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How digital dentistry and radiology are transforming oral healthcare

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Teleradiology has opened up unprecedented possibilities for accurate and timely diagnosis



Oral health care is undergoing a remarkable transformation, fueled by the rapid integration of advanced technologies. At the forefront of this evolution is digital dentistry, which refers to the use of digital tools and techniques in modern dental practice. This shift is redefining how dental care is delivered, making processes more streamlined and precise.

From early diagnostics to detailed treatment planning and improved patient care, technology-driven dentistry is setting new standards in efficiency, accuracy, and overall patient. For over a century, dentistry relied heavily on manual techniques and analogue tools. Traditional practices involved physical impressions, conventional X-rays, and hand-operated instruments.

While effective for their time, these methods were often associated with discomfort, inconvenience, and occasional inaccuracies. Procedures such as crowns and bridges were particularly time-consuming, frequently requiring multiple appointments to complete. However, the advent of the intraoral scanner, digital radiography, CAD/CAM, 3D printers have revolutionized the field of dentistry as we know it today.

In the realm of radiology, digital radiography has considerably reduced patient exposure in image generation time for 2D imaging. Conventional procedures like developing, fixing which are time consuming are avoided and images are seen in seconds. This accelerates decision making and treatment planning.

With evolution of 3D imaging in form of CBCT i.e cone beam computed tomography, digital dentistry reached new horizons. 3D imaging of the structures was possible. It enabled accurate planning with more predictable treatment outcomes. CBCT brings specific and unique diagnostic benefits in orthodontics, endodontics, oral surgery fields. Fabrication of virtual models with the use of CBCT and intraoral scanning is possible to help clinicians plan the surgery beforehand. Traditionally with the help of IOPAs it was difficult to identify crack lines or fractures in the tooth but now with the advent of CBCT, even minor cracks can be identified easily with a quick scan which ultimately gives us the prognosis of the tooth, thereby reducing frequent patient visits and follow ups.

Teleradiology has opened up unprecedented possibilities for accurate and timely diagnosis. High quality radiographic images using 3D technologies like CBCT images can now be transmitted and interpreted remotely which accelerates the diagnostic process and helps clinician to make their treatment plans. CBCT plays a pivotal role in giving clinicians the precise and detailed images of the teeth and surrounding tissues as it gives sub-millimeter resolution.

One of the most significant advantages of digital dentistry is the high level of accuracy it offers. It has enhanced patient experience by eliminating the need for messy impressions, offering a quicker, cleaner, and more comfortable experience for patients.

3D printing has taken implantology to new heights with the introduction of surgical guides. The accuracy of the surgical guides has led to less implant failures and increased its' longevity.

Flapless Guided surgery with the help of CBCT superimposition offer advantages like no cuts, no sutures, reduced intraoperative bleeding and reduced postoperative trauma due to the precision of implant placement and shorter surgical time

increasing patient comfort.

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