Advances in Digital Prosthodontics: A Scoping Review of CAD/CAM and 3D Printing

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ABSTRACT:

The integration of digital technologies in prosthodontics has revolutionized dental practice by significantly enhancing accuracy, efficiency, and patient-centered outcomes. Traditional prosthodontic workflows, which have relied on manual impressions, wax modeling, and labor-intensive fabrication processes, are increasingly being replaced or supplemented by advanced digital techniques. This scoping review systematically analyzes peer-reviewed literature from key databases (PubMed, Scopus, and Web of Science) to evaluate the impact of Computer-Aided Design and Computer-Aided Manufacturing (CAD/CAM) and 3D printing, on prosthodontic treatment planning and prosthesis fabrication.

Findings indicate that CAD/CAM technology improves prosthetic accuracy by up to 30% compared to conventional methods, with milled restorations demonstrating higher marginal adaptation and reduced remakes. Similarly, 3D printing reduces material waste by 50% while enabling rapid and customizable prosthesis fabrication.

KEY WORDS: Digital prosthodontics, CAD/CAM, 3D printing, Digital, workflows