Opportunities to innovate and accelerate use of technology across all phases of rehabilitation

Camila Shirota, PhD
Advance Queensland Fellow
Research Lead, HabITec
The Hopkins Centre
Impact of COVID-19 on rehabilitation

- Loss of inpatient beds
- Relocation
- Isolation
- Closure
- Reallocation to other services
- Inability to meet
- …

How to become resilient?

European Society of Physical & Rehabilitation Medicine, Survey on measures in PRM settings in ESPRM countries after the SARS-COV-2 outbreak

Balkaya et al., Am J Phys Med Rehabil, 2020
Technology!
Telehealth: inspiration and cautionary tale

Publications since 1960s!

Some Implications of Telemedicine

by Ben Park and Rashid Bashshur

Health care delivery by two-way television may change roles, authority, and distribution of health-care professionals.

The term “telemedicine” was introduced in the last decade to designate interactive, or two-way, television (IATV) in medical practice. Essentially, IATV provides links among individuals and groups at distances ranging from a few blocks to several miles. It can be used for remote diagnosis, consultation, counseling, psychotherapy, and teaching.
Going beyond: daily activity data

- Issue: track patient outside of the clinic

Patient

- Your tests
- Sit to stand transfer
  Last test: 8 Dec 2019 at 11:17:12
- 10 meters walk
  Last test: 4 Nov 2019 at 17:09:13
- Tandem balance
  Last test: 12 Nov 2019 at 17:29:18
- Balance on two legs
  Last test: 27 Nov 2019 at 19:19:14
- Romberg test
  Last test: 17 Dec 2019 at 11:17:16
- Free walk test
  Last test: 15 Dec 2019 at 09:27:11

Therapist

- 10 meters walk
- Walking speed: 0.56 m/s
- Cadence: 114.15 steps/min
- Swing phase: 26.72 %
- Stride length: 0.57 m
- Heel strike angle: 3.45 °
Going beyond: home monitoring

- Issue: enable safe independence
- 24/7 monitoring
- Can communicate with user
- AI learns habits and patterns
- Automated alerts

![SAMPLE HARDWARE LAYOUT](https://halleyassist.com)

Legend:
- H Hub
- L Latch Sensor
- S Speakers
- M Motion Sensor
- N Night Light

2 bedroom 2 bath
1000 square feet
all electric

Patio/Balcony

[Source: https://halleyassist.com]
Going beyond: image-based measures

Issue: precise measurements with ease and low cost

[Nakano et al., Front Sports Active Living, 2020]
Going beyond: integration

- Issue: accessing information from multiple devices in a single system
How?

What do you want?

What can you do?
Don’t waste a crisis!

- Technologies are tools
- Exploit technology’s strengths
- Reimagine rehabilitation
- Cross-disciplinary co-creation to revolutionize
Thank you!