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Artificial Intelligence in Dental Practice

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Editorial

Artificial intelligence (AI) is a broader concept that includes “machine learning”, process to think, learn and perform human like activities. The term “Artificial Intelligence” was coined in the year 1956. With a fast-growing pace, AI has touched every aspect of human’s life where health and dental sector is found no-were untouched. The AI-based solutions have profound impact on the patients of far-off rural areas with very limited or no access of the professionals.

In the dental sciences, AI has a tremendous impact on the diagnosis of different oral diseases. The advanced technology has made the risk assessment and pre-operative stratification of disease much easier than before. AI plays an invincible role in the field of 2-dimensional and 3-dimensional digital radiographic scans including orthopantomograph and cone beam computed tomography (CBCT). AI-based solutions help in early diagnosis and effective treatment plans that can reach a larger population within no time and shortage or inaccessibility of health professionals to far off rural areas falls no excuse anywhere. The technology-based solutions help in linking the medical literature with the details of patient including his laboratory and radiographic reports and then providing him with the best available treatment option. Although machines and technology is controlled by humans, still they have an upper hand at least in the terms of working hours.

The AI-based customized orthodontic solutions are the most recent innovation in dental field which is enabling the dentists to accurately decide the best treatment outcome beforehand. The aligners (like

braces) that are used to straighten the crooked teeth and bring the best smile on face are designed based on AI solutions and found to have better control over the forces applied on the teeth during the process.

Computer aided design (CAD) and computer aided milling (CAM) technology that helps in designing the artificial tooth is a quantum leap in the world of dentistry. The aesthetic requirements of patient are fulfilled by the machine-based restorations of dental cavities. The 3-dimensional scans and models help in precise fit of oral and maxillofacial prosthesis including artificial nose, ear etc and helping in fulfilling aesthetic needs of a patient.

The apex locators have solved the plight of locating the root canal apex and thus, help in saving the time both for the dentists and the patients. Also, the success of the treatment has improved a lot through AI-based solutions. Artificial Intelligence has shown its power in simplifying the process of implant placement in the jaw bone with the help of surgical guides.

The Dental Chair, an integral part of dental practice has undergone drastic changes following AI. The automatic chairs and sensors are replacing the old manual chairs. No physical input is required by the dentist in the latest voice-command based dental chair. With the growing pace in technology, the day is not far when the vitals of patient sitting on a dental chair will be sensed and the operator will get an alarming signal while performing the surgery. During the complete lockdown phase of COVID-19 pandemic, the patients were able to connect with various doctors and received at least the preventive health care. All this was made possible only through AI-based solutions.

Every coin has two sides. With so much positive prospects in affecting the human lives, the concerns are many. The age old highly qualified professionals may resist in accepting the AI. Both the patients and the doctors have to show their immense trust in an AI-centric healthcare system. The fear of data privacy and security issues has to be regulated so as to avoid the cases of information leakage and cyber-crime.
The key to develop AI in health care is the trust of medical and dental professionals in the system. Artificial intelligence is not a replacement of doctors, but a more appropriate technology that will help in augmenting their work so as to increase the efficiency and accuracy of work by them.