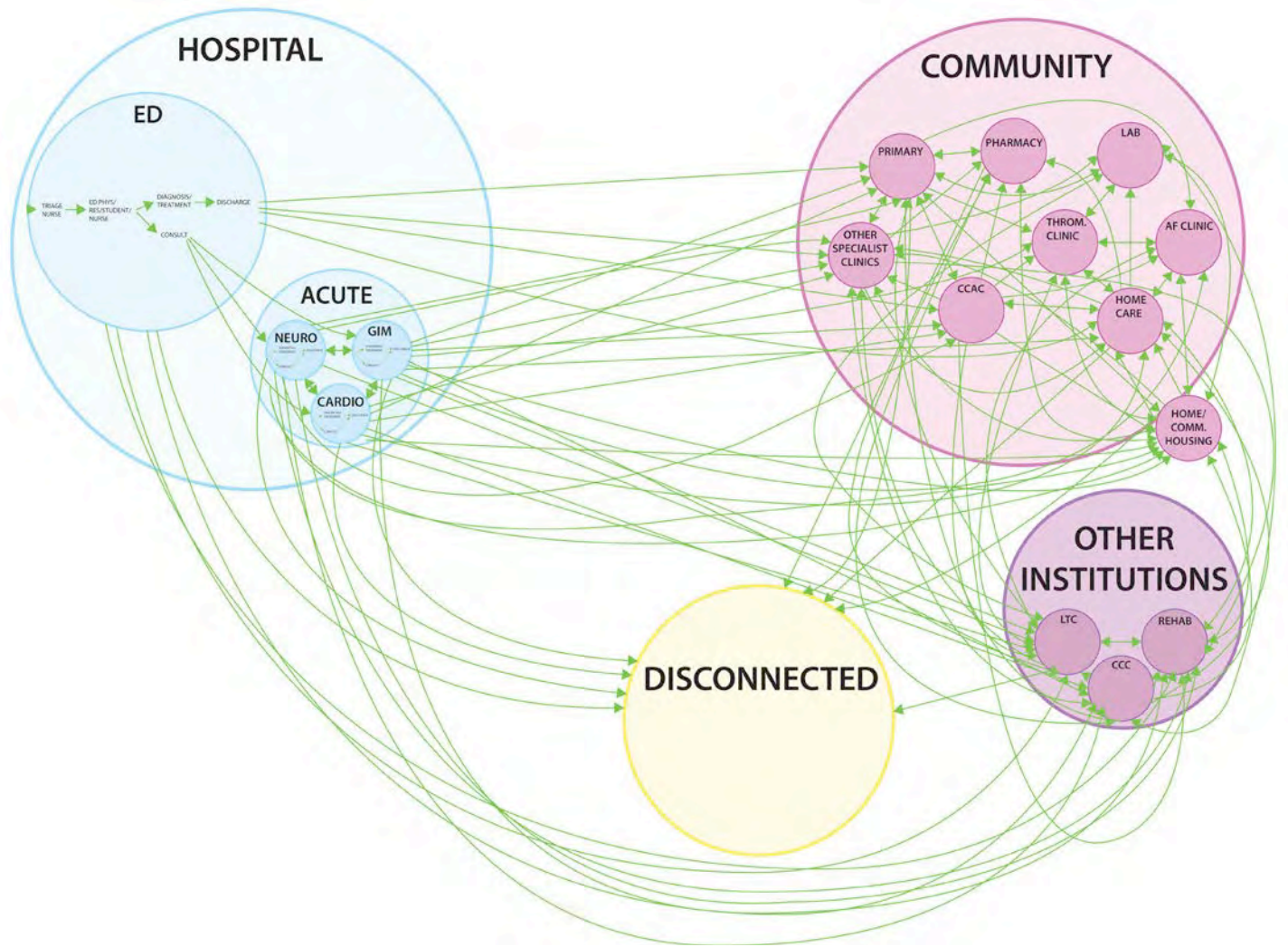


Figure 2. How AF patients currently flow among care providers in the system. Disconnected patients are those who have been and have not been touched by the system and have become lost or unaccounted for and may not be receiving proper care. This population is likely to end up in the Emergency Room.

WHY SHOULD THIS MATTER TO ONTARIANS?

Our healthcare system is in the process of evolution; from delivery of episodic, fragmented care for individual conditions, to a multidisciplinary, team-based care of patients with multiple chronic medical conditions. As our population ages, technologies change and patients become more medically complex, taking a systems-based approach to managing this greater complexity will be the only way to provide comprehensive care that keeps people healthy, and ensures that healthcare costs do not spiral out of control.

Beyond the obvious benefits of improving the lives of patients living with AF, **the Innovate AFIB project also supports stated government priorities of improving system access, establishing “excellent care for all”, system sustainability and chronic disease management.**

IMPROVING ACCESS

The government has clearly stated that reducing Emergency Room wait times is a key priority in their Open Ontario plan, and long ER wait times has been shown to be the number one health concern of Ontarians¹³. AF is not only a common cause of visits to the emergency room, but also of avoidable admissions to hospital. Admitted patients can wait up to 30 hours in the emergency room before getting a hospital bed. In addition, strokes that could be prevented by adequate anti-coagulation are also key drivers of hospital admissions. These patients once admitted, often have long hospital stays, and are also a driver of Alternate Level of Care (ALC) resource utilization. Thus, preventing avoidable ER visits, hospitalizations and complications like strokes is an important way the Innovate AFIB project can support the reduction of ER wait times in the province.

QUALITY IMPROVEMENT

The Ontario government has recently passed Bill 46, the Excellent Care for All Legislation, which aims to improve the quality of care, patient safety and patient satisfaction at all hospitals

in the province. The government also announced it plans to reduce avoidable hospital readmissions as part of the quality agenda. We believe that the Innovate AFIB project is a tangible example of quality improvement with the goal of reducing avoidable hospital admissions, and improving patient satisfaction.

SYSTEM SUSTAINABILITY

Healthcare spending in Ontario has increased dramatically in recent years, just as it has in all developed countries¹⁴. Just 20 years ago, healthcare spending represented only 32 cents on every dollar spent on provincial programs. Today, healthcare represents 46 cents on every dollar, and in twelve years at the current rate it could be 70 cents¹⁵. Given the province's current \$19 billion deficit, bending the cost curve on health spending in the province will be critical to the sustainability of a publicly funded, universal healthcare system. A recent TD Bank report of healthcare sustainability suggested improved efficiency within the health system as a way to "bend the cost curve" which included a focus on quality and increased use of multidisciplinary teams¹⁶. We agree.

In fact, the purpose of the Innovate AFIB project is to reduce system costs of AF, while simultaneously increasing the quality of care. We propose to do this by:

1) **Reducing the complications of AF:** The cost of a single acute admission in Canada with AF as a primary diagnosis is \$24,096¹⁷. By reducing the current care gap for AF patients in Ontario, we will reduce avoidable admissions and emergency room visits, including reducing stroke complications, and thus reduce the significant acute care resource utilization and associated costs, enabling reallocation of these funds.

2) **Improving efficiency and reducing redundancy:** Complex AF patients spend a significant amount of time bouncing around from different healthcare providers, into acute care and back into the community with little follow-up or organization to guide their care. This type of care leads to duplication and often unnecessary use of services. A more streamlined, interprofessional, system wide strategy will ensure that patients with AF get the right amount of care, by the right provider at the right time, and will avoid duplication. Our model will also use a team-based approach, using pharmacists, nurse practitioners, nurses, social workers and physician assistants alongside physicians, to deliver the best care possible. We believe a team-based approach will reduce costs over time, as it will not only improve quality, but also reduce the necessity of patients always seeing the physician, who is the system's highest cost provider.

Also a key consideration in the development of the AF model is recognition of the investments that have been made in achieving system improvements already, and a need to build on them. The Innovate AFIB project hopes to leverage these investments and tap into existing programs to streamline care

for AF patients. These existing resources include primary care models (FHTs and CHCs), homecare, drugs, information technology, hospitals and health human resources (nurses, allied health). We believe that these investments, if coordinated in the right way, provide the right building blocks for us to build a better system for AF patients in Ontario, and be a model for the world. We have the right pieces, we just need to reconnect and coordinate them.

CHRONIC DISEASE MANAGEMENT

In the 2007 election platform, the current government committed to tackling the burgeoning problem of chronic diseases, starting with diabetes. We intend to support and build on that commitment, leveraging the resources put in place by the government to tackle chronic diseases, and showcase a made-in-Ontario solution that can be emulated for other diseases.

CONNECTING THE PIECES TO IMPROVE CARE IN AF

The principles that underpin the reform we are talking about are not new; in fact they are well tested and used in many other jurisdictions. Value in healthcare is a function of both health outcomes and cost. The principle underlying value in healthcare is that improved outcomes actually save money through fewer complications, earlier intervention and less disability. Value-based care has been described by world renowned business expert, Michael Porter, and has been implemented around the world with excellent results.

How one uses value-based care to improve health system functioning depends on adhering to some basic rules: 1) measure what you want to achieve (preferably outcomes not process measurements) and set targets for improvement 2) define service delivery from the patient's perspective 3) organize care delivery around the solutions 4) create multidisciplinary teams.

It is with these principles and rules in mind, and through broad consultation and research that we begin to develop solutions for AF care in the province.

• WHAT SHOULD EVERY ONTARIAN WITH AF HAVE?

Through the Innovate AFIB project, it is proposed that the ideal care system would provide every Ontarian suffering from AF with:

- Specialized anticoagulation management
- 24 hour access for patients
- Follow up after any AF-related ER visit within 1 week
- Access to specialist Cardiology care where appropriate
- Appropriate risk stratification and stroke prevention therapy

- Guideline-based care for both rhythm and stroke prevention
- Global management – management of their AF within the context of their overall health-related needs

- ers for an individual patient
- Quality of care indicators are measured and utilized to optimize provision of care and outcomes for patients

• WHAT SHOULD THIS NEW SYSTEM LOOK LIKE?

PRINCIPLES OF THE IDEAL SYSTEM

The redesign of the care-delivery system for AF patients in Ontario has been based on the following principles (see Figure 3):

- The patient is at the centre of the system (not their disease)
- Current referral patterns and existing local infrastructure (i.e. Community Care Access Centres (CCAC), Ontario Telehealth Network) should be maintained and optimized (i.e. customized supported local solutions)
- The proposal will follow the model of value-based care, reducing costs and improving care
- Services for patients should remain within their communities where appropriate
- The system should support and provide for knowledge translation and training for clinicians as well as for patient self-management where appropriate
- There is coordinated communication among all care provid-

HOW DO WE MAKE THIS HAPPEN?

Utilizing the foundation and momentum created by the Innovate AFIB project, we look to our partners in providing optimal care for Ontarians for their leadership and support:

MINISTRY OF HEALTH

- Strike an expert panel to provide strategic direction on improving processes of care for AF
- Task the Ontario Health Quality Council to report on quality indicators for AF care
- Build upon the existing infrastructure of delivery of care i.e. FHT, CCAC, existing specialty care centres to create AF centres of excellence that are multidisciplinary and comprehensive in the management of all aspects of AF care.

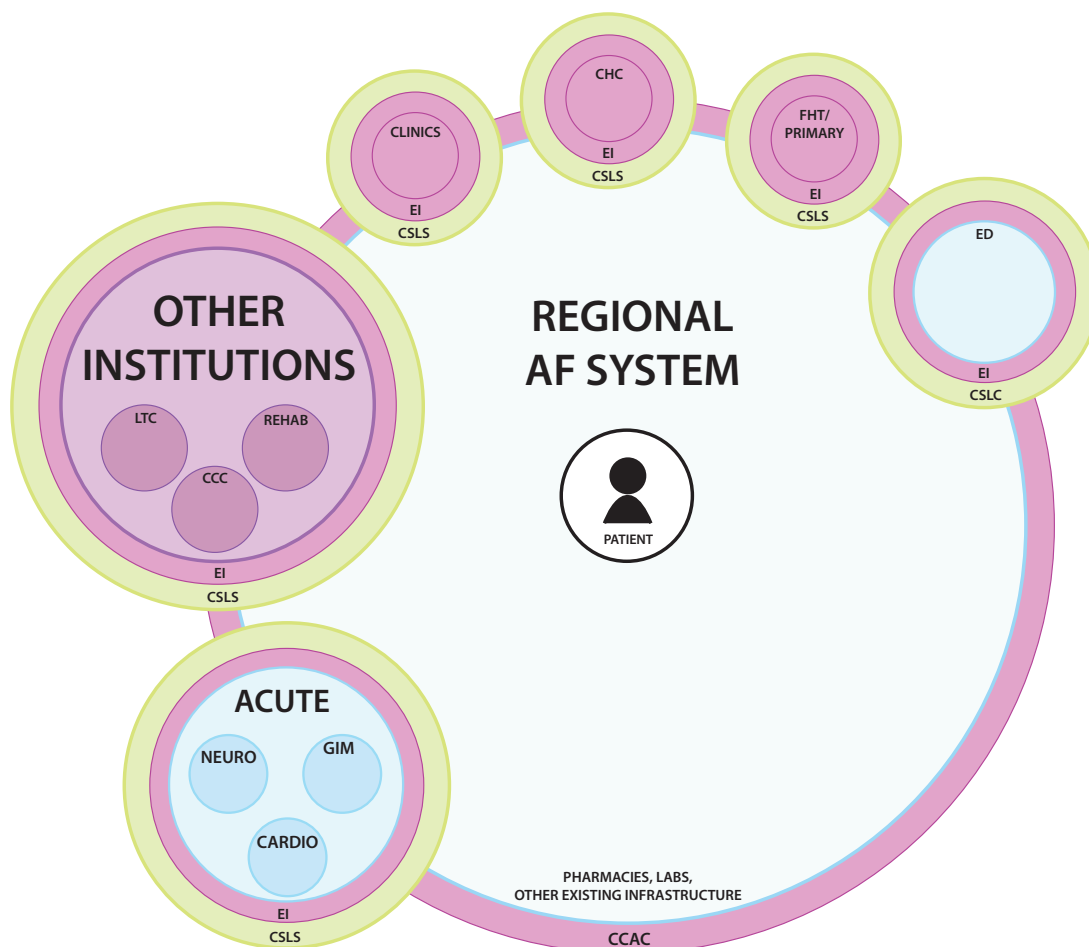


Figure 3. Proposed future state diagram. Principles of the ideal system are respresented, including: placing the patient in the centre of the system; leveraging existing infrastructure (i.e. CCAC, Ontario Telehealth Network, labs, pharmacy) and providing customized supported local solutions (CSLS) (i.e. mobile outreach); maintaining community services for patients; and coordinated communication among providers.

LOCAL HEALTH INTEGRATION NETWORKS

- Educate the public regarding the signs and symptoms, risks, management and self-care of AF
- Facilitating knowledge transfer among existing care providers to ensure providers are up to speed on both guideline-based care and system improvements from this project
 - Facilitating the coordination of care across providers and organizations

HEALTHCARE ORGANIZATIONS

- Work collaboratively with the AF project, their existing teams and infrastructures to implement system changes
- Facilitate the measurement of quality indicators of optimal AF care

PROVIDERS

- Embrace the interdisciplinary team approach
- Work with the centres of excellence to ensure evidence-based approach to care and facilitate uptake of knowledge translation efforts

OUTCOMES

With this support, we propose that this new model of care delivery will succeed in providing the type of outcomes that are valuable to the people of Ontario and to our healthcare system such as:

- Decreased AF related avoidable ER visits
- Decreased AF related avoidable hospital admissions
- Decreased incidence of AF related strokes

CONCLUSION

Atrial fibrillation is the most common cardiac arrhythmia with an increasing disease burden. There is a unique opportunity to implement a new model of care that can improve outcomes and the quality of care for Ontarians. We believe that government, institutions and providers can work together to demonstrate a model for others to follow and that Ontario can be a world leader in this regard. **We challenge everyone in the care of AF patients to embark on this journey with us.**

ACKNOWLEDGEMENTS

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Noah Ivers, Physician, Family Medicine (Women's College Hospital)

Steven Friedman, Physician, Emergency Department (Toronto General Hospital, University Health Network)

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Bob Bell, President & CEO, University Health Network

Tom Closson, President & CEO, Ontario Hospital Association

Ben Chan, CEO, Ontario Health Quality Council

Tai Huynh, Strategic Alignment Branch, Health System Strategy, MOHLTC

Kevin Smith, President & CEO, St. Joseph's Healthcare

APPENDIX A

Perspectives of thought leaders interviewed:

Cardiology
Pharmacy
Internal Medicine
Patient Flow
Primary Care
AF Clinic
Systems Approach
Nursing
AF Research
Stroke Prevention
AF Guidelines
Neurology
Thrombosis
Community Care Access Centre
Labs
Emergency Medicine
Point of Care Guidelines
Electrophysiology
Anti-coagulation

APPENDIX B

Challenges with the Current State of AF Care in Ontario: themes from stakeholder interviews

Fragmented delivery of care - The various points of care for patients are siloed; clinicians do not always have current, accurate information about the patient and their medical history, not the different care providers that the patient may be accessing.

Poor communication between providers – Even when care providers are aware of each other within a patient’s circle of medical care, barriers exist that hinder communication between them. In addition, there is no standard communication process that is followed by providers.

Lack of follow-up – Many providers who initiate patients on certain treatments and provide education (e.g. ED physicians, Cardiologists or Internal Medicine Specialists) need to rely on other clinicians for routine follow-up of patients

Non-standardized care – There is currently no standardized approach for delivering care to AF patients at different parts of the continuum nor are there widely accepted standards for management within a component of the continuum of care: e.g. acute AF patients presenting to EDs may receive either rate controlling medications, cardioversion attempts by either chemical or mechanical means and may be initiated immediately on anticoagulation for stroke prevention or may be referred back to their primary care provider to initiate said therapy

Guidelines – Current Canadian guidelines are dated, difficult to interpret and translate into practice. In addition, quality indicators for optimal care of AF patients are not readily available

No clear right door – Patients may not be seeing the optimal care providers for treatment at any phase of their AF. There is no clear pathway through the system to get the patient to the right provider.

Appropriate treatment – Assigning patients the appropriate treatment can be difficult (e.g. rate vs rhythm). Certain treatments like anti-coagulation for stroke prevention are under utilized for a variety of reasons.

Operational issues – current care system challenges such as wait times in ED, access to interventional treatments such as ablation therapy, accessibility to specialists, labs and clinics can cause significant delays and interruptions in the provision of optimal care

Patient education – Patients have difficulty understanding their illness, different treatment options, and how to self-manage their AF. Education is not standardized and patients may get different education from different providers which can be confusing.

Difficulty for patient self-management – The nature of AF treatment being directed at two main goals: anticoagulation and rhythm management is challenging for patients to understand well enough to be active participants in their care plans. The nature of AF symptoms, the frequent blood work required for stroke prevention therapies, the associated follow-up and appointments with multiple care givers can overwhelm patients. They also have difficulty managing their AF, particularly their anticoagulation, in conjunction with their other health conditions. These issues can result in patient anxiety, reliance on Emergency room management and prevent patients from being engaged in their own self management.

Compliance – Patients find it challenging to follow the set treatment plans (e.g. anticoagulation therapy), and experience side effects and increased risks – bleeding or stroke - as a result.

Anticoagulation management – Optimal anticoagulation is very difficult with currently available treatments due to requirement of close laboratory monitoring, associated risks (e.g. bleeding), drug interactions, patient lifestyle issues (e.g. impacts of diet and alcohol on achieving target INR) and the frequent follow up required.

APPENDIX C

Ideal Future State of AF Care in Ontario: themes from stakeholder interviews

Right-sizing care - Every door is the right door (patients are appropriately linked with the proper provider at the proper time) (e.g. Some patients are seeing specialists who do not need to while other complicated patients who need specialists are seeing a family doctor)

Coordinated care - Patients should be able to experience coordination in their care and go to one place (not necessarily a physical place) where there is coordination among providers (including coordination of patient care info; coordination of navigating the system)

Improved communication and transfer of information - Communication between providers around patient care can be improved

Value - Better use of existing resources, better access to best quality care for every patient

Education - Standardized, evidence-based education for patients which can enable self-management. Standardized, evidence-based education for providers in the appropriate medium

Proactive system management - Patients should not get lost in the system (e.g. every patient should be called at 6 month intervals to make sure they are getting appropriate care.) (e.g. Using existing infrastructure like Telehealth)

System-wide capture of AF patients - For evaluation to measure quality and cost measurement (e.g. Every ECG documented with AF cues a database automatically)

Guidelines-based care - For specific points of care and across the continuum (e.g. ED guidelines, EP guidelines, primary care guidelines, referral & treatment guidelines, etc., and monitoring of variability); Provision of best and consistent quality care for each patient

New clinical model with interprofessional focus - E.g. Combining cardiology and anticoagulation care; incorporating other professionals such as nurse practitioners and pharmacists

Innovations in anticoagulation management – Optimize innovations such as point of care monitoring, new anticoagulants, enhanced patient self-care

APPENDIX D

Participants of Future State Mapping event (organized by team):

Team A

Paul Dorian, Physician, Cardiac Electrophysiology (St. Michael's Hospital), Department Division Director of Cardiology (University of Toronto)

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