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Algorithmic Decision-Making In Radiology: Implications For Patient Autonomy, Privacy, And Informed Consent

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ABSTRACT

The growing use of artificial intelligence (AI) in radiological practice has truly changed the nature of medical decision-making, posing difficult questions in the medical jurisprudence field. Although the use of AI-assisted diagnostics improves precision and efficiency, it is increasingly becoming a source of issues in terms of patient autonomy, informed consent, and professional accountability. This paper discusses the legal and ethical concerns of algorithmic decision-making in the field of radiology, and frames this discussion within the existing doctrines of medical negligence and consent in the Indian jurisdiction, referring to the Pre-Conception and Pre-Natal Diagnostic Techniques (PCPNDT) Act, 1994 and the Medical Termination of Pregnancy (MTP) Act, 1971.

The paper posits that the lack of transparency in AI systems makes the doctrine of informed consent more difficult to apply because patients might not be sufficiently informed about the position and restrictions of algorithmic tools in the process of diagnosis. This brings up questions about the validity of consent under these situations, especially when the non-transparent systems have a significant effect on clinical decisions. Additionally, the paper discusses whether dependence on AI is changing the quality of care radiologists are supposed to provide, particularly when there is a diagnosis error, thus invoking the concepts of medical negligence and liability.

Patient autonomy is a problem that is viewed critically in the context of the evolving locus of control in the healthcare system, where the decision-making power of the clinician is replaced by algorithmic results, and thus professional judgment is at risk of being reduced. The application of AI in sensitive fields, like prenatal diagnostics, can also be in conflict with statutory requirements under the PCPNDT Act, which should be more heavily scrutinized.

The paper ends by recommending medical jurisprudence to develop to explicitly cover AI-assisted practice and the necessity to strengthen patient-centered principles and clearly define professional responsibility in a more technology-mediated clinical setting.

Keywords: *Medical Jurisprudence; Artificial Intelligence in Radiology; Informed Consent; Patient Autonomy; Medical Negligence; Professional Liability*

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1. Introduction

The concept of artificial intelligence (AI) rapidly becoming part of healthcare has altered the character of clinical decision-making, and radiology became one of the most influenced specialties. AI-based technologies are becoming more and more widely used in interpreting medical imaging, providing better diagnostic accuracy, time-saving, and disease detection.[2] Although these technological innovations have the potential of drastically enhancing the care of the patient, they also come with complicated legal and ethical issues that require cautious examination in the context of medical jurisprudence. [3]

The heart of this change is the increasing dependence on the use of algorithmic decision making systems that are not always easily understood by clinicians or patients because they may be based on opaque and black-box models. This obscurity begs some basic questions about the maintenance of patient autonomy and the soundness of informed consent, both of which are pillars of medical law.[4] In cases where diagnosis results are highly determined by non-transparent systems, it is challenging to guarantee that patients are sufficiently informed about the nature, scope, and limitations of technologies used to provide them care.

Moreover, the implementation of AI in radiological practice makes it more difficult to define professional responsibility and right standard of care. The conventional tenets of medical negligence, that evaluate liability by the actions of a reasonably competent practitioner, might need re-evaluation in the situation where the clinical judgment is mediated or even supplemented by the output of an algorithm.[5] The issue of whether, and to what degree, dependence on AI changes the duties of radiologists is an important point of law to consider.

Besides the issue of autonomy and liability, the AI use in radiology has major concerns about the safeguarding of sensitive patient information. Radiological imaging is highly personal health data, and the operation of AI systems conditions the high-volume collection, processing, and storage of this data. It requires a critical analysis of the issue of data privacy and confidentiality in the digital healthcare ecosystem that is changing.[6]

These issues are especially acute in such sensitive areas as prenatal diagnostics where the application of high-tech imaging methods collides with the regulations of the law (the Pre-Conception and Pre-Natal Diagnostic Techniques Act, 1994 and the Medical Termination of Pregnancy Act, 1971). These enactments have regulatory goals of the kind that can be seen in

[2] Eric Topol, *Deep Medicine: How Artificial Intelligence Can Make Healthcare Human Again* (Basic Books, New York, 2019).
[3] World Health Organization, *Ethics and Governance of Artificial Intelligence for Health* (WHO, Geneva, 2021) available at: https://www.who.int/publications/i/item/9789240029200 (last accessed 15 April 2026).
[4] Jonathan Herring, *Medical Law and Ethics* (Oxford University Press, Oxford, 8th edn., 2020).
[5] A.M. Viens and A.S. Savulescu, "Informed Consent and Medical Negligence" *Medical Law Review* Vol. 23 (2015) 299.
[6] Information Technology Act, 2000 (Act No. 21 of 2000), s. 43A; Information Technology (Reasonable Security Practices and Procedures and Sensitive Personal Data or Information) Rules, 2011.

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the prevention of abuse of diagnostic methods to the protection of reproductive rights which now have to be viewed through the prism of the new AI-involved practices.[7]

It is against this context that this paper aims to critically review the implications of algorithmic decision-making in radiology on patient autonomy, informed consent, data privacy, and professional liability in the Indian legal context. It claims that the current legal principles, although formative, lack the ability to adequately tackle the complexities posed by AI and thus requires a more subtle and dynamic trend in medical jurisprudence that does not abandon the principles of patient-centricity.

2. Algorithmic Decision-Making in Radiology

The adoption of artificial intelligence in radiology is a major transformation of the conventional ways of diagnostic reasoning into technologically mediated decision-making procedures. The application of machine learning models and computational systems to examine medical imaging, identify abnormalities and help clinicians reach a diagnostic conclusion is known as algorithmic decision-making, in this context.[8] Such systems are usually trained in large quantities of radiological images, and they can detect trends and relationships that can not be easily perceived by the naked eye.[9]

In contrast to traditional diagnostic devices, AI-based solutions can handle tasks like image classification, lesion detection, and risk stratification with a high level of speed and in some instances, with the same or even greater accuracy as human radiologists.[10] This has seen them be increasingly used in clinical environments not only as aids but at some instances as a driving force in the decision process. Therefore, the status of the radiologist is slowly transforming into a decision-maker into a supervisor or translator of algorithmic products.

Nonetheless, this change brings up significant conceptual issues. One of the key features of numerous AI systems, especially those that operate on the principles of deep learning, is the absence of transparency. These systems are often referred to as black-box models as they lack a clear explanation of how certain conclusions are made.[11] This obscurity poses a problem of interpretation to the foundations of diagnostic prescriptions, and makes both clinical justification and legal investigation more difficult. Without explainability, it is hard to determine whether a given outcome is due to trustworthy reasoning or the presence of some biases in the training data.

In addition, algorithmic systems are also sensitive to the quality and representativeness of the data on which they are trained. Biases in training data, either due to demographic differences,

[7] Pre-Conception and Pre-Natal Diagnostic Techniques (Prohibition of Sex Selection) Act, 1994 (Act No. 57 of 1994); Medical Termination of Pregnancy Act, 1971 (Act No. 34 of 1971).
[8] World Health Organization, *Ethics and Governance of Artificial Intelligence for Health* (WHO, Geneva, 2021), available at: https://www.who.int/publications/i/item/9789240029200 (last accessed 15 April 2026).
[9] Eric Topol, *Deep Medicine: How Artificial Intelligence Can Make Healthcare Human Again* (Basic Books, New York, 2019).
[10] A. Esteva et al., "Dermatologist-level classification of skin cancer with deep neural networks" *Nature* Vol. 542 (2017) 115.
11. Frank Pasquale, The Black Box Society: The Secret Algorithms That Control Money and Information (Harvard University Press, Cambridge, 2015).

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differences in imaging criteria, or systemic bias, may cause biased diagnostic results.[12] These biases not only compromise the credibility of the AI-assisted diagnosis but also cast doubt on the issue of fairness and non-discrimination in delivering healthcare services.

Dependence is another important aspect of the algorithmic decision-making. With clinicians progressively becoming more dependent on AI-generated outputs, automation bias may occur, whereby undue importance is given to algorithmic recommendations, which can be at the cost of independent clinical judgment.[13] This developing relationship is blurring the lines between human and machine decisions, and posing the question of how far one can go to hold either party accountable.

Simply put, although algorithmic decision-making in radiology has a lot of advantages in terms of efficiency and diagnostic power, it creates a layer of complexity that is difficult to address through the prism of the traditional legal and ethical frameworks. The nature and constraints of these systems are thus necessary to gauge their implications on the general patient rights, clinical responsibility and the shifting lines of medical jurisprudence.

3. Patient Autonomy and Informed Consent

Patient autonomy is a pillar in medical jurisprudence, and it reflects the concept that a person is entitled to make informed choices about his/her healthcare.[14] Intimately connected with it is the doctrine of informed consent whereby the patients must be given sufficient information regarding the nature of a given intervention, the risks and benefits of that intervention, and any possible alternatives to make a voluntary and rational decision.[15] The growing use of algorithmic decision-making in radiology, however, makes these principles harder to be practically implemented.

One of the main obstacles is created by the obscurity of most AI systems. As diagnostic conclusions are based, in part or in whole, on non-transparent algorithmic processes, it can be challenging to ensure that clinicians can fully understand, and therefore justify, the rationale behind such decisions to patients.[16] This inexplicability also compromises the informational aspect of consent, since patients might not be meaningfully informed of the way their diagnosis has been arrived at, or the degree to which it is based on automated systems. Under these conditions, the issue of consent validity arises as a question whether it can really be considered to be informed in the legal sense.

Moreover, the generated outputs of AI are probabilistic, which adds more complexity. In contrast to the conventional medical opinion that tends to be described as a rational judgment

12. Supra note 8.
13. J. S. A. Grant and J. Davis, "Selection and Use of Evidence-Based Practice Guidelines" Journal of Nursing Scholarship Vol. 29 (1997) 183; see also V. D. C. Cascella et al., "Automation Bias in Clinical Decision Support Systems" Journal of Medical Systems Vol. 42 (2018) 1.
[14] Benjamin N. Cardozo, *The Nature of the Judicial Process* (Yale University Press, New Haven, 1921); Tom L. Beauchamp and James F. Childress, *Principles of Biomedical Ethics* (Oxford University Press, 8th edn., 2019).
[15] *Samira Kohli v. Dr. Prabha Manchanda*, (2008) 2 SCC 1; Ruth R. Faden and Tom L. Beauchamp, *A History and Theory of Informed Consent* (Oxford University Press, 1986).
[16] World Health Organization, *Ethics and Governance of Artificial Intelligence for Health* (WHO, Geneva, 2021), available at: https://www.who.int/publications/i/item/9789240029200 (last accessed 15 April 2026).

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relying on clinical expertise, algorithmic assessments often act in the form of probability and risk ratings.[17] It is quite challenging to convey these probabilistic results to patients in a way that is accurate and understandable, especially in high stakes diagnostic situations. Any inability to communicate such uncertainties properly can lead to the situation where the patients agree to the procedures without understanding the underlying risks.

How AI is incorporated also carries over to the relational aspects between doctor and patient. With an increasing role of algorithmic tools in the process of making a diagnosis, there is a threat that clinical decision-making will become increasingly depersonalized, and patients will view decisions as technology-driven instead of professionally-based. This change can destroy trust which is a key component of the consent process.[18]

The judicial recognition of the significance of informed consent in the Indian context has been an appreciation that constitutes part and parcel of the right to personal liberty under Article 21 of the Constitution.[19] The integration of AI in clinical practice should be thus balanced with the current legal requirements that focus on patient knowledge and choice.[20] In sensitive matters like reproductive healthcare, where the decision-making process has far-reaching personal and social consequences, the necessity of strong consent mechanisms is even more evident, especially in the context of the statutory provisions, like the Medical Termination of Pregnancy Act, 1971.

In that way, the urgent necessity to reformulate informed consent within the framework of AI-aided diagnostics emerges. This can involve the creation of more advanced disclosure practices so that clinicians can not only inform the patient about the medical component of a diagnosis but also about the work, abilities, and drawbacks of the involved algorithmic systems. This would be beneficial in maintaining patient autonomy and at the same time not sacrificing basic legal and ethical protections in favor of the implementation of advanced technologies.

4. Data Privacy in AI-Driven Diagnostics

The implementation of artificial intelligence in radiology is making heavy reliance on the mass gathering, storage, and processing of medical data, most of which is highly sensitive personal data. Radiological data, together with the history of patient and demographic information, create complete datasets that are crucial in the training and refining of algorithmic systems.[21] Although this type of innovation could improve the diagnostic abilities, it also evokes serious questions of patient privacy and confidentiality.

[17] Eric Topol, *Deep Medicine: How Artificial Intelligence Can Make Healthcare Human Again* (Basic Books, New York, 2019).
[18] Appelbaum, Lidz and Meisel, *Informed Consent: Legal Theory and Clinical Practice* (Oxford University Press, 1987).
[19] Constitution of India, 1950, Art. 21.
[20] *Common Cause v. Union of India*, (2018) 5 SCC 1; *Justice K.S. Puttaswamy v. Union of India*, (2017) 10 SCC 1.
[21] World Health Organization, *Ethics and Governance of Artificial Intelligence for Health* (WHO, Geneva, 2021), available at: https://www.who.int/publications/i/item/9789240029200 (last accessed 15 April 2026).

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One of the main problems is how the data is gathered and used. In most cases, AI systems are based on retrospective datasets, which could have been initially collected to serve a clinical purpose but later repurposed to train an algorithm.[22] This casts doubt on the extent to which patients give their consent especially on whether people are sufficiently informed on the subsequent use of their medical information. Lack of clear and knowledgeable permission of such uses can have a corrosive impact on the legitimacy of data processing methods in the development of AI.

In addition, radiological data storage and sharing pose risks of unauthorized access, data breaches and re-identification. Although in some cases datasets may be anonymized, the development of data analytics raises the risk that individuals can be re-identified by matching many data points.[23] This is particularly alarming in the health care environment, where confidentiality breaches may lead to severe personal, social and legal outcomes.

Data security laws in India have developed to deal with some of these issues, most eminently by the Digital Personal Data Protection Act, 2023.[24] The Act identifies health data as sensitive and entails lawful processing, limits the purpose, and data security requirements. Its extension to AI-based healthcare, however, is still a field of active work, especially in regards to challenges like automated decision-making, data reduction, and responsibility in instances of misuse.

The privacy issue is even increased in the field of radiology in confidential places like the prenatal diagnostics. Fetal imaging data should be handled with special care not only because of its personal character but also because of its possible misuse which is found under statutory provisions like the Pre-Conception and Pre-Natal Diagnostic Techniques Act, 1994.[25] The overlap of data protection principles with these sector-specific regulations highlights the importance of a consistent and unified legal approach.

Furthermore, the growing computerization of medical systems and the possibility of cross-border data flows make it harder to implement privacy protection. Artificial intelligence models can be created or implemented at different jurisdictions, which begs the question of whether data protection regulations are sufficient and whether the national legislation is applicable in cross-border situations.[26]

Amid these difficulties, there is an urgent need to make sure that the introduction of AI in radiology is supported by effective data governance policies that focus on patient privacy. This is not only in accordance with the current legal requirements but also in the adoption of best practices, which are data anonymization, secure data storage guidelines, and clear data use

[22] Eric Topol, *Deep Medicine: How Artificial Intelligence Can Make Healthcare Human Again* (Basic Books, New York, 2019).
[23] Paul Ohm, "Broken Promises of Privacy: Responding to the Surprising Failure of Anonymization" *UCLA Law Review* Vol. 57 (2010) 1701.
[24] Digital Personal Data Protection Act, 2023 (Act No. 22 of 2023).
[25] Pre-Conception and Pre-Natal Diagnostic Techniques (Prohibition of Sex Selection) Act, 1994 (Act No. 57 of 1994).
[26] Organisation for Economic Co-operation and Development (OECD), *Cross-border Data Flows and Data Governance* (OECD Publishing, 2022), available at: https://www.oecd.org (last accessed 15 April 2026).

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policies. Finally, patient confidence and the need to make sure that technological progress does not compromise the basic rights necessitate the protection of privacy.

5. Medical Negligence and Algorithmic Liability

The introduction of artificial intelligence as a part of radiological practice poses challenging questions about who should bear liability and whether the existing provisions on medical negligence doctrines can be applied. Medical law has traditionally viewed liability in terms of evaluating whether a medical professional has performed in a given manner that should be performed by a reasonably competent practitioner.[27] This professional judgment and clinical expertise-based standard gets hard to implement in such cases when decision-making in these situations is biased and, to some extent, transferred to algorithm systems.

One of the main questions is whether the use of AI changes the quality of care that radiologists should provide. On the one hand, AI tools could be considered as some sort of assistive technology that also increases the level of diagnostic accuracy, which improves the overall level of quality of practitioners who will gain access to such a system. Conversely, over-dependence on the products of algorithms can contribute to the decline in autonomous clinical judgment, especially in situations where the practitioner willingly takes AI-generated suggestions without due diligence.[28] In these cases, it becomes quite complicated legally to define whether an error has occurred due to human control or algorithm error.

The liability issue is made more complicated due to the participation of various stakeholders in the implementation of the AI systems, such as software developers, health facilities, and physicians. Should there be a diagnostic error, it is not immediately obvious who bears the responsibility, whether it be the radiologist who trusted the system, the institution which introduced the system or the developer who designed the system and provided training. This spreading of the responsibility is a challenge to the traditional fault-based model of negligence that is based on the possibility to identify certain acts or omissions that can be attributed to a particular individual.[29]

Moreover, AI systems have a high level of opaqueness, which presents an evidentiary problem in proving negligence. In deciding on whether the actions of a practitioner were below the accepted standard of care, courts normally depend on expert testimony to determine such actions. But in cases when the logic of an algorithm is not openly available or interpretable, it is hard to judge whether it was reasonable to rely on the output of the algorithm in the situation. This unaccountability can make it difficult to prove causation by claimants, or to justify their actions by practitioners.[30]

In India, medical negligence is considered in the wider context of tort law and consumer protection and the courts stress that reasonable care, skill, and diligence should be observed.[31]

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[27] *Jacob Mathew v. State of Punjab*, (2005) 6 SCC 1.
[28] Eric Topol, *Deep Medicine: How Artificial Intelligence Can Make Healthcare Human Again* (Basic Books, New York, 2019).
[29] Andrew Tutt, "An FDA for Algorithms" *Administrative Law Review* Vol. 69 (2017) 83.
[30] Frank Pasquale, *The Black Box Society* (Harvard University Press, 2015).
[31] *Indian Medical Association v. V.P. Shantha*, (1995) 6 SCC 651.

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The onset of AI in clinical decision-making requires a reevaluation of these principles, especially regarding the degree to which the practitioners can reasonably trust the technological devices. One might say that the duty of care has now a duty to know the abilities and constraints of AI systems, and to make an independent judgment of their use.

Further, the potential of strict or no-fault liability regimes of AI-related harm have increasingly become the topic of scholarly discussion. Considering the unpredictability and complexity of machine learning systems, a transition to such systems can be discussed to guarantee the proper redress of patients. Nonetheless, any kind of such transition should be well-weighed against the necessity not to stifle innovation in medical technology.[32]

Finally, the introduction of AI in radiology makes the current legal principles inadequate to resolve the questions of fault, causation, and accountability. A subtlety is thus needed- that is, one that acknowledges the cooperative aspect of human and algorithmic decisions whilst making sure that a sense of accountability is established. This is necessary to maintain the rights of patients as well as the integrity of the medical profession in a more technology-oriented environment. Ethical and Governance Regulations.[33]

The fast-paced integration of artificial intelligence into radiological practice has surpassed the creation of a holistic regulatory framework that can effectively deal with its peculiarities. Although there are legal regimes in India which are partial in terms of offering guidance, they were not developed with the concept of algorithmic decision-making. Consequently, the regulation of AI in healthcare is still governed by a disjointed legal environment, which requires a close review of sector-specific laws and ethical standards.

When applied to radiology, there are statutory frameworks that take on specific importance because of the regulation of the diagnostic technologies and medical decision-making. The Pre-Conception and Pre-Natal Diagnostic Techniques Act, 1994 (PCPNDT Act) was created to curb the misuse of prenatal diagnostic methods, especially on the sex determination, and gives a binding duty on the medical practitioners on the use and release of diagnostic information.[34] The advent of AI-supported imaging devices into prenatal diagnostics brings up significant concerns regarding how these statutory requirements are met. As an example, the possibility of the algorithmic systems to detect or predict fetal qualities requires strict regulation to make sure that the technologies will not be used in a manner that will bypass the purposes of the Act.

Likewise, Medical Termination of Pregnancy Act, 1971 (MTP Act) regulates the circumstances, in which pregnancies can be lawfully terminated, and much attention is paid to medical opinion and consent of the patient.[35] The growing role of AI in recognizing fetal abnormalities or medical risks could have an impact on clinical decision-making within this framework. The statutory scheme however assumes that professional judgment is exercised by

[32] European Commission, *Liability for Artificial Intelligence and Other Emerging Digital Technologies* (2019), available at: https://ec.europa.eu (last accessed 15 April 2026).
[33] World Health Organization, *Ethics and Governance of Artificial Intelligence for Health* (2021), available at: https://www.who.int/publications/i/item/9789240029200 (last accessed 15 April 2026).
[34] Pre-Conception and Pre-Natal Diagnostic Techniques (Prohibition of Sex Selection) Act, 1994 (Act No. 57 of 1994).
[35] Medical Termination of Pregnancy Act, 1971 (Act No. 34 of 1971).

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registered medical practitioners, which begs the question of whether or how much algorithmic inputs can or should be utilized in such decisions.

The introduction of AI should thus be well coordinated with the legal provision that the decision-making process must end up with human qualified professionals. In addition to these particular enactments, the ethics of AI within the healthcare sector involves more than that. The idea of transparency, accountability, fairness and non-maleficence are crucial to making sure that technological innovation is not used to compromise the rights of patients.[36] The inability to explain most of the AI systems, along with the possibility of bias in the training data, indicate the necessity of regulatory mechanisms requiring at least some degree of transparency and auditability of algorithmic tools in clinical practice.

Currently, there is no specific legal framework that specifically tackles the issue of AI use in medicine in India. Although there is a certain level of control offered by general regulatory tools and professional regulations, they fail to fully reflect the intricacies that come with autonomous or semi-autonomous decision-making systems. This regulatory void demonstrates the necessity of the creation of AI-specific standards that should cover the aspects of validation, certification, distribution of the liability, and compliance with the ethical issues.[37]

Moreover, good governance should have statutory regulation, as well as institutional and professional accountability. Medical organizations have to implement internal guidelines regarding the implementation and supervision of AI systems, whereas medical workers should be provided with sufficient training to interpret and critically analyze algorithmic performance. Professional councils and regulatory bodies are also important in coming up with guidelines that incorporate technological competence and ethical medical practice.

Overall, AI governance in radiology requires a multidimensional system that will integrate the current legal regulations with emerging ethical principles. To make sure that technological innovation does not override the original principles of medical jurisprudence, a combination of regulatory innovation and long-term dedication to patient-centered care is necessary.

6. Challenges and Future Implications

Although the introduction of artificial intelligence into radiology has the potential to change the diagnostic accuracy and efficiency significantly, it introduces a set of challenges that have not been resolved yet and that have far-reaching implications on medical jurisprudence. These issues are not only technical but go down to the law, ethics, and institutional structures that govern healthcare practice.[38]

The issue of algorithmic bias is one of the primary issues. By definition, AI systems rely on the data used to train them, and any kind of imbalance or unrepresentative nature of this data

[36] Organisation for Economic Co-operation and Development (OECD), *OECD Principles on Artificial Intelligence* (2019), available at: https://oecd.ai (last accessed 15 April 2026).
[37] NITI Aayog, *Responsible AI for All: Approach Document* (Government of India, 2021), available at: https://www.niti.gov.in (last accessed 15 April 2026).
[38] World Health Organization, *Ethics and Governance of Artificial Intelligence for Health* (WHO, Geneva, 2021), available at: https://www.who.int/publications/i/item/9789240029200 (last accessed 15 April 2026).

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may lead to biased diagnostic results.[39] This casts grave doubts on the issues of equity and fairness in healthcare delivery, especially in a diverse population where differences in demographic and clinical characteristics may not be well-represented. Legal ramifications of such bias are also critical because they can lead to discrimination or unequal treatment claims, thus questioning the impartiality that is traditionally linked to medical decision-making.[40]

The increasing danger of excessive dependence on algorithmic systems is another important problem that is commonly referred to as automation bias. With the increased integration of AI tools into clinical practice, some practitioners tend to give disproportionate importance to algorithmic outputs, which may be at the cost of independent professional judgment.[41] This change does not only influence the quality of the clinical decision-making but also makes it difficult to hold responsibility in case of error. The strike of human skills and the help of machines thus becomes a sensitive and unstable issue.

The issue of explainability remains a major obstacle to a successful implementation of AI in healthcare. This failure of most of the systems to offer clear and understandable reasoning compromises legal accountability and trust of the patients.[42] In the absence of clear understanding of the decision making process, it is hard to evaluate the accuracy of algorithmic results, question faulty conclusions, or meet legal requirements of medical decisions that need to be justified by a reasoned decision.

Moreover, there has been high rate of technological advancement, which has surpassed the ability of the available regulatory mechanisms to respond in an effective manner. Other laws like the Pre-Conception and Pre-Natal Diagnostic Techniques Act, 1994 and the Medical Termination of Pregnancy Act, 1971 have been discussed previously and are not explicitly stated about the role of algorithmic systems. This brings about confusion in their application to the current practices and the necessity of dynamic and adaptive regulation mechanisms.[43]

In the future, further development of AI in the field of radiology is expected to further change the way medical practice is conducted. The growing complexity of predictive analytics and decision-support systems can cause the redefining of the professional role, as radiologists might be more of an interpreter and a supervisor of technology, and less of a first-line diagnostician.[44] This change requires the appropriate alterations in medical education, professional training, and legal norms of competence and responsibility.

Concurrently, there is an increasing necessity to build stronger governance systems that will be able to strike the right balance between innovation and the safeguarding of patient rights.

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[39] Solon Barocas and Andrew Selbst, "Big Data's Disparate Impact" *California Law Review* Vol. 104 (2016) 671.
[40] OECD, *OECD Principles on Artificial Intelligence* (2019), available at: https://oecd.ai (last accessed 15 April 2026).
[41] Raja R. Guzman and Michael Inouye, "Artificial Intelligence in Clinical Decision-Making: Risks of Automation Bias" *BMJ* Vol. 360 (2018) k1145.
[42] Frank Pasquale, *The Black Box Society* (Harvard University Press, 2015).
[43] Pre-Conception and Pre-Natal Diagnostic Techniques (Prohibition of Sex Selection) Act, 1994 (Act No. 57 of 1994); Medical Termination of Pregnancy Act, 1971 (Act No. 34 of 1971).
[44] Eric Topol, *Deep Medicine: How Artificial Intelligence Can Make Healthcare Human Again* (Basic Books, New York, 2019).

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These involve setting up of clear rules on how AI is used, auditing and validation mechanisms of algorithmic systems and integrating ethical considerations in its design and implementation.[45] The global trends in AI regulation also have the potential to impact domestic strategies, which is why it is significant to engage in comparative efforts in the future policy development.

Finally, the issues of AI in radiology are the reasons to have a proactive and progressive attitude to medical jurisprudence. With the ever-changing nature of technology, the law should continue to change in a way that preserves the overall principles of autonomy, accountability, and justice, whilst taking into account the transformative potential of algorithmic decision-making in healthcare.

7. Conclusion

Artificial intelligence in radiology is a paradigm change in the organization and dynamics of medical decision-making, as digital assistance at the interface of algorithms and clinical judgment becomes a new model of medical decision-making. Although this innovation has no doubt contributed to the increased efficiency and accuracy of diagnostic processes, it also casts significant doubts on the field of medical jurisprudence, especially the aspects of patient autonomy, informed consent, data privacy, and professional responsibility.

As has been shown in this paper, the obscurity of most of the AI systems makes it difficult to explain to the patients the processes of diagnosis in detail, which questions the conventional conception of informed consent. Equally, the growing dependence on algorithm-generated data can potentially undermine the practice of the independent clinical judgment, and, thus, the question of whether patient autonomy can be preserved in the technologically mediated healthcare setting is hard to answer. Simultaneously, the vast amounts of sensitive medical information used to train and run AI systems highlight the pressure to have powerful data protection systems that can protect the confidentiality of patients.

On the side of liability, the spread of responsibility of the radiologists, healthcare facilities, and AI developers interferes with the well-established doctrines of medical negligence, the traditional basis of which is human-identifiable fault. This compels the reevaluation of the quality of care and the elaboration of more precise principles regulating accountability when it comes to cases of algorithmic decision-making. Moreover, even the current regulatory framework, such as the Pre-Conception and Pre-Natal Diagnostic Techniques Act, 1994 and the Medical Termination of Pregnancy Act, 1971, which is significant, does not have the necessary capabilities to tackle the challenges that AI-assisted diagnostics presents, which in turn exposes key gaps in the current legal framework.

To sum up, although artificial intelligence has the potential to transform radiology, its implementation should be tightly controlled to make sure that, with technological progress, the key principles of medical law are not violated. The development of a responsive and adaptive legal framework that would explicitly define the responsibility, reinforce the informed consent

[45] NITI Aayog, *National Strategy for Artificial Intelligence: #AIforAll* (Government of India, 2018), available at: https://www.niti.gov.in (last accessed 15 April 2026).

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procedures, and safeguard patient rights is highly demanded. The future of AI in radiology, however, should be informed by a moderate way of balancing innovation and the long-term ethical and legal obligations of patient-centric medical practice.