Artificial intelligence to improve patient outcomes and evidence translation

Dylan Morrissey PhD BSc(Hons) MSc MMACP FHEA MCSP
NIHE/HEE Consultant Physiotherapist and Clinical Reader
d.morrissey@qmul.ac.uk @DrDylanM
Timeline of evidence translation methods

Prescription
Thought leaders
Research
Systematic review
Mixed methods

Learning Health systems

‘Offline’
‘Update slow’

‘online?’
‘real time?’
...and apply that evidence?

This patient, this time, this presentation
Is my clinical reasoning, reading and experience not enough?

no

Evidence is crucially dependent on valid outcome measures
Learning health systems

a learning health system ... ecosystem in which all stakeholders can contribute, share, and analyze data and where continuous learning cycles encourage the creation of new knowledge that can be used by a variety of health information systems.

VITAL DIRECTIONS FROM THE ACADEMY OF MEDICINE

Data Access, Curation, and Use for a Continuously Learning Health System
PROM_READS
PROtotype realisation of the Musculoskeletal Recovery Expert: Artificial intelligence for Decision Support

http://www.traumamodels.com
Our (growing) big data solution

- Patient experience
  - Likely outcome in response to a given decision (e.g., exercise)
    - Pain management
      - Injection
      - Manipulation
      - Arthroscopy
  - Latest evidence
    - Eg papers, curated resources, infographics
  - Automatic PROMs, and therefore the model learns

- Classification of presentation

- Symptoms

- Bias analysis

- Expert reasoning elicitation

- Trained by outcomes (200)
What would you want from an AI informed learning health system?

- Decision support
- Automated PROMs
- For my experience to drive improvements in knowledge
- To participate in ‘clinical trials’ without a big effort
- Pop-up evidence that updates in (almost) real time
- Seamless electronic record capture
- Robust data governance
- Integration of my notes with the patient’s notes
- Integration of my notes with sensor data
- Integration of my ‘data’ with other health care practitioner’s ‘notes’