# Impact of artificial intelligence in enhancing diagnostic accuracy and efficiency in radiology: A focus on medical imaging and disease detection

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## ABSTRACT

**Introduction:** Artificial intelligence (AI) has emerged as a transformative tool in radiology, offering significant advancements in diagnostic accuracy and efficiency. With an emphasis on medical imaging and illness detection, this study assesses how AI may improve radiological diagnostics. It specifically evaluates how successfully AI systems diagnose diseases compared to human radiologists, focuses on how AI might minimize diagnostic delays, and analyses the challenges of implementing AI in clinical practice. **Materials and Methods:** The information in this review was obtained from selected papers published between 2017 and 2025, sourced from electronic databases such as PubMed, ScienceDirect, and Google Scholar, using keywords such as "Artificial Intelligence (AI)", "radiology", and "medical diagnosis". **Results:** An overview of existing literature demonstrates that Artificial Intelligence (AI), particularly deep learning-based systems, significantly enhances diagnostic accuracy and efficiency in radiology. AI models such as Convolutional Neural Networks (CNNs) have shown comparable or even superior performance to human radiologists in detecting diseases like lung cancer, breast malignancies, fractures, and intracranial haemorrhages. These AI systems reduce human error, support faster clinical decision-making, and improve sensitivity and specificity in image interpretation. Furthermore, AI integration has contributed to minimizing diagnostic delays, especially in emergency settings, by prioritizing critical cases and reducing average diagnosis time by up to 96%. In addition to clinical benefits, AI has improved radiographic workflow efficiency and reduced radiologists' workload. However, despite its promising impact, challenges such as algorithm bias, ethical concerns, legal barriers, and technological limitations continue to hinder full-scale implementation. Addressing these challenges through multidisciplinary collaboration, rigorous model validation, and integration of AI training in medical education is essential for ensuring effective and safe adoption of AI in radiology. **Conclusion:** AI integration in radiology enhances diagnostic accuracy and efficiency, comparable to human radiologists in disease detection. It streamlines workflows and reduces delays but faces challenges like ethical concerns and limited AI literacy. Continued research and collaboration are key to safe, effective adoption.

Keywords: Artificial Intelligence (AI); radiology; medical diagnosis