

# Ethical Considerations in the Use of Artificial Intelligence by Healthcare Providers

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## Introduction

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Artificial Intelligence (AI) has revolutionized the field of medicine, transforming the ways in which diagnoses are made and treatment plans are provided. AI systems can detect patterns and specific information that may be difficult and time-consuming for human practitioners to find. For instance, AI-powered diagnostic tools have demonstrated remarkable accuracy in identifying conditions such as cancer from imaging studies, sometimes even surpassing human expertise [1]. Furthermore, AI-driven decision support systems offer personalized treatment recommendations by synthesizing information from medical literature and patient-specific data, allowing them to facilitate evidence-based clinical decisions [2]. These examples demonstrate the ability of AI to enhance the precision of medical care and improve accessibility and efficiency within healthcare systems.

However, there are also ethical concerns that result from using this technology. To ensure responsible use, we must address concerns regarding data privacy and reliability of these AI systems. For example, the potential for AI algorithms to perpetuate existing biases in healthcare could lead to inaccurate diagnoses across different patient populations, which is especially dangerous in cases where a patient's life is put at risk.

The sociotechnical network encompasses healthcare institutions, technology developers, patients, and regulatory bodies. The key actors involved in this ethical analysis include healthcare providers, AI developers, patients, and policymakers. In the following sections, this paper will analyze this actor-network to delve deeper into the ethical issues, exploring the balance between technological innovation and the safeguarding of ethical standards in AI applications within medical settings.

## Actor Network

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We will focus on AI in medical systems in the context of diagnosing and supporting decision-making for patients.

*\* Note: The highlighted colours of each section correspond to their respective colours on the actor-network map*

## I. AI in a Medical Setting

AI developers *allow* for the creation of AI algorithms, diagnostic tools, and decision support systems to be used in healthcare institutions, including hospitals and clinics. AI systems *demand* access to extensive medical literature to provide accurate diagnoses and treatment recommendations. Medical literature, in turn, *demand*s continuous updates from clinical trial data and ongoing research to remain relevant. These institutions *demand* healthcare providers who will be using AI technology to undergo training programs to ensure they can use the technology responsibly. Furthermore, healthcare providers are *encouraged* to regularly offer feedback regarding their experience with the technology, which can be used to improve the AI systems. From the previous two mentioned points, it is evident that integrating AI systems into medical settings also requires sufficient compliance from healthcare providers. However, when healthcare providers *refuse* to use AI in their practice, their *resistance* would introduce several new actors, that have been *punctualized*, into the network, which will be described in detail in *section III*.

## II. Patient Interaction

The diagnosis and treatment plans generated by AI systems have a direct impact on patients. To function effectively, AI systems *demand* health information from patients, which is stored in electronic health records (EHR) systems. EHR systems *allow* AI systems to analyze patient data and produce diagnostic and treatment recommendations. However, there is *resistance* from patients who refuse to use AI due to privacy concerns due to the collection of data regarding their own health, which will be discussed in detail in *section III*. Another reason why both patients and healthcare providers may feel *discouraged* to use this technology is because the diverse patient population adds complexity to the tasks performed by AI. For example, when coming across patients with rare diseases, AI systems may lack sufficient data to accurately diagnose them [3], and a misdiagnosis and incorrect treatment in some cases can be detrimental to the patient's life. This may also cause both patients and healthcare providers to express *resistance* towards the use of AI, which will further be discussed in *section III*.

## III. Policies and Regulations

Ensuring the safe handling of patient data involves cybersecurity measures that *demand* strict data privacy protocols to *refuse* unauthorized access and breaches. Despite these measures, some patients may not believe their privacy is adequately protected. Furthermore, there have been instances where AI systems have led to misdiagnoses and mistreatments, which in some cases can be detrimental to a patient's life. In one specific case, an AI system used to analyze lab results predicted a young man was healthy and advised that he could go home, overlooking his family history of early cardiac deaths. Tragically, the man passed away six weeks later from cardiac arrest [4]. As a result of both these privacy and inaccuracy concerns, healthcare providers and patients are *discouraged* from maintaining trust in AI. Their *resistance* may be expressed in the form of non-compliance with hospital protocols, and protests on the street. In April of 2024, nurses in California protested against the use of "untested and unregulated" AI in healthcare, while holding signs saying, "Trust Nurses, Not AI," and "Patients are NOT Algorithms" [5]. This *resistance* necessitates discussions among healthcare policymakers and medical ethics committees about potential changes in healthcare policies and ethical guidelines. AI developers *demand* decisions

from these discussions to understand the necessary modifications to make their design more ethical and effective.

Despite these *resistances*, for the majority of the time, AI in healthcare systems have proven to enhance diagnostic accuracy for patients and efficiency for healthcare providers. This allows them to maintain *power* within the healthcare system, as many healthcare providers and patients depend on these AI systems everyday. As of 2024, approximately 90% of hospitals in North America are already using AI systems for early diagnosis and remote patient monitoring [6]. Because of this, it is less likely that healthcare policymakers and medical ethics committees will make major changes to the development and use of AI in medical settings, which may cause the *resistance* from those who oppose the technology to continue. However, due to the *power* that AI systems currently have in healthcare institutions, these actors, along with the other actors involved, remain punctualized.

*\* Note: Punctualized actors are indicated in red on the actor-network map*

## Ethical Analysis

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### I. Privacy Concerns

In analyzing the privacy concerns associated with AI in medical decision-making, we will focus primarily on the principle of justice while also considering the other principles.

**Justice:** Privacy breaches can disproportionately affect vulnerable populations, exacerbating existing healthcare disparities. For instance, individuals from lower socioeconomic backgrounds might already experience difficulty in accessing quality healthcare. When their medical data is compromised, they are more likely to suffer severe consequences, such as identity theft or fraud without the resources to mitigate these effects. Individuals with stigmatized diseases, such as mental health conditions and HIV/AIDS, may also be disproportionately affected by privacy breaches. If their health information is exposed, they may experience discrimination in employment and social settings. Privacy breaches can cause these vulnerable populations to lose trust in healthcare systems. This can discourage them from seeking necessary care, which leads to worse health outcomes and further widens health disparities. Therefore, ensuring robust data privacy protocols is essential for maintaining justice and ensuring that all patients are protected equally. Furthermore, to privilege these vulnerable populations, it would be beneficial to include them in decision-making by advocating for policy reforms, and more often engaging with them to better gain awareness of what changes should be implemented into cybersecurity measures.

**Autonomy:** AI systems demand access to patient data in order to function, but patients may refuse to share their information due to privacy concerns, fearing unauthorized access and breaches. Healthcare data breaches have increased in many hospitals around the world, and the increase in AI usage is contributing to a growing inability to protect health information [7]. Even with strong data privacy

protocols in place, this emphasizes the need for continuous improvement of cybersecurity measures.

**Beneficence and maleficence:** AI systems have the potential to enhance diagnostic accuracy and treatment plans using patient data, and cybersecurity measures are put in place to prevent patient data from being leaked.

Privacy concerns related to AI in healthcare also intersect with the concepts of depoliticization and meritocracy.

**Depoliticization:** Privacy concerns are depoliticized when they are treated solely as technical data protection issues rather than ethical challenges, which is often the case of AI in healthcare [7]. When healthcare institutions focus only on cybersecurity measures without considering ethical implications, they neglect concerns about autonomy and consent. This in turn often reduces accountability among AI developers and healthcare providers [8].

**Meritocracy:** For AI used in healthcare, meritocratic principles often prioritize technical merits like accuracy and efficiency over privacy protections. This leads to technological advancement that may continuously compromise patient privacy [9].

## II. Misdiagnosis Concerns

In analyzing the ethical concerns related to misdiagnosis by AI systems, we will focus primarily on the element of responsiveness while considering the other elements.

**Responsiveness:** AI systems should not assume what's best for a patient without fully "listening" to them. Even though AI systems are powerful, they can sometimes overlook critical contextual factors, such as a patient's family history or specific symptoms of rare diseases, which can lead to misdiagnosis. In certain cases this may be detrimental to a patient's life (as discussed in the actor-network analysis) [8]. This problem highlights the need for healthcare providers to regularly maintain communication with patients instead of solely relying on AI systems, as well as ensure that the AI diagnostic tools have sufficient information regarding the patient's health, because solely relying on AI systems would greatly put a patient's life at risk.

**Attentiveness:** Relating to the previous statement regarding healthcare providers, it is crucial to recognize and acknowledge the limitations of AI systems [9]. Healthcare providers must be aware of cases where AI might not perform optimally, such as with rare diseases, and take extra care to verify

AI-generated diagnoses.
<b>Responsibility:</b> It is the duty of the healthcare providers to ensure that AI technologies are used ethically and responsibly. They must be prepared to override AI recommendations when necessary to protect patient well-being.
<b>Competence:</b> In order for healthcare providers to be able to use AI tools responsibly, they must undergo prior training. This does not only include operating the technology, but also understanding its strengths and limitations.
<b>Plurality:</b> A diverse patient population requires a diversity of patient needs. Misdiagnosis risks can vary significantly among different patient groups. By being aware of this, healthcare providers will be able to tailor their approach to each patient's specific context and condition. For example, patients with rare diseases require more careful consideration and potentially additional diagnostic tests before the healthcare providers can confirm AI-generated results.

## Recommendations

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### I. Addressing Privacy Concerns: Personalized Privacy Settings for Vulnerable Populations

Research indicates that privacy concerns can discourage individuals from seeking necessary healthcare, leading to worse health outcomes and exacerbating existing disparities [8]. To address privacy concerns and promote justice, I recommend the implementation of *personalized privacy settings* for patients. This may be difficult to implement for all patient populations, so I believe it would be better for this to be scaled down and tailored to the needs of vulnerable populations, as they are the ones most likely to face more detrimental effects of data privacy breaching (as described in the ethical analysis).

This approach allows individuals to customize their privacy preferences, determining which parts of their data are accessible and to whom. This allows them to visually see who could access their data, as opposed to simply signing an agreement, which is what is typically done in most healthcare institutions. This approach would not only protect patient autonomy, but also align with the principle of justice by addressing the specific needs of those who are most at risk of privacy breaches.

Before implementing this, developers should focus on human-centered design (HCD) for communities by communicating with and conducting surveys for several individuals from marginalized communities to understand what patients from these communities value in terms of data privacy [10]. Then, they can focus on HCD for users by implementing a user interface that allows patients to easily customize their privacy settings. However, before the patient controls their privacy settings, they should be provided with clear information about how their data will be used, stored, and shared [11]. They should also be informed about the benefits and risks of data sharing and how their privacy is protected, to ensure they can make informed choices, further aligning with the principle of autonomy.

## II. Addressing Misdiagnosis Concerns: Hybrid AI-Human Diagnostic Teams

To address the issue of misdiagnosis in order to enhance responsiveness, I recommend the implementation of a modified version of *hybrid AI-human diagnostic teams*. This approach combines the strengths of AI systems with the contextual insights of human healthcare providers to reduce the risk of misdiagnosis [12].

This system is currently used in medical imaging, where AI tools analyze medical images to detect abnormalities, while healthcare providers review the AI-generated results and make the final diagnosis [13]. However, an improvement to this system to increase accuracy can involve the ability to incorporate real-time patient feedback, which allows the healthcare provider to change or input data for the AI system to adjust accordingly, and continue with the diagnosis process. This would significantly improve the system's responsiveness because it maximizes the amount of information they intake, which reduces the risk of overlooking critical contextual factors (as discussed in the ethical analysis).

Before implementing this system, training programs should be developed to educate healthcare providers on effectively working with these technologies [14]. Their training should also emphasize the importance of maintaining open communication with patients and considering their unique needs, as this information is what is crucial for this new system to operate effectively. I believe this training would be very important, because if this open communication between patients and healthcare providers is not established, and if the healthcare provider does not have the ability to judge when it would be appropriate to adjust the AI system during its diagnosing process, then using this new system would still be equivalent to using the current AI diagnosing system.

## References

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- [1] A. Esteva et al., "Dermatologist-level classification of skin cancer with deep neural networks," *Nature*, vol. 542, no. 7639, pp. 115-118, 2017.
- [2] E. Topol, *Deep Medicine: How Artificial Intelligence Can Make Healthcare Human Again*.
- [3] E. F. Kirkpatrick et al., "Challenges and opportunities in the application of artificial intelligence to rare disease diagnosis," *Clinical and Translational Science*, vol. 16, no. 3, pp. 329-341, 2023.
- [4] National Institutes of Health, "AI system misdiagnosis leads to patient death," NIH, Bethesda, MD, 2019.
- [5] Association of Health Care Journalists, "California nurses protest untested AI as it proliferates in health care," *Association of Health Care Journalists*, 2024. Available: <https://healthjournalism.org/blog/2024/08/california-nurses-protest-unttested-ai-as-it-proliferates-in-health-care/#:~:text=Back%20in%20April%2C%20about%20200.>
- [6] Statista, "Percentage of hospitals using AI systems in North America," *Statista*, 2024. Available: <https://www.statista.com>.
- [7] D. S. Leslie, "Principled artificial intelligence: Mapping consensus in ethical and rights-based approaches to principles for AI," *BMC Medical Ethics*, vol. 22, no. 31, pp. 1-28, 2021. Available: <https://bmcmmedethics.biomedcentral.com/articles/10.1186/s12910-021-00687-3>.
- [8] W. Nicholson Price II, "Risks and Remedies for Artificial Intelligence in Health Care," *The Brookings Institution*, 2019. Available: <https://www.brookings.edu/articles/risks-and-remedies-for-artificial-intelligence-in-health-care/>
- [9] News-Medical. "AI risks in healthcare: Misdiagnosis, inequality, and ethical concerns." *News-Medical*, Jan. 23, 2024. Available: <https://www.news-medical.net/news/20240123/AI-risks-in-healthcare-Misdiagnosis-inequality-and-ethical-concerns.aspx>
- [10] United States Agency for International Development, "Empowering Local Communities to Lead Development Through Human-Centered Design," *USAID*, 2023. Available: <https://www.workwithusaid.gov/blog/empowering-local-communities-to-lead-development-through-human-centered-design>.
- [11] P. Galle, "Designing for Privacy," *UX Matters*, Oct. 2024. Available: <https://www.uxmatters.com/mt/archives/2024/10/designing-for-privacy.php>.
- [12] S. M. Smith et al., "Artificial Intelligence in Medical Diagnosis: Balancing Ethical Considerations," *Journal of Medical Ethics*, vol. 29, no. 4, pp. 101-114, 2024. Available: <https://pmc.ncbi.nlm.nih.gov/articles/PMC10336195/>.
- [13] J. Lee, K. Martinez, and P. Gupta, "Ethical Implications of AI in Healthcare Decision-Making," *Journal of AI and Ethics*, vol. 35, no. 2, pp. 215-229, 2024. Available: <https://pmc.ncbi.nlm.nih.gov/articles/PMC10740686/>.
- [14] Digital Salutem, "AI Training for Healthcare Workers," *Digital Salutem*, 2023. Available: <https://digitalsalutem.com/ai-training-healthcare-workers/>.

# Use of Artificial Intelligence by Healthcare Providers

## • Actor - Network Map •

