

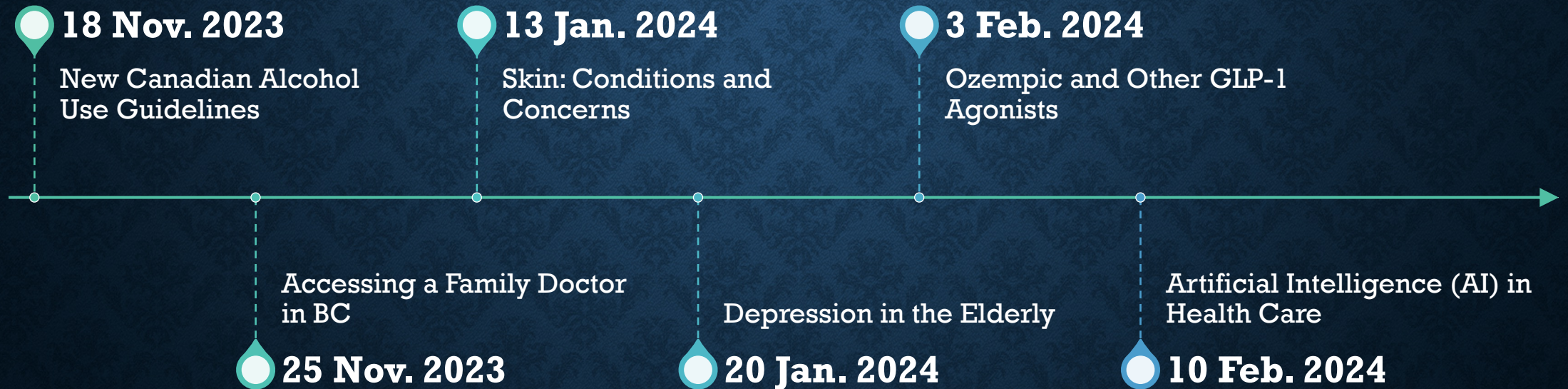
WELCOME!

If you have not already done so, please
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https://ubc.ca/qualtrics.com/jfe/form/SV_0BaujGaK34koAkK

2023-2024 MINI MED SCHOOL LECTURE SERIES



ARTIFICIAL INTELLIGENCE (AI) IN HEALTHCARE

Overview of
AI

Applications
of AI in
Healthcare

Concerns
Regarding
AI

9am-10:30am

10-minute break

15-minute Q/A
session at the
end

TIMELINE FOR TODAY

Derek Anderson



Michael Smith



WHO WE ARE

- We are both second year medical students in the UBC Faculty of Medicine
- Disclosures:
 - We are not doctors, please consult your healthcare professional.
 - We will be providing a general overview
 - This session will also be recorded for future viewing purposes

TERRITORIAL ACKNOWLEDGMENT

- I would like to acknowledge that I am joining you from the UBC Vancouver campus which is situated within the traditional, ancestral and unceded territory of the x^wməθk^wəyəm (Musqueam).

TODAY'S OUTLINE



Overview of AI

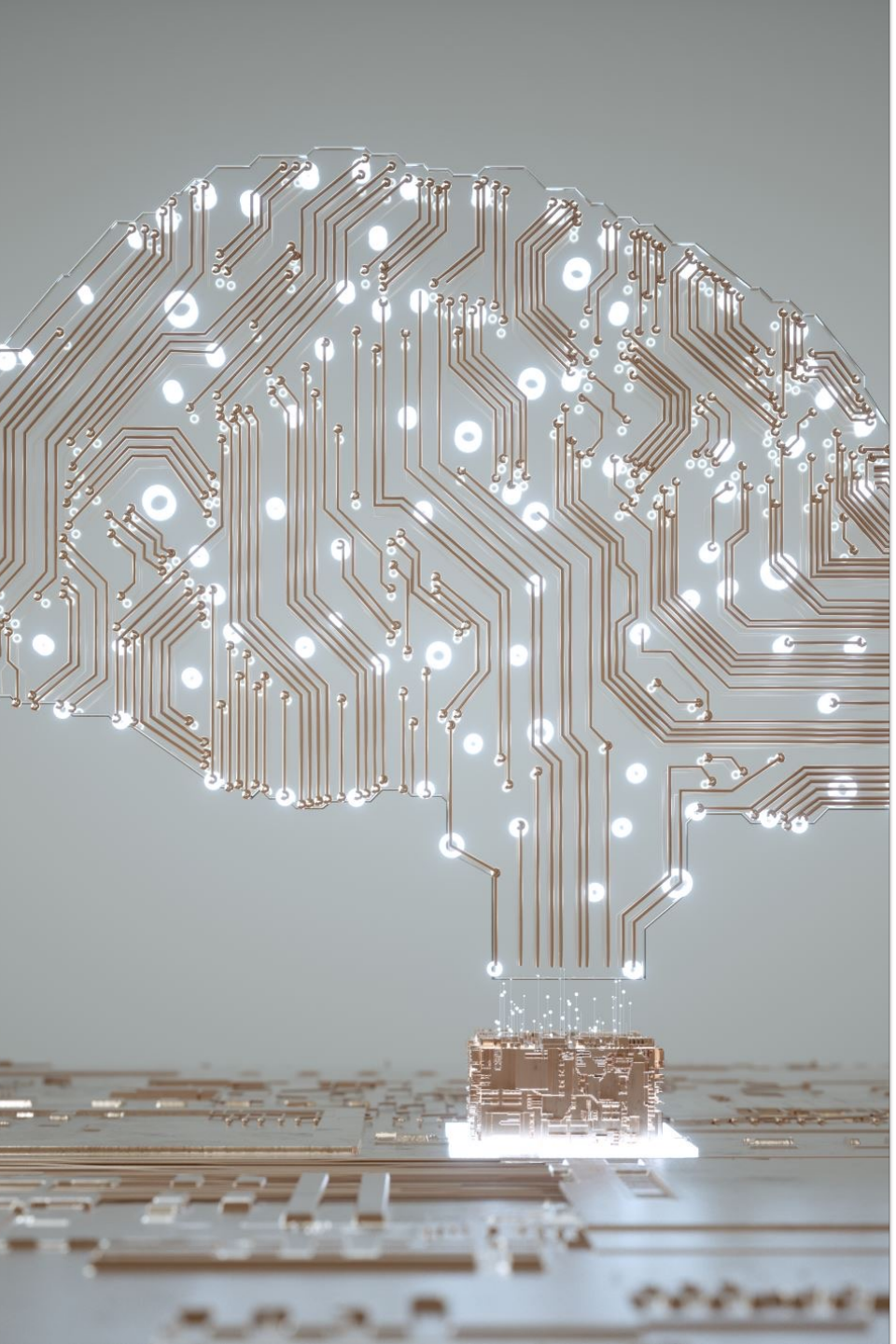


Applications of AI in Healthcare



Concerns regarding AI in Healthcare

**POLL: WHAT IS YOUR CURRENT LEVEL OF
UNDERSTANDING OF ARTIFICIAL
INTELLIGENCE (AI)?**



WHAT IS ARTIFICIAL INTELLIGENCE (AI)?

- AI = the use of machines to mimic human intelligence
- Machine Learning = a form of AI where machines take in large amounts of data and learn based off of patterns, without needing direction from humans

GENERATIVE ARTIFICIAL INTELLIGENCE

- Generative AI = artificial intelligence that can be used to create new things such as text, video, images, audio, and much more
 - ChatGPT = a free online platform that allows you to input a question and it will generate a response on a wide variety of areas:
 - Problems
 - Coding
 - Math
 - Games
 - Jokes
 - Poems, etc.

**POLL: ROUGHLY HOW MANY PEOPLE
CURRENTLY USE CHAT GPT?**

**THERE ARE CURRENTLY
ROUGHLY 180 MILLION
USERS OF CHAT GPT**

TODAY'S OUTLINE



Overview of AI



Applications of AI in Healthcare



Concerns regarding AI in Healthcare



HOW DOES ALL OF THIS APPLY TO HEALTHCARE?

- Artificial Intelligence (AI) has many current and future applications within the field of healthcare:
 - Improving diagnoses
 - Reducing administrative work
 - Drug discovery
 - Helping with virtual/rural healthcare
 - Surgery

DISCLAIMERS

I WILL BE MENTIONING A NUMBER OF AI COMPANY NAMES THROUGHOUT THE PRESENTATION, I AM IN NO WAY CONNECTED TO OR RECEIVING FUNDING FROM THESE COMPANIES. THESE ARE JUST EXAMPLES AND NOT AN EXHAUSTIVE LIST.

Analysis of retina scans: algorithm by MetaOptima has recently received Health Canada Licensing

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graph TD; A[Analysis of retina scans: algorithm by MetaOptima has recently received Health Canada Licensing] --> B[Assessing cognitive function: Linus health product analyzes traditional tests and other cognitive metrics in a digital form to efficiently assess a patient's level of cognitive function]; B --> C[Analysis of radiology images: Enlitic product helps guide diagnoses];
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Assessing cognitive function: Linus health product analyzes traditional tests and other cognitive metrics in a digital form to efficiently assess a patient's level of cognitive function


Analysis of radiology images: Enlitic product helps guide diagnoses

DIAGNOSTIC PROCESSES



DRUG DISCOVERY

- Screening for molecule combinations and potential efficacy against disease targets
 - Allows for novel drug developments
 - Recent development of this was by the startup company Cyclica where they used this technology to create a drug for COVID therapy within a few months

A high-angle photograph of a silver and black stethoscope resting on a white computer keyboard. The stethoscope's chest piece is positioned over the 'command' and 'option' keys, while its two earpieces extend towards the bottom right. The keyboard is partially visible, showing keys like 'shift', 'control', 'option', 'command', 'Z', 'X', 'C', 'V', 'B', 'N', 'M', 'J', 'K', 'L', 'P', 'O', 'I', 'U', 'Y', '8', '9', '0', and function keys. The background is a plain, light-colored surface.

REDUCING ADMINISTRATIVE WORKLOAD

- This is something that is being tried at Unity Health in Toronto:
 - Assigning nursing tasks
 - Summarizing patient data

PATIENT MONITORING SYSTEM

- Early Warning System for Patients:
 - CHART WATCH = a system that will provide hourly risk scores for patients and act as an early warning system if the patient is expected to deteriorate or need intensive care
 - Since its inception in 2020 there was a 26% reduction in relative risk of deaths for non-palliative patients at St. Michael's Hospital (part of Unity Health Toronto)



VIRTUAL/RURAL HEALTH

Virtual Assistant

- Answer questions about common conditions and connect patients to healthcare professionals

Remote patient monitoring:

- Wearable devices for chronic condition identification and management without need for in-person visit

**POLL: HOW WOULD YOU FEEL TALKING TO
A VIRTUAL ASSISTANT?**

SURGERY



- AI can complement the work of a surgeon
 - Anticipate events
 - Display warnings
 - Offer suggestions

SOME FUTURE DEVELOPMENTS



- Potential future approval of AI for interpretation of medical images in Canada
 - There has been some approval in the US
- Potential future approval of ChatGPT-like programs for use in medical settings
 - Concerns regarding the control of this if big corporations are running them. Publicly available options are emerging.



10 MINUTE BREAK

TODAY'S OUTLINE



Overview of AI



Applications of AI in Healthcare



Concerns regarding AI in Healthcare

**POLL: WHAT ARE SOME CONCERNS YOU
HAVE REGARDING AI IN HEALTHCARE?**

OVERVIEW OF SOME CONCERNS

Privacy concerns

Bias

Mistakes being made

Replacing jobs

PRIVACY AND AI IN HEALTHCARE

- There are concerns regarding the use of patient data for machine learning
- There may be alternative motivations for private corporations using this data
- Regulation may not be able to keep up with technological development
- Balancing data access vs. restriction

BIAS

01

AI gains
information from
people, and
people have biases

02

Disadvantaged
populations can be
further
disadvantaged

03

Regulators need to
lay out clear
requirements
regarding
mitigation of this
bias



REPLACING HEALTHCARE JOBS

- Concern regarding AI becoming more efficient/less costly and replacing jobs
- Patient's need for compassion
- AI is primarily currently being designed to complement and not replace jobs

AI MAKING MISTAKES

- Concerns regarding the newly developing technology not being validated enough for clinical use

HOW IS IT BEING REGULATED IN CANADA?



Health Canada regulates AI as “software as a medical device” or SaMD



Health Canada will also regulate “adaptive” SaMD that is able to learn on its own, even after it has gone to market

**POLL: HOW ARE YOU FEELING ABOUT THE
PROSPECTS OF AI IN HEALTHCARE?**

SUMMARY



AI is a burgeoning field that is constantly changing with many applications within healthcare



Important to balance these potential benefits with regulations that ensure patient privacy and safety

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QUESTIONS?



POST LECTURE SURVEY

Please consider filling out our post-lecture survey:

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