

THE CARE-AI STUDY

CREATING ACCOUNTABLE AND
RESPONSIBLE ETHICS FOR
ARTIFICIAL INTELLIGENCE IN
HEALTHCARE

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OBJECTIVES

1. Identify and understand the challenges for professionalism introduced by the use of AI technologies, including algorithmic bias, data privacy, and ethical use of AI-generated insights.
2. Apply the CARE-AI principles to scenarios specifically designed for the use of AI in healthcare.

A decorative graphic on the right side of the slide. It features a dark blue background with white circuit-like patterns. The letters 'AI' are prominently displayed in a large, white, sans-serif font. The graphic is partially obscured by a diagonal white line and a dark blue triangle in the top right corner.

AI

ACKNOWLEDGEMENTS

This work builds off of previous work in professionalism and social media created by:

Rachel Ellaway, University of Calgary

Janet Corral, University of Ottawa and University of Calgary; Friend of the Wilson Centre, University of Toronto

They have approved the use of Professionalism Principles for Social Media to be used in this work and related work, and have participated in its creation.

Funding

uOttawa Faculty of Medicine and FSC through UHN are providing funding in part to support the work of the CARE-AI study



WHY DO WE NEED A PROFESSIONALISM FRAMEWORK?

Equitable
Care

Transparency

Trust

Enduring
Behaviors

Informed
Decision
Making

IDENTIFIED GAP: PROFESSIONALISM FRAMEWORK IS NEEDED



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Clinical ethics

Clinicians and AI use: where is the professional guidance? 

 [Helen Smith](#)¹, [John Downer](#)²,  [Jonathan Ives](#)¹

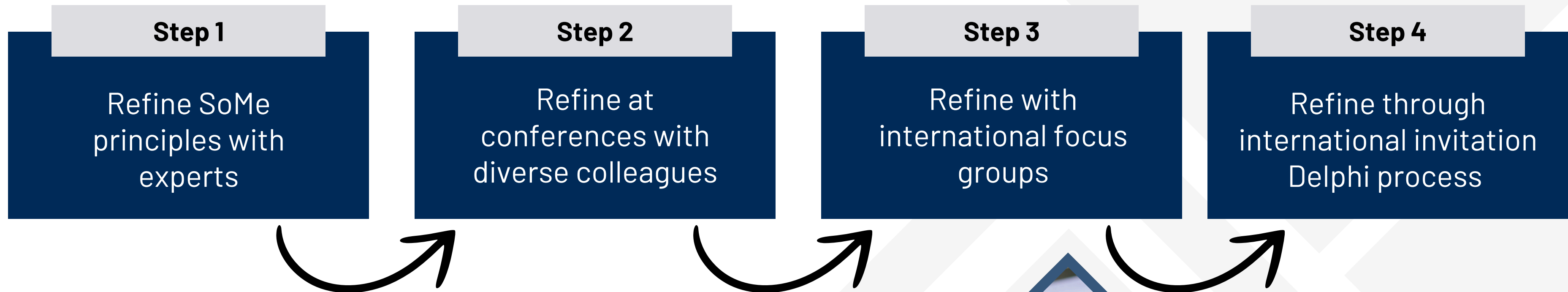
Correspondence to Dr Helen Smith, Centre for Ethics in Medicine, University of Bristol, Bristol, BS8 1QU, UK; helen.smith@bristol.ac.uk

HOW SHOULD WE USE AI RESPONSIBLY AND PROFESSIONALLY IN HEALTH CARE, EDUCATION, AND CLINICAL PRACTICE?



DEVELOPING CARE-AI

Build off Social Media Principles (2011) and iteratively develop with inclusive, diverse and expert voices:



With gratitude to collaborative colleagues:

Lyn Sonnenberg, U Alberta

Janet Corral, U Ottawa

Jerry M. Maniate, U Ottawa

David Wiljer, U Toronto

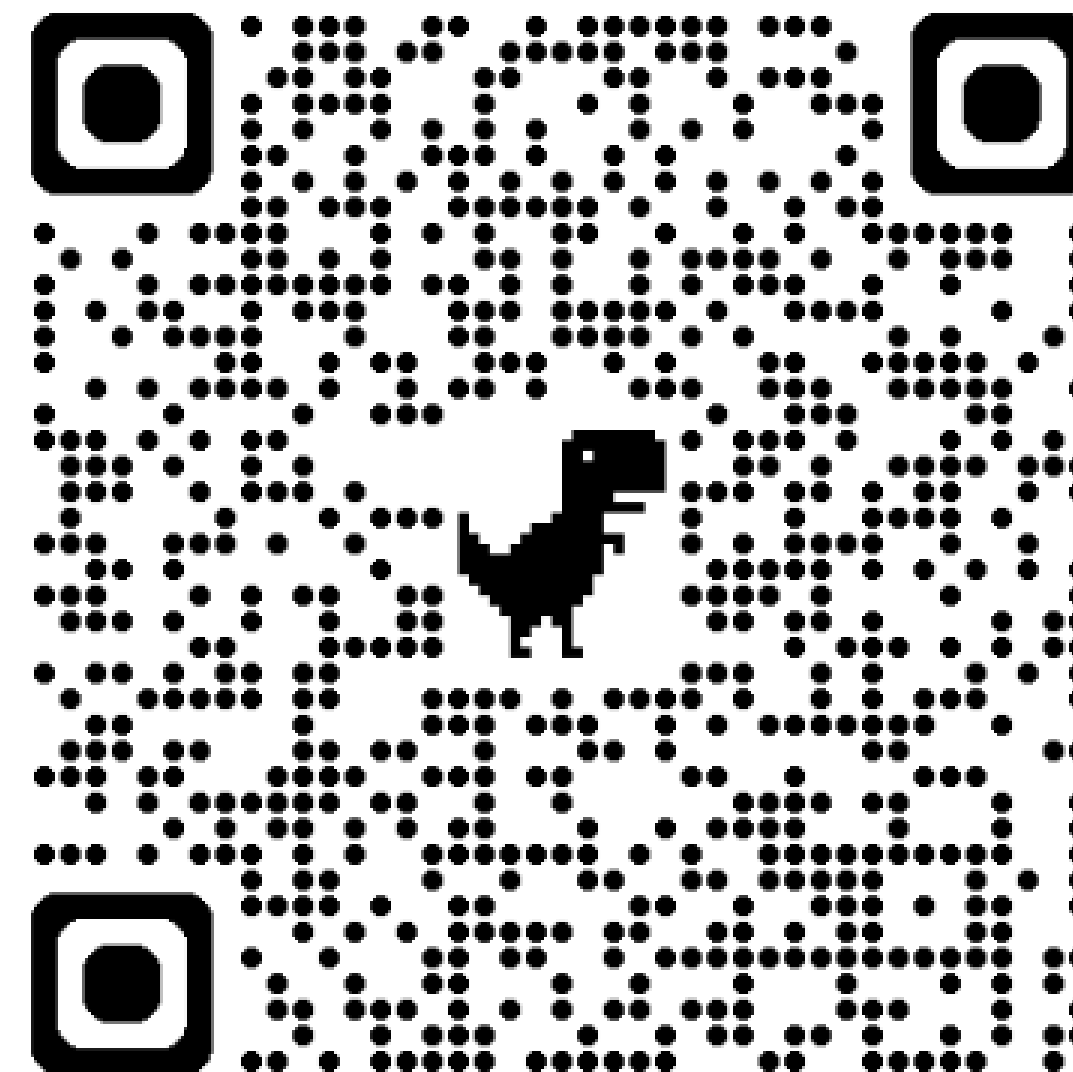
Muhammad Mamdani, U Toronto

Brandon Tang, U Toronto

Babar Haroon, Memorial U



CARE-AI FRAMEWORK



Download to Your Device
Keep Open To Refer To During Scenarios

OVERVIEW OF CARE-AI PRINCIPLES

1. Responsible AI is a professional duty.
2. Responsible AI use should complement, not replace, human judgment.
3. Think before you say, do, or interact with an AI system present.
4. Use AI with honesty and integrity.
5. Work within the law.
6. Ensure ethical information stewardship.
7. Advocate for mechanisms to reduce bias in AI tools.
8. Digital security awareness is part of your professional responsibility and your professional reputation.
9. Consider the long-term implications of your digital activities.
10. Build and maintain literacy in AI.



KEY CONSIDERATIONS FOR CLINICIANS CONSIDERING ADOPTING AN ML MODEL INTO PRACTICE AT THEIR INSTITUTION

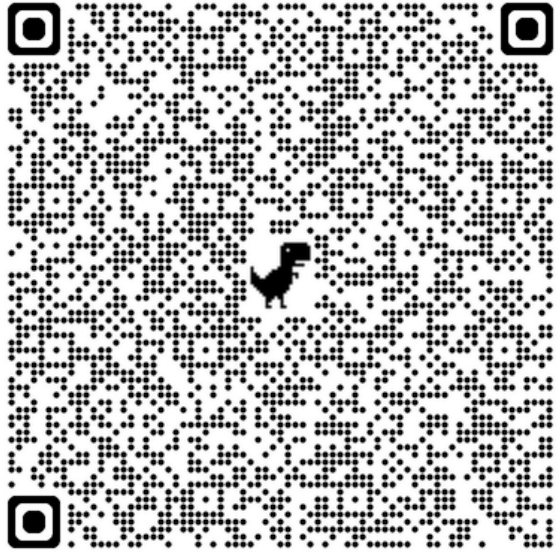
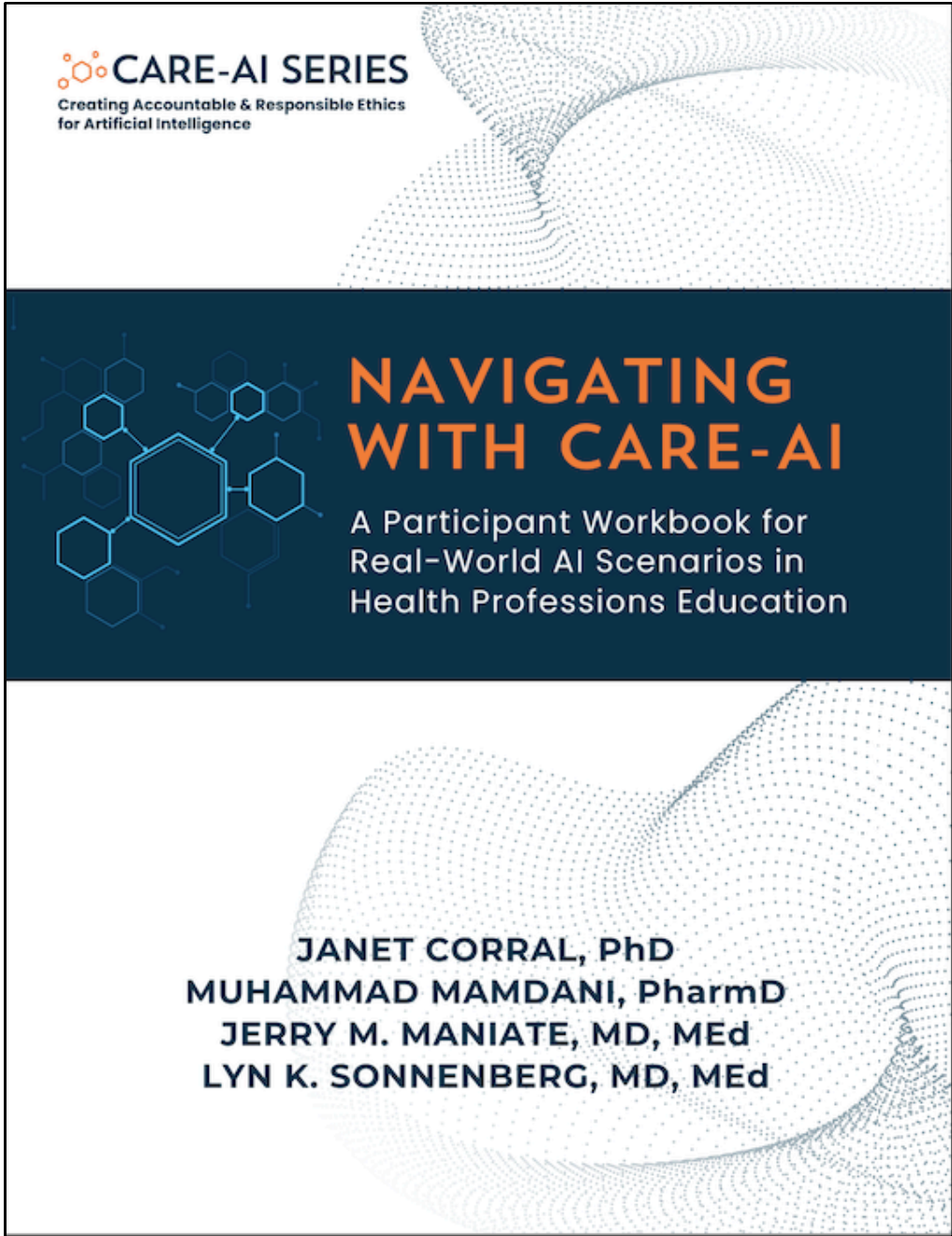
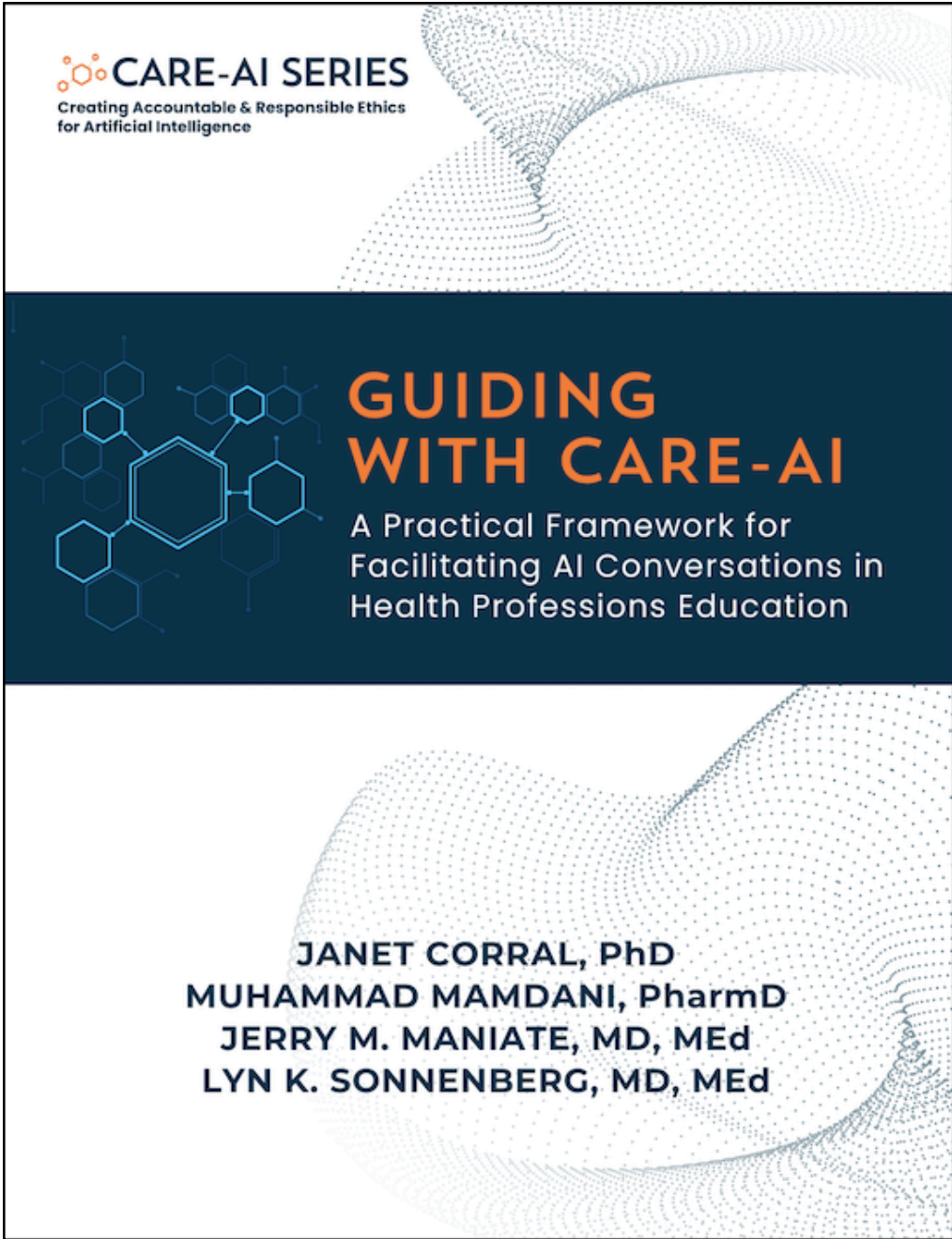


Teaching old tools new tricks—preparing emergency medicine for the impact of machine learning-based risk prediction models

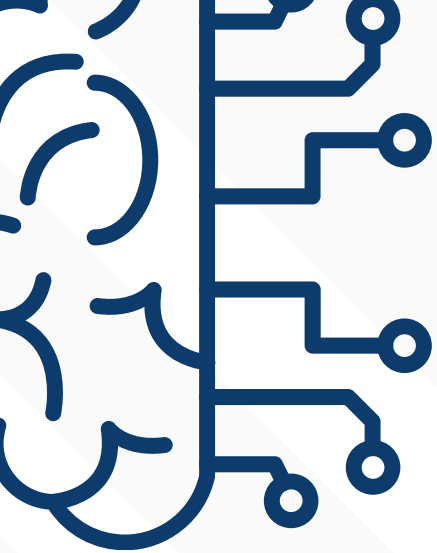
Vinyas Harish, Keerat Grewal, ... Venkatesh Thiruganasambandamoorthy in Canadian Journal of Emergency Medicine
18 March 2023

| Consideration | Recommendation |
|---|--|
| 1. Is the model needed for the outcome of interest? | <p>Is there a perceived need among frontline clinicians to use a prediction model in this context?</p> <p>Is the problem sufficiently common, challenging, and does it have enough practice variation to warrant the use of an ML model?^a</p> |
| 2. Was the model robustly developed? | <p>What predictors were used to develop the model? Are they clinically plausible or sensible?^b Are these predictors difficult to capture? (e.g., family history of sudden death)</p> <p>Are the reported performance metrics appropriate? Keep in mind the choice of performance metric is task specific and requires clinical insight</p> <p>Has the model demonstrated potential to improve meaningful clinical outcomes? (e.g., morbidity, mortality, length-of-stay)</p> <p>Checklists such as TRIPOD-AI, STARD-AI, DECIDE-AI, and SPIRIT/CONSORT-AI can help prospective end-users appraise studies of ML models</p> |
| 3. Is there sufficient technical capacity available to support potential deployment? | <p>Consult existing organizational information technology and data governance groups regarding feasibility and how the model would be integrated within existing information technology systems (e.g., the electronic medical record, cloud computing systems, etc.)</p> <p>If the model is commercially available, determine what supports the vendor can provide through the process</p> |
| 4. Is model performance robust in the target patient population? | <p>Conduct a silent trial at the site of potential deployment whereby the model is generating predictions, but these predictions are not being used to impact patient care^c</p> <p>The length of the silent trial is dependent on the prevalence of the condition of interest (e.g., rarer diseases need more time) and duration needed for outcomes to accrue (e.g., 30-day mortality)</p> <p>Use results from silent trial to determine if the model needs to be retrained or if predictors need to be updated^c</p> <p>Define a cut-off for determining poor model performance, this is highly task specific and may involve measuring the baseline performance of clinicians in that task^c</p> |
| 5. Does the model appear to be trustworthy (i.e., in terms of bias, interpretability/explainability)? | <p>Conduct a bias assessment in key population subgroups (e.g., by age, sex, race if that data are available, socioeconomic status, etc.)^c</p> <p>Audit the predictors used in the model to determine which are most important, are they clinically plausible or sensible?^{b,c} Are there any signs that may suggest overfitting?</p> <p>Audit model false positive and negatives, would clinicians make similar errors on these examples?^c</p> |
| 6. Have all relevant stakeholders considered how the model will impact clinical workflows? | <p>Create an interdisciplinary working group to explore how to navigate concerns and potential barriers</p> <p>Ensure that team members have expertise in overlooked areas, such as human factors and user interface/experience design</p> |
| 7. Is there a means of continually monitoring model performance once it has been deployed? | <p>Keep in mind that dataset shifts can cause deterioration in model performance once a model is deployed</p> <p>Create automated alerts and a protocol to revert to baseline operating procedures if model performance drops below a clinically significant threshold^c</p> |

CARE-AI FACILITATOR AND PARTICIPANT WORKBOOKS



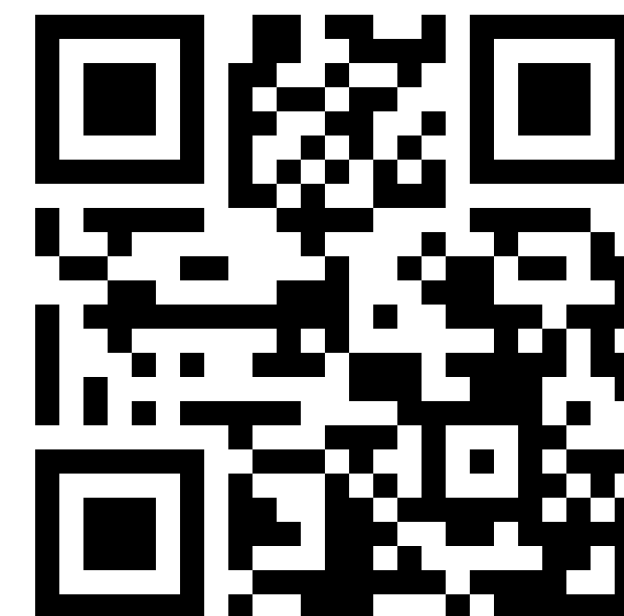
Scan here



GET INVOLVED: CARE-AI STUDY



- CARE-AI Study: Survey Link -
<https://redcap.link/CAREAI1>
 - Scan the QR Code to participate in the Delphi-based CARE-AI survey.
 - Your Feedback Matters – Survey Deadline: April 20
- REGISTER: AI in Healthcare Think Shop
 - Virtual Event: **June 9th, 1–4 pm ET.**
 - Don't miss this opportunity to engage in key discussions!



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**Let's co-create
impactful change**

CONTACT US!



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THANK YOU!

FOR YOUR PARTICIPATION

