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Adapting Advanced Technology for Sustainable Development in Dentistry with Eco-Friendly Practices and Patient Care: A Narrative Review

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Abstract

Sustainability in dentistry is receiving increasing global attention due to the environmental impact of conventional dental practices, including excessive plastic use, hazardous waste generation, and high energy consumption. Integrating digital workflows, artificial intelligence (AI), biodegradable materials, and energy-efficient systems is transforming modern dentistry by minimising waste, reducing carbon emissions, and optimizing resource utilization. The One Health approach, which highlights the interconnection between human, animal, and environmental health, further emphasizes the importance of sustainable practices. This narrative review examines the role of advanced technologies in promoting eco-friendly dentistry, focusing on digital innovations, AI-driven automation, energy-efficient equipment, and sustainable materials. It also explores waste management strategies, regulatory challenges, and future directions for implementing green dentistry. By embracing these technologies, the dental industry can significantly reduce its ecological footprint while improving patient care and clinical efficiency.

Keywords: sustainable dentistry, digital workflows, artificial intelligence, CAD/CAM, biodegradable materials, eco-friendly dental clinics, One Health, waste management

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