

Ethics and Professionalism in Artificial Intelligence and Medical Practice: A Position Paper From the American College of Physicians

Matthew DeCamp, MD, PhD; Lois Snyder Sulmasy, JD; and Kyle E. Karches, MD, PhD; for the Ethics, Professionalism and Human Rights Committee of the American College of Physicians*

Artificial intelligence (AI) in health care is being rapidly adopted in perhaps one of the most rapid implementations of technology in medicine to date. Better thought of as augmented intelligence, as a tool that provides assistance to physicians and patients, many guidelines for its use have been issued, but consensus has not yet been achieved on issues such as privacy, disclosure, and fairness. Patients and physicians need ethical guidance at the point of care. Three guideposts described in this American College of Physicians

position paper and rooted in the patient-physician relationship—principles of medical ethics, clinical integrity, and physician-independent practical reasoning—can inform the ethical use of AI: relationality, self-governance, and competence. This paper examines the implications of AI for patients, physicians, and health care and provides guidance for its ethical use.

Ann Intern Med. doi:10.7326/ANNALS-26-01792

For author, article, and disclosure information, see end of text.

This article was published at *Annals.org* on 1 September 2026.

Artificial intelligence (AI) is changing medical practice, research, education, and many other aspects of health care (1–6). Although AI holds promise to improve the efficiency and quality of health care, it can also have negative effects on patient-physician relationships and patient care. Patients entrust physicians to care for the whole patient, which is a commitment AI cannot make. In addition, AI cannot be accountable to and for patients; fully appreciate individual patient values; relate data and information to patient values (especially over time); grapple with theoretically strong but empirically weak or competing treatment options (7); engage in eye contact or therapeutic touch (8); facilitate trust, hope, or closure (9); form a therapeutic alliance; seek patient-centered outcomes; or evaluate real-world decisions under conditions of uncertainty based on clinical experience and judgment.

To date, 200 AI ethics guidelines and 17 consensus statements have been released worldwide (10), focusing on AI governance (11, 12), AI developer and health care organization responsibilities, and physician obligations to disclose AI use (13–15). Although consensus around transparency, justice and fairness, beneficence and nonmaleficence, and privacy (16) may be emerging, ethical guidance for AI use at the point of care is lacking.

The American College of Physicians (ACP) seeks to provide this guidance in this position paper. Ethical use of AI in medical practice should adhere to the following 3 guideposts, grounded not only in principles, clinical integrity, and professionalism but also in the

reality of patient-physician relationships and the health care environment:

Relationality: Physicians use practical reasoning ability to advance each unique patient's health based on ethical principles: beneficence (acting in the patient's best interest), nonmaleficence (the duty to do no harm), and respect for patient autonomy (supporting the patient's free choices) (17).

Self-governance: Physicians self-regulate, key to being members of a profession (17), with independent clinical judgment and integrity.

Competence: Physicians have medical expertise to apply in the service of patients, enabling them to appropriately tailor recommendations to each patient's needs, treat patients without bias, and support the societal obligation to equitably distribute health care (17).

In a prior position paper, ACP advised using AI as “augmented” intelligence, “as a tool to assist clinicians,” (18) and has developed an AI Resource Hub (www.acponline.org/clinical-information/clinical-resources-products/artificial-intelligence-ai-resource-hub). This paper complements that paper by expanding on the ethical aspects of that work and potential point-of-care AI uses (Table). It focuses on physicians, but the recommendations also may apply to other health care professionals.

METHODS

The authors developed this position paper on behalf of the ACP Ethics, Professionalism and Human

* This paper, written by Matthew DeCamp, MD, PhD; Lois Snyder Sulmasy, JD; and Kyle E. Karches, MD, PhD, was developed for the American College of Physicians Ethics, Professionalism and Human Rights Committee. Members of the Ethics, Professionalism and Human Rights Committee who served during the development of, contributed to, and approved this paper were: Noel N. Deep, MD (Chair)†; Alejandro Moreno, MBBS, MPH, JD (Vice Chair)†; Rebecca A. Andrews, MD‡; Alicia Arbaje, MD, MPH, PhD‡; Micah W. Beachy, DO‡; Eduardo Bruera, MD‡; COL Tatjana P. Calvano, DO, MC, USA‡; Erin S. DeMartino, MD‡; Ashley W. Fellers McKenzie, MD‡; Jason M. Goldman, MD‡; Kyle E. Karches, MD, PhD†; Laurel J. Lyckholm, MD‡; Luis Isea Mercado, MD‡; and Ikaasa Suri†. Approved by the ACP Board of Regents on 14 April 2026.

† Author.

‡ Nonauthor contributor.

Table. Ethical Guideposts, Position Statements, and Practical Implications

Ethical Guideposts	Relevant ACP Positions Summarized	Practical Implications: AI Should Be Used in Ways That ...
Relationality Focus on the good of the individual patient Create and maintain a therapeutic alliance with the patient	Position 1. Support patient-physician relationship Position 2. Preserve competencies of caring and fairness Position 3. Promote patient values and clinical judgment	Promote sufficient time between physicians and patients Support physician care and attention to patients Provide beneficial access to physicians for patients
Self-governance Self-regulate Maintain physician judgment and clinical integrity	Position 2. Preserve competencies of caring and fairness Position 3. Promote patient values and clinical judgment Position 4. Identify and mitigate bias	Support physician ethical responsibility for clinical decisions Ensure transparency and explainability of AI Minimize/eliminate bias Develop fairness metrics and governance models with patient input
Competence Maintain physician knowledge and skills Benefit patients justly and equitably	Position 2. Preserve competencies of caring and fairness Position 4. Identify and mitigate bias	Avoid deskilling of physicians or trainees Recommit to the competencies of caring Develop new competencies for appropriately using AI

ACP = American College of Physicians; AI = artificial intelligence.

Rights Committee (EPHRC). Committee members abide by ACP's conflict-of-interest policy and procedures; appointment to the EPHRC and its procedures are governed by ACP's bylaws. Based on the subject of medical ethics and professionalism, the Committee used a narrative-style review of English language, peer-reviewed research, commentaries, and organizational guidelines in PubMed and online sources on medical ethical issues in AI. The EPHRC evaluated and discussed drafts of the paper; it was then reviewed by the ACP Board of Governors, Board of Regents, Council of Early Career Physicians, Council of Resident/Fellow Members, and Council of Student Members, and other committees and experts and was revised to incorporate comments from these groups and individuals. The ACP Board of Regents approved the paper on 14 April 2026.

POSITION STATEMENTS

Position 1. The patient-physician relationship is the core of health care. AI must be implemented clinically to support, not weaken, this relationship.

To improve patient care, AI should be used to enhance the patient-physician relationship (18). Ambient scribes, for example, show promise in reducing electronic health record (EHR) burden, allowing physicians to focus more on the patient. But at present, AI scribes may introduce "hallucinations," reflect implicit or explicit bias, or unintentionally influence clinical decision making (19–21). Nearly 60% of Americans have expressed concern that AI use would worsen patient relationships with clinicians (22). The EHR provides a cautionary tale. Designed to optimize not patient care but billing and other tasks, EHRs have reduced time spent with patients and increased physician workload (18, 23, 24).

Attention

Deep, sustained focus on another person cannot be replicated by machines (25). Attention in the patient-

physician relationship promotes quality care, satisfaction, and meaning for patients and physicians (26). Sustained relationships may improve patient outcomes, particularly for chronic conditions (27). But AI could diminish attention by creating ever-increasing distractions in risk scores, algorithmic output, and automated messages; or AI could support attention to the patient by reducing administrative tasks.

Patients perceive that their physicians spent more time with them (and not the computer) with the help of ambient scribes (19). However, other studies have been less optimistic, raising concerns over privacy and calling for more study (28, 29). Note writing or replying to patient portal messages using AI might improve efficiency, but attention might be diminished. Writing a note can aid physician reasoning and judgment about diagnosis and treatment, supplementing attention. A human response to a patient message can express care, which a chatbot can only mimic.

Time and Access to Care

Time is critical to the patient-physician relationship (30). The net effect of AI on time is presently unclear. Denials of coverage enabled by AI can necessitate time-consuming appeals and prior authorizations. Yet AI tools could counter AI-enabled denials (31). Coverage decisions should be based on individual patient needs, not just AI aggregate population data. Potential efficiency gains from AI should yield better quality time with patients, not expectations that AI will enable shorter visits so that physicians can see more patients.

Access to Physicians

Use of AI should promote patient-physician relationships. Patient-facing chatbots are being used for checking symptoms, mental health care, providing test results, and scheduling (32). With constant availability and linkages to the EHR, chatbots and other AI tools could empower patients in new ways, overcoming

geographic, temporal, and other barriers to care. However, some EHR chatbots do not share patient interactions with the care team. Digital twins—AI-generated bots that can mimic voice and likeness—could undermine the patient-physician relationship by disconnecting patients from physicians/team members. A shift to AI-initiated care raises questions of fairness. Some patients could be excluded because of digital literacy or lack of internet access, unless there are alternatives. The AI-based tools used in dermatology and radiology can overcome some access barriers and physician shortages. However, these tools should not engender second-tier care for some populations.

Position 2. AI is affecting medical practice, research, and learning. Physicians and trainees must recommit to the competencies of caring and develop new competencies on the appropriate use of AI.

Medical education could be augmented by AI from medical school through continuing medical education. Chatbots could provide simulated patients, and individualized assessments created and graded by AI could foster personalized education. However, using AI for education may be especially concerning for less experienced physicians who may not identify a hallucination or inaccuracy in AI output. Learning critical reasoning in traditional ways may be necessary to effectively use AI tools.

Deskilling

Using AI tools can result in “deskilling” (33). Deskilling is an individual- and system-level issue (for example, shorter appointment times make reliance on echocardiography easier than a careful cardiac examination) (34). Current evidence is limited on AI deskilling (35), but reliance on AI may develop rapidly (36). Deskilling is an ethical issue because it can result in patient harm when automated systems err or fail, disrupt patient-physician relationships, and threaten physician self-governance as professionals with specialized knowledge and duties. Individual physicians and trainees must be attentive to deskilling, advocating for skills essential for the caring art of medical practice. Ideally, AI will lead to upskilling, enhancing physicians’ capacities for diagnosis, care, and compassion while AI is used to accomplish tasks such as pattern recognition in images or large data sets, summarization of structured data, and administrative tasks. Emerging frameworks emphasizing AI-independent competencies and supervision show promise in developing evidence-based educational safeguards (37).

Recommitting to Competencies of Caring

With increasing AI use, the core competencies of caring and virtuous physicians become more important (38). Patients fear AI could focus attention on the AI tool and not the person (39). In education, AI-generated experiences cannot replicate how an embodied and encultured patient participates in a history and physical

examination (40). Human clinical encounters not only gather and provide information but also are opportunities to convey the physician’s caring for and responsibilities to the patient (41, 42). Although AI tools can deliver educational content, they cannot create a moral community and support independent practical reasoning. Role models who demonstrate the ethical use of AI while maintaining the competencies of caring are needed.

Developing Competencies Related to AI

Physicians need to develop competency in the appropriate use of AI (43, 44). Generative AI responses to clinical queries vary with how a question is asked, the availability of evidence, and the algorithms a specific model uses to prioritize sources (creating conflicts of interest if advertising or financial relationships influence content) (45). Physicians must develop “prompt literacy” to best query the tools. Critical appraisal of AI responses requires assessing what AI says and the level of certainty. Such skills will also prepare physicians for talking with patients—who may themselves query AI before a visit—about AI’s benefits and risks.

Position 3. When physicians use AI to support medical decision making, that use should respect and promote—not replace—physician-independent clinical judgment and recommendations based on the patient’s individual needs and values.

Use of AI can potentially assist diagnosis, provide tailored treatment recommendations, and offer personalized preventive care information. For some tasks (for example, mammography screening [46] or skin cancer detection [47]), AI may augment diagnostic accuracy.

However, because AI is trained using historical data, it could narrow choice, locking individuals into past selves (48) or manipulate decision making for financial gain. Thus, ACP has emphasized transparency and that AI tools should not replace decision making by patients and physicians (18). The ability of AI to pass a licensing examination cannot be confused with real-world medical competence, commitment, and professional discretion (49, 50).

Transparency

Although essential, transparency does not require disclosing and documenting every detail of every AI model (13). Physicians should tailor the information disclosed and documented about AI use to the individual patient, using individualized clinical judgment, as they have always done (51).

Nevertheless, the newness of AI and patient concerns suggest erring on the side of disclosure. For instance, a physician using ambient note taking should disclose that use and basic information about data privacy. Just as physicians adeptly describe how clinical trial findings do or do not apply to a patient, physicians should be prepared to describe basic facts about AI systems and their applicability to individual patients. When done well (that is, when basic features of AI models are

clearly presented and updated regularly or dynamically in real time, as models change), AI “nutrition labels” show promise for facilitating patient-physician conversations (52).

As AI evolves, how much to disclose and when could change. Without flexibility, disclosure and documentation requirements may inadvertently reinforce AI fear. Health systems might use AI to detect pulmonary nodules or coronary calcification on computed tomography scans done for other purposes, and then directly contact patients, or use AI for other administrative purposes (for example, billing and revenue). When outside of patient-physician relationships, disclosure obligations rightly fall on health systems or other entities to develop accessible, culturally acceptable patient-friendly information. Publicly available, central reporting systems could support obligations of transparency (53).

Explainability

Explainability emphasizes conveying how an AI model works. Some AI models, such as deep neural networks, may be “black boxes,” unknown and unknowable. Explainability may improve knowledge and use of AI, but knowledge evolves; consider how the mechanism behind statin effectiveness has changed over time (54). Although knowing how something works is important, many patients and physicians would choose a model that is more accurate over one that is “explainable” (55).

Ethical Responsibility

While legal questions relate to whether AI-based technologies become the standard of care (56), ethical responsibility is broader, involving the physician’s primary commitment to the patient as technology interdigitates with medical decisions (38).

Complexity or inexplicability does not mean lack of responsibility. Physician responsibility to the patient does not change when AI technology is involved any more than when another human is involved (for example, a radiologist reading a radiograph). Keeping a physician “in the decision-making loop” with AI can promote choice and responsibility but is not a panacea. Time pressures, perceived liability concerns, and medical decision complexity may make it easier for physicians to follow the algorithm (“automation bias”); overskepticism of AI may mean less use than is indicated (18). “Meaningful human control,” which emphasizes human needs and values throughout AI system design and patient-physician decision making under model uncertainty, may better conceptualize physician involvement and control (55). In addition, because AI may be used differently by different health care team members, addressing how shared interprofessional responsibility works in practice will be critical.

Most AI use in medicine will include physicians or other health professionals, but fully autonomous AI is possible (57). Caution is in order. Medical decisions

involve a complex interplay of medical facts, patient values, and uncertainty that require human and humane care. Autonomous AI use should be rare, limited to low-risk, low-complexity decisions, and always allow for bringing a clinician into the loop.

Position 4. Physicians, in coordination with clinics, hospitals, and health systems, must seek to identify and mitigate the effects of algorithmic bias in the use of AI, including by addressing root social and structural causes.

Physician commitment to justice means ensuring that the life-enhancing potential of health care is accessible to all patients (17). Previously, ACP has described how AI-based technologies can exhibit unjustified differential performance between groups based in bias (18).

Bias is not unique to AI. Traditional clinical risk calculators can exhibit differential performance based on sociodemographic factors, and human-delivered care can involve implicit and explicit biases (58, 59). The inexplicability of some AI-based algorithms and the faulty perception that algorithms are inherently neutral make addressing AI bias particularly important.

Self-governance means physicians should identify and manage bias proactively. Rapidly evolving federal rules and state laws may hold health care-covered entities responsible for addressing possible discrimination in algorithms (60, 61).

Mitigating Bias

Reducing bias in AI requires understanding its manifold causes (62), including biased data sets and the deeper historical, social, and structural unfairness that biased data reflect (63). Mitigating bias in AI will require more than weighting or adjusting data and/or models after the fact or creating simulated data (64). It requires moving upstream to address health inequity and the social determinants of health.

Complicating matters, philosophical agreement on fairness remains elusive. In addition, the impossibility theorem of algorithmic fairness suggests that under real-world conditions, all statistical definitions of fairness cannot be met simultaneously (65). With no singular, universal way to designate an AI algorithm unequivocally “fair,” the ethical obligation shifts to ensuring relevant tradeoffs are identified and examined honestly and transparently (66).

At the point of care, physicians should be aware of bias in AI algorithms, just as for other clinical calculators, but should not assume that all models are biased, biased in the same way, or necessarily more biased than existing known biases. Not using AI for certain groups of patients could deny them the benefits of AI and, if the AI model continues to learn from this behavior, create a negative feedback loop that reduces AI performance for those patients (67).

Fairness Metrics

Urgent attention is needed to develop diverse AI fairness metrics to assess models (68). Fairness assessment

requires multiple metrics considering different dimensions of fairness and disease prevalence or incidence, severity, model performance, and more. Fairness also requires asking whether an AI application meets the expressed needs of patients, families, and communities. A recently developed metric examines not just whether an AI model does no harm or improves all groups equally (as “a rising tide lifts all boats”); instead, it attempts to evaluate the effect of AI on underlying health disparities (69). Validated fairness metrics can be incorporated into AI nutrition labels (52).

Governance Models

Governance models can help manage AI ethically and meet the obligations of health system algorithm users to identify and manage bias (70, 71). Limitations in current U.S. Food and Drug Administration review of AI-enabled devices (including lack of clinical performance data [72]) make local governance essential. Good models include governance throughout the project life cycle, including the critical questions of why a particular problem is worth solving (that is, is there a demonstrated patient need?) and why AI-based solutions are required (73). Decisions about managing ethical issues should be calibrated to the riskiness of a particular clinical use; with greater risk should come greater obligations about transparency, disclosure, fairness, and more.

As a matter of stewardship, consideration of potential environmental impacts of AI is needed (18). Technology is rapidly evolving, but current training and use of AI models require, for example, substantial electricity and water consumption (74). The AI-based queries use more energy than non-AI internet queries, although precise estimates are difficult to come by (75). Locating AI data centers in socially vulnerable communities (76) raises issues of harm to individuals and health equity if risks from emissions, water pollution, or climate-related effects are unequally distributed. Responsible and efficient resource consumption (for example, by optimizing electricity use) and technological advancement to reduce resource use are required. A comprehensive approach is needed, guided by principles of stewardship, transparency, and equity (alongside discussing health care resource use more broadly).

Diverse, multidisciplinary teams including leaders, clinicians, informaticists, ethicists, and others are likely to make better decisions about fairness and other ethical issues in AI in medical practice. Physicians should lead these efforts. This should include robust and authentic patient and community engagement, recognizing how important patient trust is to both use of AI and medicine (77, 78). Doing so could help address upstream factors, including mistrust and other social determinants, that lead to biased AI. Many health organizations are actively developing AI governance models. Although there is no “one-size-fits-all” solution, this creates opportunities to identify and share best practices to improve governance over time.

CONCLUSION

Now is the time for physicians to consider how to harness AI’s transformative potential while avoiding patient harm. Ethical principles and guideposts of relationality, self-governance, and competence must shape AI’s use in medical practice, based in “a code of ethics and a duty of service that, in medicine, puts patient care above self-interest,” and medicine’s societally granted privilege of self-regulation (17). Use of AI must be implemented in alignment with ethical and professional standards to improve patient care.

From University of Colorado Anschutz Medical Campus, Aurora, Colorado (M.D.); American College of Physicians, Philadelphia, Pennsylvania (L.S.S.); and St. Louis University, Saint Louis, Missouri (K.E.K.).

Acknowledgment: The authors, staff, and the ACP Ethics, Professionalism and Human Rights Committee thank the many leadership and other reviewers of the paper for helpful comments on drafts.

Financial Support: Financial support for the development of this paper came exclusively from the ACP operating budget.

Disclosures: Disclosure forms are available with the article online.

Corresponding Author: Lois Snyder Sulmasy, JD; e-mail, loissulmasy8@gmail.com.

Author contributions are available at [Annals.org](https://annals.org).

References

1. Topol EJ. High-performance medicine: the convergence of human and artificial intelligence. *Nat Med*. 2019;25:44-56. [PMID: 30617339] doi:10.1038/s41591-018-0300-7
2. Haug CJ, Drazen JM. Artificial intelligence and machine learning in clinical medicine. *N Engl J Med*. 2023;388:1201-1208. [PMID: 37342938] doi:10.1056/NEJMc2305287
3. Howell MD, Corrado GS, DeSalvo KB. Three epochs of artificial intelligence in health care. *JAMA*. 2024;331:242-244. [PMID: 38227029] doi:10.1001/jama.2023.25057
4. Wachter RM, Brynjolfsson E. Will generative artificial intelligence deliver on its promise in health care? *JAMA*. 2024;331:65-69. [PMID: 38032660] doi:10.1001/jama.2023.25054
5. Omiye JA, Gui H, Rezaei SJ, et al. Large language models in medicine: the potentials and pitfalls: a narrative review. *Ann Intern Med*. 2024;177:210-220. [PMID: 38285984] doi:10.7326/M23-2772
6. Matheny ME, Goldsack JC, Saria S, et al. Artificial intelligence in health and health care: priorities for action. *Health Aff (Millwood)*. 2025;44:163-170. [PMID: 39841940] doi:10.1377/hlthaff.2024.01003
7. Welch HG, Dossett LA. Routine surveillance for cancer metastases - does it help or harm patients? *N Engl J Med*. 2025;392:1667-1670. [PMID: 40293173] doi:10.1056/NEJMp2414159
8. Mangione S, Basile M, Post SG. Out of touch. *JAMA*. 2024;331:729-730. [PMID: 38334986] doi:10.1001/jama.2024.0888
9. Korones DN. The last dose. *N Engl J Med*. 2025;392:1774-1775. [PMID: 40323312] doi:10.1056/NEJMp2415430

10. Corrêa NK, Galvão C, Santos JW, et al. Worldwide AI ethics: a review of 200 guidelines and recommendations for AI governance. *Patterns* (N Y). 2023;4:100857. [PMID: 37876898] doi:10.1016/j.patter.2023.100857
11. World Health Organization. Ethics and Governance of Artificial Intelligence for Health. World Health Organization; 28 June 2021.
12. Krishnan S, Matheny M, Fontaine E, eds. An Artificial Intelligence Code of Conduct for Health and Medicine: Essential Guidance for Aligned Action. NAM Special Publication. National Academies Press; 14 July 2025.
13. American Medical Association. Augmented Intelligence Development, Deployment, and Use in Health Care. November 2024. Accessed at www.ama-assn.org/system/files/ama-ai-principles.pdf on 6 July 2026.
14. Brady AP, Allen B, Chong J, et al. Developing, purchasing, implementing and monitoring AI tools in radiology: practical considerations. A multi-society statement from the ACR, CAR, ESR, RANZCR & RSNA. *J Med Imaging Radiat Oncol*. 2024;68:7-26. [PMID: 38259140] doi:10.1111/1754-9485.13612
15. American Academy of Family Physicians. Ethical Application of Artificial Intelligence in Family Medicine. 22 August 2023. Accessed at www.aafp.org/about/policies/all/ethical-ai.html on 6 July 2026.
16. Jobin A, Ienca M, Vayena E. The global landscape of AI ethics guidelines. *Nat Mach Intell*. 2019;1:389-399.
17. Sulmasy LS, Bledsoe TA; ACP Ethics, Professionalism and Human Rights Committee. American College of Physicians ethics manual: seventh edition. *Ann Intern Med*. 2019;170:S1-S32. [PMID: 30641552] doi:10.7326/M18-2160
18. Daneshvar N, Pandita D, Erickson S, et al; ACP Medical Informatics Committee and the Ethics, Professionalism and Human Rights Committee. Artificial intelligence in the provision of health care: an American College of Physicians policy position paper. *Ann Intern Med*. 2024;177:964-967. [PMID: 38830215] doi:10.7326/M24-0146
19. Tierney AA, Gayre G, Hoberman B, et al. Ambient artificial intelligence scribes to alleviate the burden of clinical documentation. *NEJM Catalyst Innov Care Deliv*. 2024;5. [10.1056/CAT.23.0404]
20. Haberle T, Cleveland C, Snow GL, et al. The impact of nuance DAX ambient listening AI documentation: a cohort study. *J Am Med Inform Assoc*. 2024;31:975-979. [PMID: 38345343] doi:10.1093/jamia/ocae022
21. Owens LM, Wilda JJ, Hahn PY, et al. The association between use of ambient voice technology documentation during primary care patient encounters, documentation burden, and provider burnout. *Fam Pract*. 2024;41:86-91. [PMID: 37672297] doi:10.1093/fampra/cmado92
22. Tyson A, Pasquini G, Spencer A, et al. 60% of Americans Would Be Uncomfortable With Provider Relying on AI in Their Own Health Care. Pew Research Center; 22 February 2023. Accessed at www.pewresearch.org/science/2023/02/22/60-of-americans-would-be-uncomfortable-with-provider-relying-on-ai-in-their-own-health-care on 6 July 2026.
23. Sulmasy LS, López AM, Horwitch CA; American College of Physicians Ethics, Professionalism and Human Rights Committee. Ethical implications of the electronic health record: in the service of the patient. *J Gen Intern Med*. 2017;32:935-939. [PMID: 28321550] doi:10.1007/s11606-017-4030-1
24. Verghese A, Shah NH, Harrington RA. What this computer needs is a physician: humanism and artificial intelligence. *JAMA*. 2018;319:19-20. [PMID: 29261830] doi:10.1001/jama.2017.19198
25. Han BC. The Burnout Society. Stanford Univ Pr; 2015.
26. Kissler MJ, Kissler K, Burden M. Toward a medical "ecology of attention." *N Engl J Med*. 2021;384:299-301. [PMID: 33503689] doi:10.1056/NEJMp2027190
27. Stewart M, Brown JB, Donner A, et al. The impact of patient-centered care on outcomes. *J Fam Pract*. 2000;49:796-804. [PMID: 11032203]
28. Leiserowitz G, Mansfield J, MacDonald S, et al. Patient attitudes toward ambient voice technology: preimplementation patient survey in an academic medical center. *JMIR Med Inform*. 2025;13:e77901. [PMID: 41308194] doi:10.2196/77901
29. Shah KP, Johnson KB. The ambient AI scribe revolution—early gains and open questions. *JAMA Netw Open*. 2025;8:e2534982. [PMID: 41037270] doi:10.1001/jamanetworkopen.2025.34982
30. Braddock CH, Snyder L. The doctor will see you shortly. The ethical significance of time for the patient-physician relationship. *J Gen Intern Med*. 2005;20:1057-1062. [PMID: 16307634] doi:10.1111/j.1525-1497.2005.00217.x
31. Ross C, Herman B. Denied by AI: How Medicare Advantage Plans Use Algorithms to Cut Off Care for Seniors in Need. *STAT*; 13 March 2023. Accessed at www.statnews.com/2023/03/13/medicare-advantage-plans-denial-artificial-intelligence on 6 July 2026.
32. McGreevey JD, Hanson CW, Koppel R. Clinical, legal, and ethical aspects of artificial intelligence-assisted conversational agents in health care. *JAMA*. 2020;324:552-553. [PMID: 32706386] doi:10.1001/jama.2020.2724
33. Cabitza F, Rasoini R, Gensini GF. Unintended consequences of machine learning in medicine. *JAMA*. 2017;318:517-518. [PMID: 28727867] doi:10.1001/jama.2017.7797
34. Hoff T. Deskilling and adaptation among primary care physicians using two work innovations. *Health Care Manage Rev*. 2011;36:338-348. [PMID: 21685794] doi:10.1097/HMR.0b013e31821826a1
35. Aquino YSJ, Rogers WA, Braunack-Mayer A, et al. Utopia versus dystopia: professional perspectives on the impact of healthcare artificial intelligence on clinical roles and skills. *Int J Med Inform*. 2023;169:104903. [PMID: 36343512] doi:10.1016/j.ijmedinf.2022.104903
36. Budzyń K, Romańczyk M, Kitala D, et al. Endoscopist deskill risk after exposure to artificial intelligence in colonoscopy: a multicentre, observational study. *Lancet Gastroenterol Hepatol*. 2025;10:896-903. [PMID: 40816301] doi:10.1016/S2468-1253(25)00133-5
37. Abdulnour RE, Gin B, Boscardin CK. Educational strategies for clinical supervision of artificial intelligence use. *N Engl J Med*. 2025;393:786-797. [PMID: 40834302] doi:10.1056/NEJMra2503232
38. Rhodes R. The Trusted Doctor: Medical Ethics and Professionalism. Oxford Univ Pr; 2020.
39. Fazakarley CA, Breen M, Thompson B, et al. Beliefs, experiences and concerns of using artificial intelligence in healthcare: a qualitative synthesis. *Digit Health*. 2024;10:20552076241230075. [PMID: 38347935] doi:10.1177/20552076241230075
40. Mool A, Schmid J, Johnston T, et al. Using generative AI to simulate patient history-taking in a problem-based learning tutorial: a mixed-methods study. *Tech Know Learn*. 2026. doi:10.1007/s10758-025-09929-4.
41. Zulman DM, Haverfield MC, Shaw JG, et al. Practices to foster physician presence and connection with patients in the clinical encounter. *JAMA*. 2020;323:70-81. [PMID: 31910284] doi:10.1001/jama.2019.19003
42. Costanzo C, Verghese A. The physical examination as ritual: social sciences and embodiment in the context of the physical examination. *Med Clin North Am*. 2018;102:425-431. [PMID: 29650064] doi:10.1016/j.mcna.2017.12.004
43. Liaw W, Kueper JK, Lin S, et al. Competencies for the use of artificial intelligence in primary care. *Ann Fam Med*. 2022;20:559-563. [PMID: 36443071] doi:10.1370/afm.2887
44. Russell RG, Lovett Novak L, Patel M, et al. Competencies for the use of artificial intelligence-based tools by health care professionals. *Acad Med*. 2023;98:348-356. [PMID: 36731054] doi:10.1097/ACM.0000000000004963
45. Crossman M, Weng J, Bacchi S, et al. Advertising and large language models: a new frontier influencing medical practice. *Eye (Lond)*. 2026;40:1425-1426. [PMID: 42106507] doi:10.1038/s41433-026-04518-w

46. Subelack J, Morant R, Blum M, et al. Retrospective evaluation of interval breast cancer screening mammograms by radiologists and AI. *Eur Radiol*. 2026;36:824-836. [PMID: 40760115] doi:10.1007/s00330-025-11833-5
47. Krakowski I, Kim J, Cai ZR, et al. Human-AI interaction in skin cancer diagnosis: a systematic review and meta-analysis. *NPJ Digit Med*. 2024;7:78. [PMID: 38594408] doi:10.1038/s41746-024-01031-w
48. Ward J. *The Loop*. Hachette Books; 2022.
49. McMillan RC. Responsibility to or for in the physician-patient relationship? *J Med Ethics*. 1995;21:112-115. [PMID: 7608934] doi:10.1136/jme.21.2.112
50. Pellegrino ED. The medical profession as a moral community. *Bull N Y Acad Med*. 1990;66:221-232. [PMID: 2364217]
51. Henry MS. Uncertainty, responsibility, and the evolution of the physician/patient relationship. *J Med Ethics*. 2006;32:321-323. [PMID: 16731728] doi:10.1136/jme.2005.013987
52. Gerke S. "Nutrition facts labels" for artificial intelligence/machine learning-based medical devices—the urgent need for labeling standards. *George Washington Law Rev*. 2023;91:79-163.
53. Pencina MJ, McCall J, Economou-Zavlanos NJ. A federated registration system for artificial intelligence in health. *JAMA*. 2024;332:789-790. [PMID: 39133500] doi:10.1001/jama.2024.14026
54. Snyder Sulmasy L, Burnett JR, Carney JK, et al; ACP Ethics, Professionalism and Human Rights Committee. Ethics and academic discourse, scientific integrity, uncertainty, and disinformation in medicine: an American College of Physicians position paper. *Ann Intern Med*. 2024;177:1244-1250. [PMID: 39074368] doi:10.7326/M24-0648
55. London AJ. Artificial intelligence and black-box medical decisions: accuracy versus explainability. *Hastings Cent Rep*. 2019;49:15-21. [PMID: 30790315] doi:10.1002/hast.973
56. Price WN, Gerke S, Cohen IG. Potential liability for physicians using artificial intelligence. *JAMA*. 2019;322:1765-1766. [PMID: 31584609] doi:10.1001/jama.2019.15064
57. Abramoff MD, Tobey D, Char DS. Lessons learned about autonomous AI: finding a safe, efficacious, and ethical path through the development process. *Am J Ophthalmol*. 2020;214:134-142. [PMID: 32171769] doi:10.1016/j.ajo.2020.02.022
58. Diao JA, Inker LA, Levey AS, et al. In search of a better equation - performance and equity in estimates of kidney function. *N Engl J Med*. 2021;384:396-399. [PMID: 33406354] doi:10.1056/NEJMp2028243
59. Vyas DA, Eisenstein LG, Jones DS. Hidden in plain sight - reconsidering the use of race correction in clinical algorithms. *N Engl J Med*. 2020;383:874-882. [PMID: 32853499] doi:10.1056/NEJMms2004740
60. Katten. New Colorado AI Act Targeting "Algorithmic Discrimination" Provides AI Compliance Lessons. 11 July 2024. Accessed at <https://katten.com/new-colorado-ai-act-targeting-algorithmic-discrimination-provides-ai-compliance-lessons> on 6 July 2026.
61. Adams K. Navigating AI in Health Care: HHS's Nondiscrimination Final Rule is in Effect. Bipartisan Policy Center; 19 July 2024. Accessed at <https://bipartisanpolicy.org/blog/navigating-ai-in-health-care-hhss-nondiscrimination-final-rule-is-in-effect> on 6 July 2026.
62. DeCamp M, Lindvall C. Mitigating bias in AI at the point of care. *Science*. 2023;381:150-152. [PMID: 37440631] doi:10.1126/science.adh2713
63. Ferryman K, Mackintosh M, Ghassemi M. Considering biased data as informative artifacts in AI-assisted health care. *N Engl J Med*. 2023;389:833-838. [PMID: 37646680] doi:10.1056/NEJMra2214964
64. Collins B, Jones N. Digital simulacra: circumventing diversity and inclusion. *Am J Bioeth*. 2023;23:76-78. [PMID: 37647473] doi:10.1080/15265161.2023.2237430
65. Kleinberg J, Mullainathan S, Raghavan M. Inherent trade-offs in the fair determination of risk scores. In: *Proceedings of the 8th Innovations in Theoretical Computer Science Conference (ITCS 2017)*, Berkeley, California, 9-11 January 2017. Leibniz International Proceedings in Informatics (LIPIcs). 2017;67:43:1-43:23. [10.4230/LIPIcs.ITCS.2017.43]
66. Chin MH, Afsar-Manesh N, Bierman AS, et al. Guiding principles to address the impact of algorithm bias on racial and ethnic disparities in health and health care. *JAMA Netw Open*. 2023;6:e2345050. [PMID: 38100101] doi:10.1001/jamanetworkopen.2023.45050
67. Bracic A, Callier SL, Price WN. Exclusion cycles: reinforcing disparities in medicine. *Science*. 2022;377:1158-1160. [PMID: 36074837] doi:10.1126/science.abo2788
68. Liu M, Ning Y, Teixayavong S, et al. A translational perspective towards clinical AI fairness. *NPJ Digit Med*. 2023;6:172. [PMID: 37709945] doi:10.1038/s41746-023-00918-4
69. Schaeckermann M, Spitz T, Pyles M, et al. Health equity assessment of machine learning performance (HEAL): a framework and dermatology AI model case study. *EClinicalMedicine*. 2024;70:102479. [PMID: 38685924] doi:10.1016/j.eclinm.2024.102479
70. Callahan A, McElfresh D, Banda JM, et al. Standing on FURM ground - a framework for evaluating Fair, Useful, and Reliable AI Models in healthcare systems. *arXiv*. Preprint posted online 27 Feb 2024. doi:10.48550/arXiv.2403.07911
71. Bedoya AD, Economou-Zavlanos NJ, Goldstein BA, et al. A framework for the oversight and local deployment of safe and high-quality prediction models. *J Am Med Inform Assoc*. 2022;29:1631-1636. [PMID: 35641123] doi:10.1093/jamia/ocac078
72. Windecker D, Baj G, Shirir I, et al. Generalizability of FDA-approved AI-enabled medical devices for clinical use. *JAMA Netw Open*. 2025;8:e258052. [PMID: 40305017] doi:10.1001/jamanetworkopen.2025.8052
73. Abramoff MD, Tarver ME, Loyo-Berrios N, et al; Foundational Principles of Ophthalmic Imaging and Algorithmic Interpretation Working Group of the Collaborative Community for Ophthalmic Imaging Foundation. Considerations for addressing bias in artificial intelligence for health equity. *NPJ Digit Med*. 2023;6:170. [PMID: 37700029] doi:10.1038/s41746-023-00913-9
74. Jia Z, Chen J, Xu X, et al. The importance of resource awareness in artificial intelligence for healthcare. *Nat Mach Intell*. 2023;5:687-698. doi:10.1038/s42256-023-00670-0
75. Chen S. How much energy will AI really consume? The good, the bad and the unknown. *Nature*. 2025;639:22-24. [PMID: 40044891] doi:10.1038/d41586-025-00616-z
76. Cartwright ED. The environmental justice and community impacts of data centers. *Climate and Energy*. 2026;42:15-17. doi:10.1002/gas.70012
77. Rajkomar A, Hardt M, Howell MD, et al. Ensuring fairness in machine learning to advance health equity. *Ann Intern Med*. 2018;169:866-872. [PMID: 30508424] doi:10.7326/M18-1990
78. Mello MM, Nag S, Tuttle CT, et al. Engaging patients in AI governance. *BMJ Digit Health*. 2026;2:e000099. doi:10.1136/bmjdh-2026-000099

Author Contributions: Conception and design: M. DeCamp, L. Snyder Sulmasy, K.E. Karches.
Analysis and interpretation of the data: M. DeCamp, L. Snyder Sulmasy.
Drafting of the article: M. DeCamp, L. Snyder Sulmasy, K.E. Karches.
Critical revision for important intellectual content: M. DeCamp, L. Snyder Sulmasy, K.E. Karches.
Final approval of the article: M. DeCamp, L. Snyder Sulmasy, K.E. Karches.
Administrative, technical, or logistic support: L. Snyder Sulmasy.
Collection and assembly of data: M. DeCamp.