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Artificial Intelligence in Healthcare: Annotated Bibliography.

"Democratizing Healthcare with Ai | Lily Peng | TEDxGateway." ***YouTube*****, 25 June 2020, www.youtube.com/watch?v=MNp26DgKxOA.**

Artificial intelligence (AI) can help us do stuff like finding a specific photo in our photos app or translating signs into another language. What if we applied the same technology to really big problems in areas like healthcare? In the video, Google's Dr. Lily Peng describes her journey from medicine to technology and describes the potential of artificial intelligence in healthcare, talking about how her team trained an artificial intelligence algorithm to detect diabetic eye diseases in medical images to help doctors in India prevent blindness of millions of people. Dr. Lily Peng is a doctor by training, and now works with a team of doctors, scientists and Google Health engineers who use artificial intelligence for medical imaging to increase the availability and accuracy of medical care.

Dr, Lily Peng holds a Bachelor of Science degree with honors and distinction in Chemical Engineering from Stanford University, California, a doctorate in Bioengineering and a medical degree from the University of California, San Francisco. This gives her authority to speak about AI in healthcare. This talk was given at a TEDx event using the TED conference format but independently organized by a local community. The event happened in 2020, which

makes this source current to support points in my essay. However, Dr. Peng in this TED describes only advantages of using AI not mentioning potential disadvantages or concerns.

"DOCTOR GOOGLE WILL SEE YOU NOW." ***Australian*** **[National, Australia], 7 Dec. 2017, p. 14.** ***Gale In Context: Opposing Viewpoints*****, link.gale.com/apps/doc/A517600534/OVIC?u=mthoodcc&sid=bookmark-OVIC&xid=7e5d2e5f. Accessed 1 June 2023.**

The article says that rapid technological progress in the field of artificial intelligence and nanotechnology can potentially revolutionize healthcare. Jeff Dean, a senior researcher at Google, was a key speaker at the conference where many projects in the field of artificial intelligence were presented, in which Google, Dean and the company's engineers participate. Dean is the co-founder of the Google Brain project, which studies artificial intelligence and related concepts of machine learning and neural networks. He describes the process of artificial learning that happens at an incredible speed. Dean states that Google has released TPU hardware with a processing power of 180 thousand billion machine calculations per second. Dean explains that machine learning systems extract patterns from existing data and apply them to new information. If an artificial intelligence system is shown 10,000 images of melanoma and 10,000 images of benign skin changes, the machine will make more and more accurate predictions. Dean cites the example of an artificial intelligence system developed by Lily Peng working in Google. This system can diagnose diabetic retinopathy, which is a serious cause of vision loss among 415 million diabetics worldwide. This system is aimed at solving the problem of the

shortage of ophthalmologists, especially in developing countries. Peng also researched machine learning for breast cancer diagnosis. she says that up to one case out of 12 breast cancer is diagnosed incorrectly. Machines which analyze mammograms can mark areas where cancer is likely to be present, thereby helping doctors diagnose faster without usurping their role. The author of the article notes that artificial intelligence can pose a huge problem and risk for humanity, such as the displacement of jobs or even waging war with artificial intelligence making decisions about life and death without regard for people. At the end of the article, the author emphasizes the need to study technologies, use their advantages and at the same time avoid harmful consequences.

The author, Chris Griffith, senior technology reporter, attended the artificial intelligence conference in Tokyo courtesy of Google. He references key speaker Jeff Dean, senior fellow at Google and Lily Peng, physician-scientist, and product manager for Google. The article was published in The Australian newspaper. Although it was published in December 2017, in my opinion it is current enough for my topic, because it talks about technology that is explained in my other source as well. The information in the article is for general audience and is written at an appropriate level. Although very briefly, the author mentions the potential problems of using artificial intelligence.

Grady, Denise. "A.I. Took a Test to Detect Lung Cancer. It Got an A." ***New York Times*****, 21 May 2019, p. A17(L).** ***Gale In Context: Opposing Viewpoints*****, link.gale.com/apps/doc/A586090849/OVIC?u=mthoodcc&sid=bookmark-OVIC&xid=f29cd3ca. Accessed 1 June 2023.**

The article talks about the future of artificial intelligence in medicine. By transmitting huge amounts of data, researchers can train artificial neural networks to recognize patterns associated with certain diseases. This process known as deep learning is already being used for voice and object recognition in self-driving cars. After finding weaknesses in artificial intelligence in computed tomography, scientists thought that a computer could work better and created a neural network with several levels of processing and trained it by providing many computer images of patients whose diagnoses were known. Then they arranged an exam on data that AI had never seen, and it got an A. According to the article, artificial intelligence is designed to help doctors and not replace them.

The article was published in New York Times in 2019 and was written by Denise Grady, a science reporter The New York Times since September 1998, who wrote more than five hundred articles about medicine and biology and worked as a health editor there. It is not a newest article, but still current, in my opinion, because such complex technologies for medicine have been in the development stages for a long time and are then tested for a certain time before being used in medical institutions. The information in the article is supported by evidence, which include study and reference to doctors (one of them was not involved in the study), and a software engineer. In my opinion, the purpose of the information is to inform the audience about development of AI, its ability to help in healthcare. The article does not lean only toward the benefits of AI, it also provides the information about things that should be improved, and tests that should be done to prove the effectiveness of these new technologies.

Murdoch, Blake. "Privacy and artificial intelligence: challenges for protecting health information in a new era." *BMC Medical Ethics*, vol. 22, no. 1, 15 Sept. 2021, p. NA. *Gale In Context: Opposing Viewpoints*, link.gale.com/apps/doc/A678013598/OVIC?u=mthoodcc&sid=bookmark-OVIC&xid=bd9675a5. Accessed 3 June 2023.

The article discusses the problem of protecting health information in a new era. According to the author, advances in artificial intelligence in healthcare are proceeding apace. This raises the question of regulating its development. Many artificial intelligence technologies are owned by private corporations. This means that they will have an important role to play in obtaining, using, and protecting patient health information. The first set of problems raised by the author is access, use and control over patient data that will be in private hands. He cites as an example a situation when Google, after developing an app DeepMind partnered with Royal Free London NHS Foundation Trust, subsequently took direct control over DeepMind's app, effectively transferring control over stored patient data from the United Kingdom to the United States. The author states that appropriate precautions should be taken to preserve the data of patients and their freedom of action. Another set of problems is related to the external risk of privacy violations using methods controlled by artificial intelligence. Deidentification and anonymization of patient data may be compromised considering new algorithms that are able to successfully re-identify data. In the conclusion, the author emphasizes that regulation and supervision risk falling behind the technologies they manage.

The article is written by Blake Murdoch, who is a legal scholar, bioethicist, health privacy expert and science communicator. Mr. Murdoch is a senior research associate with the Health Law Institute at the University of Alberta's Faculty of Law, as well as a practicing privacy officer

with CANImmunize Inc. The article was published in peer-reviewed BMC Medical Ethics. The author and the journal, where the article is published, are credible. Since I will discuss different aspects of implementing AI in healthcare, this source will be useful to identify some concerns related to regulation in new technologies and protecting health information.

Sauerbrei, Aurelia, et al. "The impact of artificial intelligence on the person-centred, doctor-patient relationship: some problems and solutions." ***BMC Medical Informatics and Decision Making*****, vol. 23, no. 1, 20 Apr. 2023, p. NA.** ***Gale Academic OneFile*****, link.gale.com/apps/doc/A746436594/AONE?u=mthoodcc&sid=bookmark-AONE&xid=1bcd8c4e. Accessed 2 June 2023.**

Artificial intelligence is often mentioned as a possible solution to problems in healthcare, including freeing up time for doctors and facilitating a person-centered relationship between a doctor and a patient. The authors of the article conducted a review of the literature to study how artificial intelligence affects empathy and compassion, which are very important in the practice of personality-oriented care. In addition to empathy and compassion, the article discusses joint decision-making and trusting relationships. The authors have identified two specific ways that can guarantee a positive impact of the use and on the personality-oriented relationship between a doctor and a patient - the use of artificial intelligence tools as an auxiliary tool and the adaptation of medical education. In the Western world, the demand for medical workers is growing and as a result, the workload is increasing. So, new technologies are welcome that can improve the efficiency and therefore the quality of care. It is hoped that AI technologies will save time for doctors and doctors will be able to use this saved time to improve the relationship between doctor and patient. Personality-centered care is considered the gold standard of the doctor-patient

relationship and empathy is the cornerstone of this relationship. Empathy is also a source of compassion that allows doctors to act in the best interests of the patient. However, doctors do not have enough time to develop sensitive and trusting relationships for person-centered care. The authors of the article conducted a literature review to identify arguments in favor of the positive and negative effects of AI on the relationship between a doctor and a patient. Within one month, they found 4848 papers in five different databases. After a careful selection by relevance, there are 45 best ones left. They used an iterative process to synthesize and interpret the data during two-week sessions between all the authors. Collaborative decision-making is a central aspect of person-centered care. To do this, it is necessary to increase the patient's autonomy, which AI can help him with. Some doctors agree with this point of view. Others believe that fiduciary duties should be maintained in the doctor-patient relationship, which implies an imbalance of power. It can be said that the emerging literature disagrees on whether artificial intelligence will improve the relationship between doctor and patient by encouraging joint decision-making by increasing patient autonomy or create a new form of paternalism by hindering pluralism of values. One of the authors explains that the Watson artificial intelligence tool for oncology takes 40 seconds to collect and analyze data, and then form treatment recommendations based on the available data. For comparison, manual data collection and analysis takes an average of 20 minutes, reducing to 12 minutes when oncologists get better acquainted with cases. However, it is unclear whether this time saved will be used to improve the doctor-patient relationship.

The article was written in April 2023 by four authors and was published in peer-reviewed academic journal. Therefore, it is current and authoritative. The authors conducted a review of the literature using methods commonly associated with systematic reviews in order to ensure a

comprehensive coverage of the literature and identify the main topics discussed relating to the impact of AI on the doctor-patient relationship. Based on this information, I think the information in the article is reliable. This source will help me explore the impact of AI on doctor-patient relationship in my essay.

"Will AI Mean We No Longer Need Doctors? | Enrico Coiera | TEDxMacquarieUniversity." ***YouTube*****, 14 Oct. 2019, www.youtube.com/watch?v=ZTp8r--YR84.**

In the video Enrico Coiera refutes an idea, from a small group of computer scientists, that AI can replace doctors. Coiera emphasizes that big companies are heavily investing in AI, and there is discussion that has gone from building tools to help doctors to possibility to replace doctors and not only radiologists but anybody who does imaging. According to speaker, there are a lot of papers published demonstrating that technology is equal to or even superior to humans. However, Coiera suggests that these AIs are "brilliant idiots" because AI is fantastic at solving simple single task as identifying objects on the picture. But it can not tell you why they are assembled or what is happening on the picture. Enrico Coiera states that it should be "marriage made in heaven" between AI and humans because we are good at different things.

The TEDx speaker is Enrico Coiera. Trained in medicine and with a computer science PhD in Artificial Intelligence (AI), Professor Coiera has a research background in both industry and academia and a strong international research reputation for his work on decision support and communication processes in biomedicine. Even though it was recorded in 2019, in my opinion,

the information is current enough for my topic as it explains general characteristics of AI that are used or are planned to use in healthcare. This TEDx video will help me build the evidence for looking to AI not only as at something that can replace doctors but rather as a tool to help them.