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# Artificial Intelligence in Healthcare: Navigate Pitfalls like a Machine

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CANADIAN COLLEGE OF  
HEALTH LEADERS



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# AGENDA

- AI adoption in healthcare
- Regulatory framework
- Legal and risk considerations
- AI in practice
- Group exercise
- Debrief
- Key takeaways



# THE RISKS

**“The biggest dangers of AI are exactly the same as with any other tool: misuse by stupid, ignorant, or deluded humans in position of power.”**

Yann LeCun  
VP & Chief AI Scientist at Meta



# But, AI is being used...and not safely...

46% of Canadian workers are using GenAI in their jobs, up from 22% in 2023

24% of users have entered proprietary company data into public GenAI platforms, up from 16 % in 2023

40% of users are not aware of any controls from their employer re the use of GenAI

# AI ADOPTION TRENDS IN HEALTHCARE

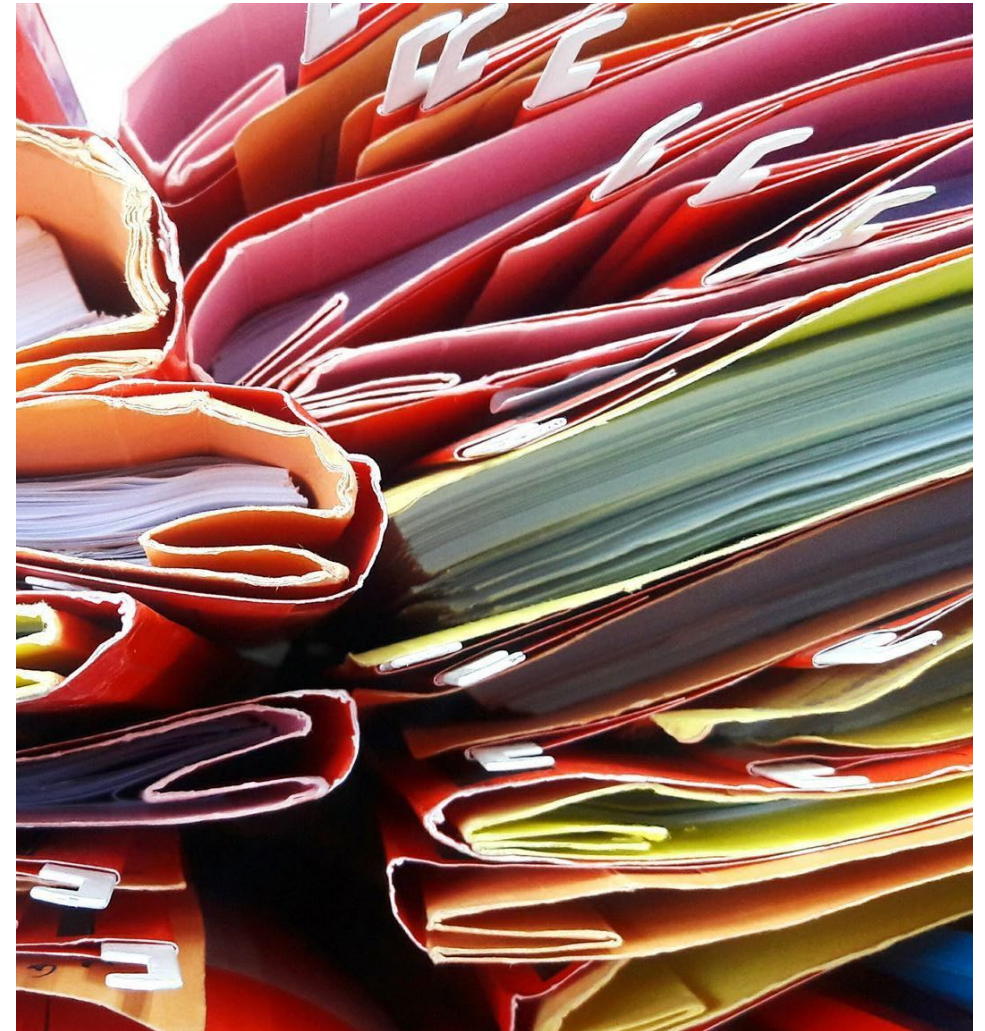
- Fewer than 10% of Canadian physicians actively using AI tools in their medical practice by late 2024.<sup>1</sup>
- Adoption is cautious but growing, with pilots in documentation, triage, and predictive analytics.
- Major hospitals are leading AI integration with federal/provincial funding support.
- Unified EHRs and AI research centers are enabling scaled deployment.



<sup>1</sup>Aunt Minnie: Canadian physician wary of AI

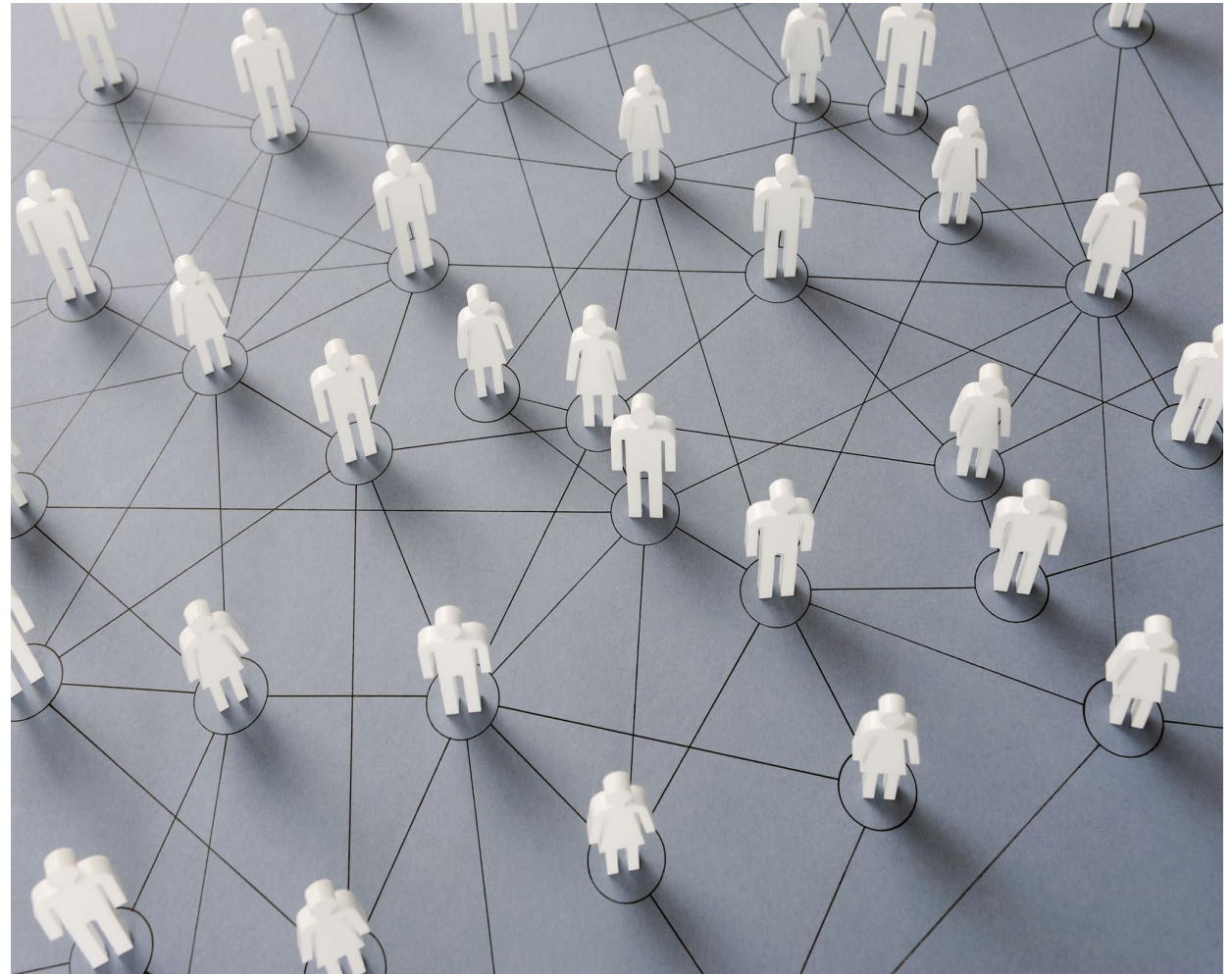
# NAVIGATING AI REGULATIONS

- Bill C-27, which included the *Artificial Intelligence and Data Act (AIDA)*, died when parliament prorogued
- Canada lacks specific AI laws but regulates AI through existing privacy laws (federal and provincial)
- New Minister of AI and new legislation
- Recognized frameworks and voluntary codes for responsible AI use
- Recommendations and resolutions from privacy commissioners



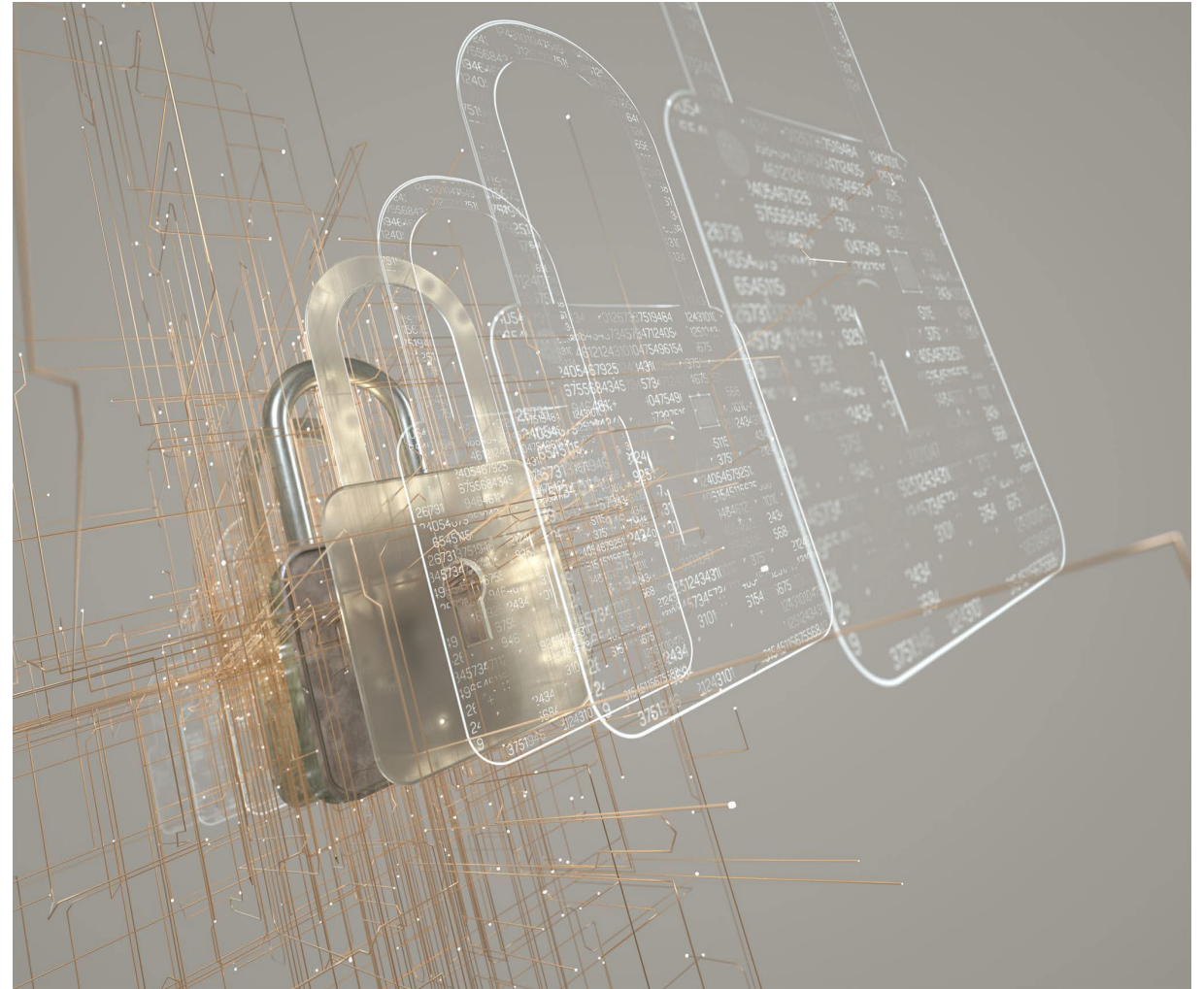
## STAYING UP-TO-DATE

- Use diverse sources: regulatory updates, professional associations, journals, and internal collaboration
- Participate in AI training, forums, and internal committees
- Embed AI briefings into executive and board-level discussions



# SAFETY AND RISKS OF “EVERYDAY AI”

- Built-in AI features in commonly used tools (e.g., Zoom, Teams) pose privacy and data security risks in healthcare settings.
- Staff should be trained, and AI features should be controlled and governed.



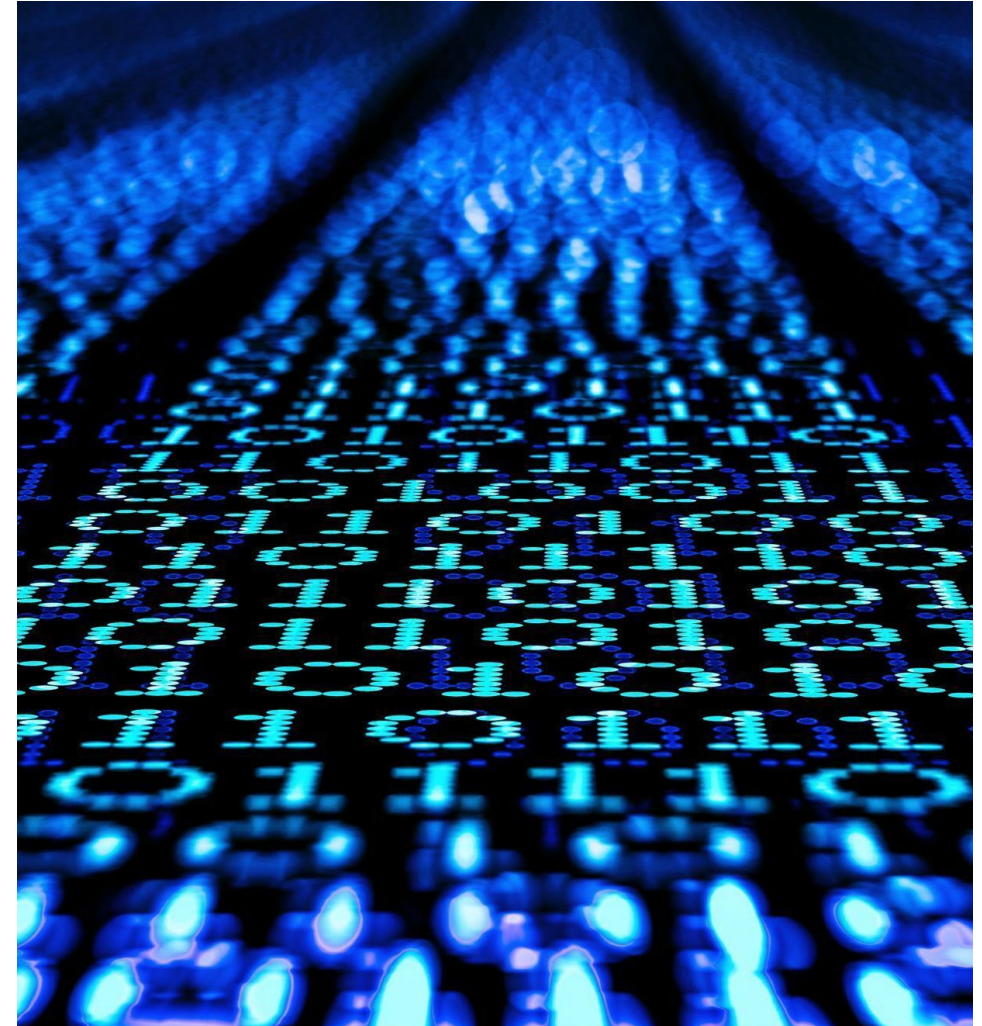
# INTERNAL AI POLICIES

- Policies should define acceptable AI uses, privacy protections, and governance structures.
- Consider establishing guiding principles and mandatory criteria for AI technologies.
- Staff must be trained, and policies reviewed regularly to stay current.



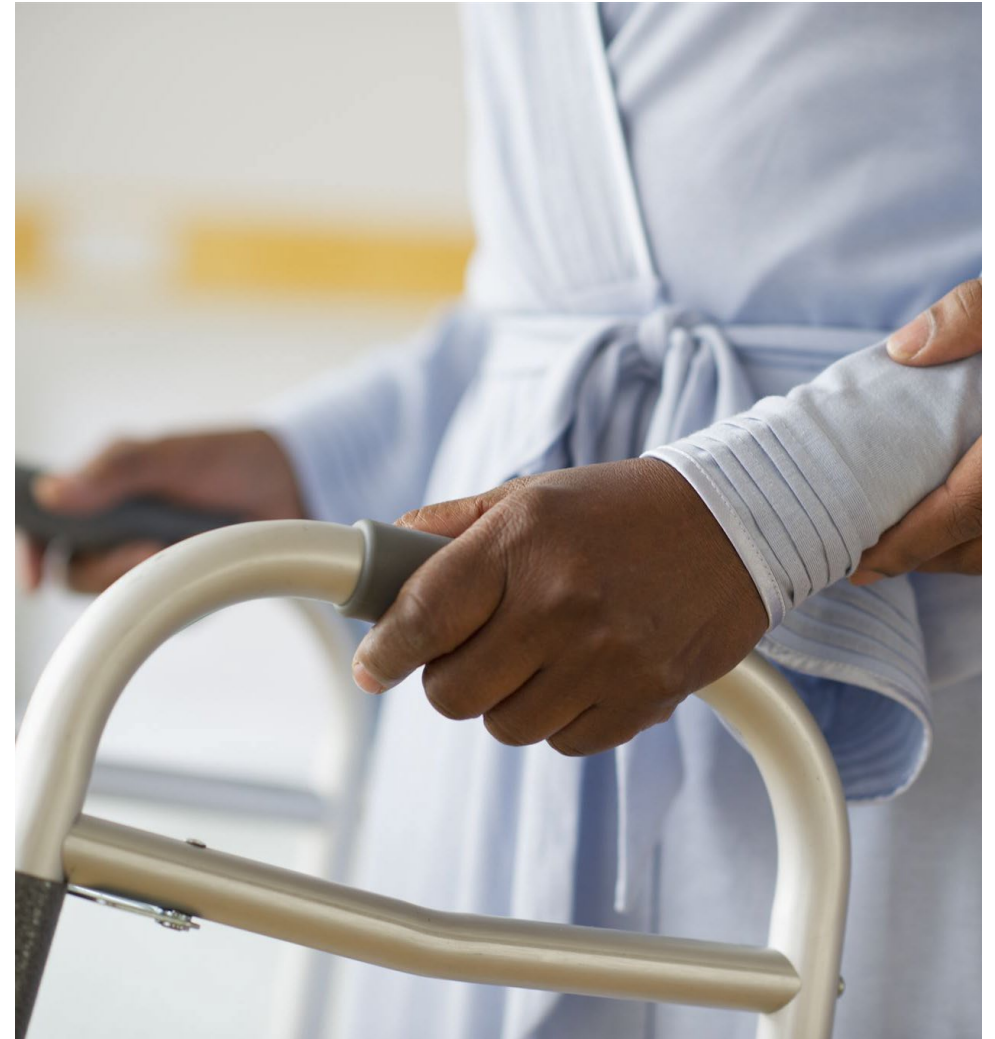
# PRIVACY CONTROLS FOR AI WITH PHI

- Avoid entering PHI or confidential data into public AI tools without enterprise agreements.
- Implement data minimization, encryption, access control, vendor contracts, and audit trails.
- De-identify data wherever possible and monitor for privacy incidents.
- Align AI data practices with legislative requirements and best practices to maintain trust and compliance.



# BALANCING RISKS OF AI IN HEALTHCARE

- Using AI carries risks: safety errors, bias, liability, data breaches.
- Not using AI also poses risks: inefficiency, missed diagnoses, reputational lag.
- Balanced adoption with strong oversight mitigates both sets of risks.



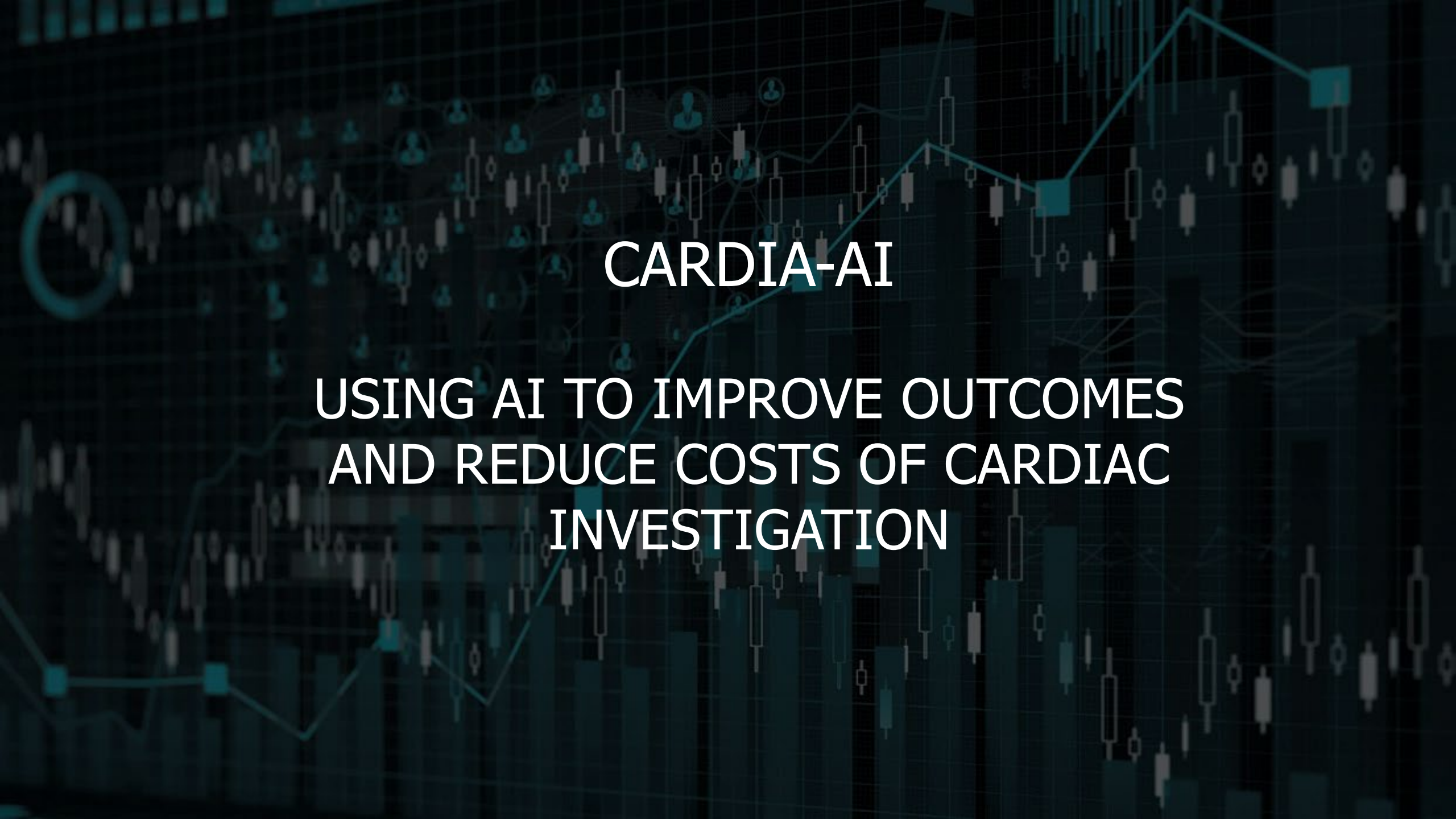


**CREATE**

Centre For Data Science  
And Digital Health

# Inventing the Future of Health Care



The background of the slide features a dark teal color with a complex overlay of financial and network-related graphics. These include multiple candlestick charts, line graphs with square markers, and a network diagram consisting of numerous small human icons connected by thin lines. The overall aesthetic is high-tech and data-driven.

# CARDIA-AI

USING AI TO IMPROVE OUTCOMES  
AND REDUCE COSTS OF CARDIAC  
INVESTIGATION

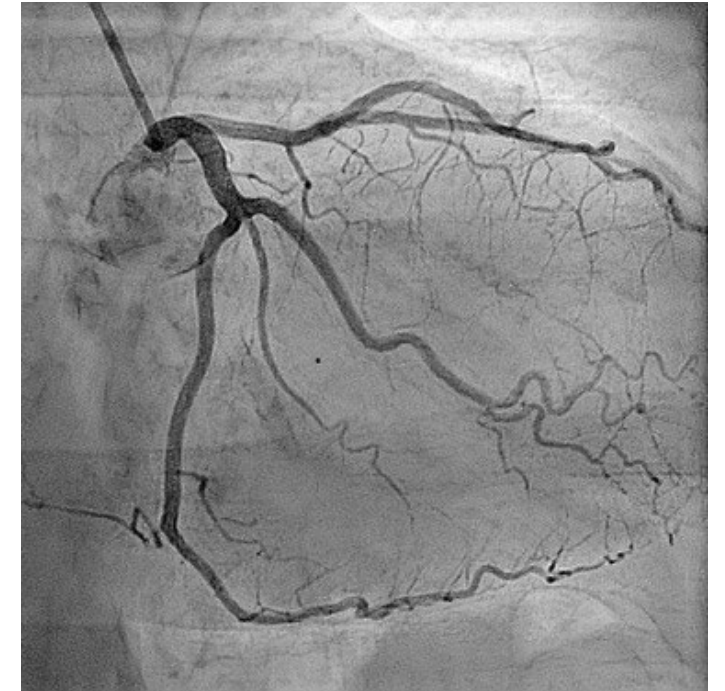


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# INVASIVE CORONARY ANGIOGRAPHY (ICA)

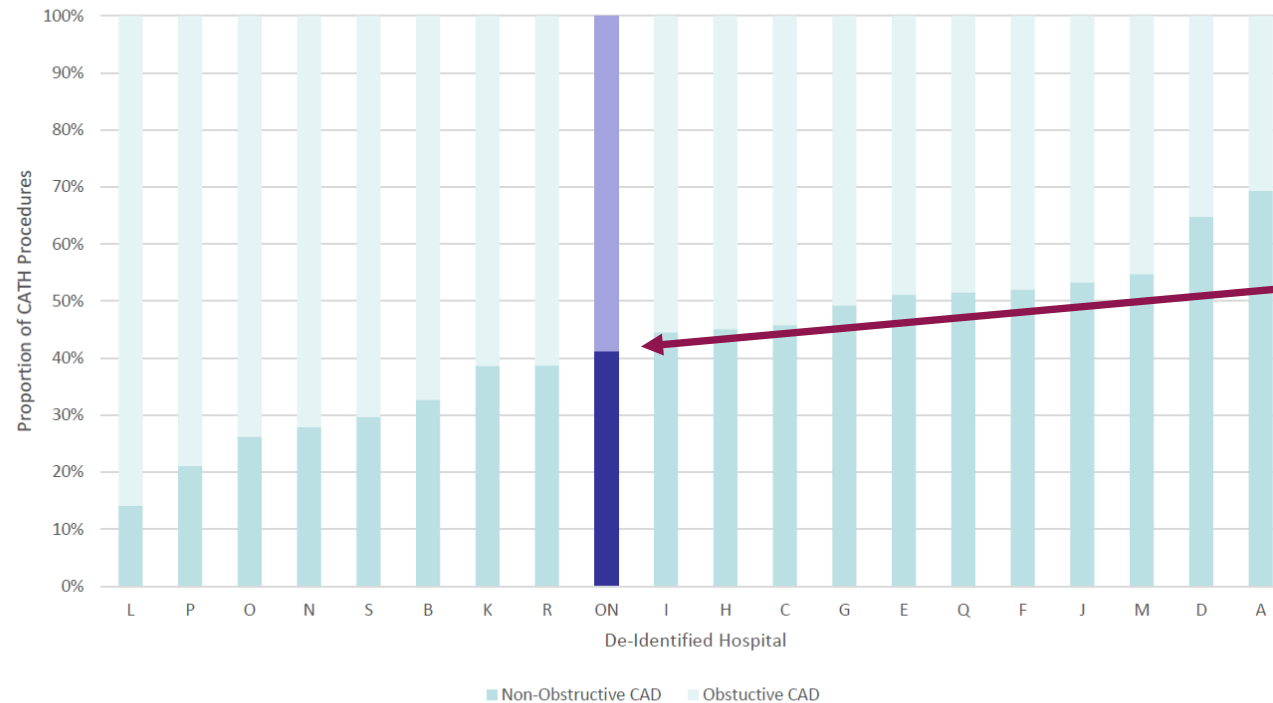
ICA has long been the gold standard to diagnose Coronary Artery Disease (CAD) and is essential to facilitate life-saving revascularization when applied to the right patient.

However, when applied to a suboptimal population, it increases **costs** to the system and carries potential **risks** to patients.





# NOT A SMALL PROBLEM



Data are from the CCN Cardiac Registry; Non-Obstructive CAD includes 'Normal Coronary Anatomy' and Non-Significant CAD'

- >40% of Invasive Coronary Angiograms in elective patients do not have significant CAD
- This approaches 60-70% in low-to-mod risk patients

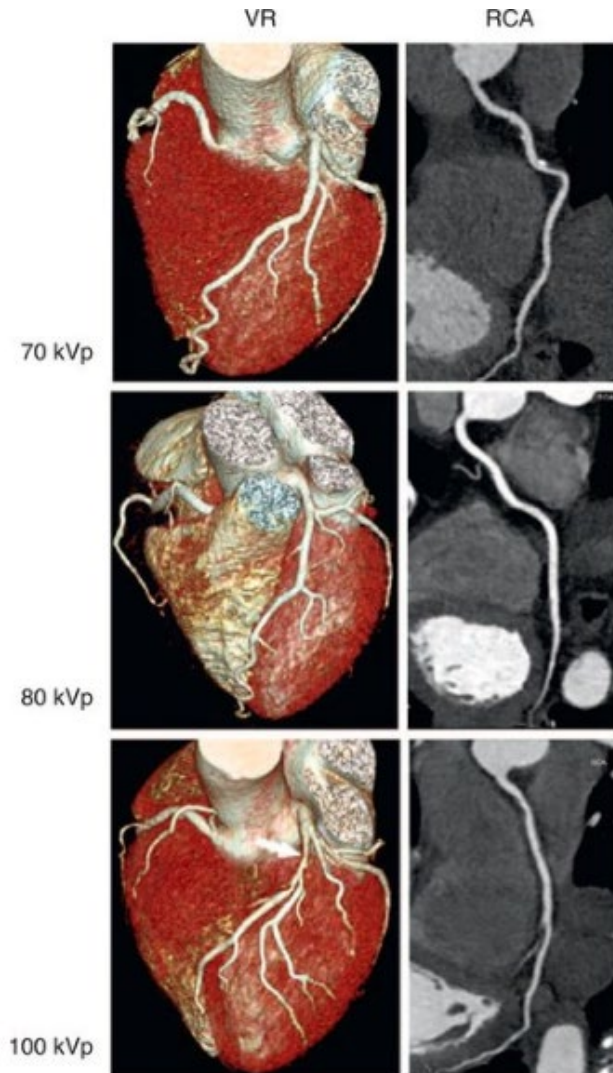


# Cardiac CT Angiogram (CCTA)

CCTA is an evidence based alternative to ICA for diagnosis of obstructive disease in select populations that is **less expensive** and **lower risk** (NEJM 2022).

However, CCTA-first strategies result in most patients receiving **double-procedures**, which increase costs and expose patients to additional radiation.

Ideally, we would have a model of care that can optimize patient selection for CCTA vs. ICA.



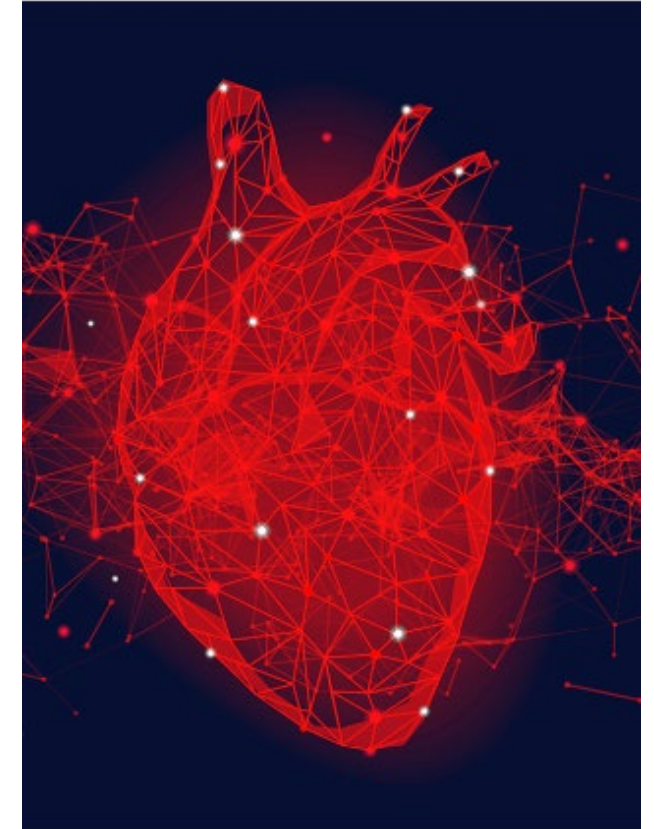


## How AI can help

What is missing is a scalable method for screening patients for CCTA vs. ICA

We trained an AI model on 12 years of HHS referral data to predict which patients should receive CCTA vs. ICA

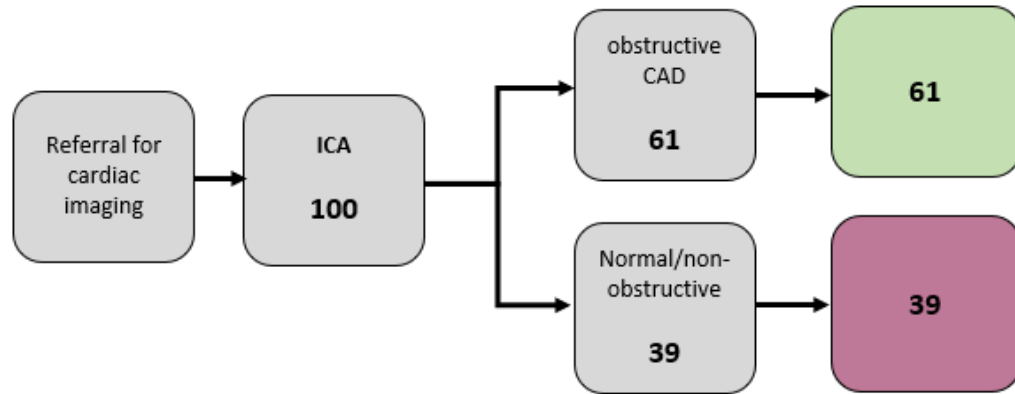
Model performance achieved an AUC of 0.806, far outperforming any previous model



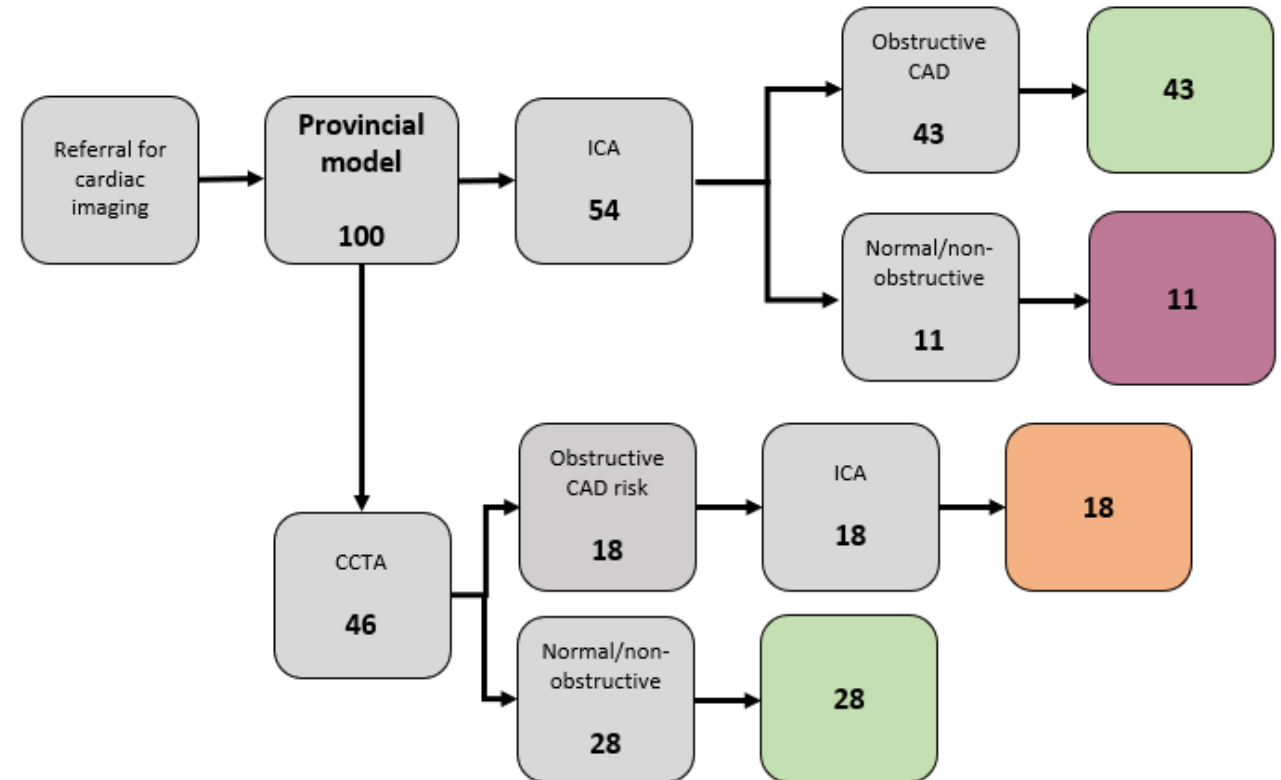


# PROJECTING IMPACT IN PROVINCE OF ONTARIO

## Usual care

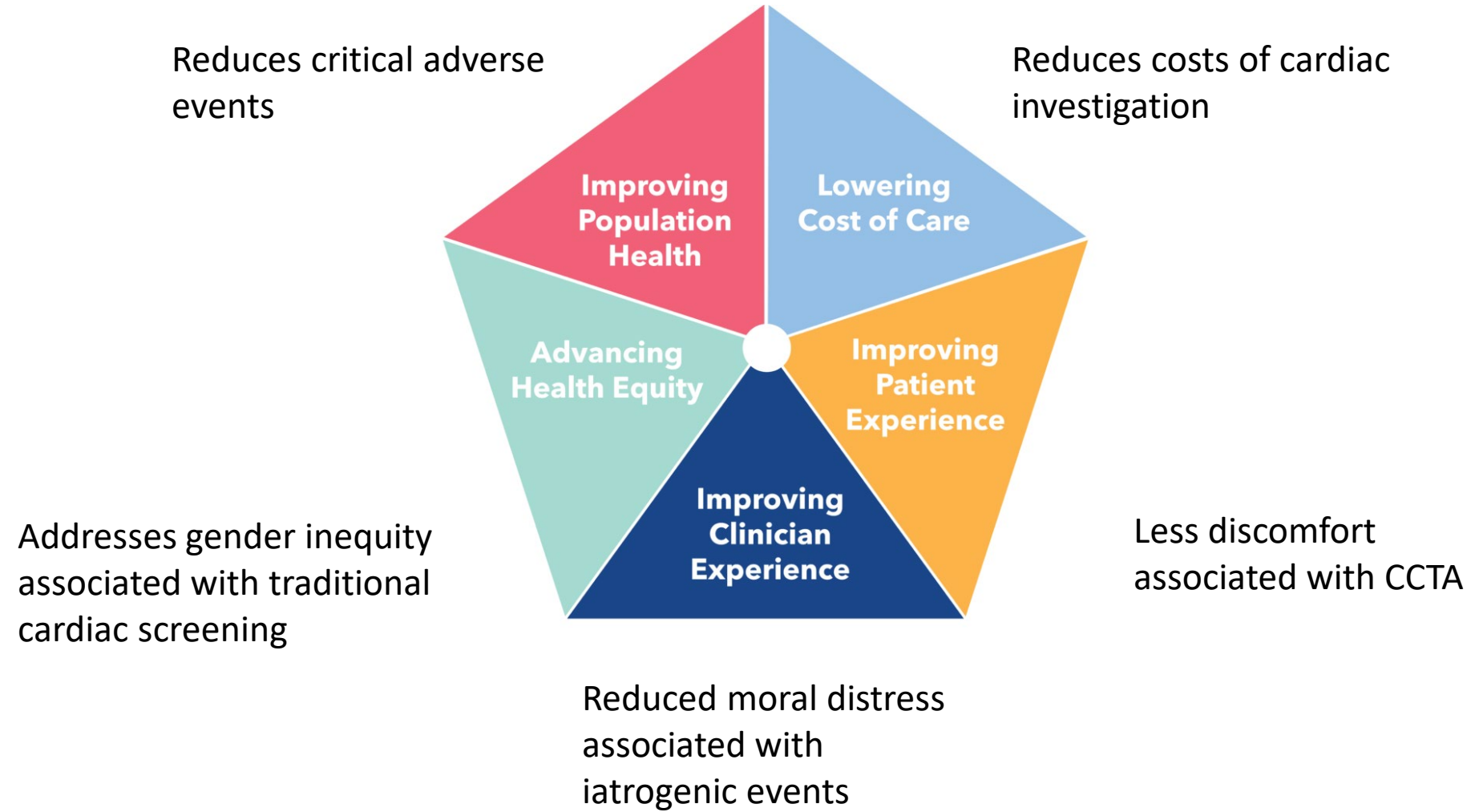


## CarDIA-AI



# VALUE OF AI FOR OPTIMIZING CARDIAC INVESTIGATION

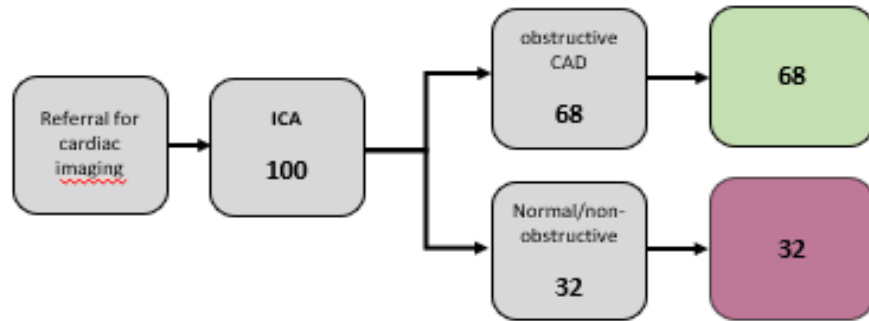
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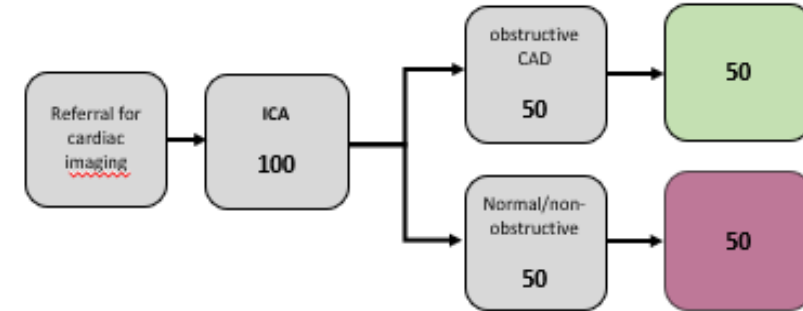
# IMPACT ON GENDER EQUITY (PROVINCIAL MODEL)



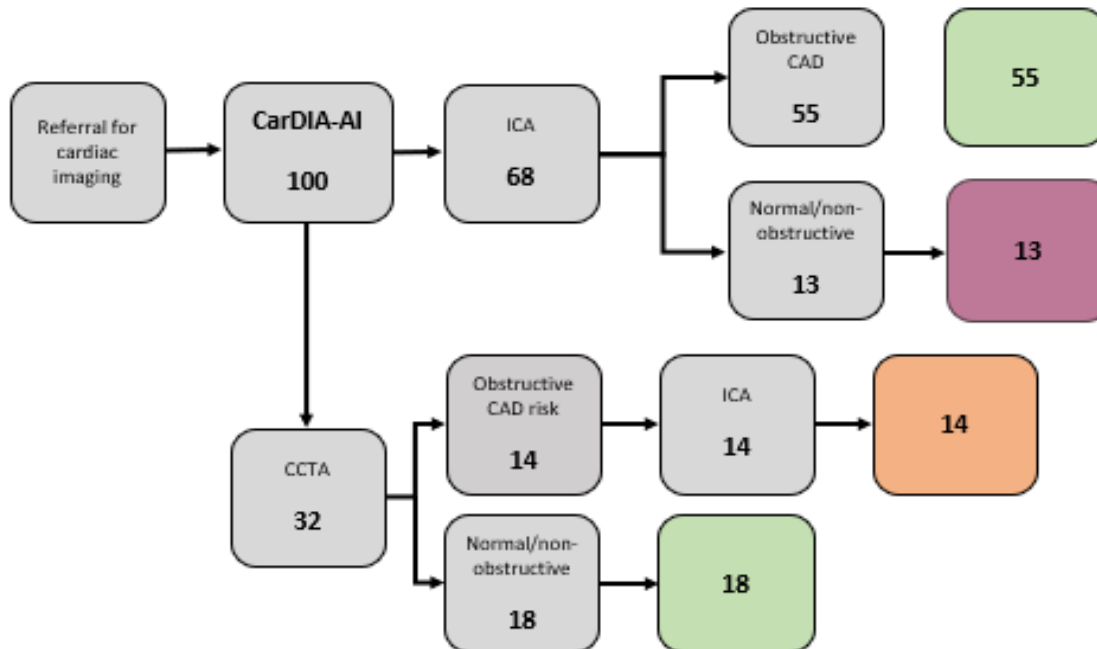
## Usual care (Male)



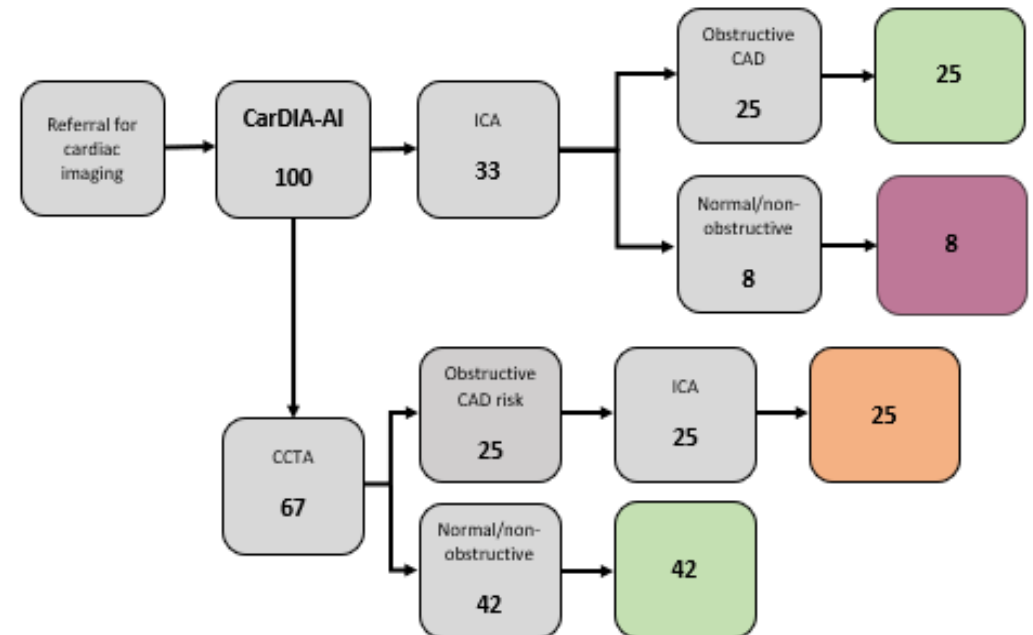
## Usual care (female)



## CarDIA-AI (Male)



## CarDIA-AI enabled model (Female)



# CURRENT STAGE: RANDOMIZED CONTROL TRIAL

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Open-label, multi-site, patient-level RCT.

252 patients (126 per arm).

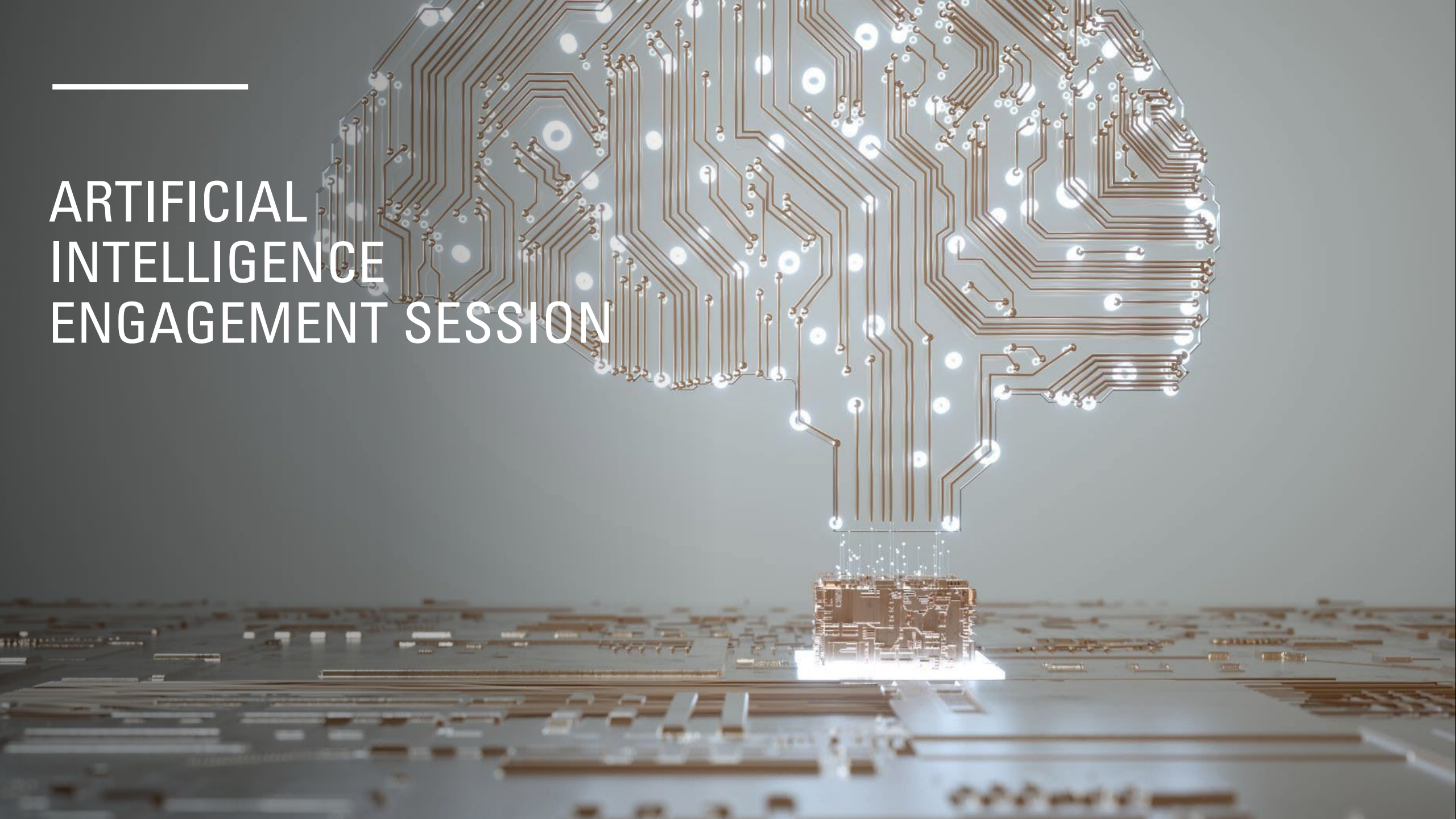
*Primary outcome:* The rate of normal or non-obstructive CAD diagnosed through ICA

*Secondary outcomes:*

- Budget impact of new strategy for risk stratification of CAD in low-risk patients
  - Difference in the rate of normal/non-obstructive CAD diagnosed through ICA between males and females
-

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# ARTIFICIAL INTELLIGENCE ENGAGEMENT SESSION



## SCENARIO - 10 MINUTES

# REPORT OUT - 5 MINUTES

**Please choose –  
Scribe and  
Spokesperson at  
each table**



- Your hospital has been approached by a vendor in the US looking to partner on a new AI tool that is anticipated to revolutionize the way diagnoses are made in hospital emergency departments across North America.
  - The AI tool is called “DiagnoseMeNow”.
  - The idea is that a patient’s triage data will be entered into the tool, which will then output the patient’s most likely diagnosis together with recommendations regarding further investigations and treatment.
  - In addition to the patient’s triage data, the tool would have direct access to the hospital’s Electronic Health Record (EHR) and would be able to pull the patient’s health history as well as trends in recent admissions and Emergency Room (ER) attendances at the hospital.
  - The tool also takes account external inputs, such as weather and environmental conditions, reported accidents and events, and trends in recent admissions and ER attendances at the hospital.
  - The vendor does not currently have any relationships with Canadian hospitals or healthcare entities and is looking for a partner to adapt and develop the tool for introduction to the Canadian market.
-

**You are the clinical leader responsible for the Emergency Department and have been asked to make a recommendation to the hospital leadership regarding whether to proceed with implementing the tool.**

**How would you go about considering the opportunity?**

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## Table 1 Exercise

Your participation needed

10 MINUTES

**What questions should be considered in this scenario?**  
**Try to identify 1-2 questions per risk in each area**

### Governance Risks (Board, Health Leaders, Risk Managers)

How are AI related  
decisions made?  
What is the  
approved process?

### Clinical Risks

What happens if AI  
system gives conflicting  
advice from the  
individual triaging?

### Performance Risks

How do users provide  
feedback?

### Ethical Risks

Has the proposed AI  
solution undergone  
an independent ethics  
review?

### Privacy or Security Risks

What is stored?  
Where it is stored?

### Implementation Risks

Does consent need to  
be considered?

**Who should be involved in the process for AI considerations?**

## REPORT OUT RAPID FIRE





PARTNERING TO CREATE THE SAFEST HEALTHCARE SYSTEM





# ORGANIZATIONAL READINESS AND CULTURE

|           |                                                                |
|-----------|----------------------------------------------------------------|
| Evaluate  | Evaluate Board and Organizational commitment and risk appetite |
| Align     | Align AI use with institutional values and mission             |
| Assess    | Assess digital literacy of frontline healthcare providers      |
| Provide   | Provide AI education                                           |
| Designate | Designate accountable leadership & committee for AI oversight  |
| Engage    | Engage Patients and Family Advisory Council in AI discussions  |
| Develop   | Develop AI Governance Policy                                   |

# CLINICAL VALIDITY AND SAFETY

|           |                                                                                           |
|-----------|-------------------------------------------------------------------------------------------|
| Validate  | Validate AI systems with robust, peer-reviewed clinical studies                           |
| Benchmark | Benchmark against current standards of care and standards/guidelines in your jurisdiction |
| Ensure    | Ensure testing across varied clinical scenarios and demographics                          |
| Require   | Require real-world performance data (sensitivity and specificity)                         |
| Use       | Use independent third-party audits to assess safety claims                                |
| Document  | Document known failure modes and contraindications                                        |
| Apply     | Apply organizational ethics framework as a part of AI assessment plans                    |
| Evaluate  | Evaluate AI tools for potential scope creep                                               |



# ALGORITHMIC BIAS AND EQUITY

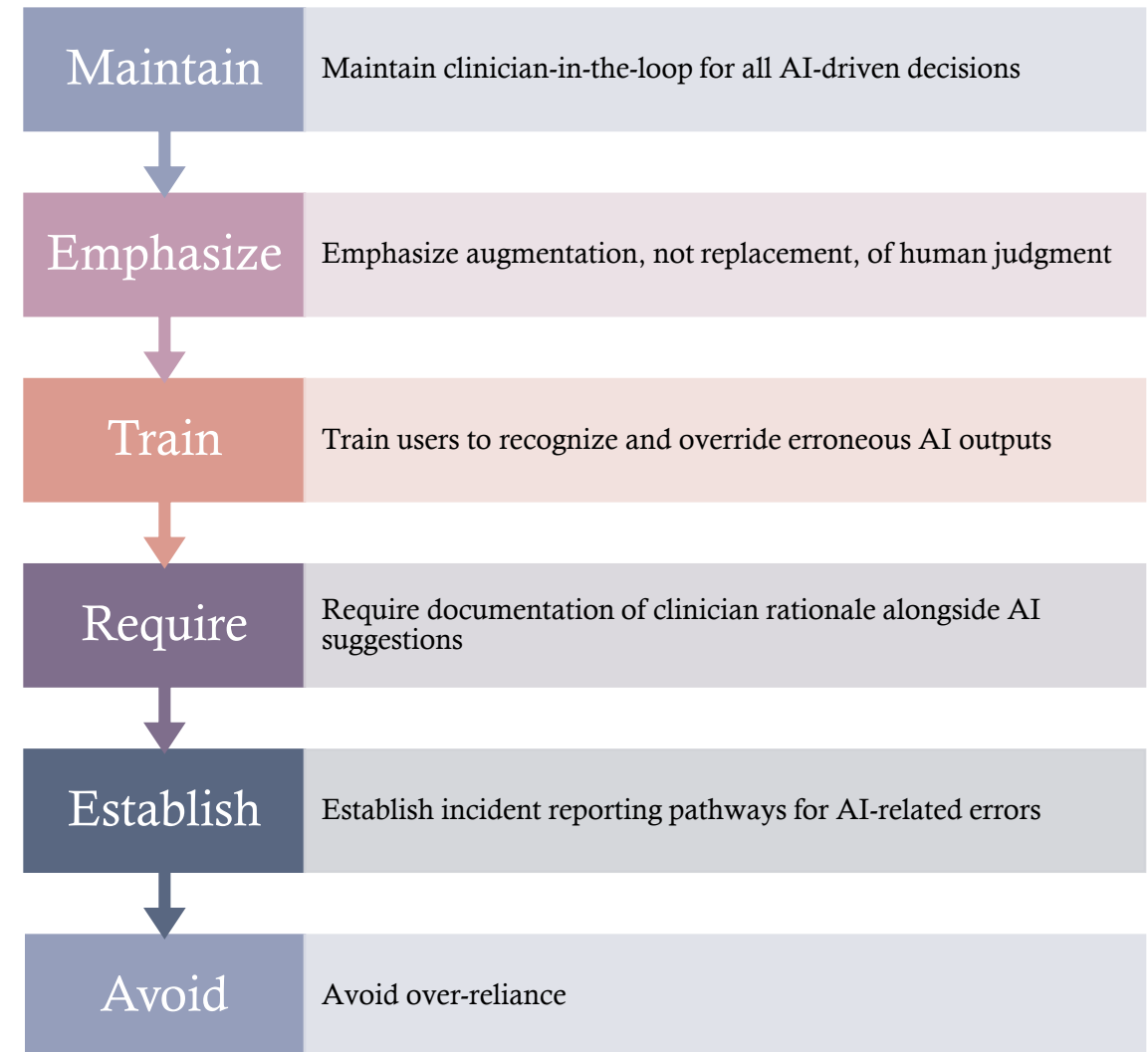


- Examine training data for diversity and representativeness
- Evaluate for racial, gender, and age-related bias
- Assess performance disparities across vulnerable populations
- Require vendors to disclose bias mitigation strategies
- Monitor outcomes post-deployment for equity impacts
- Integrate equity reviews into institutional AI governance processes

# DATA GOVERNANCE

|          |                                                                      |
|----------|----------------------------------------------------------------------|
| Conduct  | Conduct data protection impact assessments                           |
| Ensure   | Ensure de-identification and secure data transfer protocols          |
| Clarify  | Clarify data ownership, access, and retention policies               |
| Restrict | Restrict third-party access unless explicitly approved               |
| Require  | Require vendor compliance with institutional cybersecurity standards |

# HUMAN OVERSIGHT AND CLINICAL AUTONOMY



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# INTEGRATION WITH CLINICAL WORKFLOWS

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Conduct workflow analysis before AI adoption

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Avoid disruptions to existing care delivery patterns

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Design user-centered interfaces that fit into EHR and daily practice

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Minimize alert fatigue through adaptive thresholds

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Ensure cross-platform compatibility and interoperability

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Co-design with frontline clinicians during pilot phases

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# CONTINUOUS MONITORING AND QUALITY ASSURANCE

- Implement post-deployment surveillance for performance drift
- Establish KPIs for clinical and operational impact
- Use dashboards for real-time performance tracking
- Require scheduled revalidation and retraining of models
- Monitor unintended consequences and secondary harms
- Report metrics to operational, quality, and governance committees

# MITIGATION OF ADVERSARIAL AI THREATS

**MALICIOUS ACTORS MAY TRY TO  
MANIPULATE AI TOOLS TO CAUSE HARM OR  
MISLEAD RESULTS**

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Ensure AI systems are part of your organization's broader cybersecurity planning

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Ask vendors to explain how their AI tools are protected against manipulation

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Periodically simulate attack scenarios to ensure systems remain resilient and safe

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Set up alerts for when AI systems behave in unexpected or inconsistent ways

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Collaborate with IT cybersecurity teams to integrate AI into incident response plans

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Include AI tools in institutional medical device oversight policies

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Keep a documented audit trail of AI-related decisions and actions



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## RESOURCES:

- Setting the Winning Conditions for AI-powered Healthcare. A CHIEF Executive Forum Report, May 2025: <https://digitalhealthcanada.com/setting-the-winning-conditions-for-ai-powered-healthcare-2/>
- Tyler S, Olis M, Aust N, Patel L, Simon L, Triantafyllidis C, Patel V, Lee DW, Ginsberg B, Ahmad H, Jacobs RJ. : A Scoping Review. Use of Artificial Intelligence in Triage in Hospital Emergency Departments: A Scoping Review Cureus. 2024 May 8;16(5):e59906. doi: 10.7759/cureus.59906. PMID: 38854295; PMCID: PMC11158416.
- Preparing for the future: How organizations can prepare boards, leaders, risk managers for artificial intelligence. Dixit, Quaglietta, Gaulton, 2021
- HIROC - Artificial Intelligence: Risk Management in Healthcare
- Health Excellence Canada; Implementing Artificial Intelligence in Canadian Healthcare: A kit for getting started.

## CONTACTS:

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