

Sustainability in Radiology: How Can Imaging Services Go Green Without Compromising Care?

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Abstract

Radiology is central to modern healthcare yet contributes substantially to the carbon footprint of hospitals, with MRI and CT accounting for a large proportion of energy use even when idle. As health systems move toward net-zero targets, imaging services must reduce emissions without compromising diagnostic quality or patient safety. This review outlines practical, evidence-based strategies—supported by data and frontline experience—to make radiology more sustainable across five domains: imaging demand, energy efficiency, protocol optimisation, materials management, and digital practice. Reducing low-value imaging through appropriateness criteria, decision support, and referrer feedback lowers unnecessary radiation, avoids incidental findings, and shortens waiting times. Energy-saving interventions, such as scheduled standby modes, workstation power management, lean scheduling, and AI-assisted acceleration of CT/MRI, can cut per-scan consumption while improving workflow. Choosing lower-impact modalities and validated low-dose or abbreviated protocols maintains diagnostic confidence with reduced resource use. Waste can be curbed by redesigning interventional packs, expanding safe reusables, improving segregation, and adopting digital-by-default pathways. Optimising PACS infrastructure and expanding remote MDTs further reduce emissions from IT systems and travel. Robust governance—prospective validation, infection-control oversight, exception policies, and outcome audits—ensures patient safety remains paramount. Finally, sustainable procurement, refurbishment pathways, and a departmental culture of climate-aware practice embed long-term change. Greener radiology and high-quality care are not competing goals: when guided by evidence and safety metrics, sustainability initiatives can improve efficiency, reduce harm, and enhance patient outcomes while significantly lowering environmental impact.