Artificial Intelligence (AI) in Healthcare: Ethical Considerations
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Disclosures

No Relevant Disclosures

No irrelevant disclosures I want to mention
You’ve probably seen the headlines…

How Artificial Intelligence Could Transform Medicine

Artificial Intelligence is Ramping up in Drug Development

Published: May 07, 2019    By Mark Terry

Top 12 Ways Artificial Intelligence Will Impact Healthcare

Artificial intelligence is poised to become a transformational force in healthcare. How will providers and patients benefit from the impact of AI-driven tools?

3 ways AI is already changing medicine

They might surprise you.

By Julie Belsic | @juliebelsic | julie.belsic@nymag.com    Mar 15, 2019, 52-40pm EDT

As Artificial Intelligence Moves Into Medicine, The Human Touch Could Be A Casualty

April 30, 2019 - 2:35 PM ET

Heard on All Things Considered

Richard Harris
Overview

1. What is Artificial Intelligence (AI)?

2. How is AI being integrated into the healthcare context?

3. What do we mean by ethics?

4. What are some ethical concerns that AI poses?
What is Artificial Intelligence?

Brain metaphor is important…

Wellcome Trust (2018) identifies 5 ways AI touches healthcare:

- Process Optimization
- Pre-clinical Research
- Clinical Pathways
- Patient-facing Applications
- Population-level Applications

FASTER  
MORE  
ACCURATE  
PERSONALIZED  
MORE COST-EFFECTIVE
AI – Process Optimization (Wellcome 2018)

Improving the “strategic deployment of resources, both physical and human.”

- Staff scheduling
- Supply chain – procurement and distribution
- Quality/Performance improvement analytics
- Natural Language Processing for EMR
AI – Preclinical Research (Wellcome 2018)

Speeding the process of therapeutic development

• Rapid ID of drug candidates

• Modeling molecule interactions

• Predicting side effects based on molecule properties

• ID of possible drug repurposing
Harnessing AI to improve direct patient care
Studies already indicating AI systems capable of...

- Categorizing suspicious moles as “benign” or “cancerous” as accurately as a panel of 21 dermatologists (Estreva, et al., 2017).

- Detecting diminutive colon polyps more frequently than colonoscopy by GI physician alone (Wang, et al., 2019).

- Grading eye fundus images of diabetic retinopathy with same specificity and sensitivity as board-certified ophthalmologists (Gulshan, et al., 2016).

- Tracking ICU patient movement to reduce risk of delirium (Yeung, et al. 2019)
Empowering patients and enhancing their experience

- AI “chat bots” to answer patient questions, coach/counsel patients
- Interface to allow patients to manage conditions from home
- Closed-loop insulin pumps (my favorite)
- AI-informed consumer genetic testing
- At-home robot assistants

Image via Wellcome Trust
Public health possibilities

• Predicting and responding to infectious disease outbreaks

• Predicting non-communicable conditions (childhood obesity)

• Collection of non-clinical data to examine potential health impacts
What do we mean by *ethics*?

Ethics is an *activity*...something we *do*...

- Clarifying values we hold as individuals, communities, professionals.
- Evaluating our ideas, actions, policies in light of those values.
- Articulating reasons for the choices we make.
Many ways to *do* ethics…

- Teleological
- Deontological
- Virtue-based
- Appeals to principles
Accepted Bioethics Principles

Beauchamp and Childress, *Principles of Biomedical Ethics*

1. Autonomy
2. Beneficence
3. Nonmaleficence
4. Justice
Healthcare Ethics and AI

In light of these four principles, some unsettled questions arise:

1. Will AI destroy the physician-patient relationship?

2. How will clinicians inform patients about AI’s role in their care? Do they need to?

3. AI requires vast amounts of data…are we setting ourselves up for a disaster? Are we asking patients to give up their privacy?

4. Are AI systems really devoid of human bias, error?

5. Who might miss out on AI’s potential benefits? Will AI exacerbate existing inequalities?

6. Who bears responsibility when AI makes a mistake?
References


