ESSAY

Keeping AI Under Observation: Anticipated Impacts on Physicians' Standard of Care*

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As Artificial Intelligence (AI) tools become increasingly present across industries, concerns have started to emerge as to their impact on professional liability. Specifically, for the medical industry—in many ways an inherently "risky" business—hospitals and physicians have begun evaluating the impact of AI tools on their professional malpractice risk. This Essay seeks to address that question, zooming in on how AI may affect physicians' standard of care for medical malpractice claims.

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I. INTRODUCTION

With the increasing pervasiveness of Artificial Intelligence (AI) tools, a growing refrain, at least within the legal and business communities, has asked, "What are the liability risks involved when using AI?" This concern has been particularly relevant for medical communities, where AI breakthroughs quickly promised medical solutions—with varying degrees of success,[1] even going as far as predicting that AI would bring about a cure for cancer and other serious ailments.[2] Juxtaposed against such lofty goals, however, is the reality that the medical field incurs inherent risks. Errors in diagnosis or treatment could have severe consequences for patients, which, in turn, may translate into liability for physicians and hospitals in the form of medical malpractice. Navigating this risk landscape requires careful balancing, and—while potentially beneficial and even transformative—AI tools introduce additional uncertainty. When considering whether to incorporate these tools into a medical practice, it is imperative to ask what might happen if the AI tool "gets it wrong": Will the use of AI change the nature of physicians' liability by altering the standard of care expected of them? And, if so, how?

At present, there is no direct answer to the questions of whether and how AI will affect the standard of care expected of physicians and hospitals. Simply put, there have yet to be any cases directly addressing these questions—though it is predicted that (inevitably) such cases will soon be making their way through the court system.[3] However, drawing

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1. *See, e.g.*, Sam Daley, *Surgical Robots, New Medicines and Better Care: 32 Examples of AI in Healthcare,* BUILT IN (July 4, 2019), http://builtin.com/artificial-intelligence/artificial-intelligence-healthcare (listing examples of currently available Medical AI tools and their uses and reported success rates); Scott Mayer McKinney et al., *International Evaluation of an AI System for Breast Cancer Screening*, 577 NATURE 89 (2020) (describing a study in which an AI system surpassed human experts in breast cancer prediction); *Top Smart Algorithms in Healthcare*, MED. FUTURIST (Feb. 5, 2019), http://medicalfuturist.com/top-ai-algorithms-healthcare/.

2. *See, e.g.*, Jeremy Kahn, *The Promise and Perils of AI Medical Care*, BLOOMBERG (Aug. 15, 2018, 6:00 AM), http://www.bloomberg.com/news/articles/2018-08-15/the-promise-and-perils-of-ai-medical-care; Kyree Leary, *Microsoft Wants to Use AI and Machine Learning to Discover a Cure for Cancer*, FUTURISM (Nov. 6, 2017), http://futurism.com/microsoft-ai-machine-learning-discover-cure-cancer; Bernard Marr, *How Is AI Used in Healthcare—5 Powerful Real-World Examples that Show the Latest Advances*, FORBES (July 27, 2018, 12:41 AM), http://www.forbes.com/sites/bernardmarr/2018/07/27/how-is-ai-used-in-healthcare-5-powerful-real-world-examples-that-show-the-latest-advances/#71271aba5dfb; Cade Metz, *A.I. Shows Promise Assisting Physicians*, N.Y. TIMES (Feb. 11, 2019), http://www.nytimes.com/2019/02/11/health/artificial-intelligence-medical-diagnosis.html; Alvin Powell, *The Algorithm Will See You Now*, HARV. GAZETTE (Feb. 28, 2019), http://news.harvard.edu/gazette/story/2019/02/in-health-care-ai-offers-promise-and-hype/.

3. The rise in U.S. law firms with designated AI practice groups reflects this growing eventuality; one firm, in a recent announcement, even alluded to "starting to see some of the first

from scholarly literature exploring this question and analogous cases of advancing technology in the medical malpractice context, this Essay attempts to outline several predictive trends.

When a physician's judgment in diagnosis and treatment, including the decision to use AI, comports with those of similarly situated physicians, there is little, if any, evidence that AI tools carry additional liability risk. Courts will likely consider how the physician used the AI tool, whether it was reasonable to use AI under the circumstances, and whether the medical advice rendered conforms to that which a reasonably prudent physician would provide. Over time, a physician's standard of care may be heightened and may even come to require the use of AI. After analyzing these trends, this Essay will conclude by exploring ways to minimize liability risk when using AI tools, including the implementation of adequate policies, training, and device maintenance designed to ensure the safe and effective use of AI.

II. IMPACT OF AI ON MEDICAL STANDARD OF CARE

At the time of writing, there are no known cases—pending or decided—involving medical AI technological tools (Medical AI).[4] More broadly, there appear to be "very few appellate decisions that address directly the malpractice standard of care in relation to medically induced injuries that allegedly result from the application of new technologies."[5] Some guidance does exist, however, in cases involving Electronic Health Records (EHR) and *Physician's Desk Reference* (PDR).[6] Additionally, legal academics have begun to explore, in theory, whether AI may change the standard of care required of medical practitioners. Two major trends can be extrapolated from the combined literature: (1) focusing the standard of care inquiry on the reasonableness of the treatment and

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litigation involving the use of predictive algorithms," without divulging any specific details about the legal matters involved. *See* Reenat Sinay, *DLA Piper Announces New Artificial Intelligence Practice*, LAW 360 (May 15, 2019, 9:55 PM), http://www.law360.com/articles/1160069/dla-piper-announces-new-artificial-intelligence-practice.

4. *Can You Sue an Algorithm for Malpractice?*, FORBES (Feb. 11, 2019, 12:52 PM), http://www.forbes.com/sites/insights-intelai/2019/02/11/can-you-sue-an-algorithm-for-malpractice/#618d0ec07013 (interview with Professor W. Nicholson Price).

5. Michael D. Greenberg, *Medical Malpractice & New Devices: Defining an Elusive Standard of Care*, 19 HEALTH MATRIX 423, 433 (2009).

6. *See generally* Johnson v. Hillcrest Health Ctr., Inc., 70 P.3d 811 (Okla. 2003); McCorkle v. Gravois, 2013-2009 (La. App. 1 Cir. 06/06/14); 152 So.3d 944; Jones v. Bick, 2004-0758 (La. App. 4 Cir. 12/15/04); 891 So.2d 737; Fournet v. Roule-Graham, 00-1653 (La. App. 5 Cir. 03/14/01); 783 So.2d 439.

diagnosis, regardless of the tools used, and (2) raising the standard of care to require the use of AI, where available.[7]

A. A Brief Snapshot of Physicians' Standard of Care

As a form of professional negligence, physicians' standard of care requires a reasonableness inquiry, comparing the physician's actions to those of a reasonably prudent physician, as determined by the relevant community or area of practice.[8] The former question—what a reasonably prudent physician would have done—is one of fact, while the latter inquiry—who makes up the set of comparable physicians—is "primarily an issue of law."[9]

Several approaches have developed regarding the latter inquiry, including strict locality standards, same or similar locality standards, statewide standards, nationwide or nongeographically dependent standards, or a mixed approach of multiple standards. The major U.S. jurisdictional trends of how the standard of care is analyzed—including a list of the states that follow each approach—are summarized in the Appendix. Overall, the two most common approaches are the national or nongeographic (usually based on the practitioner's medical specialty) approach and the same or similar locality approach.[10] While this Essay provides a more general discussion of how AI may impact physicians' standards of care, these jurisdictional differences may result in some variations of the themes presented here. Where particularly relevant, this Essay attempts to highlight a nonexhaustive review of these variations and explore how AI may drive the evolution of these majority trends more broadly.

B. Trend One: Reasonableness, Regardless of Tools Used

One trend in the literature is to maintain focus on the reasonableness of the physicians' judgment, including the reasonableness of their

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7. Nicolas P. Terry & Lindsay F. Wiley, *Liability for Mobile Health and Wearable Technologies*, 25 ANNALS HEALTH L. 62, 77 (2016); *see* 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 (2019); Ian Kerr et al., *Robots and Artificial Intelligence in Health Care*, *in* CANADIAN HEALTH LAW AND POLICY 257 (Joanna Erdman et al., eds., 5th ed. 2017).

8. Jay M. Zitter, Annotation, *Standard of Care Owed to Patient by Medical Specialist as Determined by Local, "Like Community," State, National, or Other Standards*, 18 A.L.R. Fed. 4th 603, § 2 (1982) (describing each state's approach to how the medical standard of care is determined, including seminal cases and statutes).

9. Froomkin et al., *supra* note 7, at 53.

10. *See id.*

judgment to use, or not to use, AI tools.[11] As one scholar put it, for example, "The standard of care might be, no matter what tools you're using, you have to identify the tumors that a radiologist would have identified."[12]

This trend emphasizes that the "aim of malpractice" is "to ensure that providers use appropriate care and skill in delivering medical services, regardless of treatment modality."[13] In this way, "[t]he standard of care is typically quite forgiving" and does not require that physicians "provide *optimal* care in order to avoid liability" or "take extraordinary steps to exhaustively research every technology or resource on which they rely."[14]

In *McCourt ex rel. McCourt v. Abernathy*, the South Carolina Supreme Court stressed the principle that merely taking a "different approach"—or even disagreement about "what is the best or better approach"—is insufficient for liability.[15] The court acknowledged that "[m]edicine is an inexact science," and "[n]egligence may not be inferred from a bad result."[16] The standard of care thus allows for different preferences in treatment, so long as they are still reasonable and prudent compared to similarly situated physicians, rather than requiring a specific set of procedures, tools, or tests.[17]

As applied to the use of AI in medical services, these sources suggest that the mere decision to use Medical AI would not necessarily impose additional medical malpractice liability risk. So long as the physician's diagnosis or treatment—and, by extension, the decision to use Medical AI—conformed to what similar practitioners would have identified or prescribed, the physician is not likely to incur any additional liability for

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11. *See, e.g.*, Terry & Wiley, *supra* note 7, at 77 ("If a physician's use or non-use of a mobile health product reflects reasonable medical judgment, then she or he is unlikely to be held liable.").

12. *Can You Sue an Algorithm for Malpractice?*, *supra* note 4.

13. Greenberg, *supra* note 5, at 441.

14. Sharona Hoffman & Andy Podgurski, *E-Health Hazards: Provider Liability & Electronic Health Record Systems*, 24 BERKELEY TECH. L.J. 1523, 1534 (2009); Terry & Wiley, *supra* note 7, at 79-80.

15. McCourt *ex rel.* McCourt v. Abernathy, 457 S.E.2d 603, 607 (S.C. 1995); *see* Amanda Swanson & Fazal Khan, *The Legal Challenge of Incorporating Artificial Intelligence into Medical Practice*, 6 J. HEALTH & LIFE SCI. L. 90, 123 (2012) ("Because medicine is a profession that involves the exercise of individual judgment, mere differences in opinion still may be consistent with the standard of care."); Terry & Wiley, *supra* note 7, at 77.

16. *McCourt*, 457 S.E.2d at 607; *see also* Froomkin et al., *supra* note 7, at 61.

17. *McCourt*, 457 S.E.2d at 607; *see also* Froomkin et al., *supra* note 7, at 61 ("Thus, a physician, hospital, or insurer relying on an [sic] ML diagnosis will, at least initially, be held to no higher standard than that of the ordinary human.").

using or not using AI in the process.[18] Courts will likely consider how the physician used the AI tool, whether it was reasonable to use the AI under the circumstances, and whether the medical advice rendered conforms to that which a reasonably prudent physician would provide.

C. Trend Two: Raising the Standard of Care to Require AI Use

Another prevailing trend in the academic literature notes that "[t]he [medical] standard of care is shifting forward with the advances in technology."[19] As with tort law more generally, these scholars point to "landmark cases" demonstrating how standards of care "change over time in response to new technology and eventually their adoption may become mandatory."[20] It is therefore prudent to consider whether the adoption of Medical AI technology will raise the standard of care more broadly, imposing liability risks for physicians who choose not to use Medical AI.[21]

To this end, the use of Medical AI may cause physicians to "be held to a higher standard of care" because of their increased "access to additional information" in diagnosis and treatment.[22] If or when AI-enhanced medicine becomes better than human physicians alone, the standard of care is highly likely to require the use of new medical technologies to avoid liability.[23] If the Medical AI becomes generally available and—in the case of Virginia—used in the state, the absence of AI tools, or the failure to use them when available, "may become evidence of substandard care and that the doctor did not act as a reasonable doctor would have under the circumstances."[24] Scholars note, from this

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18. *See* Froomkin et al., *supra* note 7, at 61.

19. Kori M. Klustaitis, *Dr. Watson Will See You Now: How the Use of IBM's Newest Supercomputer Is Changing the Field of Medical Diagnostics and Potential Implications for Medical Malpractice*, 5 BIOTECH. & PHARMACEUTICAL L. REV. 88, 100 (2011-2012).

20. Helling v. Carey, 519 P.2d 981, 985 (Wash. 1974) (involving liability for failure to use glaucoma pressure tests); Washington v. Wash. Hosp. Ctr., 579 A.2d 177, 180 (D.C. Cir. 1990) (finding liability for failure to use continuous oximetry technology); Greenberg, *supra* note 5, at 432 n.26 (citing T.J. Hooper v. N. Barge Corp., 60 F.2d 737, 738-740 (2d Cir. 1932) (discussing liability for failure to adopt radio technology)); *see also* Shilkret v. Annapolis Emergency Hosp. Ass'n, 349 A.2d 245 (Md. 1975) (emphasizing "the realities of medical life," including the influence of technology, to produce "contemporary standards that are . . . much higher than they were just a few short years ago").

21. *See, e.g.*, Froomkin et al., *supra* note 7, at 51, 62.

22. 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, 1064 (2013).

23. Here, meaning less error prone compared to human counterparts alone. Froomkin et al., *supra* note 7, at 62-63; *see also Can You Sue an Algorithm for Malpractice?*, *supra* note 4 ("The standard of care might be . . . that you have to use an AI once one's available.").

24. *See* VA. CODE. ANN. § 801.581.20 (West 2015); Klustaitis, *supra* note 19, at 100-01.

perspective, that "[d]oing things the 'old way' can appear safer from a liability standpoint, but that is true only up to an ill-defined tipping point at which the innovation becomes the prevailing standard of care."[25]

So far, the discussion of this trend has focused on the liability ramifications for physicians when AI is available for use, but physicians elect not to use Medical AI. Relatedly, there may be liability risk for hospitals that do not make Medical AI tools available for physicians should the use of this technology become the standard of care expected.[26] Other AI scholars suggest, however, that factors, like exorbitant costs or locality-based standards, may slow the adoption of AI as a mandatory aspect of physicians' standard of care or carve out exceptions to a general rule requiring combined physician and machine medical care.[27]

For instance, where the cost of providing Medical AI services is "extortionately high," courts are unlikely to require that physicians and hospitals use these tools to satisfy their standard of care.[28] Likewise, in jurisdictions with locality-based standards, the custom in areas and specialties that are slower to adopt new medical technology will "act as a brake on innovation."[29] For instance, while Virginia maintains a statewide standard of care, the state's statutory exception that allows for same or similar locality standards where more appropriate may help to balance technical advancements with the practicality—or, in this case, impracticability—of implementation.[30]

However, as was the case with x-rays or automated external defibrillators, at some point—potentially soon—the standard of care will ultimately reflect that the failure to use or supply AI-enhanced medical services is "clearly negligent."[31] In the case of AI tools, scholars suggest that the nature of Medical AI—which can be accessed remotely or through the cloud as a decentralized service, rather than physical equipment stored in and maintained by the hospital—reduces the viability of arguments that

25. Terry & Wiley, *supra* note 7, at 80.

26. Froomkin et al., *supra* note 7, at 50 ("[O]nce ML diagnostics are statistically superior to humans, it will only be a short while before legal systems, including in the United States, treat machine diagnosis as the 'standard of care.' That designation will mean that any physician or hospital failing to use machine diagnosis without a good excuse will be running a substantial risk of malpractice liability if the patient is incorrectly diagnosed.").

27. *Id.* at 50, 64, 66-67.

28. *Id.* at 50, 52.

29. *Id.* at 62.

30. *Cf.* VA. CODE. ANN. § 801.581.20 (West 2015).

31. *See* Froomkin et al., *supra* note 7, at 55-57.

it is infeasible to obtain Medical AI, so long as these services are not prohibitively costly.[32]

The trend towards mandatory AI use, presented here, is not necessarily mutually exclusive to what was discussed in Section II.B. Rather, a standard mandating the use of AI technologies may naturally evolve out of a reasonableness standard that, while not changing the standard of care in definition, eventually accepts that it would be unreasonable, *per se*, not to use Medical AI.[33] Likewise, this trend predicts only that the standard of care may eventually require that physicians *consult* AI tools. Even if physicians are required to consult those tools, there may be instances in which courts must then decide the reasonableness of following, or not following, AI-generated advice or recommendations.

For example, this consideration is especially important for situations in which AI tools generate unpredictable outputs. Often discussed in relation to AI is the "Black Box Problem," which describes "the inability to fully understand an AI's decision-making process and the inability to predict the AI's decisions or outputs."[34] This "problem" becomes more complicated, as it derives from the essential features that make AI so useful: its ability to weigh vast, unstructured variables and make complex, context-dependent decisions in short timeframes. Applied to the standards discussed, a physician may be required to consult with Medical AI, but when that tool produces unexpected recommendations, the courts may still be charged to ask whether it was reasonable for the physician, relying on his or her independent judgment, to subsequently follow or not follow the AI's advice in each particular case.[35]

D. Drawing Analogies from EHR and PDR Cases

Case law involving other medical technologies and advancements provide helpful analogies for how courts may treat the use of AI tools in medicine. For example, in *Johnson v. Hillcrest Health Center*, the Oklahoma Supreme Court effectively raised the standard of care when EHRs were in use.[36] In that case, a patient's lab results were placed in the

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32. *See id.* at 58-59.

33. *See* Klustaitis, *supra* note 19, at 102.

34. Yavar Bathaee, *The Artificial Intelligence Black Box and the Failure of Intent and Causation*, 31 HARV. J.L. & TECH. 889, 905 (2018).

35. Scholars have also addressed the scenario whereby, because of quality of medical advice or cost, machine learning may surpass physicians entirely and the standard may favor the AI's output. *See generally* Froomkin et al., *supra* note 7.

36. Johnson v. Hillcrest Health Ctr., Inc., 70 P.3d 811, 814 (Okla. 2003).

wrong paper charts; the lab results (though not the pathologist's report interpreting the results) were, however, accessible on the hospital's EHR system.[37] Prior to this case, it was sufficient for a physician to rely on the information included in paper charts to avoid liability. While stopping short of mandating data only be filed and accessed through EHR, the court in that case effectively required the physician to take the "extra step" of consulting the electronic record to satisfy the standard of care.[38]

Case law involving PDR may also help anticipate how courts treat the standard of care when using Medical AI.[39] A series of cases in Louisiana held that the failure to consider explicit warnings identified in the PDR led to a breach of the physician's standard of care.[40] Applied to AI-enabled tools—some of which may provide warnings, notices, or reminders for physicians—the failure to use or acknowledge explicit warnings in these systems could result in liability.[41]

III. ADDITIONAL LIABILITY CONSIDERATIONS WHEN MEDICAL AI IS IN USE

Because the standard of care analysis broadly questions the reasonableness of physicians'—and, by extension, hospitals'—decisions and actions, other contextual factors may influence a liability decision regarding Medical AI. When weighing reasonableness, especially of whether and how to use AI or whether to follow unexpected AI output, the following related duties and concerns will likely be taken into consideration where applicable.

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37. *Id.*

38. *Id.*; Blake Carter, *Electronic Medical Records: A Prescription for Increased Medical Malpractice Liability?*, 13 VAND. J. ENT. & TECH. L. 385, 396-97 (2011) (analyzing the impact of *Johnson*).

39. *See* Efthimios Parasidis, *Clinical Decision Support: Elements of a Sensible Legal Framework*, 20 J. HEALTH CARE L. & POL'Y 183, 213-14 (2018) (discussing PDR cases to predict liability risk for clinical decision support systems).

40. *See, e.g.*, Jones v. Bick, 2004-0758 (La. App. 4 Cir. 12/15/04); 891 So.2d 737 (holding that failure to consider and monitor potentially adverse drug interactions noted in the PDR for psychiatric medication breached the physician's standard of care); Fournet v. Roule-Graham, 00-1653 (La. App. 5 Cir. 03/14/01); 783 So.2d 439 (prescribing a hormone pill despite a contraindication with the patient's medical history breached the standard of care); *see* McCorkle v. Gravois, 2013-2009 (La. App. 1 Cir. 06/06/14); 152 So.3d 944 (distinguishing *Jones*, *Fournet*, and similar cases where the PDR contained explicit warnings or contraindications from mere recommendations or more general warnings).

41. *See* Parasidis, *supra* note 39, at 213.

A. Quality & Maintenance of Medical AI Tools

Courts have found that hospitals have a duty to maintain "safe and adequate facilities and equipment."[42] It is reasonable to anticipate that hospitals will have a duty to adequately examine the quality of the AI tools for safety and effectiveness, including AI-enabled clinical decision support software.[43]

B. Defective Devices, Malfunctions, and Unpredictable Outcomes[44]

To the extent that harm results from AI device malfunction or defect, physicians' liability is likely to depend on "whether the physician knew or had reason to know that the product was defective, poorly designed, or otherwise prone to malfunction."[45] In the case of Medical AI, if the physician has reason to believe that the tool is malfunctioning or defective, or, during use, discovers a malfunction or defect, the physician has a duty to stop using the equipment experiencing technical difficulties.[46]

A related issue—which has yet to be thoroughly analyzed by the literature—connected to the black box problem discussed in Section II.C, is whether simply knowing that AI may behave in unpredictable ways is sufficient to ascribe liability to hospitals for harms caused by physicians relying on Medical AI for diagnosis and treatment. However, because unpredictability is a feature of AI, not a malfunction or defect, the analysis is likely distinguishable from liability incurred through knowledge of defective or malfunctioning devices.[47]

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42. Likewise, in the context of telemedicine, scholars anticipate that hospitals will have a duty to "maintain [the technology] in good working condition and to use it appropriately." Patricia C. Kuszler, *Telemedicine and Integrated Health Care Delivery: Compounding Malpractice Liability*, 25 AM. J.L. & MED. 297, 316 (1999); *see* Thompson v. Nason Hosp., 591 A.2d 703, 707 (Pa. 1991).

43. Greenberg, *supra* note 5, at 438-39; Parasidis, *supra* note 39, at 213-14.

44. A separate consideration for device malfunctions and defects is products liability. While products liability implications are not addressed here, as hospitals and physicians have traditionally been outside the reach of products liability claims, some scholars have noted that if products liability is unavailable to plaintiffs for Medical AI, plaintiffs may be more likely to pursue medical malpractice causes of action to remedy their injuries. *See* Allain, *supra* note 22, at 1069-70.

45. Terry & Wiley, *supra* note 7, at 77.

46. *See, e.g.*, Mahfouz v. Xanar, Inc., 94-305 (La. App. 3 Cir. 11/16/94); 646 So. 2d 1152; Shepherdson v. Consol. Med. Equip., Inc., 714 A.2d 1181 (R.I. 1998); Kuszler, *supra* note 42, at 317-18.

47. While the authors have separately explored this issue in the context of products liability, a full analysis applying that area of complex law to AI tools is beyond the scope of this Essay. *See generally* W. Nicholson Price II, *Medical Malpractice and Black-Box Medicine*, *in* BIG DATA, HEALTH LAW, AND BIOETHICS 295-306 (I. Glenn Cohen et al. eds., 2018); David C. Vladeck,

C. *Inadequate Training on Use and Safety of Medical AI Tools*

In cases where AI devices are misused and harm results, courts may "consider whether the physician should have known how to use the technology properly" or else refrained from using the technology altogether.[48] Likewise, courts have found that hospitals have a duty to ensure the selection and retention of competent physicians and oversee clinical practice.[49] Therefore, hospitals that fail to train adequately physicians on the use, reliability, and safety of Medical AI tools are also likely to incur liability to misuse related harms.

IV. MINIMIZING LIABILITY RISK WHEN USING MEDICAL AI

Because Medical AI technologies, like any emerging technology, carry potential risks, it is possible to extrapolate from the literature the following suggestions for minimizing risk associated with implementing Medical AI:

(1) *Carefully examine* the quality of the Medical AI systems to be used;
(2) *Continuously monitor* the tools that are in use to ensure that they are in good working condition and making medically appropriate recommendations;
(3) *Perform regular maintenance* on the devices, including any software or system updates;
(4) *Maintain robust cybersecurity and privacy* controls for patient data, considering the specific risks imposed by AI tools;
(5) *Develop and enforce adequate oversight policies* for the use of Medical AI tools, which includes ongoing monitoring by sufficiently senior personnel;
(6) *Thoroughly train* employees on the use, safety, reliability, and limitations of Medical AI tools prior to use, and follow up with continuing education programs;
(7) *Obtain informed consent* from patients before incorporating Medical AI into their treatment and care (on a nonemergency basis); and

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Machines Without Principals: Liability Rules and Artificial Intelligence, 89 WASH. L. REV. 117, 121 (2014).

48. Terry & Wiley, *supra* note 7, at 77.

49. Greenberg, *supra* note 5, at 438 (citing Thompson v. Nason Hosp., 591 A.2d 703, 707 (Pa. 1991)).

(8) *Consider the specific risks* of using Medical AI based on the individual patient and procedures involved.[50]

V. CONCLUSION

As with medical malpractice generally, the law demands reasonableness, but not perfection. When a physician's judgment in diagnosis and treatment, including the decision to use AI and follow AI recommendations, comports with those of similarly situated physicians, there is at present little, if any, evidence that Medical AI tools carry additional liability risk. Over time, a physician's standard of care may come to require the use of AI when available, and it may even become a liability risk for AI tools not to be available for physicians' use. The law will and must continue to adapt to the use of these new technologies, which understandably causes tensions as the industry adopts emerging technology before these new legal rules are settled. While legal uncertainty can be daunting, at least some steps can be taken now to manage and minimize known liability risks.

50. *See, e.g.*, Greenberg, *supra* note 5, at 434-37; Parasidis, *supra* note 39, at 214; Max Raskin, *Designer Babies, Robot Malpractice, and the Cure for Cancer: A Legal Survey of Some Medical Innovations*, 12 N.Y.U. J.L. & LIBERTY 151, 187 (2018); Swanson & Khan, *supra* note 15, at 125-27; *cf*. Kuszler, *supra* note 42, at 316.

APPENDIX

Standard of Care Across U.S. Jurisdictions[51]

Standard	Description	States
Strict Locality	Duty to possess and exercise skill and care ordinarily employed, under similar circumstances, by members of the specialty in good standing in the same locality	Idaho; N.Y.
Same or Similar Locality	Duty to possess and exercise skill and care which a specialist of ordinary prudence and skill, practicing in the same or a similar community, would have exercised in the same or similar circumstances	Ark.; Ill.; Kan.; Md.; Mich.; Minn.; Neb.; N.C.; N.D.; Or.; Tenn.
Entire State	Duty to possess and exercise skill and care as would be exercised by specialist of good standing in the same specialty throughout the state	Ariz.; Va.; Wash.
National or Nongeographic	Duty of care not limited by the applicable community, but determined by "nationwide," "nongeographic," or in line with "standards of similar specialists"	Ala.; Alaska; Cal.; Conn.; Del.; Fla.; Ga.; Haw.; Ind.; Iowa; Ky.; Me.; Mass.; Miss.; Mo.; Nev.; N.H.; N.J.; N.M.; Ohio; Okla.; R.I.; S.C.; Tex.; Utah; Vt.; Wash.; W. Va.; Wis.; Wyo.
Mixed	Same or similar locality for general practitioners; national or nongeographic for specialists	Colo.; La.; Mont.; Pa.; S.D.

51. Michelle H. Lewis et al., *The Locality Rule and the Physician's Dilemma*, 297 J. AM. MED. ASS'N 2633 (2007), http://jamanetwork.com/journals/jama/fullarticle/207496 (containing a chart of each state's standard of care standard).