EAS Journal of Dentistry and Oral Medicine
Abbreviated Key Title: EAS J Dent Oral Med
ISSN: 2663-1849 (Print) & ISSN: 2663-7324 (Online)
Published By East African Scholars Publisher, Kenya

OPEN ACCESS

Volume-8 | Issue-1 | Jan-Feb-2026 | DOI: https://doi.org/10.36349/easjdom.2026.v08i01.003

Review Article

Digital Dentistry in Routine Clinical Practice: Applications and Advancements

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Article History
Received: 07.10.2025
Accepted: 26.11.2025
Published: 13.01.2026

Journal homepage:
https://www.easpublisher.com

Quick Response Code

Abstract: ***Background***: Digital dentistry has transformed clinical workflows across multiple dental specialties, offering enhanced accuracy, efficiency, and patient-centered care. Advances in intraoral scanning, CAD/CAM systems, CBCT imaging, 3D printing, artificial intelligence, and virtual planning have redefined diagnosis, treatment planning, and restorative procedures. ***Objective:*** This review aims to provide a comprehensive overview of digital dentistry applications in routine clinical practice, highlighting current technologies, clinical benefits, limitations, and future directions. ***Methods***: A narrative review of contemporary literature was performed, focusing on digital workflows in prosthodontics, implant dentistry, orthodontics, restorative dentistry, endodontics, periodontics, and oral surgery. Emerging technologies, including AI-driven treatment planning, digital twins, teledentistry, cloud-based ecosystems, and automation, were examined. ***Results:*** Digital technologies enhance clinical accuracy, reduce chairside and laboratory time, improve patient communication, and enable predictable, reproducible outcomes. They also support better documentation, data management, and environmentally friendly workflows. Limitations include high initial costs, technical learning curves, interoperability challenges, and limited long-term evidence for certain innovations. Future trends suggest fully digital clinics, AI-assisted decision-making, patient-specific digital twins, integrated teledentistry, and cloud-based collaborative platforms. ***Conclusion***: Digital dentistry is increasingly becoming integral to routine clinical practice, offering substantial improvements in precision, efficiency, and patient care. While challenges remain, ongoing technological advancements, training, and research will continue to expand its adoption and impact across all dental specialties.

Keywords: Digital Dentistry, CAD/CAM, 3D Printing, Artificial Intelligence, Teledentistry, Clinical Workflows.

1. INTRODUCTION

Digital dentistry refers to the use of computer-assisted technologies and digital tools in the diagnosis, planning, and delivery of dental care. It includes intraoral scanners, cone-beam computed tomography (CBCT), CAD/CAM systems, 3D printing, artificial intelligence (AI), and virtual treatment planning platforms [1, 2]. These technologies have revolutionized traditional workflows by increasing precision, reducing chairside time, and improving patient outcomes [1].

The concept of digital dentistry can be traced back to the 1970s and 1980s, when CAD/CAM systems were first introduced to fabricate dental restorations. Early systems, such as the CEREC 1 system developed in 1985, allowed chairside milling of ceramic crowns, representing a significant shift from purely manual methods [3, 4]. Since then, digital technologies have evolved rapidly: intraoral scanners became more accurate, CBCT provided three-dimensional diagnostic capabilities, and 3D printing enabled rapid fabrication of

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surgical guides, prostheses, and models [5, 6]. Clinical expectations have shifted toward technology-driven solutions that enhance diagnostic accuracy, treatment precision, and workflow efficiency. Digital workflows, such as the combination of intraoral scanning, CAD/CAM, and 3D printing, are increasingly preferred over conventional methods because they allow superior standardization, reproducibility, and integration across multiple dental specialties [6, 7]. Conventional workflows, in contrast, often involve multiple manual steps, higher variability, and a greater potential for human error. Digital workflows minimize these issues while supporting evidence-based decision-making [6].

The purpose of this review is to provide a comprehensive overview of the applications and advancements of digital technologies in routine dental practice. It aims to summarize current clinical uses, highlight recent innovations, discuss benefits and limitations, and provide insights into future developments. By comparing digital workflows with conventional methods, this review emphasizes how digital dentistry is reshaping modern clinical practice and establishing new standards for precision, efficiency, and patient satisfaction.

2. Digital Dentistry in Daily Clinical Workflow

Digital technologies have become essential components of routine dental workflows, beginning from patient assessment to diagnosis and treatment planning. These tools improve clinical accuracy, enhance communication, and streamline procedures across specialties.

2.1 Patient Assessment & Data Collection

2.1.1 Digital Records

Digital patient records are increasingly replacing paper-based systems, allowing seamless storage of clinical images, radiographs, treatment plans, and 3D data. Electronic patient management systems improve information accessibility, support interdisciplinary communication, and reduce documentation errors [8]. The integration of digital imaging and 3D patient files allows clinicians to monitor treatment progression more consistently than conventional methods [9].

2.1.2 Intraoral Scanning vs. Conventional Impressions

Intraoral scanners (IOS) have become integral to modern patient assessment. IOS provide high accuracy for capturing dental arches, reducing distortions associated with traditional impression materials such as polyvinyl siloxane and alginate [10]. Studies show that digital impressions improve patient comfort, reduce procedural time, and eliminate steps such as disinfection, cast pouring, and storage [11]. Compared to conventional impressions, IOS workflows demonstrate equal or superior precision, especially for single crowns and short-span restorations [12].

2.1.3 Digital Photography

Digital photography is widely used for documentation, treatment planning, and patient communication. It facilitates smile analysis, shade matching, and esthetic evaluation, especially when integrated with digital smile design software [13]. High-resolution images support accurate diagnosis and enable remote consultations and tele-dentistry applications.

2.1.4 Extraoral Face Scanners

Face scanning technologies capture 3D facial morphology, enhancing esthetic planning and prosthodontic workflow. These scanners allow integration of facial data with intraoral scans, enabling more harmonious smile design and prosthesis fabrication [14]. Optical facial scanners and photogrammetry systems offer non-invasive methods to obtain accurate soft-tissue data.

2.2 Digital Diagnostics

2.2.1 CBCT in Routine Evaluation

Cone-beam computed tomography (CBCT) provides three-dimensional imaging for enhanced diagnosis and treatment planning. CBCT is used in implant placement, endodontic assessment, orthodontic evaluation, airway analysis, and oral surgery [15]. It offers improved anatomical visualization compared with 2D radiographs, allowing superior detection of root morphology, periapical lesions, and bone structures [16].

2.2.2 Digital Radiography

Digital radiography provides immediate image acquisition with reduced radiation dose compared to conventional film-based radiographs. It allows image enhancement, measurement tools, and storage in digital patient files [17]. The ability to adjust brightness, contrast, and magnification improves diagnostic performance.

2.2.3 AI-Assisted Radiographic Interpretation

Artificial intelligence systems assist clinicians by detecting caries, periodontal bone loss, periapical lesions, and other pathologies. AI algorithms trained on large datasets demonstrate accuracy comparable to experienced clinicians, improving consistency and early diagnosis [18]. AI-based software is increasingly integrated into digital radiography and CBCT platforms to support objective decision-making.

2.3 Treatment Planning

2.3.1 3D Treatment Planning Software

Digital planning software allows clinicians to design implant positions, orthodontic tooth movements, and prosthodontic restorations with enhanced precision. Implant planning software integrates CBCT and intraoral scan data to simulate implant placement, identify anatomical risks, and fabricate surgical guides [19]. In orthodontics, digital models enable virtual setups and clear-aligner planning, while prosthodontic CAD systems allow virtual crown design and occlusal optimization.

2.3.2 Virtual Articulators

Virtual articulators reproduce mandibular movements digitally, offering an alternative to mechanical articulators. They improve the accuracy of occlusion simulation and enhance esthetic and functional planning [20]. When integrated with IOS and facial scans, virtual articulators provide patient-specific dynamic occlusal analysis.

2.3.3 Digital Occlusion Analysis

Digital occlusal analysis tools measure bite force distribution, timing, and patient-specific occlusal patterns. These systems reduce subjective interpretation associated with articulating paper and enable objective assessment of occlusal contacts during restorative, orthodontic, and prosthodontic treatment [21].

3. Clinical Applications in Different Dental Specialties

Digital technology is now deeply integrated into almost every area of dentistry. Its applications support diagnostic accuracy, treatment predictability, communication, and workflow efficiency. The following subsections outline major specialty-wise applications and advancements (Figure 1).

3.1 Prosthodontics

3.1.2 Digital Impressions

Digital impressions obtained through IOS have become a central component of prosthodontic practice. IOS eliminates common errors associated with conventional impression materials such as dimensional instability, distortion, and void formation. They also improve patient comfort by avoiding impression trays and materials that may trigger gag reflexes. Digital impressions provide immediate visualization and allow chairside corrections, reducing remakes and adjustments. Studies consistently demonstrate that digital impressions yield clinically acceptable, and often superior, accuracy for single crowns and short-span fixed partial dentures compared with traditional impression [22].

3.1.2 CAD/CAM Crowns and Bridges

CAD/CAM technology enables both chairside and laboratory production of crowns, veneers, inlays, onlays, and fixed dental prostheses with high precision. These restorations benefit from controlled milling processes that eliminate variability associated with manual waxing and casting. Materials like zirconia, lithium disilicate, and resin hybrids exhibit improved mechanical properties and esthetics when processed through CAD/CAM systems. Systematic reviews report excellent clinical survival rates and marginal integrity for CAD/CAM restorations, supporting their widespread adoption in prosthodontic practice [23].

3.1.3 Digital Dentures

The workflow for digital dentures involves scanning edentulous arches, designing dentures through specialized CAD software, and fabricating them using milling or 3D printing. Digital dentures reduce patient visits, improve repeatability, and lower the risk of human error associated with conventional flasking and packing techniques. They also allow rapid reproduction of dentures if lost or damaged, as the design remains stored digitally. Clinical studies highlight improved fit accuracy, enhanced occlusal balance, and reduced chairside adjustments with digital denture protocols [24].

3.1.4 3D-Printed Provisional Restorations

3D printing enables rapid production of provisional restorations with good surface quality, color stability, and mechanical properties. These provisional restorations serve as functional mock-ups, allowing patients and clinicians to evaluate esthetics, occlusion, and phonetics before definitive treatment. Printed provisionals also facilitate immediate provisionalization in implant and full-mouth rehabilitation cases. Research shows that printed provisional crowns and bridges exhibit clinically acceptable fracture resistance and marginal fit, making them suitable for short- to medium-term use [25].

3.2 Implant Dentistry

3.2.1 CBCT + IOS Merging

Merging CBCT data with intraoral scans allows comprehensive visualization of both hard- and soft-tissue structures. This integration supports prosthetically driven implant planning, where implant positioning is dictated by the ideal restoration design rather than anatomy alone. The combined datasets offer a more accurate representation of the patient's oral condition, improving diagnostic precision and reducing surgical complications. Research confirms that CBCT-IOS merging improves planning accuracy and enhances surgical predictability [26].

3.2.2 Virtual Implant Planning

Digital implant planning software provides the ability to evaluate bone density, thickness, and anatomical risks such as the mandibular canal or maxillary sinus. Prosthetic components can be virtually designed and aligned with the intended implant position, allowing clinicians to anticipate esthetic and functional outcomes before surgery. This method significantly reduces guesswork and enhances interdisciplinary planning between surgeons and prosthodontists. Virtual planning is associated with improved placement accuracy and reduced surgical complications [27].

3.2.3 Guided Implant Surgery

Guided surgery involves fabricating stereolithographic surgical templates based on virtual planning files. These guides can be partially guided (drilling steps only) or fully guided (drilling and implant insertion). Guided surgery improves accuracy in implant angulation, depth, and mesiodistal positioning. It is particularly beneficial for complex cases like full-arch reconstructions or patients with limited bone availability. Studies show that guided surgery reduces postoperative discomfort, shortens surgical time, and enhances overall predictability [28].

3.2.3 CAD/CAM Custom Abutments

Custom abutments produced via CAD/CAM systems allow individualized emergence profiles, optimal soft-tissue contours, and improved esthetic outcomes. They can be fabricated in titanium, zirconia, or hybrid materials. CAD/CAM abutments show superior adaptation compared with prefabricated abutments and reduce the risk of peri-implant tissue recession. Evidence shows that custom abutments demonstrate better marginal accuracy and improved long-term esthetic stability in implant prosthodontics [29].

3.3 Orthodontics

3.3.1 Digital Models

Digital models have replaced traditional plaster models in many practices. They allow precise measurements, easy storage, and quick retrieval, improving workflow efficiency. Digital models also integrate seamlessly with planning software and clear aligner systems. They offer reliable accuracy comparable to or better than stone casts, making them suitable for diagnosis, treatment simulation, and progress tracking [30].

3.3.2 Clear Aligner Workflows

Clear aligner therapy is entirely dependent on digital technology. The workflow involves scanning the dentition, virtually staging tooth movements, and fabricating aligner trays through 3D printing. Digital planning allows clinicians to visualize predicted outcomes and adjust staging based on biomechanical principles. Aligner therapy has shown success in correcting mild to moderate crowding, spacing, and certain malocclusions. Digital workflows also enhance patient acceptance, as simulations help explain treatment progress and expected outcomes [31].

3.3.3 AI-Based Tooth Movement Predictions

AI algorithms analyze large amounts of orthodontic data to predict tooth movement patterns, treatment duration, and aligner efficiency. They improve planning accuracy by accounting for factors such as root morphology, bone density, and biomechanics. AI tools assist in refining digital setups, reducing mid-course corrections, and enhancing treatment predictability. Recent studies show that AI-assisted planning can achieve accuracy comparable to that of experienced orthodontists in treatment forecasting [32].

3.4 Restorative Dentistry

3.4.1 Chairside CAD/CAM Restorations

Chairside CAD/CAM enables same-day restorative treatments, providing convenience to both clinicians and patients. Digital workflows allow real-time margin evaluation, occlusal adjustments, and color customization before milling. Studies report high survival rates, excellent marginal adaptation, and favourable patient satisfaction with chairside CAD/CAM restorations compared with traditional laboratory-fabricated options [33].

3.4.2 Digital Shade Matching Systems

Traditional visual shade matching is prone to human error and environmental influences. Spectrophotometric and digital shade-matching devices provide objective color readings based on wavelength analysis. These systems enhance consistency and accuracy, particularly for anterior esthetic restorations where shade precision is critical. Research indicates that digital methods outperform visual techniques in repeatability and reliability [34].

3.4.3 Caries Detection Technologies

New caries detection technologies such as fluorescence-based cameras, near-infrared transillumination (NIRI), and digital fibre-optic transillumination provide non-invasive, radiation-free diagnosis of early enamel lesions. These systems complement traditional radiography and offer higher sensitivity in detecting incipient lesions that may not be visible on radiographs. Studies demonstrate improved early detection and reduced false negatives with these tools [35].

3.5 Endodontics

3.5.1 CBCT-Based Canal Mapping

CBCT significantly enhances endodontic diagnosis by revealing canal morphology, extra canals, periapical pathology, and root fractures that conventional radiographs often miss. It aids in identifying complex anatomies such as C-shaped canals, dens invaginatus, and calcified canals, allowing more accurate treatment planning. Evidence shows CBCT improves detection of periapical lesions and root canal variations, decreasing treatment uncertainties [36].

3.5.2 Guided Endodontic Access

Guided endodontics combines CBCT with IOS scans to design access guides for calcified or anatomically complex canals. This technique allows precise, minimally invasive entry paths and reduces the risk of perforation. Clinical studies show that guided access significantly increases success rates in locating obliterated canals and preserves more tooth structure compared to freehand access [37].

3.6 Periodontics
3.6.1 Digitally Guided Periodontal Surgeries
Digital workflows allow virtual planning of bone recontouring, regenerative procedures, and periodontal plastic surgeries. Guides fabricated via 3D printing improve precision by directing incisions, osteotomies, and flap designs. Studies report reduced surgical time, improved esthetic outcomes, and enhanced accuracy with digitally guided periodontal procedures [38].

3.6.2 Digital Crown-Lengthening Planning
Digital smile design combined with CBCT and IOS allows precise planning of esthetic crown lengthening. Soft-tissue and bone architecture can be superimposed to determine accurate gingival margins and bone recontouring levels. This improves predictability, reduces the need for chairside adjustments, and enhances patient acceptance of treatment plans [39].

3.7 Oral & Maxillofacial Surgery
3.7.1 Virtual Surgical Planning (VSP)
VSP enables surgeons to rehearse procedures such as orthognathic surgery, trauma reconstruction, and tumor resection digitally. By simulating skeletal repositioning, occlusion, and soft-tissue effects, VSP reduces intraoperative guesswork and enhances procedural accuracy. Studies demonstrate significant improvements in surgical efficiency, accuracy of bone movements, and postoperative outcomes when VSP is used [40].

3.7.2 3D-Printed Surgical Guides
3D printing allows fabrication of osteotomy guides, resection templates, and drilling stents that enhance precision during maxillofacial procedures. These guides reduce intraoperative time, enhance accuracy in bone cutting, and minimize complication risks. They are widely used in orthognathic surgery, mandibular reconstruction, and dental implant placement within surgical contexts [41].

3.7.3 Patient-Specific Implants (PSI)
PSIs, fabricated using CAD/CAM and 3D printing technologies, are increasingly used for the reconstruction of craniofacial defects, trauma, or tumor resection defects. Designed from CBCT data, PSIs offer superior adaptation, improved esthetic outcomes, and reduced surgical time compared with stock implants. Clinical evidence supports their use in orbital reconstruction, mandibular defects, and TMJ prostheses with high success rates [42].

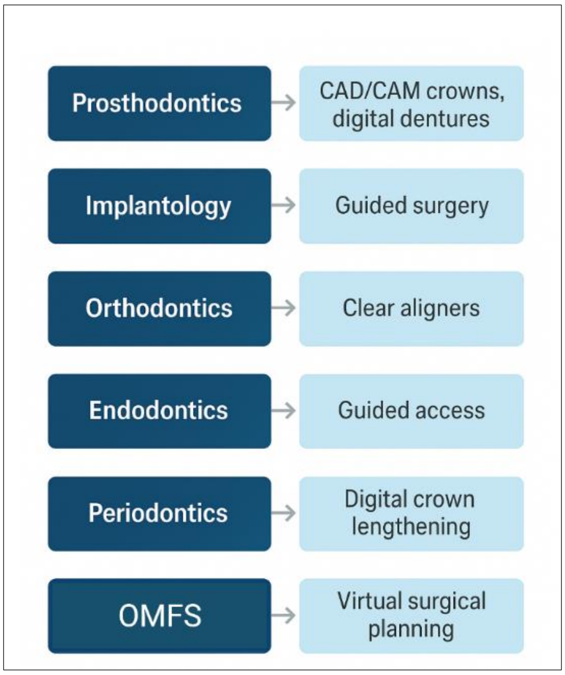

Figure 1: Digital dentistry in different dental specialties

4. Emerging Technologies in Routine Practice
Rapid advancements in digital tools continue to reshape everyday dental workflows. Several emerging technologies, previously considered experimental, are now becoming increasingly accessible in general practice. These innovations enhance diagnostic accuracy, streamline clinical procedures, and expand the possibilities for patient-centered care (Fig. 2).

4.1 Artificial Intelligence
4.1.1 Caries Detection
AI has become an important adjunct in early caries detection. Machine-learning algorithms trained on thousands of radiographs can identify subtle radiolucencies, incipient proximal lesions, and enamel demineralization that may be missed by the human eye. AI-assisted diagnostic software improves sensitivity and

reduces inter-clinician variability, making it a valuable tool in preventive and minimally invasive dentistry [43].

4.1.2 Oral Cancer Screening

AI models have shown promise in detecting suspicious lesions through intraoral photographs, autofluorescence images, and optical coherence tomography. These systems assist clinicians by identifying early mucosal changes, potentially improving early detection rates of oral squamous cell carcinoma. Such technology is especially beneficial in community screenings and tele-dentistry settings, where specialist access is limited [44].

4.1.3 Predictive Treatment Simulations

AI-driven simulations allow clinicians to anticipate treatment outcomes by analyzing patient-specific data, including occlusion patterns, bone density, periodontal status, and orthodontic movements. Predictive modeling helps in designing more precise implant positions, forecasting tooth movement trajectories in orthodontics, and estimating restoration longevity. This enhances clinical decision-making and improves communication with patients [45].

4.2 3D Printing

4.2.1 Impression Trays

3D printing allows rapid fabrication of customized impression trays tailored to each patient's anatomical features. These trays provide superior fit and uniform material thickness compared to stock trays, improving impression accuracy and patient comfort [46].

4.2.2 Surgical Guides

Surgical guides produced by stereolithography or digital light processing (DLP) printers enable precise implant placement, periodontal surgeries, and endodontic access. Their fabrication is faster and more cost-effective compared to outsourced milling, making guided procedures more accessible in routine practice [47].

4.2.3 Provisional Restorations

3D-printed provisional crowns and bridges are increasingly used due to their good esthetics, strength, and affordability. Printing allows rapid turnaround, often within an hour, making same-day provisionalization feasible. These provisionals also serve as a functional blueprint for evaluating occlusion, contours, and patient preferences before fabricating the final restorations [48, 49].

4.3 Augmented Reality (AR) and Virtual Reality (VR)

4.3.1 Demonstrating Treatment Outcomes

AR tools can overlay virtual restorations, implant positions, or orthodontic results directly onto the patient’s face or dentition, enabling visual communication of expected outcomes. This enhances patient understanding and increases treatment acceptance by providing realistic previews before procedures begin [50].

4.3.2 Patient Education

VR modules allow patients to visualize dental anatomy, disease progression, and procedural steps in an immersive environment. This improves comprehension, reduces anxiety, and supports informed consent by simplifying complex clinical explanations [51].

4.3.3 Training and Simulation

VR simulators with haptic feedback offer realistic training environments for dental students and practitioners. They allow repeated practice of procedures such as cavity preparation, implant placement, and surgical flap design without patient risk. These systems also support objective assessment of clinical skills [52].

4.4 Robotics & Automation

4.4.1 Robotic Implant Placement (Emerging)

Robotic systems for implant placement are gaining attention due to their potential for enhanced accuracy and real-time intraoperative adjustments. These systems combine CBCT data, optical tracking, and robotic arm positioning to guide drilling trajectories. While adoption is still limited, robotics is expected to become increasingly relevant as technology becomes more affordable and user-friendly [53].

4.4.2 Automated Tooth Setup in Dentures

Automation is transforming denture fabrication through AI-driven tooth arrangement systems. Software can automatically generate tooth setups based on esthetic principles, occlusal schemes, and patient-specific anatomical data. Automated setups reduce technician workload, improve standardization, and accelerate digital denture production [54].

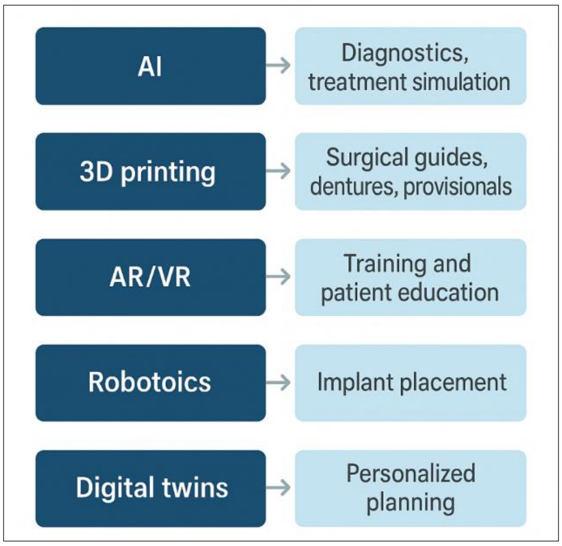

Figure 2: Emerging Technologies

5. Benefits vs. Limitations of Digital Dentistry

Digital dentistry enhances clinical practice through improved accuracy, efficiency, and predictability. Tools like intraoral scanners, CAD/CAM systems, and 3D printing reduce errors, shorten appointments, and improve restoration quality. Digital visualization aids patient communication, while digital records streamline documentation. However, high costs, training demands, technical issues, and limited long-term evidence pose barriers to adoption. Successful integration requires balancing these benefits with practical limitations [55-57] (Table 1).

Table 1: Benefits and Limitations of Digital Dentistry

Benefits of Digital Dentistry	Limitations & Barriers
High accuracy and reduced distortions	High initial investment cost
Faster workflows and fewer appointments	Steep learning curve for clinicians/staff
Better patient communication & visualization	Technical malfunctions and maintenance needs
Predictable, reproducible outcomes	Lack of interoperability between systems
Reduced material waste & eco-friendly	Frequent training and software updates required
Improved digital record-keeping & storage	Limited long-term clinical evidence for some technologies

6. Future Directions

As digital technologies continue advancing, dentistry is moving toward more integrated, intelligent, and patient-centered systems. Several emerging trends indicate the future trajectory of routine dental practice.

6.1 Fully Digital Dental Clinics

Future clinics are expected to operate almost entirely digitally, from patient intake and diagnostics to treatment planning and fabrication. Seamless integration of intraoral scanners, CBCT imaging, CAD/CAM systems, and 3D printing will allow chairside production of prostheses, real-time diagnostics, and minimally invasive workflows. These clinics will reduce treatment time, lower human error, and enhance clinical predictability [58].

6.2 AI-Driven Automated Treatment Planning

Artificial intelligence will increasingly support automated decision-making by analyzing radiographs, diagnostic scans, clinical images, and patient records. AI tools may soon generate preliminary treatment plans for orthodontics, implants, caries management, and prosthodontic rehabilitation. This automation can improve precision, standardize care, and assist clinicians in complex diagnostic scenarios [59].

6.3 Digital Twins (Patient-Specific Dental Replicas)

A digital twin is a dynamic 3D digital replica of a patient's oral structures that evolves with new data inputs. Digital twins enable simulation of occlusal changes, orthodontic tooth movements, implant loading, and restorative designs before actual treatment. This technology supports personalized treatment planning, risk assessment, and long-term monitoring [60].

6.4 Teledentistry Integration with Digital Workflows

Teledentistry will expand beyond consultations and screening. Integration with intraoral scanners, remote case review, AI-based diagnostics, and cloud-sharing platforms will enable clinicians to manage routine follow-ups, orthodontic progress checks, and treatment planning remotely. This will be particularly valuable in rural, underserved, and mobile patient populations [61].

6.5 Cloud-Based Data Ecosystems

Cloud platforms will increasingly centralize digital records, imaging files, design libraries, and laboratory communication. This will enable real-time collaboration among dentists, specialists, technicians, and AI tools. Cloud ecosystems improve data security, simplify storage, and support continuity of care across multiple locations [62].

7. CONCLUSION

Digital technologies have fundamentally transformed routine dental practice, offering unprecedented improvements in diagnostic accuracy, workflow efficiency, and patient engagement. This review highlights how tools such as intraoral scanners, CAD/CAM systems, 3D printing, CBCT imaging, artificial intelligence, and virtual planning platforms contribute to predictable and reproducible clinical outcomes across dental specialties.

The transition toward digital dentistry is not merely a technological shift but an essential evolution in modern clinical practice. As patient expectations rise and treatment options expand, digital workflows provide clinicians with the precision, communication tools, and adaptability needed for contemporary care. However, successful implementation requires ongoing training, investment in infrastructure, and continuous evaluation of emerging evidence.

Looking forward, advancements such as AI-driven automation, digital twins, integrated teledentistry, and cloud-based ecosystems will further shape the future of dentistry. These innovations promise to enhance treatment personalization, improve accessibility, and elevate overall clinical quality. Ultimately, digital dentistry will continue playing an increasingly central role in routine practice, driving dentistry toward a more efficient, accurate, and patient-centered future.

8. Source of Support: Self.

9. Conflict of Interest: Nil.

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Cite This Article: Ileana Vanessa Picado Duarte, Niharika Rambhatla, Ajuwon Olumide Daniel, Avantika Karthik, Kiranprasad Chileveru, Mounica Pinnamaneni, Sandeep Singh (2026). Digital Dentistry in Routine Clinical Practice: Applications and Advancements. *EAS J Dent Oral Med, 8*(1), 9-18.