Category: Clinical Application of Technology

Workshop Title: Ethical Implications of Artificial Intelligence and Sensing Devices in Rehabilitation

Workshop Organizer(s): Shehroz Khan & Rosalie Wang

In person Speaker(s):

- Koh, Ryan, KITE, University Health Network, Canada
- Yue Li, KITE, University Health Network, Canada
- Dinesh Kumbhare, University of Toronto
- Mollayeva, Tatyana, KITE, University Health Network, Canada
- Lynn Haslam-Larmer, KITE, University Health Network, Canada
- Andria Bianchi, Unity Health Toronto, Canada

Virtual Speaker(s): TBA

Workshop Time: 08:15 - 09:45

Attendee Engagement:

We will organize three sessions

1. Invited talks by:

    - A clinician (15 min)
    - An AI practitioner/scientist (15min)
    - An Ethicist? (15 min)

2. Small group (30 min): Workshop participants will be divided into groups to discuss the following topics: a. Key challenges in applying AI and sensing devices, b. Ways they have integrated ethics considerations in projects or managed ethical issues, c. Resources or tools that have supported analysis and management of ethical issues.

3. Large group (15 min): Major themes emerging from discussions will be identified and shared to inform their research.

Abstract:

Millions of people worldwide seek rehabilitation services post injuries due to physical or cognitive impairment. Technology including wearable / ambient devices, video cameras, exoskeleton, avatars, and robots, play an important role in the swift recovery of these individuals preventing further decline. These devices can collect large amount of data from people living in the community or care setting, and feed to artificial intelligence (AI) algorithms to predict the onset of adverse health events (e.g., falls, seizures) or assess improvements in clinical outcomes (e.g., functional recovery after hip surgery). However, the data collected may be biased and skewed towards a particular sex and gender, physical attributes, ethnicity, and age group, which could lead to improper inferences and inequitable predictive models. Patient data is mostly stored remotely on manufacturers' clouds; therefore, it is difficult to ascertain its privacy and security. It is also not clear who owns the data and

for what purposes the data is used by the manufacturers. If a data breach occurs, in the absence of established ethical framework, the implications and consequences on the institutions, healthcare providers and on the patients are unknown. The user interfaces to operate many sensing devices may be complex and developed without the involvement of patients, which could further lead to rejection of these technologies. There are additional challenges related to informed consent, data governance and comprehension, accessibility, acceptability and security of sensing devices. The user agreements to use these technologies may be lengthy and complicated, which could ultimately lead to "digital resignation" of patients.

In this workshop, we will explore the ethical implications of using sensing devices, patients' data and AI algorithms in addressing the needs in the rehabilitation population. This workshop is relevant to clinicians, engineers, ethicists, patients and their caregivers.