**“The Promise and Pitfalls of AI in Medicine”**
**Muhammad Mamdani and Amol Verma, University of Toronto**
**International Disability Rights Affirmation Conference 2024**
**November 15**

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[2024/11/15 10:32] Elektra Panthar: Hello everyone.
Today's presentation is being transcribed so those without audio or who require text only can participate in real time.
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Transcriptionists will fill in any gaps and support the Question & Answer section at the end.
A little explanation about this service.
Voice-to-text transcriptionists provide a translation of the key ideas discussed, NOT a word for word transcription.
Voice-to-text services provide an in-the-moment snapshot of ideas and concepts, so that those who are unable to hear or to understand the audio program are able to participate in real-time.
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Transcription is provided by Virtual Ability, Inc.
The transcriptionists are:
Elektra Panthar
Shaerken Changeheart
The speakers will be identified by initials as they speak.
The following initials in the transcription record will identify the speakers:
MH: Muhammad Mamdani
AV: Amol Verma

<<transcription begins>>

[2024/11/15 10:30] Valencia Skydancer: Hello and welcome to Virtual Ability’s 2024 International Disability Rights Affirmation Conference.
I am Valencia Skydancer.
I have post traumatic stress disorder and I use a rollator due to neuropathy in my legs.
love to explore and play the different games in second life. I own a small cafe.
Today I’d like to introduce Muhammad Mamdani and Amol Verma.
Dr. Mamdani is Vice President of Data Science and Advanced Analytics at Unity Health Toronto & Director of the University of Toronto Temerty Faculty of Medicine Centre for Artificial Intelligence Education and Research in Medicine.
Dr. Verma is an Associate Professor in General Internal Medicine at St. Michael’s Hospital & the University of Toronto and the Temerty Professor of AI Research and Education in Medicine at the University of Toronto.
Today, they are presenting information regarding The Promise and Pitfalls of AI in Medicine.

This presentation will provide a basic overview of artificial intelligence (AI) in medicine and its applications using real-world examples. It will also highlight potential challenges with developing and deploying AI solutions in realizing societal benefits and minimizing risks for potential harm.
Please hold all questions till the end of the presentation. Gentlemen, the floor is yours.

[2024/11/15 10:32] Elektra Panthar: AV: Thank you for having us, apologies, we're new to SL
There are so many applications in AI in medicine. I want to speak about the project of predictive analytics
We are trying to predict undesirable events in patients
We know that the #1 root cause of unplanned transfer to ICU is clinicians failing to rescue patients because they didn't recognize clinical deterioration soon enough.
We can use AI to monitor physical status of patients and give us an early warning
We created this tool: CHARTwatch is an artificial intelligence-based tool that uses >100 inputs from routinely collected data in the electronic health record to predict unplanned ICU transfers and death in hospital – an early warning signal.
Can we use the info that we already have in the computer to warn the medical personnel early to reduce mortality
Our goals were:
-reduce mortality
-improve communication with patients and families
-improve coordination between clinical teams
-improve end-of-life care
If we know in advance, we can also warn the family and help them prepare

CHARTwatch care pathway: when the tool identifies the high risk patient, the computer provides a what to do for the patient
We have AI supporting the clinicians
We spent 3 years developing these pathways and deployed it in October 2020
In one wing of the hospital - general adult medical wing
We want to prevent care and provide end of life palliative care for those who couldn't be identified in time before
The rates of non palliative death were similar before we deployed it. Once we deployed it we had an improved result, there are positive results
There was a lot of attention in the media about this when we published the results, and we were very happy about the human element, that we could help
Real world experience
The resident on call overnight received a high risk alert around 11 pm. She went and reviewed the chart and saw the patient as per the recommended protocol. He was relatively stable. Approximately 2 hours later, she received a call from the nurse that the patient was decompensating. As she already knew the patient, she was able to quickly get ICU involved. The patient went to the ICU but did not have a respiratory arrest, which was certainly a risk if intervention had not been done as quickly. She feels that CHARTwatch made a big impact.

What are the challenges with deploying AI in Ontario hospitals?
AI solutions work best in the data they were trained on
Epic algorithm trained on data from 3 hospitals
Deployed in 2 new hospitals: Missed 2/3 of cases, 90% of alarms were false
So we need to be careful about changing the setting of AI
Another problem is the biased algorithms
Algorithm designed to detect patients who need additional attention favoured white patients, reducing number of Black patients eligible for additional care by more than half.
We need to be careful before we deploy them for this reason
To get an AI into use, it takes a lot of expertise and effort
We need to figure out a way to test rigorously the projects
So we need to create a network where we can share the data, the algorithms, and patient knowledge, clinicians, so that these solutions can be deployed in more places

We deployed GEMINI that can help build solutions doing this
Our generation's challenge is to integrate advanced computing in medicine to improve quality and humanism
GEMINI is among Canada's largest hospital data and analytics networks, one of the largest in the world. We collect electronic clinical data (extracted from hospital information systems) and administrative data from 30 hospitals across all regions of Ontario, who care for about 60% of the province's patients. The data are collected for all medical (i.e. general medicine and medical specialties like cardiology, oncology, etc.) and intensive care admissions. GEMINI data currently contain more than 1.6 million hospitalizations.

The data are collected at St. Michael's Hospital and made available to a large community of students and scientists in the HPC4Health data platform, a secure high-performance computing cloud based at SickKids.
I'll leave my contact as well so you can contact me
[2024/11/15 10:48] Amol Verma (VAIPresenter5 Resident): amol.verma@mail.utoronto.ca

[2024/11/15 10:48] Elektra Panthar: MM: there's a lot of interest in AI in healthcare
Papers and products about AI have grown exponentially in the past few years
There is a huge market interest in AI which is also why it grew so much
We formed Unity by combining 3 hospitals
We have a team of 30 people
We develop solutions to help patients
We operate globally, in Canada and also Taiwan
In India and China they are pursuing this energetically
We have to be careful, and make sure to include people the devices are geared to , especially disabled people
Some products like Voiceitt can help nonverbal people communicate
There are talks of neurolink to help quadriplegic people with movement
Some are looking at exoskeleton devices who can monitor signals from the body and brain and help the person move
The connection between humans and machine is expanding

Any questions?

[2024/11/15 10:54] Gentle Heron: QUESTION – Might your work be even more important for small rural hospitals than for larger urban ones?
[2024/11/15 10:54] Shaerken Changeheart (ChangeheartShaerken Resident): MM: sure, maybe I can start and hand it over to Amol
We are fortunate to be in a teaching hospital -- we have a unit to test brain bleed.
The benefit is there.
Far more beneficial in rural hospitals
Great for hospitals without the larger hospital resources
AV: Yes, I agree with MH. If we were to design a tool based on huge urban hospitals in mind ...
I'm not sure these tools will easily translate
When I spoke about networks -- it's really important to include smaller rural networks
For expertise on what is available and how a tool could work
I think we can create exciting technologies that can have a lot of impact
[2024/11/15 10:57] Gentle Heron: I asked that because I live in a rural area. There are no neurologists within a hour and a half drive from where I live. I have no way to get services related to my MS.
[2024/11/15 10:57] Shaerken Changeheart (ChangeheartShaerken Resident): AV: Yes, using AI as a tool for accessibility for services that are hard to get to is an exciting opportunity
Does anyone else have a question?

GH: I think Dr Verma may have a question for the audience.
AV: We seek PWLE (people with lived experience) for comment.
I'll reach out to GH for access to your thoughts.
[2024/11/15 11:00] Gentle Heron: Thanks Dr Verma

[2024/11/15 10:58] Warthog Jun: Where do you think personal data should reside? Patient? Doctor?
[2024/11/15 10:58] Shaerken Changeheart (ChangeheartShaerken Resident): AV: Yes. It's an important question. I'll answer 1st.
No, I think that wherever patient data resides (currently in many places ...
transparency is most important
Along with what protections for privacy are put in place
What health care data can be used for should be a social contract
That kind of transparency -- should not be buried in multi-pages of data that we have to "find"
MM: I agree with AV
Patients own their data
Hospitals have the privilege of being the custodian of your data
Patients come first
I have to leave as well
Terrific to have been here

This has been fun!
Congratulations to EVERY one who has set this up.

[2024/11/15 11:02] Elektra Panthar: GH: Thank you both !
[2024/11/15 11:01] Mook Wheeler: ♫•:*¨♥¨*:•♫ APPLAUSE ♫•:*¨♥¨*:•♫
[2024/11/15 11:02] Pecos Kidd: Great job - thanks!
[2024/11/15 11:02] Buffy Beale: cheering!
[2024/11/15 11:02] Lyr Lobo: /me cheers
[2024/11/15 11:02] Gentle Heron: Lots of good information here
[2024/11/15 11:02] Stepin (Stepinwolf Darkstone): Interesting.
[2024/11/15 11:03] Mook Wheeler: AI is a good 'guard-dog' as long as it isn't expected to be subjective about things...
[2024/11/15 11:03] Particle Physicist Bejiita (Bejiita Imako): as long AI is used right in genera its ok but its a 2 edged sword
[2024/11/15 11:04] Gemma (Gemma Cleanslate): it sounds wonderful for the small rural hospitals if they can do this