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Program Speaker – Johan Wolfaardt

Title

The Future of Maxillofacial Prosthodontics in North America: The Role of Advanced Digital Technology and Artificial Intelligence

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Abstract

In order to be successful in deployment and use, advanced and potentially disruptive technology requires context. Providing context requires establishing an ecosystem that allows optimal, safe, and ethical application of an advanced technology that has critical outcomes. In the case of advanced digital technology (ADT) used in complex critical clinical healthcare applications requires a structured competency based knowledge work ecosystem. The ecosystem includes components such as regulatory requirements (software, hardware, medical device, materials), good manufacturing processes, quality management systems, knowledge worker competency, risk management, and legal requirements. ADT use in maxillofacial prosthodontics needs to be considered a complex critical clinical healthcare technology cluster that requires a specifically designed ecosystem. This applies equally to point-of-service as it does to external services.

Presently, maxillofacial prosthodontic ADT engagement uses a clinical workflow that integrates internal and surface imaging, surgical design, navigation, additive manufacturing, treatment delivery, and laboratory procedures among other. The adoption of ADT occurred with little known of perceptions of maxillofacial prosthodontists. It is not known what ADT education and training maxillofacial prosthodontists have received, nor what access to ADT is available or what barriers exist to ADT engagement. The technical and

behavioral design of ADT driven head and neck teams has received no attention. No known standards have been established for maxillofacial prosthodontic ADT clinical competency nor for a required knowledge worker level. The reason for this may be that ADT in maxillofacial prosthodontics has been seen as an individual interest and not as a clinical competency. It appears that maxillofacial prosthodontics has not developed a competency based knowledge work ecosystem for ADT engagement. Adding to the challenge, artificial Intelligence (AI) is a new and more complex ADT change agent emerging in maxillofacial prosthodontics. It is predicted that AI will increasingly bring about disruptive technology change unlike anything previously known. Consequently, understanding maxillofacial prosthodontics ADT-AI engagement for the future becomes essential. It appears that maxillofacial prosthodontics has much work to be done to develop a structured competency based knowledge work ecosystem.

To explore ADT-AI engagement for the future, a discussion document was developed. The discussion document considers ADT engagement, history of past factors influencing ADT engagement and perceptions of maxillofacial prosthodontists. The intent of the discussion document is to identify issues important to AAMP deliberation on the future of maxillofacial prosthodontics. The presentation will explore key areas of the discussion document.

Biography

Dr. Wolfaardt is a Professor Emeritus and previously a Full Professor, Division of Otolaryngology-Head and Neck Surgery, Department of Surgery, Faculty of Medicine and Dentistry, University of Alberta. Dr. Wolfaardt is co-founder and past staff member of the Institute for Reconstructive Sciences in Medicine (iRSM), Alberta Health Services/Covenant Health/University of Alberta. His primary maxillofacial prosthodontic clinical and research interests related to surgery of the head and neck in its broad sense, craniofacial osseointegration, functional outcomes and advanced digital technology (ADT) application to the head and neck resection-reconstruction-rehabilitation continuum. With intertest in ADT, Dr. Wolfaardt led initiatives to establish: the ADT Medical Modelling Research Laboratory, iRSM; a Master of Science with specialism in digital surgical design (Faculty of Rehabilitation Medicine, University of Alberta and iRSM); an International Fellowship in Maxillofacial Prosthodontics that included clinical application of ADT (Continuing Medical Education, Faculty of Medicine and Dentistry, University of Alberta and iRSM). Dr. Wolfaardt held a special interest in quality management. He introduced a systems approach to quality management and led the initiative for iRSM to be ISO9001 registered for clinical intraoral, craniofacial and bone amplification osseointegration care. Dr. Wolfaardt has published 118 papers in refereed journals and contributed to texts in surgery and maxillofacial prosthodontics. Among other subjects, he has presented nationally and internationally on maxillofacial prosthodontic aspects of ADT driven care for the head and neck resection-reconstruction-rehabilitation continuum, functional assessment, permanent percutaneous device skin response management, craniofacial osseointegration, radiation therapy as well as quality systems management for osseointegration. Dr. Wolfaardt has served on the boards of the International College of Prosthodontics, the American Academy of Maxillofacial Prosthetics, the International Society for Maxillofacial Rehabilitation, and the Advanced Digital Technology Foundation for Head and Neck Reconstruction. Dr. Wolfaardt was awarded: Honorary Membership, 2011, Canadian Dental Association; Award of Excellence, 2013, Alberta Dental Association and College; Andrew J. Ackerman Memorial Award, 2014, American Academy of Maxillofacial Prosthetics; Honorary Membership, 2016, British Society of Prosthodontics (BSSPD); Life Achievement Award, 2017, Edmonton Zone Medical Staff Association.

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