introduces the Ethical Entrustment Model, a framework designed to safeguard professionalism while leveraging AI's potential.

Methods: A systematic analysis of governance models, academic literature and real-world case studies was conducted to assess AI integration's ethical and operational risks. The proposed Ethical Entrustment Model emphasises competency validation, transparent task delegation and accountability mechanisms. Educational strategies, such as embedding digital literacy and ethical reasoning into clinical training, ensure alignment with professional standards and real-world healthcare priorities. The framework also fosters interdisciplinary collaboration, helping radiologists, clinicians and allied health professionals navigate AI integration through shared accountability and communication strategies.

Results: The findings reveal AI's limitations in nuanced clinical reasoning and its propensity for algorithmic bias. Transparency emerged as essential for patient trust, underscoring the need for clinician oversight in AI-driven diagnostics and triage. In radiology, where AI-driven diagnostic tools increasingly support clinicians, the model provides guidance for balancing automation with human oversight, ensuring ethical and accountable practices in AI interpretation. Additionally, the model addresses equity issues in AI deployment by ensuring transparent processes and mitigating biases that disproportionately affect underserved populations. Embedding AI literacy into clinical training further equips healthcare professionals to critically evaluate and safely adopt AI in practice. Scenario-based simulations aligned with the Ethical Entrustment Model prepare clinicians for real-world decision-making challenges, fostering confidence in ethically navigating AI integration. Cultural competence training is incorporated to ensure AI systems reflect the diverse populations they serve, enhancing trust and equity.

Conclusion: Embedding professionalism into AI integration strategies is critical for maintaining patient trust and clinician confidence. While this research focuses on AI, the Ethical Entrustment Model also provides a framework for addressing workforce challenges, such as the expanding roles of allied health professionals (AHPs) and physician associates (PAs). This framework contributes to the broader discourse on education and governance in healthcare AI, offering practical strategies for managing the ethical complexities of AI adoption. Future research will evaluate the model's impact on clinical practice and explore its adaptability to emerging AI technologies, including imaging-specific applications.

00230

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EVALUATING THE ENVIRONMENTAL SUSTAINABILITY OF AI IN RADIOLOGY: A SYSTEMATIC REVIEW OF CURRENT PRACTICE

Rachel M. Thomson[1], Jesus Perdomo Lampignano[1], Euan Fisher[2], Gowsikan Jeyakumar[2], Cindy Wati[3], Sean Duncan[4], David J. Lowe[4]. [1] *NHS Education for Scotland;* [2] *NHS Greater Glasgow & Clyde;* [3] *University of Central Lancashire;* [4] *University of Glasgow*

Purpose: Data- and energy-heavy artificial intelligence (AI) technologies are increasingly applied in radiology, often without consideration of potential environmental consequences. We aimed to assess current practice in evaluating environmental sustainability (ES) impacts of AI-enabled clinical pathways in radiology.

Methods: We searched MEDLINE and Embase on 5 November 2024 for clinical radiology studies that used AI to aid in radiological diagnosis or intervention and discussed ES impacts. We included peer-reviewed, English-language studies published from 2015 onwards. Our primary outcome was any quantitative reporting of ES impacts (including carbon emissions, energy/water/mineral usage, waste generation/disposal and impacts on material environments), and our secondary outcome was any within-text qualitative discussion of ES impacts. For quantitative outcomes we conducted synthesis without meta-analysis based on effect size, with our secondary outcome synthesised narratively. The study was pre-registered with PROSPERO: CRD42024601818.

Results: Of 4,365 citations screened, 16 met our inclusion criteria. 6 reported quantitative ES outcomes, and 13 included qualitative discussion of ES. When applied to the same tasks, algorithms designed to be 'lightweight' (meaning less computationally intensive) generated from 2.19 to 17.15 times less carbon emissions (median 7.81, 16 datapoints) and from 1.60 to 751.62 times less energy consumption (median 3.22, 16 datapoints) compared with state-of-the-art alternatives, while maintaining similar or improved clinical performance. No studies compared ES outcomes for an AI-enabled pathway versus standard of care, and 70% of studies reporting only on our secondary outcome included just one sentence on sustainability. All included studies were published within the past four years, with most (75%) from 2023/24.

Conclusion: Despite increasing concern about the climate impacts of AI, environmental outcomes are rarely measured within evaluations of AI-enabled clinical pathways in radiology. However, evidence suggests designing AI products with sustainability in mind can substantially reduce their carbon footprint. Environmental sustainability should be better integrated into AI evaluation and procurement to ensure costs and benefits for both climate and health are fully considered.

00231

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AI-POWERED TRIAGE FOR ACUTE MSK MRI REQUESTS: IMPROVING WORKFLOW EFFICIENCY AND CLINICAL DECISION-MAKING

Walid Ali[1], Sabeeh Syed[2], Samiullah Dost[2]. [1] *NHS (University Hospitals Sussex);* [2] *NHS (GSTT radiology registrar)*

Purpose: This study investigates the utility of artificial intelligence (AI) in triaging acute musculoskeletal (MSK) magnetic resonance imaging (MRI) requests, focusing on justification assessment, urgency classification and protocol suggestion. The aim was to evaluate AI's ability to enhance radiology workflow efficiency by improving clinical decision-making and prioritisation.

Methods: MRI request forms for acute indications were collected from a local hospital and reviewed by radiologists, who assessed each case for justification (yes/no), urgency classification (immediate: scan within 6 hours, urgent: scan within 24 hours, non-urgent inpatient: scan within 72 hours) and protocol suggestion (eg, MRI knee, MRI spine). A large language model (LLM) analysed the same data, providing triage classifications and protocol suggestions. The AI's performance was evaluated against the radiologists' decisions using accuracy, sensitivity and specificity metrics.

Results: The AI demonstrated high performance in determining examination justification, achieving an accuracy of 98.18%, closely aligning with radiologists. For urgency classification, the overall accuracy was 56.36%, with a sensitivity of 100% for identifying cases requiring immediate scans and specificity of 90.57% for distinguishing non-immediate cases. The AI effectively identified all cases needing immediate scans but showed variability in distinguishing between urgent and non-urgent inpatient categories. Protocol suggestions showed moderate alignment, with an accuracy of 65.45%, highlighting the AI's ability to support radiologists in suggesting clinically appropriate imaging protocols.

Conclusion: AI demonstrates significant promise in automating aspects of MSK MRI triage, particularly in justification checks and identifying cases needing immediate scans. These findings highlight AI's potential to enhance radiology workflows, prioritise critical cases effectively and reduce radiologists' workload by automating repetitive tasks while maintaining high clinical accuracy.

00235

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A COMPARATIVE ANALYSIS OF ARTIFICIAL INTELLIGENCE AND HUMAN PERFORMANCE IN DETECTING WRIST FRACTURES ON X-RAYS USING MRI AS THE GOLD STANDARD

Subhasis Basu, Babalola Afolabi. *Wrightington, Wigan and Leigh NHS Foundation Trust*

Purpose: To compare the diagnostic accuracy of artificial intelligence (AI) and human readers in detecting wrist fractures across five anatomic zones using magnetic resonance imaging (MRI) as the gold standard.

Methods: A retrospective study was conducted involving 107 subjects referred to the radiology unit for wrist X-rays from 16 August 2023 to 15 August 2024. Patients were attending the scaphoid fracture clinic, and exclusions included those under 18 years, absent MRI scans or unavailable AI readings (41 patients). True positives (TP), false positives (FP), true negatives (TN) and false negatives (FN) were recorded, and diagnostic