

ARTIFICIAL INTELLIGENCE IS ALTERING THE FACE OF MEDICINE



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“Some people call this artificial intelligence, but the reality is this technology will enhance us. So instead of artificial intelligence, I think we’ll augment our intelligence.”

—Ginni Rometty

Artificial intelligence (AI) permeates all aspects of life from providing driving directions to answering questions through applications like Siri and ChatGPT. Health care is no different. In the blink of an eye, references to AI in medicine have become ever-present.¹ In fact, about 86 percent of medical providers use at least one type of AI in their practices.² However, such use presents uncharted risks since not all possible outcomes are known.³ As a result, the tort implications remain unsettled since both the technology and its uses are still emerging.⁴ This article presents an overview of the applications of AI in the medical field, which will be followed by an examination of some of the novel legal issues raised by this technology.

THE SCIENCE OF AI

AI deals with the hardware and software applications that permit computers “to determine relationships between datasets and apply the learned relationships in a predictive fashion.”⁵ These systems attempt to mimic the brain’s neural network.⁶ They employ different types of processes such as “algorithms, pattern matching, rules, deep learning and

cognitive computing” to determine how to understand the information.⁷ This technology, which has taken over 50 years to develop, has caused “both excitement and trepidation.”⁸ While AI has the potential to revolutionize medicine, significant issues exist about the technology’s impact on privacy, security, and bias.⁹

How AI Works

AI is a subdivision of computer technology that attempts to comprehend and create aptitude, customarily as software programs.¹⁰ The software accumulates background data about a problem “through sensors or human input,” compares that to the collected data, and decodes the background information founded upon the previously collected materials.¹¹ The software contemplates various possibilities, and “predicts which action will be most successful based on the collected information.”¹² While this method produces useful outcomes, it is restricted by the boundaries of the imputed data.¹³

These systems can perform undertakings previously believed to demand human intelligence. They can deal with uncertainty, “learning from experience; making predictions; interpreting language in a complex, contextual manner.”¹⁴ These emerging usages of AI can perform on a scale that far exceeds our intellectual capabilities, thereby presenting endless opportunities to make use of large assemblages of information.¹⁵

AI in healthcare

Rapidly emerging AI-driven technologies have applications in many areas of medicine. It is estimated that by 2030, “AI may affect up to 14% of global domestic product with half of this effect coming from improvements in productivity,” and the health care field will probably be a priority for its implementation.¹⁶ In fact, “AI will transform healthcare by ‘deriving new and important insights from the vast amount of data generated during the delivery of health care every day.’”¹⁷ These systems are presently being used to diagnose disorders such as heart arrhythmias, low blood sugar, tissue pathologies, and abnormalities visible on diagnostic imaging.¹⁸

Physicians have long grappled with “balancing the exorbitant amount of patient information with diagnosing disease accurately,” and that dilemma has been exacerbated by “an overall shortage of clinical support.”¹⁹ Nevertheless, the development of AI in medicine allows physicians to diagnose and treat illnesses from a new platform.²⁰ For instance, it “can readily diagnose and track a patient’s health without a doctor present, ... algorithms ... can accelerate and assist in drug development,” and robots can be used in “biologicals, genomics, and surgical care.”²¹

The magic of this technology is that it can answer queries presented by physicians, suggest diagnoses and treatment strategies, and predict the probability of success behind each treatment suggestion.²² AI is perfectly suited for the medical profession, where “the body of medical literature currently doubles every seven years,”²³ because it can provide instant information to a physician at any given time. AI-based systems are also designed to consider the infinite variables in the human body and suggest an answer to a physician’s medical inquiries within seconds.²⁴ An AI system can oversee an individual’s health and can offer a customized treatment plan premised upon the patient’s medical records.²⁵

The medical application of AI that has garnered much attention is robotic surgery. This form of high-tech surgery permits a doctor to perform a variety of complex procedures with increased precision than

is available through conventional techniques.²⁶ This type of AI assembles information by observing physicians performing recurrent surgeries.²⁷ Coupled with the capacity to remember the movements of a surgeon, AI assists these robots with the deduction and use of cognitive actions like decision-making, problem-solving, and speech recognition.²⁸

AI-based algorithms also aid in reviewing scans, identifying carcinomas, and expediting instrument positioning.²⁹ For example, assisted by AI, robotic arms can automatically detach the deep roots of hair during a hair transplant and correctly insert them onto a person’s scalp, with the required force and speed.³⁰

LIMITATIONS OF AI IN MEDICINE

AI in the medical field will test the status quo as health care embraces the new technology.³¹ Some medical personnel, such as pathologists and radiologists, are concerned that this new tool will replace them.³² While AI has made tremendous advances in medicine, human interaction is still required.³³

Additionally, some studies reveal that patients are hesitant to follow the recommendations presented by AI even when they surpasses doctor recommendations.³⁴ Patients often think that their health problems are distinctive and cannot be appropriately appraised by AI.³⁵ Research further demonstrates that when medical advice was offered by AI, rather than by a physician, some patients were less inclined to follow those suggestions.³⁶ They also favored having a doctor provide care even if it generated a more significant risk of a misdiagnosis or an unfavorable surgical outcome.³⁷

Another criticism is that surgical robots “operate logically, as opposed to empathetically.”³⁸ While AI software may be able to assign a patient to a particular rehabilitation unit or nursing home, the system may not consider a patient’s modest financial means or the person’s personal preferences.³⁹

AI also raises challenges involving data privacy and security. These concerns are magnified because most algorithms require access to vast amounts

of data and patient records for training and validation.⁴⁰ “Shuffling gigabytes of data between disparate systems is uncharted territory for most healthcare organizations, and stakeholders are no longer underestimating the financial and reputational perils of a high-profile data breach.”⁴¹ Some critics even note that AI has not fulfilled its potential because the infrastructure of many health systems are not ready for its full-scale implementation.⁴² This deficiency has caused health care facilities to establish their own engineering teams and create AI and other technology personalized to their own requirements.⁴³

LEGAL ISSUES RAISED BY AI IN MEDICINE

The excitement over AI in medicine is somewhat tempered by the legal implications if something goes wrong.⁴⁴ The use of AI in medicine will inevitably create tort consequences because of the inability to forecast all liability scenarios.⁴⁵ For instance, if a health care provider uses AI to formulate a medical impression of a patient and that conclusion is ultimately incorrect, it is uncertain who should be liable and to what extent.⁴⁶ As with most advancements, the law lags in addressing the issues presented by this developing technology.⁴⁷

Little guidance exists on how the tort system will respond to these quickly changing medical systems, and the duty of care.⁴⁸ Complicating matters, the technology and its usages are not yet fully understood.⁴⁹ This deficiency means that health care providers will be unable to depend upon accepted medical practices but will be required to repeatedly research and follow the most recent developments to ascertain the best and safest treatment plan.⁵⁰

A diagnosis founded upon AI technology offers an array of legal issues that are difficult to remedy through present concepts of legal responsibility.⁵¹ For instance, how do you assign liability involving a “black box” diagnosis?⁵² Many entities end up being involved in the decision-making process including the manufacturer of the system and the doctor who relied upon the information produced by the AI technology. This allocation of

responsibility among the stakeholders when no one entity is solely responsible for the diagnosis muddles judicial resolution. It is also hard to determine breaches of the duty of care given untested AI software.⁵³ For instance, a black box will provide a diagnosis, but it does not explain how it arrived at that impression.⁵⁴ Existing tort law can be employed to resolve some of these issues, but not to the level of certainty desired by the judiciary, which seeks established measures for assessing liability and apportioning responsibility.⁵⁵

The primary reason for apprehension in assigning responsibility for medical errors arises because no one can “see” the reasoning made by the artificial intelligence technology.⁵⁶ This limitation fosters concerns about whether standard products liability principles should be applied.⁵⁷ The issue of liability is further obscured because AI is associated with the health care provider as an aspect of patient care. From this perspective, it is just an instrument to help the doctor render care to the patient.⁵⁸ One must also be mindful that the pace of AI deployment in medicine is accelerating very quickly, such that “what might be malpractice if relied on today may be negligent to not use tomorrow.”⁵⁹

AI-based systems are not perfect and will occasionally provide incorrect information.⁶⁰ While some of these mistakes may be harmless, others could injure a patient. What is the liability if an AI algorithm makes an incorrect diagnosis that causes an injury? How should the fault be apportioned? These questions require an analysis of the laws of products liability and AI.⁶¹

Since products liability is a creature of state law, theories of liability will sound in negligence, strict liability, or breach of warranty.⁶² Regardless of the theory, a claimant must prove the item that caused the injury was defective at the time it left the hands of the seller, and that the defect caused the injury.⁶³

Theories of liability

Suppliers of medical devices and manufacturers are obvious targets for injured claimants.⁶⁴ Several theories of products liability arise: design defect,

manufacturing defect, and marketing defect.⁶⁵ The manufacturers of medically-focused AI technologies and machine-learning algorithms may be sued under a products liability theory “if an error involving the technology occurs.”⁶⁶ Counsel may assert responsibility premised upon the concept that AI caused the injury, and the harm is implicit evidence of a flaw within that technology.⁶⁷

Applying products liability law to AI in a medical setting is a difficult undertaking. A creator of AI technology cannot always foresee how the computer will function once it is utilized in the field.⁶⁸ Consequently, one might assert that it is not fair to allocate liability to an entity whose efforts were detached from the actual use of the technology.⁶⁹ Accordingly, the courts are disinclined to expand products liability to encompass software creators, and they are even more reluctant in the framework of health care software.⁷⁰

Defenses to a product liability claim

Several defenses exist that a manufacturer or seller of AI medical technology can assert against a product liability claim. One theory is that the software was not defective. Rather, if a defect was present in the product, it was created after the unit or software was given to the user.⁷¹ After all, the software is designed to accommodate additional data after its issuance to enhance its functionality.⁷² For example, a doctor may supplement the software’s database with patient or hospital records. Therefore, the seller could not be expected to know the particulars of these additional records or how the software evolved after its utilization by the health care facility.⁷³

A more fundamental issue is whether software can be the foundation of a product liability claim. The defense may assert that software is more like a service than a tangible item. This makes it dissimilar to the expansive classification of material goods that give rise to product liability claims.⁷⁴ Rather, they are more akin to a category that courts have traditionally ruled are not products under a strict liability scheme.⁷⁵

A few issues arise involving informed consent and AI. For instance, does the law of informed consent compel health care providers to tell their patients that AI will be used to help in treatment decisions? If such disclosure is mandated, how much information must the physician provide about the suggestions rendered by the system.⁷⁶ Informed consent is premised upon the patient’s right of self-decision and is based upon the duty to reveal. That right can only be properly exercised if the patient is given sufficient information to make an intelligent decision.⁷⁷

The standard for ascertaining whether there is an obligation to disclose that AI was employed in arriving at a diagnosis is “what a reasonable patient would find material.”⁷⁸ Nevertheless, there is no obvious answer to this determination. One possibility is to treat this technology as another “member of the care team.”⁷⁹ In that instance, the doctor may be obliged to supply the patient with data about the technology’s expertise.⁸⁰ Health care providers may even be required to explain how they use an AI system and how much they do or do not understand the recommendations given their limited understanding of how the technology arrived at its conclusions.⁸¹

Courts may analogize an AI system to a consulting doctor. In that case, a patient would have to be told that the physician is using AI to provide a recommendation.⁸² While the physician has the obligation of controlling the medical care, informed consent may require that a patient be told of the opinions rendered by the AI, including the options the physician did not choose to follow.⁸³ This conversation could cause arguments between the patient and physician over the best course of action.⁸⁴

Breach of warranty

Another theory of liability involving AI is breach of warranty. If the claimant can overcome the initial problem of showing that the technology is a product and not a service, the plaintiff must then prove that: (i) the product was obtained from the defendant; (ii) the seller provided express and implied warranties; (iii) the seller breached the warranty because the system did not work as advertised; and (iv) the

plaintiff was injured.⁸⁵ It is unlikely for a patient to succeed on a breach of warranty claim in a medical device setting because it is typically the medical provider, and not the patient, that purchased the system. However, as AI technology becomes more routine, these systems may be sold directly to consumers and used in at-home settings.⁸⁶ This development is not implausible. Presently, examples of home medical devices include glucose meters, ventilators, infusion pumps, sleep apnea machines, and home dialysis equipment.⁸⁷

CONCLUSION

AI has already fostered significant advancements in medicine.⁸⁸ The technology is gradually performing day-to-day tasks such as reviewing patient charts.⁸⁹ It will also permit doctors to focus

on the complex and more taxing matters instead of unexciting administrative duties.⁹⁰

The use of AI in health care will unavoidably create risk since not all outcomes are foreseeable.⁹¹ Currently, there is little guidance on how the tort system will respond to these changing medical technologies and standards of care.⁹² The void is only worsened because the technology and applications are still developing.⁹³ Therefore, health care providers will not be able to rely upon “accepted medical practice,” but will be mandated to recurrently study and follow the most recent developments to ascertain the best practices and safest treatment plan.⁹⁴ Nevertheless, the technology offers great promise in the medical field and the unsettled legal questions presented by artificial intelligence will eventually be sorted out. █

Notes

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