

12-30-2021

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Recommended Citation

Benedict See, *Paging Doctor Robot: Medical Artificial Intelligence, Tort Liability, and Why Personhood May Be the Answer*, 87 Brook. L. Rev. 417 (2021).

Available at: <https://brooklynworks.brooklaw.edu/blr/vol87/iss1/10>

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Paging Doctor Robot

MEDICAL ARTIFICIAL INTELLIGENCE, TORT LIABILITY, AND WHY PERSONHOOD MAY BE THE ANSWER

INTRODUCTION

Artificial intelligence (AI) is a part of everyday life. From our phones, to social media accounts, to online shopping, AI is present and enhances our experiences.¹ One area where AI has a heavy (and increasing) presence is the medical industry, where “approximately 86% of health care providers utilize at least one form of artificial intelligence in their practices.”² But, just as humans make errors, so do AI systems. In the medical context, AI faults have caused burns and have even punctured organs during surgery.³ When doctors make these mistakes, they can be subjected to medical malpractice lawsuits.⁴ But when a machine makes a mistake, who is to be held responsible?⁵

The term “artificial intelligence” may conjure up images of humanlike robots created for entertainment or destroying mankind.⁶ However, this thinking was far from reality when mathematician and computer scientist John McCarthy coined the

¹ Bernard Marr, *The 10 Best Examples of How AI is Already Used in Our Everyday Life*, FORBES (Dec. 16, 2019, 12:13 AM), <https://rb.gy/djwzlk> [<https://perma.cc/PAA2-EM3S>].

² Sarah Kamensky, Note, *Artificial Intelligence and Technology in Health Care: Overview and Possible Legal Implications*, 21 DEPAUL J. HEALTH CARE L. 1, 1 (2020).

³ See *Da Vinci Robotic Surgery Complications*, MORGAN & MORGAN L. FIRM, <https://www.forthepeople.com/defective-product-lawyers/da-vinci-robotic-surgery-complications/> [<https://perma.cc/A7RN-3QE8>].

⁴ See *A Doctor’s Liability for Mistakes: Accident, Error, or Gross Negligence?*, ALLLAW, <https://www.alllaw.com/articles/nolo/medical-malpractice/doctors-liability-mistakes-accident-error-gross-negligence.html> [<https://perma.cc/LR8H-NDWP>].

⁵ See Nicolas Terry, *Of Regulating Healthcare AI and Robots*, 18 YALE J. HEALTH POL’Y, L. & ETHICS 133, 162 (2019) (explaining that it is important to determine “which members of the distribution chain will face liability and under what legal theory and what are the relative responsibilities of hospitals and developers in training physicians and developing or enforcing protocols for the implementation of AI generally or its use in a particular case”).

⁶ See, e.g., *Westworld* (Home Box Office 2016–2020) (presenting a world in which robots function as a source of entertainment in a wild west-type theme park); *THE TERMINATOR* (Hemdale Film Corporation 1984) (showing a world in which a robot from the future is sent back in time to kill the main character to prevent her son from being born, therefore saving the world from a robot uprising).

phrase in 1955⁷ to describe “the science and engineering of making intelligent machines.”⁸ The world saw the first real breakthroughs in medical AI in the 1970s and 1980s.⁹ Almost fifty years after McCarthy coined the term AI, the world was introduced to IBM’s Watson: a robot that not only could beat Jeopardy champions,¹⁰ but also had “Deep QA” software that allegedly had the capabilities to properly diagnose and treat various forms of cancer.¹¹ Interest in developing AI is only increasing; in 2016, medical AI received the largest portion of investments in AI compared to all other sectors.¹²

Many medical algorithms take in a significant amount of information and synthesize that information through a complex process before providing their output.¹³ These algorithms teach themselves how to perform tasks and are called “black box” because even the scientists who created the algorithms do not know how the algorithms make their decisions.¹⁴ The algorithms cannot explain why or how they have reached their conclusion.¹⁵ “Either they cannot explain it at all, or they can give explanations that are accurate but meaningless in terms of medical understanding.”¹⁶

⁷ John McCarthy, BRITANNICA (Aug. 31, 2021), <https://www.britannica.com/biography/John-McCarthy> [<https://perma.cc/R2VD-5EKG>].

⁸ Vivek Kaul et al., *History of Artificial Intelligence in Medicine*, 92 GASTROINTESTINAL ENDOSCOPY 807, 807 (2020) (quoting Amisha et al., *Overview of Artificial Intelligence in Medicine*, 8 J. FAM. MED. & PRIMARY CARE 2328, 2328 (2019)).

⁹ See *id.* at 808–09.

¹⁰ Amanda Swanson & Fazal Khan, *The Legal Challenge of Incorporating Artificial Intelligence into Medical Practice*, 6 J. HEALTH & LIFE SCIS. L. 90, 93 (2012).

¹¹ Jason Chung & Amanda Zink, *Hey Watson—Can I Sue You for Malpractice? Examining the Liability of Artificial Intelligence in Medicine*, 11 ASIA PAC. J. HEALTH L. & ETHICS 51, 54 (2018); see also Eliza Strickland, *How IBM Watson Overpromised and Underdelivered on AI Health Care*, IEEE SPECTRUM (Apr. 2, 2019, 2:00 PM), <https://spectrum.ieee.org/biomedical/diagnostics/how-ibm-watson-overpromised-and-underdelivered-on-a-i-health-care> [<https://perma.cc/3BU2-JC5T>] (noting that, while Watson was designed and advertised as having immense capabilities, “IBM has discovered that its powerful technology is no match for the messy reality of today’s health care system. And in trying to apply Watson to cancer treatment, one of medicine’s biggest challenges, IBM encountered a fundamental mismatch between the way machines learn and the way doctors work. . . . Watson learned fairly quickly how to scan articles about clinical studies and determine the basic outcomes. But it proved impossible to teach Watson to read the articles the way a doctor would. ‘The information that physicians extract from an article, that they use to change their care, may not be the major point of the study,’ Kris says. Watson’s thinking is based on statistics, so all it can do is gather statistics about main outcomes, explains Kris. ‘But doctors don’t work that way.’”).

¹² Amisha et al., *Overview of Artificial Intelligence in Medicine*, 8 J. FAM. MED. & PRIMARY CARE 2328, 2328 (2019).

¹³ See Hannah R. Sullivan & Scott J. Schweikart, *Are Current Tort Liability Doctrines Adequate for Addressing Injury Caused by AI?*, 21 AMA J. ETHICS 160, 160 (2019).

¹⁴ Richard Harris, *How Can Doctors Be Sure a Self-Taught Computer Is Making the Right Diagnosis?*, NPR (Apr. 1, 2019, 6:14 AM), <https://www.npr.org/sections/health-shots/2019/04/01/708085617/how-can-doctors-be-sure-a-self-taught-computer-is-making-the-right-diagnosis> [<https://perma.cc/GS8J-MP9B>].

¹⁵ W. Nicholson Price II, *Artificial Intelligence in Health Care: Applications and Legal Implications*, SCITECH LAW, Fall 2017, at 10, 10.

¹⁶ *Id.*

When black box algorithms generate suggestions without providing an explanation for those suggestions, it creates issues regarding who to hold responsible when things go wrong.¹⁷ This raises the issue of determining who should be held responsible for mistakes arising from an AI's "thought" process.¹⁸ As journalist Robert David Hart puts it:

[H]ow do we determine at what point an AI's error crosses over from an unfortunate (yet inevitable) medical mistake to an unacceptable, possibly negligent one? And, can doctors or health care institutions using the AI be truly held liable for what might go wrong when they don't even know the inner workings of the tool?¹⁹

This fear that a doctor or hospital may be held liable for the mistakes of technology may scare away risk-averse physicians from using medical AI.²⁰ Physicians who are scared to use new and emerging AI and medical technology may forgo using new state-of-the-art devices, which in turn could lead to worse outcomes for their patients.²¹ It is also hard to determine liability when one cannot definitively point to how the problem arose:²² was it a freak accident, a design flaw, or a mistake that a "minimally competent" doctor would make?²³

¹⁷ THE DOCTORS COMPANY, THE ALGORITHM WILL SEE YOU NOW: HOW AI'S HEALTHCARE POTENTIAL OUTWEIGHS ITS RISK 9 (2020), <https://rb.gy/xjftay> [<https://perma.cc/U5SP-B4CV>].

¹⁸ See Robert David Hart, *Who's to Blame When a Machine Botches Your Surgery?*, QUARTZ, <https://qz.com/1367206/whos-to-blame-when-a-machine-botches-your-surgery> [<https://perma.cc/9PRV-B772>].

¹⁹ *Id.*

²⁰ See Erin Dietsche, *How the Current Healthcare Mindset is Preventing Wider Digital Health Adoption*, MEDCITY NEWS (Mar. 21, 2018, 8:06 PM), <https://medcitynews.com/2018/03/current-healthcare-mindset-preventing-wider-digital-health-adoption/?rf=1> [<https://perma.cc/MV6J-PLJD>]; A. Michael Froomkin et al., *When AIS Outperform Doctors: Confronting the Challenges of a Tort-Induced Over-Reliance on Machine Learning*, 61 ARIZ. L. REV. 33, 55, 58 (2019).

²¹ See, e.g., Froomkin et al., *supra* note 20, at 57 (explaining that "the automated external defibrillator became the standard of care for first responders in 1988 when the Advanced Cardiac Life Support (ACLS), a working group of the American Heart Association, endorsed it. The first articles about clinical use of those defibrillators had appeared in medical journals only a decade earlier, but the national consensus crystalized quickly after studies published in the late 1980s demonstrated their value in improving patient survival." (footnote omitted)).

²² See *Insights: Mitigating Product Liability for Artificial Intelligence*, JONES DAY (Mar. 2018), <https://www.jonesday.com/en/insights/2018/03/mitigating-product-liability-for-artificial-intell> [<https://perma.cc/VH5C-YLFF>].

²³ See Steven Shavell, *Liability for Accidents*, in 1 HANDBOOK OF LAW AND ECONOMICS 139, 163–64 (A. Mitchell Polinsky & Steven Shavell eds., 2007) (finding that, in freak accidents, there may not be proximate causation and therefore there are situations when "[a]llowing parties to escape liability for unusual accidents is sometimes thought not to undermine incentives, on the ground that no one could have foreseen such accidents"); *What is Product Liability?*, FINDLAW (July 2, 2019), <https://www.findlaw.com/injury/product-liability/what-is-product-liability.html> [<https://perma.cc/3WA7-HK4Q>] (listing a design defect as one of three types of defects that give rise to a product liability claim); Stuart P. Swadron et al., *A Resource-Based Locality Rule*, 16 AM. MED. ASS'N J. ETHICS 111, 111–12 (2014) (explaining

The issue of AI liability is not new, and laws have been proposed in other parts of the world to address the issue.²⁴ In 2017, the European Parliament presented a resolution to the European Commission, which proposed granting personhood to AI.²⁵ Granting legal personhood bestows legal rights and duties on nonhuman entities and is usually accompanied by the capacity to sue and be sued.²⁶ The European Parliament recommended granting personhood to AI, coupled with an insurance regime to hold the robot responsible for its actions and to provide a remedy for those that were injured by the robot's actions.²⁷ Ultimately, the European Commission decided against granting personhood.²⁸

This note argues that, as the thought process in medical AI becomes more advanced, the problem of the black box algorithm will create an environment where liability will be hard to determine under current tort law. More specifically, the more autonomous an AI device becomes, the harder it will be to determine where the error occurred and who should be held responsible for that error. This note proposes adopting and applying the European Parliament's proposal of (1) granting personhood for medical AI, and (2) insuring AI under the medical malpractice scheme to remedy the foreseeability issues under current tort law and to provide redress for patients injured by medical AI.

that, in medical malpractice, the "minimally competent" doctor is used as a benchmark to determine whether a physician fell below the standard of care and defining the standard of care as "each physician has a duty to use his or her knowledge and therewith treat through maximum reasonable medical recovery, each patient, with such reasonable diligence, skill, competence and prudence as are practiced by minimally competent physicians in the same specialty or general field of practice throughout the United States, *who have available to them the same general facilities, services, equipment and options.*" (quoting *Hall v. Hilbun*, 466 So.2d. 856, 873 (Miss. 1985)).

²⁴ For the European Parliament's proposal addressing the issue before the European Commission, see generally European Parliament Resolution of 16 February 2017 with Recommendations to the Commission on Civil Law Rules on Robotics, EUR. PARL. DOC. P8_TA(2017)0051 [hereinafter European Parliament Proposal], <https://rb.gy/pqyaxj> [<https://perma.cc/2LYF-95M3>].

²⁵ See Shawn Bayern, *Are Autonomous Entities Possible?*, 114 NW. U. L. REV. ONLINE 23, 46 (2019).

²⁶ Lawrence B. Solum, *Legal Personhood for Artificial Intelligences*, 70 N.C. L. REV. 1231, 1238–39 (1992).

²⁷ See European Parliament Proposal, *supra* note 24, ¶¶ 57–59.

²⁸ Thomas Burri, *The EU is Right to Refuse Legal Personality for Artificial Intelligence*, EURACTIVE (May 31, 2018), <https://rb.gy/zkcloc> [<https://perma.cc/2LYF-95M3>]; see also Janosch Delcker, *Europe Divided Over Robot 'Personhood'*, POLITICO (Apr. 11, 2018, 12:45 PM), <https://www.politico.eu/article/europe-divided-over-robot-ai-artificial-intelligence-personhood/> [<https://perma.cc/7QBE-SM84>] (noting that the main opposition to the European Parliament's proposal was due to the fact that it would absolve manufacturers of all liability and responsibility for their AI, as well as the fact that "all-encompassing robot intelligence" is not actually in reach and it may be dangerous to give people and nations the idea that it is that advanced).

Part I of this note gives a brief history of medical AI, the current state of medical AI, and the potential future advancements. Part II of this note analyzes current tort law and the weaknesses of applying it to medical AI. Part III of this note introduces the European Parliament's proposal to the European Commission to establish personhood for AI. Finally, Part IV of this note uses the European Parliament's resolution as a framework to propose that granting personhood, coupled with a structured medical malpractice insurance regime, is the best method for tackling the liability issues with medical AI. Creating and following a personhood and obligatory insurance regime like the one proposed by the European Parliament will help address the liability issues under current tort law, allowing for more predictable legal results, which will in turn encourage innovation in the medical AI field.

I. OVERVIEW OF MEDICAL AI

While the term “artificial intelligence” was not conceived until the 1950s, the concept of AI was documented in works dating back to the ancient Greeks, who held myths about robots.²⁹ Ancient Chinese, Greek, and Egyptian engineers built mechanical statues that looked like human beings; Chinese statues could even perform simple tasks like pouring wine for guests.³⁰ But it would take more than a thousand years before Alan Turing developed and described the concept of using machines to simulate human intelligent behavior and critical thinking.³¹

When Turing wrote his paper, “Computing Machinery and Intelligence,” in 1950, he imagined a world in which computers would possess critical thinking skills.³² Computers at the time,

²⁹ Tanya Lewis, *A Brief History of Artificial Intelligence*, LIVE SCI. (Dec. 4, 2014), <https://www.livescience.com/49007-history-of-artificial-intelligence.html> [<https://perma.cc/8FGC-L7L6>].

³⁰ *See id.*; *see also* Lisa Hix, *Ancient Androids: Even Before Electricity, Robots Freaked People Out*, COLLECTORS WKLY. (July 30, 2018), <https://www.collectorsweekly.com/articles/ancient-androids/> [<https://perma.cc/HYM7-R5Q6>] (“The first records of automata, or self-operating machines that give the illusion of being alive, go back to ancient Greece and China. . . . Chinese engineer Huang Kun, serving under Sui Yang Ti, described an outdoor mechanical puppet theater To impress his guests, the emperor’s automata would stop to serve them wine.”).

³¹ *See* Kaul et al., *supra* note 8, at 807; *see also* Alan Turing, BIOGRAPHY (July 22, 2020), <https://www.biography.com/scientist/alan-turing> [<https://perma.cc/6588-F8VC>] (noting that Alan Turing was a “British mathematician who took a leading role in breaking Nazi ciphers during WWII. . . . His work is widely acknowledged as foundational research of computer science and artificial intelligence.”).

³² *See* A.M. Turing, *Computing Machinery and Intelligence*, 49 MIND 433, 442 (1950) (“I believe that at the end of the century the use of words and general educated opinion will have altered so much that one will be able to speak of machines thinking without expecting to be contradicted.”).

however, lacked one necessary component to be considered intelligent—they could not store commands, they could only execute them.³³ Limits on processing speeds and information storage would prove to be a challenge for the next twenty years as scientists developed algorithms and began engineering faster, cheaper computers.³⁴

AI advanced from the 1950s through the 1970s, from stationary robots that could “mimic human conversation” to mobile robots that could follow simple one-step commands.³⁵ The 1970s also saw the first collaborative steps towards AI in medicine.³⁶ In 1976, the medical world saw a groundbreaking prototype that demonstrated the possibility of utilizing AI in a medical setting with the development of a consultation program for glaucoma using “a causal–associational network that consists of [three] separate programs: model-building, consultation, and a database that was built and maintained by the collaborators.”³⁷ The prototype could apply information about glaucoma to separate patients, while providing physicians with guidance on the management of each individual patient.³⁸

Ten years later, the University of Massachusetts created a decision support system that could generate a differential diagnosis based on symptoms.³⁹ The 1980s also saw “deep learning” algorithms and systems that allowed computers to learn through experience, thanks to advances made by psychologists Geoffrey Hinton and David Rumelhart and scientist John Hopfield.⁴⁰ Further, computer scientist Edward Feigenbaum introduced expert systems—computer systems that were capable of mimicking the decision-making processes of human experts.⁴¹ The computer asked an expert how to respond in specific situations, and after learning the different possibilities from those responses, the computer was able to give advice to nonexperts.⁴²

³³ Rockwell Anyoha, *The History of Artificial Intelligence*, SITNBOSTON (Aug. 28, 2017), <http://sitn.hms.harvard.edu/flash/2017/history-artificial-intelligence/> [<https://perma.cc/63AZ-98CA>].

³⁴ *See id.*

³⁵ Kaul et al., *supra* note 8, at 808.

³⁶ *See id.* at 808–09 (“The Stanford University Medical Experimental—Artificial Intelligence in Medicine, a time-shared computer system, was created in 1973 and enhanced networking capabilities among clinical and biomedical researchers from several institutions.”).

³⁷ *Id.* at 809.

³⁸ *Id.*

³⁹ Amisha et al., *supra* note 12, at 2329.

⁴⁰ Anyoha, *supra* note 33; *see also Deep Learning’s Origins and Pioneers*, MCKINSEY & CO. (May 8, 2018), <https://www.mckinsey.com/featured-insights/artificial-intelligence/deep-learning-origins-and-pioneers> [<https://perma.cc/6X37-XDKX>].

⁴¹ Anyoha, *supra* note 33.

⁴² *Id.*

In 2007, IBM developed Watson, a supercomputer that would go on to win Jeopardy.⁴³ One of Watson's primary strengths is that it can read words, and interpret them in "natural-language."⁴⁴ Another strength of Watson is its ability to process thousands of documents in a matter of minutes.⁴⁵ Both of these strengths have helped Watson excel in the health care industry.⁴⁶ In a study conducted at the University of North Carolina School of Medicine, Watson diagnosed 990 cases of cancer when it was tested against 1,000 diagnoses made by oncologists.⁴⁷ More impressively, Watson found treatment options that oncologists had missed in 30 percent of the cases.⁴⁸ This success may be attributed to the fact that Watson is able to read, synthesize, and retain research papers and clinical trials at such a high rate.⁴⁹

Research and analysis are not the only tasks that Watson is capable of executing.⁵⁰ Watson is used by doctors to provide "a natural language interface for the delivery of general and patient specific information," allowing Watson to give information to patients, while also receiving feedback.⁵¹ In essence, Watson is learning to perform tasks that are typically done by human medical students and medical assistants.⁵²

Deep learning algorithms are quickly being integrated into the medical field. In 2017, the US Food and Drug Administration approved Arterys, the first cloud-based deep learning application.⁵³ Arterys analyzes cardiac images in just seconds and provides information, like cardiac ejection fraction, from the scans.⁵⁴ Arterys's capabilities are not just limited to cardiac images; its application has since been used on liver, lung, chest, and musculoskeletal imaging.⁵⁵

⁴³ Katherine Noyes, *Watson's the Name, Data's the Game*, PCWORLD (Oct. 7, 2016, 5:33 AM), <https://www.pcworld.com/article/3128917/watsons-the-name-datas-the-game.html> [<https://perma.cc/2M9H-F5LM>]; see also Steve Lohr, *IBM Is Counting on Its Bet on Watson, and Paying Big Money for It*, N.Y. TIMES (Oct. 17, 2016), <https://www.nytimes.com/2016/10/17/technology/ibm-is-counting-on-its-bet-on-watson-and-paying-big-money-for-it.html> [<https://perma.cc/GP72-TSMT>].

⁴⁴ Lohr, *supra* note 43.

⁴⁵ *Id.*

⁴⁶ *See id.*

⁴⁷ *Id.*

⁴⁸ *Id.*

⁴⁹ *See id.* ("Some treatments were based on research papers that the doctors had not read—more than 160,000 cancer research papers are published a year. Other treatment options might have surfaced in a new clinical trial the oncologists had not yet seen announced on the web. But Watson read it all.")

⁵⁰ Chung & Zink, *supra* note 11, at 56.

⁵¹ *Id.* (quoting Bertalan Mesko, *What is Using IBM in Everyday Medicine Like?*, MED. FUTURIST (July 26, 2016), <https://medicalfuturist.com/what-is-using-ibm-watson-in-medicine-like/> [<https://perma.cc/Z89U-XSBH>]).

⁵² *See id.*

⁵³ Kaul et al., *supra* note 8, at 809.

⁵⁴ *Id.* at 809–10.

⁵⁵ *Id.* at 810.

AI's use in medical imaging has inspired startups to work towards automating the imaging process.⁵⁶ Automating medical AI “can dramatically reduce costs and democratize access to healthcare by making expert health guidance available without the need for human physicians’ expensive time.”⁵⁷ As the algorithms continue to improve, they will require less and less interaction from humans, which will lead to even more savings for hospitals, clinics, and other health care organizations.⁵⁸ This will cut costs for customers as well—one of the main goals of health care systems.⁵⁹

Deep learning algorithms present issues in the health care context because they “cannot explain *why* or *how* they reach the conclusion they do.”⁶⁰ The black box algorithms either have trouble providing any type of explanation, or they give explanations that are technically accurate but are unable to be understood by the medical professionals trying to assess the reasoning behind the algorithm’s decision.⁶¹ This lack of transparency creates a black box problem, where medical professionals are forced to either take the AI’s recommendations and analyses at face value—running the risk of potentially using a faulty result that can lead to malpractice lawsuits⁶²—or they must manually retest and assess the situation, which can cost time. To complicate the issue, medical AI algorithms are constantly learning over time.⁶³ As more data becomes available for AI, the algorithm can refine its future predictions.⁶⁴ This creates issues when it comes to establishing a standard of care to which to hold medical AI,⁶⁵ as the technology may be advancing faster than the standard of care.

⁵⁶ See Rob Toews, *These Are the Startups Applying AI to Transform Healthcare*, FORBES (Aug. 26, 2020, 10:47 AM), <https://www.forbes.com/sites/robtoews/2020/08/26/ai-will-revolutionize-healthcare-the-transformation-has-already-begun/?sh=4060d1fd722f> [<https://perma.cc/XL44-NVDX>].

⁵⁷ *Id.*

⁵⁸ *See id.*

⁵⁹ See BARRY R. FURROW ET AL., HEALTH LAW: CASES, MATERIALS AND PROBLEMS 1 (8th ed. 2018) (noting that “[c]ost, quality, access, and choice are the chief concerns of the health care system”).

⁶⁰ Price, *supra* note 15; *see also* Harris, *supra* note 14.

⁶¹ *See* Price, *supra* note 15, at 10.

⁶² Stephanie Baum, *Healthcare Must Overcome AI’s ‘Black Box’ Problem*, MEDCITY NEWS (Jan. 9, 2019, 1:02 PM), <https://medcitynews.com/2019/01/healthcare-must-overcome-ais-black-box-problem/> [<https://perma.cc/33HQ-BGR6>]; *see, e.g.*, Strickland, *supra* note 11 (noting that despite all of Watson’s capabilities, it was impossible for Watson to synthesize information like a real doctor because Watson bases its decisions on statistics, meaning that Watson would not change its decision-making based on a select number of patients in the way a doctor would based on new treatments that show promising results in small study groups).

⁶³ *See* Price, *supra* note 15, at 10.

⁶⁴ *Id.*

⁶⁵ *See* Ranjeet Soni & Rohit Shrivastava, *Emanating Consequences of AI in Healthcare—Ethicality and Legality*, CRIM. L. BLOG (May 29, 2020), <https://rb.gy/ljff6ja> [<https://perma.cc/3R29-QNJC>]; *see also* Sullivan & Schweikart, *supra* note 13, at 161 (“Standards of care evolve over time with advances in medical knowledge and technology . . .”).

Although algorithms present this black box problem and are capable of making mistakes, they have tremendous potential to improve in the facets of medicine, such as “prognostics, diagnostics, image analysis, resource allocation, and treatment recommendations.”⁶⁶ These algorithms have been able to identify skin cancer, both melanoma and nonmelanoma, with results that are comparable to those of dermatologists.⁶⁷ They can also predict cardiovascular risk and are capable of improving accuracy in predicting cardiovascular risk.⁶⁸ Finding a way to remedy the black box problem could help save lives and ensure that companies are not fearful of developing new medical technologies and that hospitals and doctors are not hesitant to integrate new technologies. While AI’s capabilities to improve science and medicine are undoubted, the new technology presents troubling and unprecedented legal issues.

II. CURRENT TORT LAW

Under American tort law, patients can normally bring suit if they are injured as a result of an individual’s or organization’s failure to meet “judicially accepted standards.”⁶⁹ Tort law allows an injured patient to bring, among other claims: (1) a medical malpractice suit against physicians who breach their duty of care; (2) a vicarious liability suit (typically under the doctrine of *respondet superior*) against health care organizations that fail to ensure that their staff and equipment meet a certain standard of care owed to all patients; and (3) a products liability suit against pharmaceutical and medical device companies for defective products.⁷⁰ All three tort remedies present issues when applied to medical AI because current tort law is based around human behavior and foreseeability—two things that black box AI lacks.⁷¹

⁶⁶ Price, *supra* note 15, at 10.

⁶⁷ See Kaul et al., *supra* note 8, at 810.

⁶⁸ *Id.*

⁶⁹ Sullivan & Schweikart, *supra* note 13, at 161.

⁷⁰ *Id.* at 161–62.

⁷¹ See Cause, CORNELL L. SCH.: LEGAL INFO. INST., <https://www.law.cornell.edu/wex/cause> [<https://perma.cc/J2ZU-XWXM>] (stating that causation is an element that must be proven in an alleged tort case); see also Yavar Bathaee, *The Artificial Intelligence Black Box and the Failure of Intent and Causation*, 31 HARV. J.L. & TECH. 890, 890–92, 895 (2018) (“[T]he law is built on legal doctrines that are focused on human conduct, which when applied to AI, may not function. . . . The implications of this inability to understand the decision-making process of AI are profound for intent and causation tests, which rely on evidence of human behavior to satisfy them. These tests rely on the ability to find facts as to what is foreseeable. . . . When the AI is a black box, foreseeability cannot be proven because the creators or users of the AI will not know ex ante what effects the AI will have.” (footnotes omitted)).

A. *Medical Malpractice*

First, a patient may sue a doctor for malpractice.⁷² It is estimated that “at least 44,000 Americans die each year as a result of medical errors . . . [and that] number may be as high as 98,000.”⁷³ Medical malpractice is when a doctor or health care professional injures a patient through negligence.⁷⁴ The negligent act or omission may happen at any stage in the doctor-patient relationship; it could be in the diagnosis of the illness or ailment, in the actual treatment, or in the aftercare and management of the patient’s health.⁷⁵ To prevail in a malpractice suit, a patient must establish that (1) the physician owed a duty of care to the patient, (2) the physician breached that duty and failed to uphold that required standard of care, (3) the patient sustained damages, and (4) the breach of the physician’s duty was the cause of those damages.⁷⁶

Courts across the United States have held that the foreseeability of the resulting harm is important and necessary when bringing a medical malpractice lawsuit.⁷⁷ Thus, without being able to prove the foreseeability of the resulting harm, the plaintiff may not be able to bring a successful medical malpractice claim.⁷⁸

Currently, most AI machines are simply used to assist human doctors in their everyday practice, from generating patient-record summaries to monitoring disease progression.⁷⁹ In these situations, the doctor can still be held responsible because they have the final say in the treatment of the patient.⁸⁰ Holding a doctor responsible for the output of a black box algorithm poses unique problems as AI advances and as AI’s “thoughts” become

⁷² Sullivan & Schweikart, *supra* note 13, at 161.

⁷³ FURROW ET AL., *supra* note 59, at 207 (alterations in original).

⁷⁴ *What is Medical Malpractice?*, AM. BD. OF PRO. LIAB. ATT’YS, <https://www.abpla.org/what-is-malpractice> [<https://perma.cc/3VNY-GDNC>].

⁷⁵ *Id.*

⁷⁶ Chung & Zink, *supra* note 11, at 67.

⁷⁷ See David Goguen, *Medical Negligence*, ALLLAW, <https://rb.gy/ytaqig> [<https://perma.cc/JY28-CQ4P>] (explaining that “[i]f the doctor’s medical negligence was not a foreseeable result of the patient’s harm (causation), or if the doctor’s medical negligence actually had no detrimental effect on the patient’s condition (damages), a medical malpractice claim will fall short”); see also Christine Marshall & Sutter O’Connell, *Foreseeability of Harm May Be Necessary to Prove Medical Malpractice*, N. OHIO PHYSICIAN, Mar./Apr. 2015, at 15 (concluding that “foreseeability of harm is not only relevant, but may be necessary, for a jury to consider when determining if medical negligence has occurred”).

⁷⁸ Goguen, *supra* note 77.

⁷⁹ See Tanya Albert Henry, *4 Ways Health Care AI Could Help Physicians’ Work*, AM. MED. ASS’N (Oct 5, 2020), <https://www.ama-assn.org/practice-management/digital/4-ways-health-care-ai-could-help-physicians-work> [<https://perma.cc/TT36-VZX6>].

⁸⁰ See Price, *supra* note 15, at 12 (noting that when it comes to the use of health case software, the final decision is “always resting in the hands of the provider”).

more complex.⁸¹ Specifically, doctors are having a hard time deciphering the algorithms that AI systems use to come to conclusions.⁸² This means that a doctor cannot foresee issues with the algorithm's thought process, and therefore its suggestion on a treatment or course of action, because the doctor cannot determine how the AI came to its conclusion.

The development and increasing intricacy of technology and algorithms create uncertainty for doctors and the courts as to what the current standard of care is.⁸³ Establishing a standard of care is difficult when a machine that thinks independently, and is generally held to be more accurate than a human, is added to the mix.⁸⁴ To discern what a reasonable standard of care is for a particular situation, courts often rely on the advice of expert witnesses.⁸⁵ With technological advances and new research in medicine, the standard of care evolves to incorporate new technology and practices.⁸⁶ For example, in the 1980s, mistakes in administering anesthesia caused a surprising number of injuries and deaths around the world.⁸⁷ Mistakes that often led to death were “inadequate preparation for anaesthesia and surgery, inappropriate choice or application of technique, inadequate postoperative care, and overdose.”⁸⁸ Outrage over anesthesia-related deaths and injuries in the 1980s led the American Society of Anesthesiologists to develop new methods for monitoring oxygen levels during surgery, which created a new standard of care for anesthesiologists.⁸⁹ This ever-evolving

⁸¹ See Terry, *supra* note 5, at 139 (noting that science “suggests that neural networks are evolving in ways that not only mimic but also exceed the human brain”); Shailin Thomas, *Artificial Intelligence, Medical Malpractice, and the End of Defensive Medicine*, HARV. L. PETRIE-FLOM CTR.: BILL OF HEALTH (Jan. 26, 2017), <https://rb.gy/ikiaqh> [<https://perma.cc/FT37-Z7ZJ>] (suggesting that “[a]s algorithms improve and doctors use them more for diagnosing and decision-making, the traditional malpractice notions of physician negligence and recklessness may become harder to apply”).

⁸² See Baum, *supra* note 62.

⁸³ Sullivan & Schweikart, *supra* note 13, at 161.

⁸⁴ See Froomkin et al., *supra* note 20, at 37 (observing that robotic surgery “can perform some tasks more quickly and more accurately than humans”); see also Zach Harned et al., *Machine Vision, Medical AI, and Malpractice*, HARV. J.L. & TECH. DIG. 1, 6 (Mar. 13, 2019), <https://jolt.law.harvard.edu/assets/digestImages/PDFs/Harned19-03.pdf> [<https://perma.cc/WRX4-MYZJ>] (noting that “because a lawsuit involving medical machine vision would be a matter of first impression with no clear precedent, it is challenging to predict exactly how a court would handle physician liability”).

⁸⁵ Soni & Shrivastava, *supra* note 65.

⁸⁶ *Id.*; Sullivan & Schweikart, *supra* note 13, at 161.

⁸⁷ *How Does the Medical Malpractice Standard of Care Change Over Time?*, GILMAN & BEDIGIAN, <https://www.gilmanbedigian.com/how-does-the-standard-of-care-change-over-time/> [<https://perma.cc/87GK-3WYK>].

⁸⁸ A. R. Aitkenhead, *Injuries Associated with Anaesthesia. A Global Perspective*, 95 BRIT. J. ANESTHESIA 95, 96–97 (2005).

⁸⁹ See Gilman & Bedigan, *supra* note 87; see also *APSF History, Mission and Vision Statements*, ANESTHESIA PATIENT SAFETY FOUND., <https://www.apsf.org/about->

standard of care creates uncertainties for doctors and medical professionals as to what the standard of care would be when integrating or utilizing new AI technologies,⁹⁰ and may even create a situation where a physician could be held liable for failing to use medical AI in arriving at a diagnosis.⁹¹

B. *Vicarious Liability/Respondeat Superior*

As a second current tort remedy, the patient may sue the hospital or clinic for liability under *respondeat superior*.⁹² Under the doctrine of *respondeat superior*, an employer is liable for an employee's negligence if the employee was acting within the scope of their employment.⁹³ To prove that the conduct of the employee fell within the scope of their employment

- (1) the conduct must have occurred substantially within the time and space limits authorized by the employment;
- (2) the employee must have been motivated, at least partially, by a purpose to serve the employer; and
- (3) the act must have been of a kind that the employee was hired to perform.⁹⁴

This means that if an employee is acting within the scope of employment, and the employer could foresee the employee's misconduct, the employer would most likely be held responsible for the harm the employee caused.⁹⁵

In the health care setting, courts have held that hospitals and clinics are responsible for the actions of their doctors, even if the doctor is hired as an independent contractor.⁹⁶ In *Webster*

apsf/mission-and-vision-statements/ [https://perma.cc/TFM7-5Y2V] (“The [Anesthesia Patient Safety Foundation] was launched in late 1985 as an independent (allowing organizational agility and the freedom to tackle openly the sensitive issue of anesthesia accidents), nonprofit corporation with the vision . . . ‘that no patient shall be harmed by anesthesia.’ . . . In 1986, the [American Society of Anesthesiologists] adopted an expanded form [of safety monitoring] as a national standard, a landmark step for a medical professional society and which epitomized the lead role taken by anesthesiology in the nascent patient safety movement.”).

⁹⁰ See Soni & Shrivastava, *supra* note 65.

⁹¹ See, e.g., Froomkin et al., *supra* note 20, at 55–56 (noting that soon after the introduction of the x-ray machine, physicians' failure to use the device became “so clearly negligent as to constitute *res ipsa loquitur* . . . an obvious failure to follow accepted medical practice” (alteration in original) (quoting William J. Curran, *The Unwanted Suitor: Law and the Use of Health Care Technology*, in *THE MACHINE AT THE BEDSIDE: STRATEGIES FOR USING TECHNOLOGY IN PATIENT CARE* 119, 123 (Stanley Joel Reiser & Michael Anabar eds., 1984))).

⁹² Sullivan & Schweikart, *supra* note 13, at 161.

⁹³ *Tort Liability Basics: Strict, Vicarious, and Joint Liability*, INC.COM, <https://www.inc.com/articles/1999/11/15396.html> [https://perma.cc/EY2P-YYDH].

⁹⁴ *Id.*

⁹⁵ See *id.*; David Goguen, *Can an Employer Be Liable for Personal Injury?*, LAWYERS.COM, <https://www.lawyers.com/legal-info/personal-injury/introduction-to-personal-injury-law/can-an-employer-be-liable-for-personal-injury.html> (last visited Dec. 31, 2021).

⁹⁶ See, e.g., *Webster v. CDI Ind., LLC*, 917 F.3d 574, 575, 577 (7th Cir. 2019).

v. CDI Indiana, LLC, a patient and her husband sued a radiology diagnostic imaging facility, alleging that the facility was liable for the conduct of its radiologist, an independent contractor, who had reviewed the patient's scans and negligently failed to diagnose the patient's cancer even though her scans showed a mass.⁹⁷ The Seventh Circuit held that the fact that the radiologist was an independent contractor did not shield the imaging facility from being held responsible for the radiologist's conduct.⁹⁸ The court explained that a hospital, clinic, or health care center could be held liable for an independent contractor's conduct because patients believe that it is actually the hospital or its doctors and staff that are providing the care.⁹⁹

A court's interpretation of the doctrine of *respondeat superior* may have serious consequences when a hospital is deciding whether to purchase AI equipment. A hospital's risk aversion may prevent it from adopting new technologies if it thinks that it will foot the bill for mistakes.¹⁰⁰ Since the hospital has a duty when buying technology to ensure its efficacy as well as ensuring that staff are properly trained on how to handle and use that technology,¹⁰¹ the doctrine of *respondeat superior* could create an environment where hospitals and clinics are hesitant to invest in new technologies for fear of costly litigation. For example, although the da Vinci robot was "designed to improve complex, minimally invasive surgeries by providing surgeons with more precision and patients with reduced recovery times," its manufacturer, Intuitive Surgical, Inc., amassed almost one hundred claims for complications

⁹⁷ *Id.* at 574–75.

⁹⁸ *Id.* at 577–78.

⁹⁹ *Id.* at 577; see RESTATEMENT (SECOND) OF TORTS § 429 (AM. L. INST. 1965) ("One who employs an independent contractor to perform services for another which are accepted in the reasonable belief that the services are being rendered by the employer or by his servants, is subject to liability for physical harm caused by the negligence of the contractor in supplying such services, to the same extent as though the employer were supplying them himself or by his servants.")

¹⁰⁰ See Dietsche, *supra* note 20 ("Why does healthcare take so long to innovate? Rivas said part of it has to do with the mindset of the industry and of physicians. Most entrepreneurs are willing to take plenty of risks. Doctors, on the other hand, are risk-averse. They're taught not to fail, as it may bring harm to a patient."); Brian Buntz, 5 *Reasons Why Medical Device Innovation is So Tough*, MED. DEVICE & DIAGNOSTIC INDUS. (Apr. 4, 2016), <https://www.mddionline.com/rd/5-reasons-why-medical-device-innovation-is-so-tough> [<https://perma.cc/S2AP-L7MV>] ("The culture in the United States is relatively litigious when compared with that of many other developed nations. 'In our society, we tend to worry more about killing one patient than we do about saving thousands,' Betten says, referring to the fact that there is often little attention given to the large number of devices that work as they are intended.")

¹⁰¹ See Sullivan & Schweikart, *supra* note 13, at 161.

ranging from “electrical burns to organ damage and death.”¹⁰² These issues led the company to reserve \$67 million in 2014 to settle almost three thousand claims.¹⁰³ The mistakes made by the da Vinci robot also led to claims against the hospitals themselves, which resulted in settlements with patients affected by the device’s surgical mistakes.¹⁰⁴ These types of mistakes and subsequent litigation could have potentially profound effects on hospital practices. Doctors and the medical industry are traditionally known for being risk-averse and slow to integrate technologies.¹⁰⁵ In turn, the risk aversion due to fear of litigation could halt the advancement and creation of revolutionary medical technologies.¹⁰⁶

C. *Products Liability*

Finally, the patient may sue the manufacturers for products liability.¹⁰⁷ Products liability “refers to the liability of any or all parties along the chain of manufacture of any product for damage caused by that product.”¹⁰⁸ In a products liability case, the injured party “must prove that the product that caused

¹⁰² Kristin Compton, *Da Vinci Robotic Surgery Lawsuits*, DRUGWATCH (Mar. 30, 2021), <https://www.drugwatch.com/davinci-surgery/lawsuits/> [<https://perma.cc/YE2T-X4V3>].

¹⁰³ *Id.*

¹⁰⁴ See, e.g., *Teresa Hershey, et al. v. Intuitive Surgical, Inc., et al.*, LAWZILLA: LEGAL NEWS, <http://lawzilla.com/blog/teresa-hershey-et-al-v-intuitive-surgical-inc-et-al/> [<https://perma.cc/F8C7-KLLK>] (presenting preliminary court ruling in case where plaintiff sued the manufacturer of the da Vinci device after suing and reaching settlement with the hospital where she received the operation).

¹⁰⁵ See Joe Randolph, *Why Healthcare Leaders Must Take Risks and Not Have Regrets*, HEALTHCARE INNOVATION, (Oct. 19, 2020), <https://rb.gy/nn7s3v> [<https://perma.cc/59BM-4XU2>] (“In healthcare, physicians are trained to follow protocols, use evidence-based medicine, standardize processes and eliminate variation. Any variation in care delivery that results in a bad outcome increases the risk of malpractice litigation. . . . It’s no surprise that the culture for healthcare is one that is averse to taking risk. It only makes sense when you are dealing with patients’ lives. Historically, there have been no outlets for physicians, clinicians and employees to bring forth their ideas on how to improve care delivery.”).

¹⁰⁶ See Roy Smythe, *Why Changing Health Care Is Hard*, FORBES (Feb. 24, 2014, 12:27 PM), <https://www.forbes.com/sites/roysmythe/2014/02/24/why-changing-health-care-is-hard/?sh=1b7179bd4f1b> [<https://perma.cc/KJ8D-DS4L>] (“It is no surprise that physicians are conditioned by education and training to minimize risk. After all, trying unproven things in the delivery of care can theoretically lead to suffering and loss of life if things don’t go well. This approach may be beneficial in the moment when caring for a patient, but it also may lead to resistance to change efforts in health care delivery.”).

¹⁰⁷ Sullivan & Schweikart, *supra* note 13, at 162; see Ethan Baron, *Robot-Surgery Firm from Sunnyvale Facing Lawsuits, Reports of Death and Injury*, MERCURY NEWS (Oct. 22, 2017, 9:45 AM), <https://www.mercurynews.com/2017/10/22/robot-surgery-firm-from-sunnyvale-facing-lawsuits-reports-of-death-and-injury/> [<https://perma.cc/GWM2-ZM46>].

¹⁰⁸ *Products Liability*, CORNELL L. SCH.: LEGAL INFO. INST., https://www.law.cornell.edu/wex/products_liability [<https://perma.cc/83FV-ZM6Z>].

injury was defective and that the defect made the product unreasonably [and inherently] dangerous.”¹⁰⁹

Three kinds of defects may result in a products liability action: (1) design defects, (2) manufacturing defects, and (3) marketing defects.¹¹⁰ Design defects are built into the design of the device or product.¹¹¹ These are defects that exist before manufacturing even occurs, and while the defect may allow the device to continue to serve its purpose, it is nevertheless inherently and unreasonably dangerous—for example, cellphones that are designed with batteries that overheat and could catch fire.¹¹² Manufacturing defects are defects that arise in production or assembly.¹¹³ Not all products are affected; it is usually limited to a few products¹¹⁴—for example, a car that was manufactured with a leaky gas tank.¹¹⁵ Marketing defects are defects in the way a product is marketed, such as by having improper or insufficient labeling or instructions, or inadequate safety warnings about latent dangers of the product¹¹⁶—for example, advertising a product as “light cigarettes” but failing to warn consumers that they are not any less dangerous than traditional cigarettes, despite their name.¹¹⁷

Products liability and the defects described above apply only to products, not services.¹¹⁸ This distinction may have implications for AI because software may be categorized as a service, rather than a product.¹¹⁹ This is especially true for purely software-based AI, as

¹⁰⁹ *What is Product Liability?*, *supra* note 23; see also *Dangerous Products*, LEGALMATCH, <https://www.legalmatch.com/law-library/article/dangerous-products.html> [<https://perma.cc/LW2B-SNVM>] (“A product can contain a manufacturing defect without being defective in design. Such products can be so-called ‘inherently dangerous’ products.” An example could be a chemical such as ammonia: “[a]n ammonia product may be properly designed. However, it may be defectively manufactured. The product container may have a crack that causes ammonia to spill, injuring a consumer. Here, the manufacturer can be held liable for a manufacturing defect.”).

¹¹⁰ *What is Product Liability?*, *supra* note 23.

¹¹¹ *Products Liability*, *supra* note 108.

¹¹² *Id.*; *Dangerous Products*, *supra* note 109.

¹¹³ *Products Liability*, *supra* note 108.

¹¹⁴ *Id.*

¹¹⁵ See *Product Liability for Defective Design, Part 1*, LAW SHELF EDUC. MEDIA, <https://lawshelf.com/shortvideoccontentview/product-liability-for-defective-design-part-1/> [<https://perma.cc/8GDP-UXVC>].

¹¹⁶ *Products Liability*, *supra* note 108.

¹¹⁷ Kenneth Ross, *Liability for What You Say and What You Don’t Say*, IN-HOUSE DEF. Q., Fall 2010, at 34, 34.

¹¹⁸ See Karni A. Chagal-Feferkorn, *Am I an Algorithm or a Product? When Products Liability Should Apply to Algorithmic Decision-Makers*, 30 STAN. L. & POLY REV. 61, 83 (2019); James M. Beck, *Guest Post—Is Artificial Intelligence a “Product”? The Third Circuit Says, “No.”*, DRUG & DEVICE L. (Mar. 27, 2020), <https://rb.gy/uehrnb> [<https://perma.cc/3YEF-WZ55>].

¹¹⁹ See Beck, *supra* note 118 (explaining that the Restatement (Third) of Torts defines a product as “tangible personal property distributed commercially for use or consumption” or any “[o]ther item[]” whose “context of . . . distribution and use is sufficiently analogous to [that] of tangible personal property” (alterations in original) (quoting *Rodgers v. Christie*, No. 19-2616, 2020 WL *1079233, at *2 (3d Cir. 2020))). The article notes that “courts are likely to apply

opposed to AI with mechanical or robotic components that house the software and, as such, may be deemed a product.¹²⁰

A question that courts must grapple with is whether AI is a product or a service.¹²¹ While there have not been medical AI cases before the Supreme Court that have addressed this issue, lower courts have ruled that AI in other sectors is not a product.¹²² And because algorithms are typically considered a “service,” several courts have not subjected them to the products liability framework.¹²³ Courts have been particularly hesitant in applying products liability tenets to situations dealing with health care software,¹²⁴ perhaps to encourage innovation and development in the health care field. Innovation in health care is important, and there is no doubt that algorithms are useful in providing quick and cheap analysis, which can help with patient care.¹²⁵

Even if medical AI was classified as a product, a mistake based on calculations in the algorithm that it developed by “learning” would present foreseeability issues when bringing a products liability claim.¹²⁶ Because AI algorithms are constantly learning to perform new functions and can arrive at decisions beyond those of its original programmed algorithm, companies may be able “to document and prove that a function was performed or a decision was made as a result of reasonable programming that met then-current industry standards or best practices.”¹²⁷ For this same reason, companies may be able to use the defense that the harm “was not reasonably foreseeable at the time” the algorithm was coded.¹²⁸ This is the same foreseeability problem that makes medical malpractice claims difficult to prove.¹²⁹ Regulations may also prevent parties from determining fault by limiting the admissibility of

traditional product liability principles to AI and find that AI is not a ‘product’ within the meaning of the Restatement (Third) of Torts.” *Id.* The article goes on to explain that “courts following [the Third Circuit ruling in *Rodgers v. Christie*] are likely to hold that AI is not subject to strict liability claims.” It is important to note that *Rodgers* is not binding precedent in the Third Circuit. *See Rodgers v. Christie*, 795 F. App’x 878, 878 (3d Cir. 2020).

¹²⁰ *See Jones Day*, *supra* note 22 (“Under the Uniform Commercial Code, mass-produced, off-the-shelf software is a ‘good,’ but software specifically designed for a customer is a service. Some courts distinguish between the thing containing the software (a product) and information produced by software (not a product).”).

¹²¹ *See id.*

¹²² *See, e.g., Beck*, *supra* note 118 (“On March 5, 2020, the Court of Appeals for the Third Circuit held in *Rodgers v. Christie*, that an algorithmic pretrial risk assessment, which uses a ‘multifactor risk estimation model,’ to assess whether a criminal defendant should be released pending trial, was not a ‘product’ under the New Jersey Products Liability Act”).

¹²³ *See Chagal-Feferkorn*, *supra* note 118, at 83.

¹²⁴ *Price*, *supra* note 15, at 11.

¹²⁵ *See id.*

¹²⁶ *See Jones Day*, *supra* note 22.

¹²⁷ *Id.*

¹²⁸ *Id.*

¹²⁹ *See supra* Section II.A.

certain data,¹³⁰ allowing a manufacturer to escape a products liability claim because the result was not foreseeable at the time they created the algorithm, and the algorithm was too complex to adequately assign fault to the programmer.

Finally, even if a court holds that medical AI qualifies as a product, the manufacturer may be able to invoke the learned intermediary doctrine as a defense to liability.¹³¹ Under the learned intermediary doctrine, the manufacturer of the product does not have a direct duty to the patient because the physician using the product, rather than the patient, is considered to be the end consumer of the medical device.¹³² As the end consumers, the physicians are “in the best position to weigh the risks against the possible benefits of using the device,” and therefore have a duty to inform the patient of all the risks and side effects.¹³³ This allows manufacturers to escape any potential liability for marketing defects because, if a physician subsequently fails to properly warn a patient and adequately disclose the risks and benefits associated with the product, it is the physician who will face liability.¹³⁴

The learned intermediary doctrine places a lot of pressure on doctors to weigh the risks of using particular AI.¹³⁵ If the doctor determines that “the foreseeable risks of a product are higher than foreseeable benefits,” the doctor may feel obligated to bypass use of the product to avoid liability.¹³⁶ If the doctor does proceed despite having knowledge the risks, then under the learned intermediary doctrine, the doctor will be liable for any resulting harms.¹³⁷ This means that physicians need to be vigilant in informing their patients about all of the potential effects and risks associated with the use of medical AI devices.¹³⁸

¹³⁰ See Jones Day, *supra* note 22.

¹³¹ See Sullivan & Schweikart, *supra* note 13, at 162.

¹³² *Id.*

¹³³ *Id.* (quoting Jessica S. Allain, Comment, *From Jeopardy! to Jaundice: The Medical Liability Implications of Dr. Watson and Other Artificial Intelligence Systems*, 73 LA. L. REV. 1049, 1049–79 (2013)).

¹³⁴ Sullivan & Schweikart, *supra* note 13, at 162; see, e.g., Jason Husgen, *Product Liability Suits Involving Drug or Device Manufacturers and Physicians: The Learned Intermediary Doctrine and the Physician’s Duty to Warn*, 111 MO. MED. 478, 478–79 (2014) (describing how Pfizer and Searle successfully used the learned intermediary defense to avoid liability when a man sued the drug manufacturers for injuries sustained during shoulder pain treatment as the burden was on the physician to warn the man of any potential side effects).

¹³⁵ Because failure to do so would allow a product developer to assert the defense of the learned intermediary doctrine. See Husgen, *supra* note 134, at 478–79.

¹³⁶ See Soni & Shrivastava, *supra* note 65.

¹³⁷ *Id.*

¹³⁸ See Sullivan & Schweikart, *supra* note 13, at 162 (“The physician as end consumer means that manufacturers may fulfill their duty to warn about the potential dangers of their products by providing warnings to the physicians who will be using them. If a physician subsequently fails to properly warn a patient and adequately disclose the risks and benefits associated with the product, it is the physician who will face liability.”).

D. *Applying AI to Current Tort Law*

One of the major problems with the current tort regime is that it was built with humans in mind and may be hard to apply to nonsentient beings.¹³⁹ One of the main hardships of applying current tort doctrines is the foreseeability element.¹⁴⁰ It is almost “impossible for the creators of AI to foresee what the actions of AI will be, once it is brought to use.”¹⁴¹ This means it is not only hard to hold developers liable under current tort law, but it might be irrational.¹⁴²

AI is also becoming more autonomous,¹⁴³ which will make vicarious liability doctrines hard to enforce because of the hospital’s lack of control over the actions of the AI systems.¹⁴⁴ Finally, algorithms will most likely be considered service and thus would not be subject to a products liability suit for failing to be deemed a product under the law.¹⁴⁵ This classification can prevent injured patients from seeking redress when injuries occur, and can directly impact patients’ compensation for their injuries.¹⁴⁶ Products liability also has the potential to disincentivize programmers and engineers, which might in turn reduce the potential positive impact that medical AI has on society.¹⁴⁷ Therefore, a new approach may be necessary to ensure equity for all.

III. AN INTERNATIONAL SOLUTION: EUROPEAN UNION, AI, AND PERSONHOOD

In February 2017, the European Parliament presented a resolution to the European Commission that proposed granting “a

¹³⁹ See Soni & Shrivastava, *supra* note 65.

¹⁴⁰ *Id.*

¹⁴¹ *Id.*

¹⁴² *Id.*

¹⁴³ Sullivan & Schweikart, *supra* note 13, at 163.

¹⁴⁴ See Soni & Shrivastava, *supra* note 65.

¹⁴⁵ See Price, *supra* note 15, at 11 (finding that “courts have been reluctant to extend or apply product liability theories to software developers, and even more reluctant in the context of healthcare software”).

¹⁴⁶ See Soni & Shrivastava, *supra* note 65, at 4.

¹⁴⁷ See Matthew U. Scherer, *Of Wild Beasts and Digital Analogues: The Legal Status of Autonomous Systems*, 19 NEV. L.J. 259, 281 (2018) (“Imposing the rules of products liability on A.I. would discourage innovation and creative applications of new A.I. technologies. The designers of learning A.I. systems, knowing that they face strict liability, would have a powerful incentive ‘to limit the ability of consumers and users to modify, adapt or customize their advanced A.I. and robotics products in order to retain greater control over how they are used.’ This would greatly reduce the potential for beneficial A.I. systems to have a positive impact on society.” (quoting Peter M. Asaro, *The Liability Problem for Autonomous Artificial Agents*, ASS’N FOR ADVANCEMENT A.I., Spring Symposia Mar. 2016, at 190, 193)).

specific legal status” to AI.¹⁴⁸ The Parliament argued that, due to advances in technology, robots are now able to complete functions that were once considered “exclusively human.”¹⁴⁹ It also noted that “the development of certain autonomous and cognitive features—e.g. the ability to learn from experience and take quasi-independent decisions—has made [robots] more and more similar to agents that interact with their environment and are able to alter it significantly,” and that due to this increase in cognitive features, the legal liability for a robot’s actions is a significant issue to address.¹⁵⁰ The resolution was met with quick backlash in an open letter by robotics and AI experts, who expressed their concerns over establishing legal personhood for AI.¹⁵¹ The European Commission ultimately decided against the resolution.¹⁵² While the Commission may not have granted AI personhood, the European Parliament’s proposed solution lays out a good framework that would alleviate some of the challenges that medical AI faces when it is applied to American tort law.

The European Parliament’s resolution was premised on the fact that “in the long-term, the current trend [in AI] leans towards developing smart and autonomous machines, with the capacity to be trained and make decisions independently.”¹⁵³ The Parliament recognized that these innovations not only bring about economic advantages, but they also raise concerns regarding their direct and indirect effects on society as a whole.¹⁵⁴ The resolution posed the question of whether ordinary liability would be sufficient as AI becomes more complex, or whether new principles and rules of legal liability would be necessary “concerning responsibility for the acts and omissions of robots where the cause cannot be traced back to a specific human actor and whether the acts or omissions of robots which have caused harm could have been avoided.”¹⁵⁵

The Parliament further noted that, in a scenario where a robot makes autonomous decisions, traditional rules are not

¹⁴⁸ See Bayern, *supra* note 25, at 46; European Parliament Proposal, *supra* note 24, ¶ 59(f). While the proposal itself stated that it was granting “a specific legal status” and “electronic personality,” its scheme was effectively bestowing personhood on AI. See Burri, *supra* note 28 (noting that the proposal was creating personhood for AI).

¹⁴⁹ European Parliament Proposal, *supra* note 24, ¶ Z.

¹⁵⁰ *Id.*

¹⁵¹ *Open Letter to the European Commission Artificial Intelligence and Robotics, ROBOTICS OPENLETTER*, <http://www.robotics-openletter.eu> [<https://perma.cc/Y2J2-EKJN>] (asserting the belief “that creating a legal status of electronic ‘person’ would be ideological and non-sensical and non-pragmatic”).

¹⁵² Burri, *supra* note 28.

¹⁵³ European Parliament Proposal, *supra* note 24, ¶ G.

¹⁵⁴ *Id.* ¶ G.

¹⁵⁵ *Id.* ¶ AB.

adequate to address the legal liability for damage caused by a robot because it would be impossible “to identify the party responsible,” and therefore, there is no way to determine who should compensate parties for the damage caused by the robot.¹⁵⁶ The Parliament also went on to argue that, under its current liability scheme, “once the parties bearing the ultimate responsibility have been identified, their liability should be proportional to the actual level of instructions given to the robot and of its degree of autonomy.”¹⁵⁷ In essence, the greater an AI’s learning capability or autonomy, the greater the trainer’s responsibility should be. The ultimate goal is “to identify the person to whom the robot’s harmful behaviour is actually attributable.”¹⁵⁸ Under current liability regimes, the responsibility must fall on a human and not the robot directly.¹⁵⁹ Trying to find the person who is the root cause of the robot’s behavior is complicated and shows that the European Union is grappling with the same issues of foreseeability and liability as the United States when it comes to AI and redress for those injured by autonomous AI or black box algorithms.¹⁶⁰

Finally, the resolution proposed a solution to compensate those harmed by AI after personhood is granted. The Parliament recommended instituting an obligatory insurance scheme to help tackle the complexity of allocating responsibility for damage caused by autonomous AI.¹⁶¹ This scheme would be similar to car insurance, but “unlike the insurance system for road traffic, where the insurance covers human acts and failures, an insurance system for robotics should take into account all potential responsibilities in the chain.”¹⁶² The Parliament further suggested that the insurance system could be supplemented by an additional fund to help ensure that compensation would be available in instances where no insurance exists to cover a given situation.¹⁶³ It also proposed that the insurance industry could develop new insurance products that align with advances in AI and robotics.¹⁶⁴

The main argument behind opposing this proposal was “namely that such personhood is not necessary to meet liability concerns which artificial intelligence may give rise to.”¹⁶⁵ Some scholars argue that there are sufficient mechanisms under

¹⁵⁶ *Id.* ¶ AF.

¹⁵⁷ *Id.* ¶ 56.

¹⁵⁸ *Id.*

¹⁵⁹ *See id.*

¹⁶⁰ *See supra* Part II.

¹⁶¹ European Parliament Proposal, *supra* note 24, ¶ 57.

¹⁶² *Id.*

¹⁶³ *Id.* ¶ 58.

¹⁶⁴ *Id.* ¶¶ 58–59.

¹⁶⁵ Burri, *supra* note 28.

European law to attribute liability in situations in which there is uncertainty and risk.¹⁶⁶ Another challenge the proposal faced is that, in the European Union, the power to define what constitutes a “person” is a member state’s power, not a power that is vested in the European Parliament or the European Commission.¹⁶⁷ This means that it is up to the individual member states to determine what entities they grant legal personhood to, and an entity can only utilize European Union law once national law has deemed it a legal person.¹⁶⁸

While these are indeed strong arguments in Europe, they may not be as strong in the United States. Our current tort regime arguably will not be able to address the liability concerns that AI is beginning to present. Namely, the fact that our current tort law is based around human behavior and foreseeability already poses an issue when it comes to medical errors and medical devices.¹⁶⁹ Second, the United States may already have the precedent needed to establish personhood for AI; one notable example is the establishment of personhood for corporations in the United States.¹⁷⁰ For these reasons, along with the reasons laid out in the European Parliament’s resolution, the best course of action is adopting personhood for AI coupled with mandatory medical malpractice insurance.

IV. SOLUTION: GRANTING MEDICAL AI PERSONHOOD AND REQUIRING MEDICAL MALPRACTICE INSURANCE

A. *Personhood for Medical AI*

Granting AI personhood may seem like a work of fiction straight out of a movie,¹⁷¹ but it is the reality we need to face to address potential liability issues under current tort law. The foundation for AI personhood may already be among us.¹⁷² The

¹⁶⁶ *Id.*

¹⁶⁷ *Id.*

¹⁶⁸ *Id.*

¹⁶⁹ *See supra* Part II.

¹⁷⁰ *See* Burri, *supra* note 28 (“Shawn Bayern, a US scholar at Florida State University, was the first to demonstrate how current company law in the US can be used to establish a legal person, i.e. a company, that is wholly and solely controlled by an artificial intelligence, the result being that artificial intelligence gains legal personality on the basis of the law as it presently stands.”).

¹⁷¹ *See* BICENTENNIAL MAN (Touchstone Pictures 1999) (depicting a robot that is granted his independence and eventually petitions the government to be recognized as a human—a request that is ultimately granted).

¹⁷² *See generally* Jason Zenor, *Endowed by Their Creator with Certain Unalienable Rights: The Future Rights for Artificial Intelligence?*, 5 SAVANNAH L. REV. 115 (2018) (presenting the history of granting corporations personhood, and bestowing animals with inherent rights).

United States recognizes corporations as legal persons and has granted animals inherent rights through animal cruelty laws.¹⁷³ People are usually hesitant about granting rights to nonhuman beings, but this may be because they generally perceive laws as granting rights to protect the entities from us as humans; however, in the case of medical AI and other robots, the laws would be protecting us from them.¹⁷⁴

As the European Union resolution explained, we are seeing trends in medical AI that are leading to smarter and more autonomous AI.¹⁷⁵ As AI performs tasks traditionally thought of as exclusively human, this raises the question about whether ordinary liability is sufficient because it is becoming harder to trace liability back to a specific human being.¹⁷⁶

The discussed liability issues would be addressed by adopting the European Union's proposed personhood scheme, allowing patients harmed by medical AI to know right away who can be held liable for their injury and allowing the patient to bring suit as soon as possible to be compensated. For example, imagine a robot that monitors and administers anesthesia to a patient in surgery, and in the process, makes an error in judgment that causes the robot to administer too much anesthesia. The overdose causes the patient to be deprived of oxygen and in turn causes brain damage.¹⁷⁷ When the patient brings suit under current tort law, the court would need to determine who is responsible for the patient's injury, as the AI cannot be held directly liable.¹⁷⁸ Was it the doctor's fault for not monitoring the AI?¹⁷⁹ Was it the hospital's fault for not maintaining the device or failing to adequately train its staff on how to use the AI?¹⁸⁰ Or was it a foreseeable risk of which the manufacturer should have been aware of when it created the algorithm?¹⁸¹ By granting personhood to AI, the patient would be able to sue the AI directly. This would be similar to a doctor being sued under traditional medical malpractice doctrine. This would also eliminate the need for the court to ascertain the party that bears responsibility, and would

¹⁷³ See *id.* at 121–26.

¹⁷⁴ See Amanda Wurah, *We Hold These Truths to Be Self-Evident, That All Robots Are Created Equal*, 22 J. FUTURE STUD. 61, 65 (noting that “[t]he argument for robot rights is more about protecting us from robots, than protecting robots from human destruction”).

¹⁷⁵ European Parliament Proposal, *supra* note 24, ¶ G.

¹⁷⁶ See *id.* at 242; Sullivan & Schweikart, *supra* note 13, at 162–63.

¹⁷⁷ See *Cerebral Hypoxia*, MEDLINEPLUS MED. ENCYC., <https://medlineplus.gov/ency/article/001435.htm> [<https://perma.cc/A3VW-CY66>] (noting that cerebral hypoxia can result from lack of oxygen caused by anesthesia, and can lead to “severe brain damage or death”).

¹⁷⁸ See *supra* Part II.

¹⁷⁹ See *supra* Section II.A.

¹⁸⁰ See *supra* Section II.B.

¹⁸¹ See *supra* Section II.C.

allow the patient to seek redress as soon as possible with no confusion over who to bring suit against.

Furthermore, the United States already has a built-in insurance plan that can be expanded to cover AI: medical malpractice insurance. While the European Union proposed a new insurance program—one that could be created and updated by insurance companies¹⁸²—the United States can require that medical AI be insured as a doctor would be under medical malpractice insurance. Normally, malpractice insurance only covers medical professionals,¹⁸³ but with AI being granted personhood, it would essentially be akin to just another medical professional at the hospital, clinic, or health care facility.¹⁸⁴ Malpractice insurance covers all the costs associated with litigating a malpractice claim.¹⁸⁵ While the hospital would need to pay the malpractice insurance premiums, the insurance would ultimately save the hospital from having to bear the full cost of litigation if a malpractice lawsuit were brought against the AI device.¹⁸⁶

With liability placed on the AI itself, mandatory medical malpractice insurance will allow patients harmed by AI to be compensated. Having the hospital, clinic, or health care center pay for the insurance premiums will ensure that they take care of the AI and that it is in proper working order. The hospital, clinic, or health care center could spread out the cost of such premiums by

¹⁸² See *supra* text accompanying notes 161–164.

¹⁸³ Julia Kagan, *Malpractice Insurance*, INVESTOPEDIA (June 13, 2021), <https://www.investopedia.com/terms/m/malpractice-insurance.asp> [<https://perma.cc/8MUN-FP77>].

¹⁸⁴ See Sullivan & Schweikart, *supra* note 13, at 163–64 (“Viewing the machine itself as a person resolves agency questions, which are important for analysis of vicarious liability claims (i.e., *respondeat superior*), as the machine will be viewed as the ‘principal’ and no longer as an agent . . . and treated the ‘same as any other physician.’” (first quoting David C. Vladeck, Essay, *Machines Without Principals: Liability Rules and Artificial Intelligence*, 89 WASH. L. REV. 117, 117–50 (2014); then quoting Jessica S. Allain, Comment, *From Jeopardy! to Jaundice: The Medical Liability Implications of Dr. Watson and Other Artificial Intelligence Systems*, 73 LA. L. REV. 1049, 1049–79 (2013))).

¹⁸⁵ Kagan, *supra* note 183 (“The types of costs covered under a malpractice policy are wide. They include all legal fees, such as lawyer fees, settlement and arbitration costs, medical damages, and punitive damages.”).

¹⁸⁶ See Keith L. Martin, *Medscape Malpractice Premium Report 2019*, MEDSCAPE (Dec. 4, 2019), <https://www.medscape.com/slideshow/2019-malprac-prem-rep-6012332#1> [<https://perma.cc/3SHF-HE9Z>] (noting that malpractice premiums typically range from \$5,000 to \$46,000 a year for certain specialties and generally cost group suppliers \$27,000 a year to insure their doctors); see also Neil Chesanow, *Malpractice: When to Settle a Suit and When to Fight*, MEDSCAPE (Sept. 25, 2013), https://www.medscape.com/viewarticle/811323_3 [<https://perma.cc/76PJ-AUPH>] (noting that in medical malpractice cases “[t]he average court settlement is about \$425,000; the average jury award tops \$1 million”).

incorporating them into the fees charged to patients, which would help spread out the overall costs associated with the AI.¹⁸⁷

This regime would free each party of some liability. The programmers would not need to worry about having products liability claims being filed for results that were unforeseen at the time the algorithm was programmed.¹⁸⁸ However, the manufacturer may still be held liable in a products liability claim for a malfunction in the hardware of an AI device resulting from a design or manufacturing defect,¹⁸⁹ as personhood would only protect against injuries resulting from the AI's "thought" process. Hospitals would not be held responsible through vicarious liability,¹⁹⁰ except in instances where they fail to ensure that the AI is being properly maintained or repaired.¹⁹¹ Finally, doctors would be immune from medical malpractice suits stemming from their use of AI,¹⁹² unless they use the AI in a way in which it was not intended, or otherwise negligently use the AI.¹⁹³

By adopting the personhood resolution that the European Parliament presented to the European Commission and coupling it with medical malpractice insurance, the liability behind the black box algorithm's thought process will be simplified. The AI will be "deemed a principal," rather than an agent; it would have "burdens and duties of its own and . . . [could] be sued directly for any negligence claims."¹⁹⁴ This will encourage AI development and integration while ensuring that anybody hurt by AI will have an adequate avenue for redress.

Currently, corporations are granted personhood in the United States through complicated long-standing jurisprudence, in which the Supreme Court has held that the Fourteenth Amendment bestows protections and certain legal rights to

¹⁸⁷ See Sullivan & Schweikart, *supra* note 13, at 163–64 (noting that "allowing for a 'different form of cost-spreading' . . . promotes fairness, as its focus extends beyond the technology's creators and encourages users of such technology to also bear some cost" (quoting David C. Vladeck, Essay, *Machines Without Principals: Liability Rules and Artificial Intelligence*, 89 WASH. L. REV. 117, 117–50 (2014))).

¹⁸⁸ See *supra* Section II.C.

¹⁸⁹ See *Products Liability*, *supra* note 108.

¹⁹⁰ See *supra* Section II.B.

¹⁹¹ See David Goguen, *Hospital Liability for Staff/Employee Errors*, ALLLAW, <https://www.alllaw.com/articles/nolo/medical-malpractice/hospital-liability-errors-by-staff.html> [<https://perma.cc/7E99-WPBY>] (noting that hospitals can be held directly liable for negligently "maintaining and repairing equipment").

¹⁹² See *supra* Section II.A.

¹⁹³ See *What is Medical Malpractice?*, *supra* note 74; *Understanding the Most Common Kinds of Medical Malpractice Claims*, COLLEGIAN (Mar. 18, 2019), <https://collegian.csufresno.edu/2019/03/understanding-the-most-common-kinds-of-medical-malpractice-claims/> [<https://perma.cc/F76B-MJ9C>] (noting that "improperly using equipment" could give rise to a medical malpractice case).

¹⁹⁴ Sullivan & Schweikart, *supra* note 13, at 163–64.

corporations.¹⁹⁵ While this jurisprudence may allow proponents of personhood for medical AI to argue that the same protections and rights should be extended to medical AI, it may be easier and more straightforward to establish personhood through congressional law, especially considering that legislatures and the Court have granted limited personhood to nonliving beings before.¹⁹⁶ As stated above, there are legal and policy benefits to granting medical AI personhood, and codifying it in federal law would eliminate any confusion or doubt about whether medical AI are deemed “persons” under the law and which rights are extended to medical AI devices.

B. *Critiques of Personhood for AI*

AI personhood is not without its opponents. There are critics that have opposed granting personhood to AI because they believe that technology is not advanced enough to support this theory.¹⁹⁷ But as technology becomes more autonomous, it is not outside the realm of possibility that AI could develop a physician-patient relationship and be held accountable for its own actions in a malpractice lawsuit, especially when looking at how broadly the practice of medicine is defined across the United States.¹⁹⁸ Furthermore, waiting to update the law until everyone

¹⁹⁵ See Ciara Torres-Spelliscy, *The History of Corporate Personhood*, BRENNAN CTR. FOR JUST. (Apr. 8, 2014), <https://www.brennancenter.org/our-work/analysis-opinion/history-corporate-personhood> [<https://perma.cc/3GTR-PPCZ>]; Sarah Pruitt, *How the 14th Amendment Made Corporations into ‘People’*, HISTORY (Oct. 15, 2018), <https://rb.gy/f99uo3> [<https://perma.cc/2XHN-4GTU>]; Josh Clark, *Why Do Corporations Have the Same Rights as You?*, HOWSTUFFWORKS, <https://money.howstuffworks.com/corporation-person.htm> [<https://perma.cc/2EK8-UJ8A>].

¹⁹⁶ See *Judge Made Law: Everything You Need to Know*, UPCOUNSEL, <https://www.upcounsel.com/judge-made-law> [<https://perma.cc/M3N5-Q54G>] (“Unlike the laws made by the legislature, judge made laws aren’t fully developed. They’re always being tweaked. As a result, they’re often easily changed. Every case used as a precedent for a judge made law clearly defines the facts of the dispute and how the judge reached a final decision.”); Wurah, *supra* note 174, at 64–65 (noting that both corporations and animals have been granted rights and protections that were once reserved for just human beings).

¹⁹⁷ Yoon Chae & Ben Kelly, *Granting AI Legal Personhood Would Be Premature*, LAW360 (May 24, 2019, 12:58 PM), <https://www.law360.com/articles/1162408/granting-ai-legal-personhood-would-be-premature> [<https://perma.cc/28RR-W5TC>].

¹⁹⁸ See Mindy Nunez Duffourc, *Are You My Doctor? Defining the Doctor-Patient Relationship in the Global Age of E-Health*, 28 TUL. J. INT’L & COMPAR. L. 311, 320 (2020) (“Virginia defines the practice of medicine as ‘the prevention, diagnosis and treatment of human physical or mental ailments, conditions, diseases, pain or infirmities by any means or method.’ In Louisiana, the practice of medicine includes ‘diagnosing, treating, curing, or relieving of any bodily or mental disease, condition, infirmity, deformity, defect, ailment, or injury in any human being . . . or the examining . . . of any person or material from any person.’ In New York, [t]he practice of the profession of medicine is defined as diagnosing, treating, operating or prescribing for any human disease, pain, injury, deformity or physical condition.” (alterations in original) (first quoting Medical Practice Act, VA. CODE ANN. § 54.1-2900 (2019); then quoting LA. REV. STAT. §37:1262 (2008); and then quoting N.Y. EDUC. LAW § 6521 (McKinney 2019)).

agrees that AI is finally advanced enough may leave courts and injured patients frustrated and without consistent remedies and courses of action.¹⁹⁹

Critics also argue that granting personhood to AI would leave patients hurt by the AI without a party who can compensate or be punished for their actions.²⁰⁰ But incorporating mandatory medical malpractice insurance not only sets up the party that could compensate the patient—the AI itself—but also ensures that there are funds available to the patients through insurance companies. This would allow the patient to know exactly who to list as the party, and the patient could rest assured knowing that there is a fund to compensate those harmed by the AI. Allowing tort law to stand as it currently does, the patient and the court may have a difficult time assigning liability to an individual party.²⁰¹ As discussed above, the liability of the programmer and manufacturer will be hard to assess because of the lack of transparency of black box algorithms.²⁰² Finally, while the hospital will probably always carry some liability, and as medical AI becomes more autonomous, it may be hard to assign liability to the hospital because of the lack of foreseeability and control that the hospital can exert over the AI.²⁰³

Others argue that personhood would disincentivize people from taking responsibility for or supervise the AI's decisions and actions.²⁰⁴ By making health care providers responsible for insuring AI, however, the health care providers will have a vested interest in ensuring that the AI is performing well and causing no harm. Health care providers will have a vested interest, because (1) they are responsible for paying the premiums on the insurance policy; and (2) they will make money because the more efficient the AI is, the more it helps in cutting down overall costs for the provider, while increasing accessibility to health care for patients. Thus, the health care provider would be motivated to ensure the technology is performing to the best of its ability.

CONCLUSION

As the thought process in medical AI becomes more intricate, the problem of the black box algorithm creates an

¹⁹⁹ See *supra* Section II.D.

²⁰⁰ See Solum, *supra* note 26, at 1244–45.

²⁰¹ See *supra* Part II.

²⁰² See *supra* Section II.C.

²⁰³ See *supra* Section II.D.

²⁰⁴ See Scherer, *supra* note 147, at 263.

environment where liability is hard to determine under modern tort law. The more autonomous an AI device becomes, the harder it is to determine where the error occurred and who should be held responsible for that error. Current US tort law is insufficient to address the liability issues associated with these innovations.²⁰⁵ Liability issues under current tort law will be addressed by establishing medical AI personhood and insuring AI under a mandatory medical malpractice insurance regime similar to the one proposed by the European Parliament, allowing for more predictable legal results and encouraging innovation in the medical AI field. As lawyers Jason Chung and Amanda Zink stated, when granting AI personhood, there is “little harm in attributing legal personhood . . . and much to gain.”²⁰⁶ After all, it “just makes it all the more human.”²⁰⁷

Benedict See†

²⁰⁵ See Sullivan & Schweikart, *supra* note 13, at 164.

²⁰⁶ Chung & Zink, *supra* note 11, at 77.

²⁰⁷ *Id.* at 80.

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