Use of AI and Digital Technologies in
Supporting Transition of Patients between Acute and Community Care

CUHK Centre for Bioethics
Workshop on AI and Digital Healthcare

November 23rd, 2018

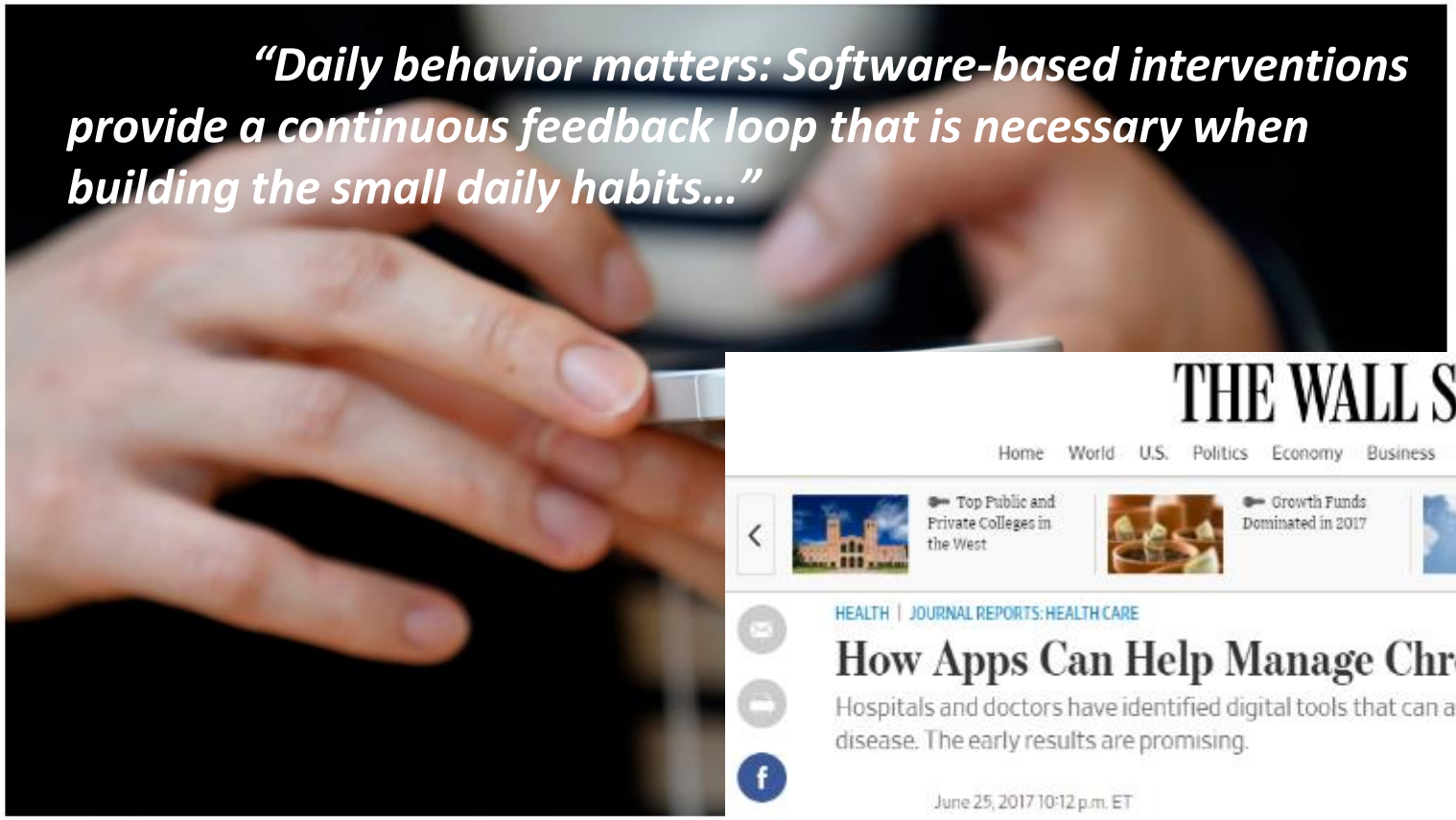
Kendall Ho, MD FRCPC
Lead, Digital Emergency Medicine
Professor, UBC Faculty of Medicine

Digital Emergency Medicine

FIRST OPINION

Your smartphone as medicine: Digital therapy is here to stay

By STEPHANIE TILENIUS / DECEMBER 11, 2017



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Top Public and Private Colleges in the West

Growth Funds Dominated in 2017

The Year's Fund Returns Are In. Do They Matter?

What You Need to Know About Bitcoin Funds

HEALTH | JOURNAL REPORTS: HEALTH CARE

How Apps Can Help Manage Chronic Diseases

Hospitals and doctors have identified digital tools that can assist patients in dealing with ailments such as diabetes, heart disease and lung disease. The early results are promising.

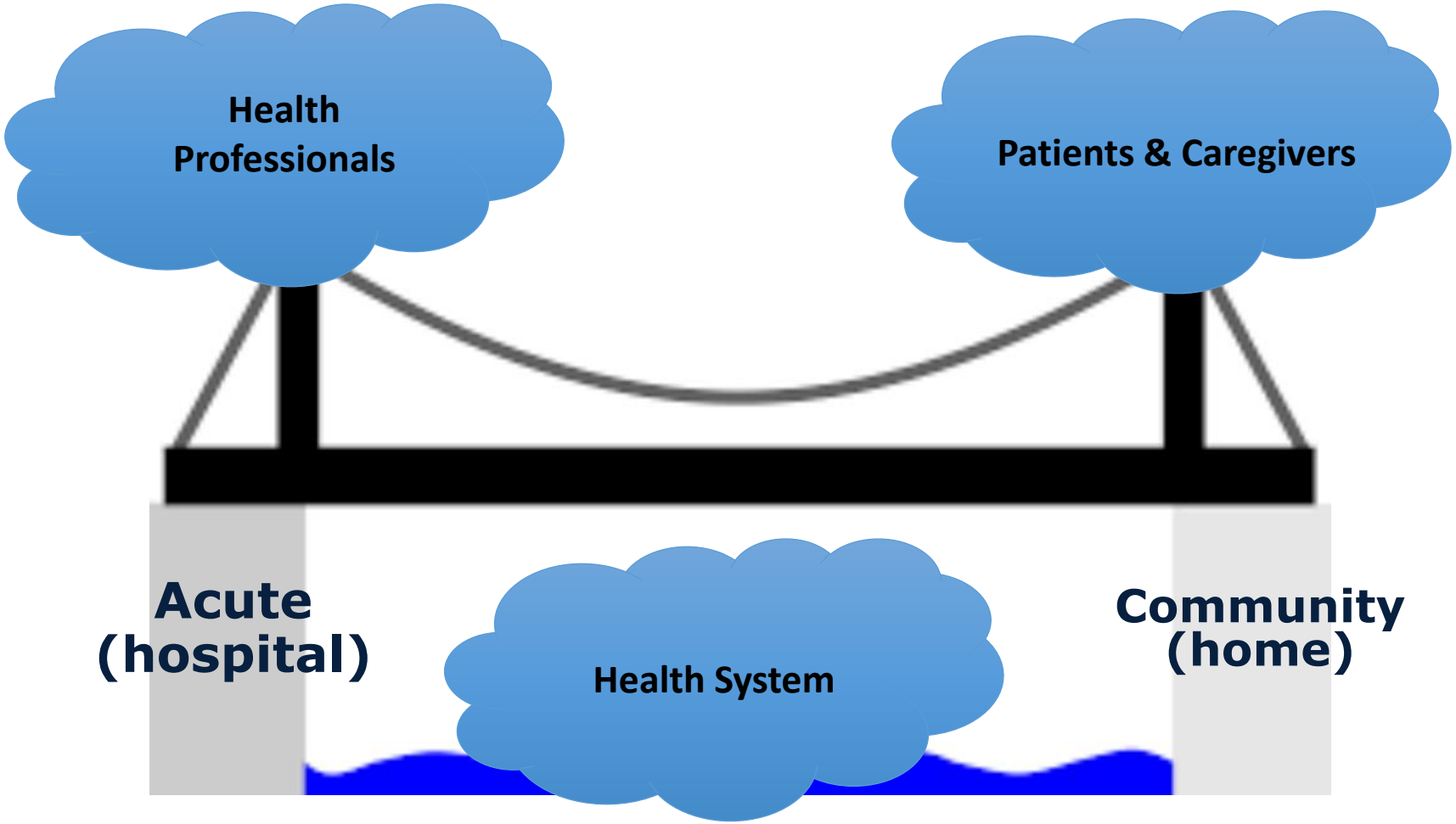
June 25, 2017 10:12 p.m. ET

AGENDA: Acute-Community Transition & Digital Health

- 3 Contexts of Transition
- Case studies: Chronic Disease Management
- Issues & challenges

Digital Emergency Medicine

Digital Emergency Medicine



a place of mind
THE UNIVERSITY OF BRITISH COLUMBIA
FACULTY OF MEDICINE

Makovsky/ Kelton 5th annual “Pulse of Online Health” survey

Two-Third patients
to use mHealth

#1015 ppl

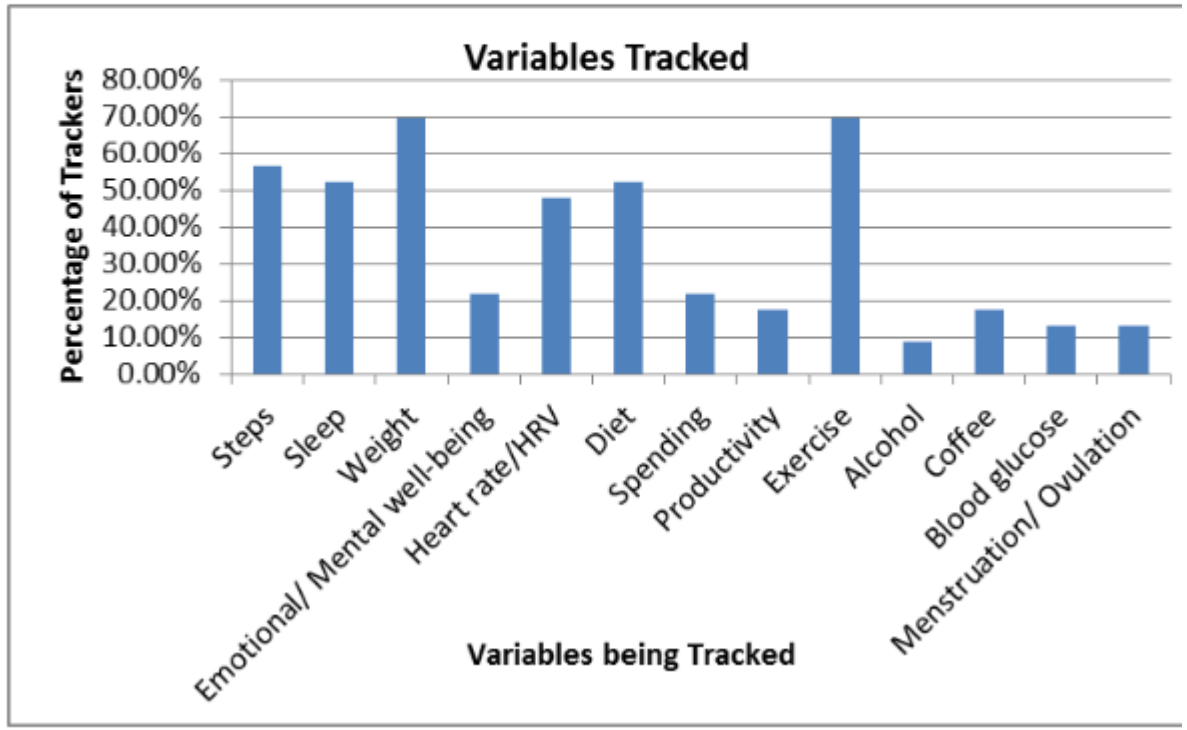
Dispatch from QS Dublin: Results from a QS Community Survey

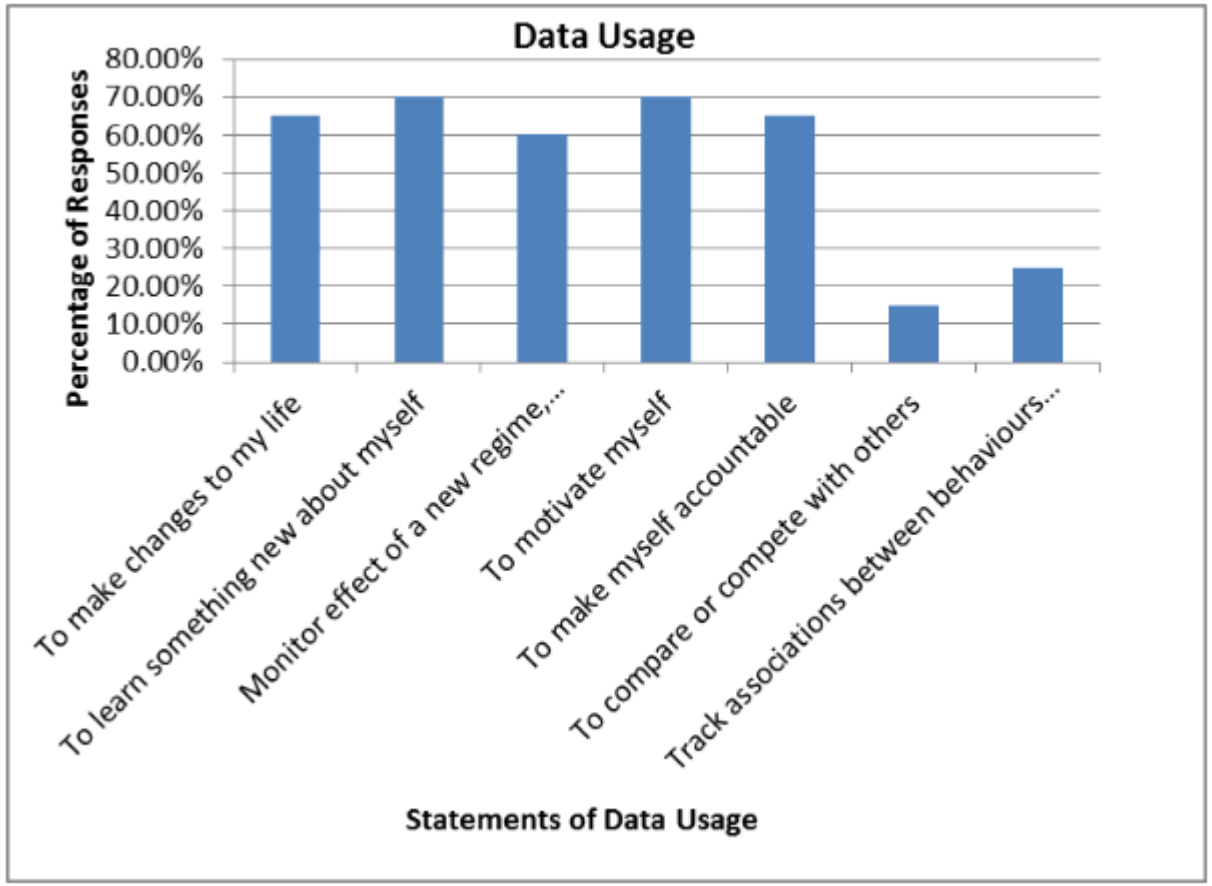
Posted on February 28, 2017 by Steven Jonas

Quantified Self
self knowledge through numbers

- A wide range of tools being used – from fitness trackers to phone apps to pen & paper.
- Motivations for self-tracking included fitness goals, to tackling chronic diseases to self-knowledge & curiosity.
- People found that the process of self-tracking was very useful for motivating behaviour change.
- People found that once they started tracking biometrics, they didn't stop once it became a habit.
- People are not too concerned about the confidentiality of the data.
- Overall people are happy with the tools we have.

Some charts from the survey:





Patients Use Digital Health Devices, Want Them Connected to Care

64% Patients say that they use a digital device (including mobile apps) to manage their health.

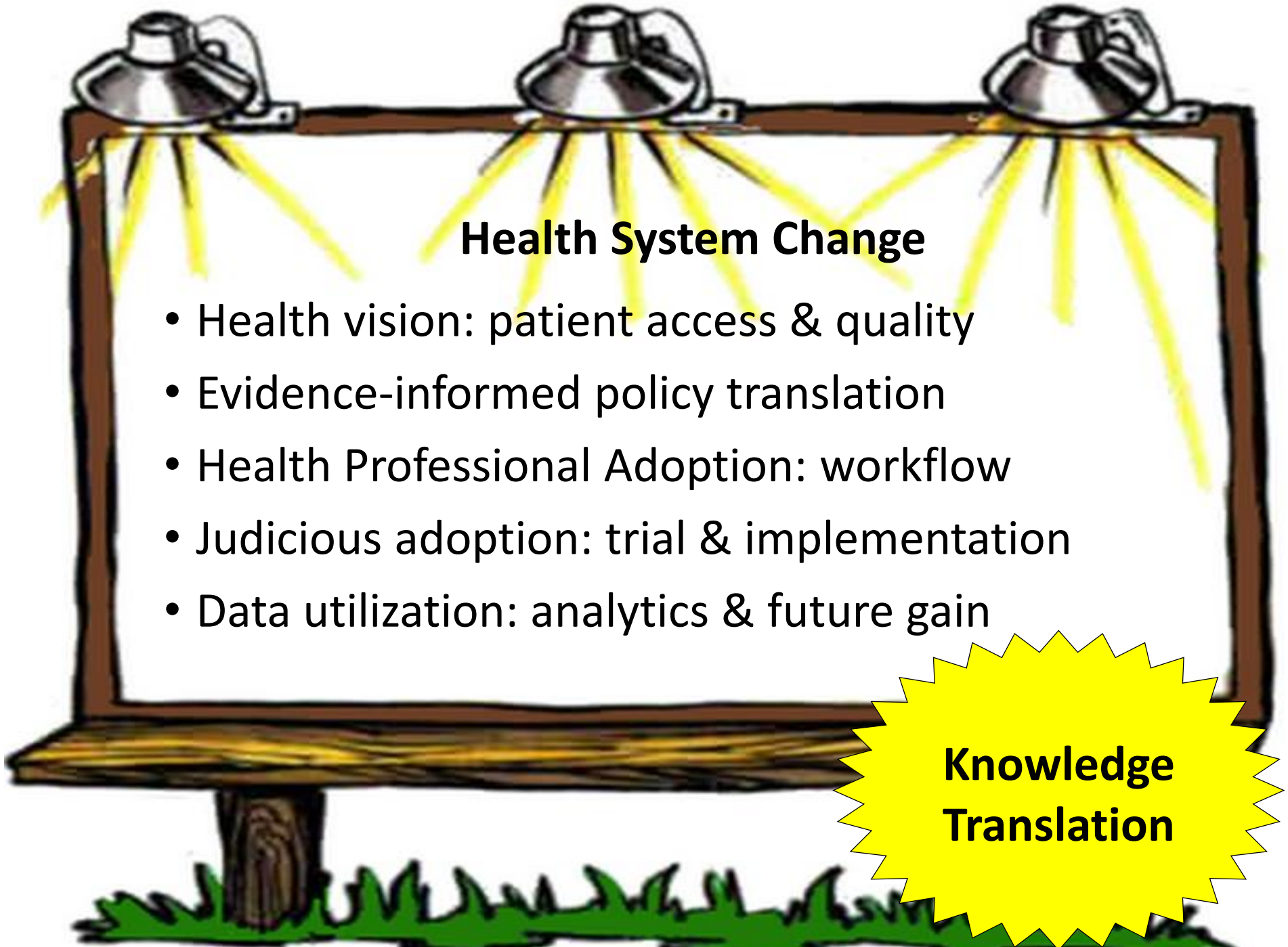
71% Patients believe it would be helpful for their doctor to have access to this information as part of their medical history.

mobihealthnews

By **Jack McCarthy** | March 06, 2017

Health Professional Partnership

- **D** iscernment
- **E** xperience/expertise
- **P** artnership
- **T** rials/testing
- **H** umility


Health System Change
• Health vision: patient access & quality
• Evidence-informed policy translation
• Health Professional Adoption: workflow
• Judicious adoption: trial & implementation
• Data utilization: analytics & future gain
Knowledge Translation

Mobile Digital Access to Wireless Network (mDAWN)

Biosensors

Text Messaging

Social Media

- 3 months results:
- A1c 7.41 to 6.77
- Weight loss 3.51 lb
- Systolic BP reduction
- Health stress reduction
- Diabetic empowerment

Quantified Self

HP Communication

Peer & Caregiver Communication

mDAWN Participants' Comments

"I think it was a great experience…I really like the idea of people connecting with one another...I think that's a key piece and if people can connect in that way it's very supportive and this is an illness where you can really work with depression a lot and to have those other connections I think is really important."

"[What I will take away from the program] was knowledge and the incentive just to keep going, not to let losses…pull you down, that you've got to get up and above that and even reading some of the other comments that were there, you could see the honesty and sincerity that was coming through and that has…an impact on me too."

TEC4Home

Telehealth for Emergency-Community Continuity of Care Connectivity via Home Tele-monitoring

Patients discharged from hospital to go home:

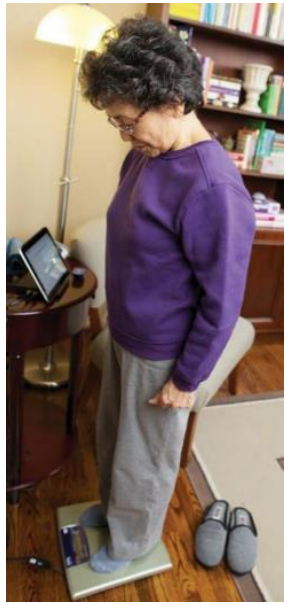
Safe monitoring by doctors and nurses, support self-care

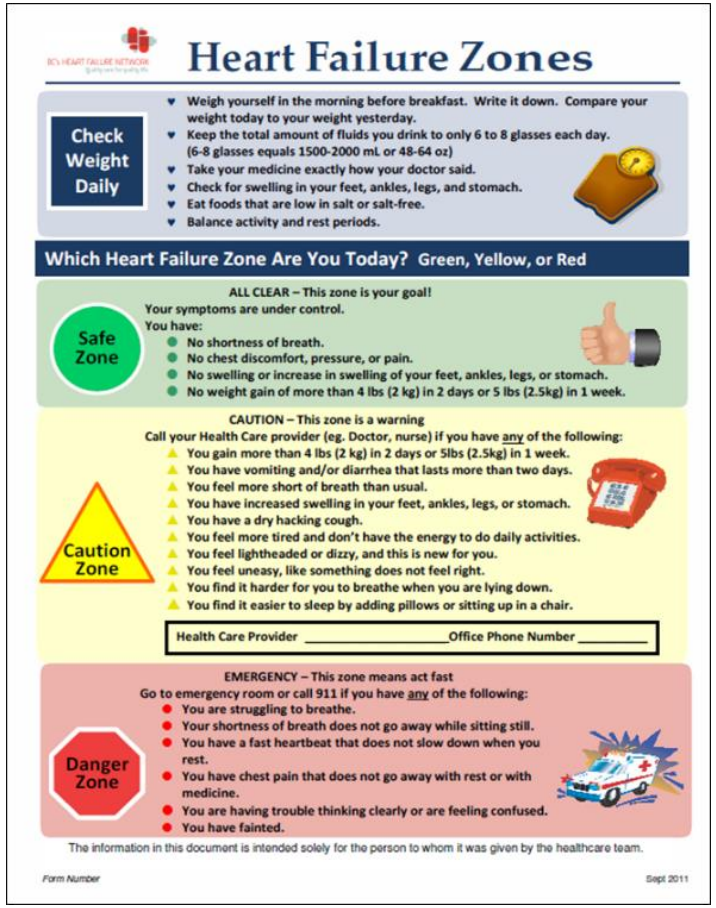
4 year Goals

- Starts in Vancouver, spread to communities in BC
- Involve doctors, nurses, patients, government, tech companies
- Study benefits: Patient satisfaction and safety
- Test new sensors and devices over time

TEC4Home

Telehealth for Emergency-Community Continuity of Care Connectivity via Home Tele-monitoring





Heart Failure Zones

Check Weight Daily

- Weigh yourself in the morning before breakfast. Write it down. Compare your weight today to your weight yesterday.
- Keep the total amount of fluids you drink to only 6 to 8 glasses each day. (6-8 glasses equals 1500-2000 mL or 48-64 oz)
- Take your medicine exactly how your doctor said.
- Check for swelling in your feet, ankles, legs, and stomach.
- Eat foods that are low in salt or salt-free.
- Balance activity and rest periods.

Which Heart Failure Zone Are You Today? Green, Yellow, or Red

Safe Zone

ALL CLEAR – This zone is your goal!
Your symptoms are under control.
You have:

- No shortness of breath.
- No chest discomfort, pressure, or pain.
- No swelling or increase in swelling of your feet, ankles, legs, or stomach.
- No weight gain of more than 4 lbs (2 kg) in 2 days or 5 lbs (2.5kg) in 1 week.

Caution Zone

CAUTION – This zone is a warning
Call your Health Care provider (eg. Doctor, nurse) if you have any of the following:

- You gain more than 4 lbs (2 kg) in 2 days or 5lbs (2.5kg) in 1 week.
- You have vomiting and/or diarrhea that lasts more than two days.
- You feel more short of breath than usual.
- You have increased swelling in your feet, ankles, legs, or stomach.
- You have a dry hacking cough.
- You feel more tired and don't have the energy to do daily activities.
- You feel lightheaded or dizzy, and this is new for you.
- You feel uneasy, like something does not feel right.
- You find it harder for you to breathe when you are lying down.
- You find it easier to sleep by adding pillows or sitting up in a chair.

Health Care Provider _____ Office Phone Number _____

Danger Zone

EMERGENCY – This zone means act fast
Go to emergency room or call 911 if you have any of the following:

- You are struggling to breathe.
- Your shortness of breath does not go away while sitting still.
- You have a fast heartbeat that does not slow down when you rest.
- You have chest pain that does not go away with rest or with medicine.
- You are having trouble thinking clearly or are feeling confused.
- You have fainted.

The information in this document is intended solely for the person to whom it was given by the healthcare team.

Form Number Sept 2011

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FACULTY OF MEDICINE

Moving Forward

TEC4Home COPD (Canada Health Infoway)

- 01/2017 to 8/2018

TEC4Home Stroke/Hypertension (VCH Research Institute)

- 9/2017 to 12/2018

TEC4Home Medication Vigilance & Protection (Boehringer Ingelheim)

- Pharmacists participation in meds management
- 9/2018 – 6/2019

Increasing number of sensors and data analytics (medium data)

- 2019-

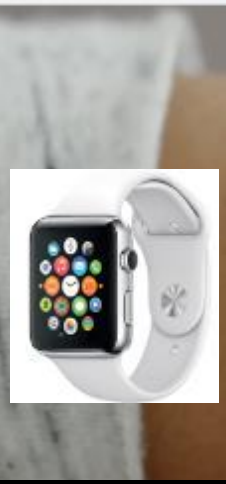
Mobile Technologies & Wearables: The Future is here!

IN A HEARTBEAT —

FDA clears first medical accessory for the Apple Watch

KardiaBand uses a neural

VALENTINA PALLADINO - 11/30/2017, 6:2



MEDICAL

Ultrasound patch goes deep to better-monitor blood pressure

Ben Coxworth | September 13th, 2018

The ultrasound patch's island-bridge structure allows it to be deformed without damage to the electronics (Credit: Chonghe Wang/Nature Biomedical Engineering)

VIEW GALLERY - 2 IMAGES

Source: Welch Allyn

iExaminer

nature > nature biomedical engineering > articles > article

MENU

nature biomedical engineering

Article | Published: 11 September 2018

Monitoring of the central blood pressure waveform via a conformal ultrasonic device

Chonghe Wang, Xiaoshi Li, Hongjie Hu, Lin Zhang, Zhenlong Huang, Muyang Lin, Zhuorui Zhang, Zhenan Yin, Brady Huang, Hua Gong, Shubha Bhaskaran, Yue Gu, Mitsutoshi Makihata, Yuxuan Guo, Yusheng Lei, Yimu Chen, Chunfeng Wang, Yang Li, Tianjiao Zhang, Zeyu Chen, Albert P. Pisano, Liangfang Zhang, Qifa Zhou & Sheng Xu

Nature Biomedical Engineering **2**, 687–695 (2018) | Download Citation

Summary

FDA approves Abilify MyCite, a pill with a sensor that digitally tracks if patients have ingested their medication

Health System Issues and Considerations

- Privacy & confidentiality
- Data storage and security: piracyCost versus cost effectiveness
- Change management: integration
- Access: Paradoxical marginalization

PR Newswire
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Sixth Annual "Pulse of Online Search" Survey Finds Consumers Weighing Trust, Ease-of-Use When Seeking Health Guidance

- Website Ease-of-Use Trumps Trust in Driving Consumers to Online Resources -

- Doctors Remain Most Trusted Source on Medications - But Patients Increasingly Supplement with Online Search About Treatments -

- Millennials Most Responsive to Pharmaceutical Advertising, on Both New and Traditional Channels -

Mar 10, 2016, 08:01 ET from Makovsky Integrated Communications

"…Ease-of-Use trumps trust…"

The doctor is online, anytime – it's the freewheeling world of eHealth

ERIN ELLIS
More from Erin Ellis

Published on: August 6, 2016 | Last Updated: August 6, 2016 2:00 AM PDT

SECTIONS SEARCH

Chicago Tribune

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SATURDAY AUG. 27, 2016 BREAKING SPORTS TRENDING OPINION SUBURBS ENTERTAINMENT BUSINESS ADVERTISING 80°

Points for pills: Walgreens hopes gamelike program will make taking meds easier

Walgreens at State and Randolph Streets in Chicago on July 20, 2015. (Phil Velasquez / Chicago Tribune)

By Lisa Schencker · Contact Reporter
Chicago Tribune

AUGUST 15, 2016 6:14 AM

Points for:

- Taking meds on time
- Meds refill
- Education/quizzes

Over-engagement?

Pokemon Go Nightmares and Horror Stories

by Jacob Shelton | 855k views | 40 items | tags Save to Facebook

Two Guys in California Walked Off a Cliff

Cyberpsychology, Behavior, and Social Networking

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Frequent Use of Social Networking Sites Is Associate Functioning Among Children and Adolescents

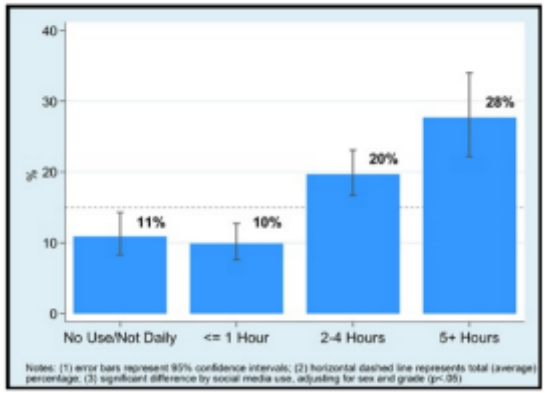
To cite this article:
Sampasa-Kanyinga Hugues and Lewis Rosamund F.. Cyberpsychology, Beh 18(7): 380-385. doi:10.1089/cyber.2015.0055.

Published in Volume: 18 Issue 7: July 13, 2015

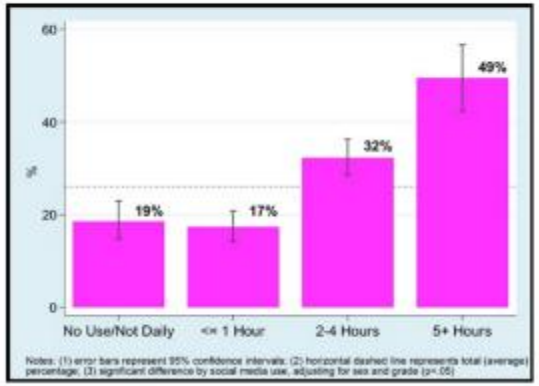
camh discovers
News from CAMH Research and the Campbell Family Mental Health Research Institute
Research Roundup

Social media and student mental health: What's the connection?

Percentage of Ontario Students in Grades 7–12 Rating Their Mental Health as "Poor" or "Fair" According to Daily Use of Social Media, 2013 OSDUHS (n=5,478)



Percentage of Ontario Students in Grades 7–12 Indicating a Moderate or High Level of Psychological Distress According to Daily Use of Social Media, 2013 OSDUHS (n=5,478)



cmaj News

Many doctors pessimistic about direction of medical profession

Lauren Vogel | CMAJ | October 23, 2018

US Physicians identify EMRs as the single largest contributor to burn-out

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THE NEW YORKER

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ANNALS OF MEDICINE NOVEMBER 12, 2018 ISSUE

WHY DOCTORS HATE THEIR COMPUTERS

Digitization promises to make medical care easier and more efficient. But are screens coming between doctors and patients?

By Atul Gawande

UBC a place of mind THE UN

a place of mind
THE UNIVERSITY OF BRITISH COLUMBIA
Faculty of Medicine
Department of Emergency Medicine

Let's build a digital health community together!

Kendall Ho

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www.emergency.med.ubc.ca

UBC Digital Emergency Medicine

@UBCdigem

www.youtube.com/ "UBC digem"

eHealth Strategy Office