Exploring Ethical Considerations for Artificial Intelligence in Military Medicine

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Kenneth W. Goodman, Ph.D., F.A.C.M.I., F.A.C.E., is founder and director of the University of Miami Miller School of Medicine's Institute for Bioethics and Health Policy and director of the university's Ethics Programs. The Institute has been designated a World Health Organization Collaborating Center in Ethics and Global Health Policy, one of 14 in the world and the only one in the United States.

Dr. Goodman is a Professor of Medicine at the University of Miami with appointments in the Department of Philosophy, School of Nursing and Health Studies and Department of Public Health Sciences. He co-directs the program in Data Ethics + Society for the university's Institute for Data Science and Computing. He is immediate past chair of the Ethics Committee of American Medical Informatics Association (AMIA), for which organization he co-founded the Ethical, Legal and Social Issues Working Group. He has been elected as a Fellow of the American College of Medical Informatics (FACMI). He is also a Fellow of the American College of Epidemiology (FACE), and past chair of its Ethics Committee, and of the Hastings Center.

Dr. Goodman directs the Florida Bioethics Network and chairs the University of Miami Health System (UHealth)/University of Miami Hospital Ethics Committee and the Adult Ethics Committee for Jackson Memorial Health System. He is a published author and has presented a number of papers in bioethics, including end-of-life care, the philosophy of science, and computing.

Disclosures

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Quotation by Scottish Surgeon Sir William Arbuthnot-Lane

"More and more the tendency is towards the use of mechanical aids to diagnosis; nevertheless, the five senses of the doctor do still, and must always, play the preponderating part in the examination of the sick patient. Careful observation can never be replaced by the tests of the laboratory. The good physician now or in the future will never be a diagnostic robot." (Lane, 1936)

Learning Objectives

At the conclusion of this activity, participants will be able to:

1. Contribute to institutional initiatives and policies to implement Artificial Intelligence (AI) tools appropriately

2. Explain the leading ethical issues in the use of AI in healthcare

3. Identify and discuss AI opportunities and issues in military medicine

The Story So Far

- Bias

- Safety

- Transparency

- Explainability

- Accountability

- Responsibility

- Governance

The Hard Problem

- The Parfait System: no bias, no confabulation, explainable to the satisfaction of all, designed by committed and responsible coders, manufactured by corporations dedicated to the common good …

- Affordable, reliable, easy to use

- Consistently more accurate than human experts

Hurray ... or uh-oh?

- The data and information scraped from electronic health records, registries, etc. and used to train the Parfait System thus guides practice – and eventually replaces the data and information used to train future systems

- Future systems are thus trained on data and information derived from practice shaped or guided by computers

- Which data and information is used to train new systems

- Progress, or the systematic replacement of a store of human-acquired knowledge by machine intelligence?

In the Meantime ...

- "Better than humans" is usually a good thing. Humans + tools are better than humans without tools,

- ...which tend to be imperfect (sometimes because of humans).

- The more we look the more we find uncertainty if not error.

- This analysis and its findings will continue for the foreseeable future.

Brain + Computer > Computer

Source: Charles Friedman

We're Used to Error, Inaccuracy

- His prognosis is poo.

- Mr X was seen by himself in the hospital room today.

- I saw but didn't see the order placed. Thank you.

- I asked that her house Mr. H doing prior to come to the hospital.

- His current PPS 505% is more related to ...

- Seen by Neurology, unable to do MRI due to penile metal prosthesis. Still minimally arousable.

- He initially presented by EMS, who report they found him on the side of the road stating he wished to diet.

- ... is an 82 y.o. male admitted on 1/2/3 with a primary diagnosis of No primary diagnosis.

To Do

- Comparative outcomes and safety analysis research
- Consider health-ethics-and-informatics swat teams (HEISTs)
- Manage intellectual property issues
- Manage privacy issues
- Ensure – indeed, require – sharing

U.S. Defense Issues

- Familiar adoption issues
- Failure to adopt as potentially blameworthy
- Implementation as research
- Electronic health record (EHR) capacity and reliability; vendors; oversight
- Education

Military Medicine Opportunities

- AI and the medical battlefield

- Autonomous and reliable health tools for all, including deployed forces, veterans and families

- Department of Defense (DOD)/Veterans Affairs (VA) Research as uniquely poised to advance analysis and appropriate adoption of AI in military medicine

- Social Determinants of Health: Do trainees, fighters, veterans and families constitute a vulnerable population?

Standards

- Value-driven standards support ethically optimized products, processes, and actions
- They are public, transparent, and driven by transparent processes
- See https://www.hl7.org/, https://www.iso.org/standards.html, https://www.ieee.org/standards/#

Key Takeaways

- AI is known to offer many opportunities and pose many challenges.

- Even if all such challenges were successfully addressed, there would remain interesting and difficult ethical issues.

- Military medicine could be a leader in both AI adoption and in ensuring such adoption is ethically optimized.

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