Perspectives

Radiology in India stands at the crossroads: Friends, foes, and the future

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Abstract

Radiology is one the most important and rapidly evolving modern diagnostic fields. It is facing significant challenges which makes it stand on crossroads in India. Regulatory pressures, technological shifts, and inter-specialty tensions pose real threats. While new technologies like Artificial Intelligence (AI) and teleradiology offer promising advances, they are accompanied by regulatory hurdles, professional encroachments, and workflow disruptions.

Keywords: Artificial intelligence, Communication, Malpractice, Medical errors, Radiology, Risk Management.

Introduction

Radiology, as a cornerstone of modern diagnostics, is evolving rapidly-but not without facing significant challenges. In countries where cultural and religious beliefs glorify male children to great extents, cases of female foeticide are prevalent. With the introduction of the pre-conception and pre-natal diagnostic techniques (PC-PNDT) act which prohibits sex detection of foetuses has significantly improved the trends towards female child sex ratio but the provisions of the act

put radiologists under a constant threat of violation. Even a minor clerical mistake can be a cognizable, non-bailable, and non-compoundable offence; therefore, this aspect of the act needs attention from law makers [1]. The widespread adoption of teleradiology enhanced the reach of radiology services to underprivileged and remote areas but the lack of parity in reimbursement to radiologists calls for need for national and international standardisation of this service. The various clinical departments especially super and sub specialities consider imaging in their respective fields as part of their domain and radiologists need to reclaim their relevance by enhancing their clinical and communication skills. In this write-up, we also highlighted another challenge which a practising radiologist encounters i.e. kickbacks, how making the approach patient-centric can eliminate middlemen. Another problem within the Indian setup is the mushrooming of private colleges and the consequent increase in MD seats, which is diluting the prospects for radiologists and undermining the integrity of the profession Radiology is evolving at an exponential pace with the advent of Artificial Intelligence, so the adoption and clinical integration of AI is the future [2]. The future with all anticipated caveats is promising for this field provided we change our education system as well as the training of young radiologist by involving them in the emerging era of Artificial intelligence. Although these new technologies like Artificial Intelligence (AI) and teleradiology offer promising advances, they are often accompanied by regulatory hurdles, professional encroachments, and workflow disruptions [3]. This editorial explores the key challenges and opportunities shaping the present and future of radiology in India.

The PC-PNDT Act: An Ethical Shield or a Legal Burden?

Challenges
The Pre-Conception and Pre-Natal Diagnostic Techniques (PC-PNDT) Act came into effect in 1994 at a time when illegal foetal sex determination was rampant, with some ultrasound reports guaranteeing the sex of the foetus. The alarming decline in the sex ratio necessitated strict legislation. The Act was amended in 2003 and 2011 to tighten its enforcement [4]. However, its implementation has often been seen as harsh— as radiologists are presumed guilty until proven innocent,

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a principle contrary to basic legal norms in the Indian Penal Code [5]. This has emerged as a major cause of professional stress among Indian radiologists [6].

Mitigation

Radiologists must be fully aware of their legal obligations under the Act. Simultaneously, there should be widespread public awareness about gender equality, the social evil of dowry, and the misplaced pride in having a male child. While the Act may have limitations, radiologists must strictly comply with its provisions to uphold its intended purpose [7]. A possible long-term solution is to shift focus towards tracking and protecting female foetuses throughout antenatal and perinatal care, ensuring that the Act's original intent is achieved through positive reinforcement and accountability.

Teleradiology: Expanding Access or Eroding Standards?

Challenges

Teleradiology has made it possible to extend radiology services to underprivileged and remote areas, but its implementation in India has been far from ideal. In practice, it often translates to underpaid and high-volume reporting with suboptimal reimbursement. This economic model encourages overreporting with reduced quality and professional burnout [8,9]. Additionally, the absence of direct patient interaction and real-time discussions with clinical teams compromises comprehensive patient management, especially in complex cases [10].

Mitigation

Globally, teleradiology is an accepted and growing practice, and also in India, it plays a key role in improving healthcare access. However, it must be integrated into hospital-based systems without displacing radiologists from clinical roles [11,12]. Workload distribution, structured reimbursement models, and quality assurance mechanisms can transform teleradiology from a cost-cutting tool into a quality-enhancing solution.

Clinical Specialty Impingement: Collaboration or Competition?

Challenges

Subspecialties such as obstetrics, neurology, and gastroenterology increasingly rely on in-house imaging capabilities, sidelining radiologists. These clinical departments consider imaging in their respective fields as part of their domain. At the same time, radiologists are retreating from clinical discussions, often due to excessive workloads and lack of updated clinical knowledge [13,14].

Mitigation

To reclaim their relevance, radiologists must enhance their clinical understanding and communication. Sub-specialization within radiology is essential to match the depth of knowledge in clinical departments. Diseases often span multiple organ systems and require multimodality imaging expertise—something only trained radiologists can provide [13]. Collaboratively, patient-centered care should be the goal, rather than siloed practice.

Elephant in the Room: Culture of Cut-Practise

Challenges

As radiology is dependent on clinical branches to refer patients to a radiologist, this system is highly abused by referring doctors. No patient will be referred to you unless you give a substantial amount in the form of kickbacks to the referring doctor in some cases the kickbacks can be as high as 50 percent of the total cost of the imaging modality, whether it is X-ray, ultrasound, CT or MRI.

Mitigation

If competence is equal, one clear differentiator could be pricing—charging less and passing the savings on to patients. Another is developing a more patient-centric and engaging practice, prepare personalized reports, or send tailored WhatsApp/SMS messages to the patient [15].

Artificial Intelligence: Threat or Ally?

The Hype

In 2016, AI pioneer Geoff Hinton predicted that radiologists would become obsolete within five years. This prediction has not materialized, for which later he publicly acknowledged his mistake in 2025 [16]. Dr. Nicola Strickland, Past President of the Royal College of Radiologists from 2016-2019, more realistically advised focusing AI development on "low hanging fruit" like normal chest X-rays. In 2021, Dr Paul J. Chang, a professor of radiology and a vice chairman of Radiology Informatics at the University of Chicago, described the state of the landscape for implementing Artificial Intelligence (AI) in radiology as a 'trough of disillusionment' [17]. AI has undeniably improved workflow and reduced repetitive tasks like lesion measurements [18], but interpreting images in isolation does not constitute practicing radiology.

The Reality

Radiologists' role go beyond image interpretation. It involves clinical judgment, communication with referring physicians, and integrating multiple data sources to form a diagnosis. Appropriate communication is becoming more and more important in the current era of application of generative Artificial Intelligence to the radiological world [19]. AI, often trained on single-modality inputs like X-rays or CT scans, lacks the nuanced understanding of patient history, physical findings, and lab results that human clinicians routinely use [20].

For example, post-surgical intracranial haemorrhages can be misinterpreted by AI and pulmonary embolism detection has failed in up to 10% of preliminary AI assessments [20]. Current AI models are based on convolutional neural networks (CNNs) that work on image pixel values. Even basic patient demographics are frequently omitted from AI pipelines [20].

The Way Forward

Radiology systems like HIS and RIS are evolving to enable integration of electronic medical records, pathology, biochemistry, and imaging. This creates opportunities

for holistic AI-powered tools that support—rather than replace—radiologists [21-24].

With radiologists interpreting between 10,000 to 15,000 images per shift, fatigue and diagnostic errors present actual concerns [21,22]. However, AI should focus on complementing radiologists through better data aggregation, structured reporting, and bidirectional communication between radiologists and clinicians [25].

A correct clinical history and context provided in imaging requisitions dramatically improve reporting accuracy, while poor-quality information can lead to harmful misinterpretations [22-27].

Ultimately, AI is a tool—not a competitor. A picture may be worth a thousand words, but when those words are structured, informed, and contextualized, they become invaluable to patient care. According to the Summary of the Proceedings of the International Forum 2021, instead of making the radiologists obsolete, AI will allow them to reposition themselves and increase their visibility by positioning them technology leaders in the inevitable change that will affect the whole of medical profession [28].

Conclusion

Radiology in India stands at a complex crossroad. Regulatory not only pressures, technological shifts, and inter-specialty tensions pose real threats—but also creates opportunities for reinvention. A proactive approach that balances compliance, specialization, and technological integration can redefine a radiologist's role. In this landscape, a radiologist is not a passive image interpreter but a clinical partner, data integrator, and patient advocate—supported, not replaced, by machines.

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