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Editorial

# Robotics in Dentistry – A Revolutionary Breakthrough!!!

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There is a tremendous advancement in the modern science and technology including health science across the globe [1]. Among those, Robotics has become a popular research area and social concern pertaining to human medicine and attracted like hot cakes pertaining to many health domains [2]. Robots related to medicine are categorized into three types as macro robots, micro-medical and bio-robots. Among these three robots, bio-robots play a major role in medical robots as they have capacity to think, judge and perceive like humans. Macro-robots further include two main types as rehabilitation robots and surgical robots. Brain-surgery robots and eye-surgery robots come under surgical robots and also includes minimally invasive surgical robots and medical endoscopic devices [3].

Pertaining to dental science, introduction of surgical and medical robots is a new avenue in the future of dentistry as it improvised conventional oral diagnosis and treatment models. Medical robots have engulfed many fields of dentistry like oral implantology, prosthodontics, oral surgery, endodontics and orthodontics. The applications of robots in Prosthodontics mainly focuses on the development of tooth preparation, intelligent prosthodontic treatment and tooth-arrangement robots. Robotic applications in Oral Implantology can be broadly classified into robot-assisted and fully automated implantation robots. Yomi, developed by Neocis in the United States is a commercial robot-assisted dental-surgery system successfully used [2,3]. Pertaining to oral surgery, robotic system established a break though in many surgeries. In orthognathic surgery, a robotic system has been developed to assist in bone segment repositioning. An autonomous oral and maxillofacial surgery system with the assistance and supervision of a surgeon was also developed. Apart from these, the role of robots in Oral and Maxillofacial Surgery mainly consists of the acquisition and reconstruction of three-dimensional image data of the oral and maxillofacial region before the surgery, analysis of the characteristics of the lesion and design of a targeted surgical plan, and the accurate segmentation, reshaping, displacing and fixing of the craniofacial bone according to the surgical plan. With regard to Orthodontics, robots are used for clinical diagnosis and the preparation of treatment plans and most widely used in arch-wire bending. Orthodontic arch wire-bending robots have the advantages of a simple structure, low cost, and can bend various types of arch wires. This decreases the labour intensity of the doctor, avoids fatigue fracture of the arch wire caused by repeated bending and improves treatment efficiency. In Endodontic field, a robot called the 'Omin Phantom' with a haptic virtual reality simulator has been developed to help users efficiently train in endodontic procedures. In addition to this, Hong Seok at

Columbia university proposed a project named 'The Advanced Endodontic Development' which aimed to develop an intelligent micro-robot that can perform endodontic treatment automatically [4]. Therefore, because of robotic invention, the future of dentistry is becoming a reality as these robots can increase, predictability, safety, precision, the standard of care and finally the treatment efficiency. The applications of robotics in dentistry are showing a promising result in many countries representing a dream come true in the health science techno-verse era.

Although dental robots have numerous applications in dentistry including many advantages, several critical issues concerning privacy, ethics and patient security must be strong considered.

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