November 4, 2024

Jennifer Webster-Cyriaque, DDS, MS, PhD
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Building 31, Room 2C39
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Re: Request for Information on National Institute of Dental and Craniofacial Research's Proposed Research Initiatives.

via website: https://www.nidcr.nih.gov/grants-funding/funding-priorities/future-research-initiatives-concept-clearances/nidcr-requests-input-september-2024-proposed-research-initiative

The American Association for Dental, Oral, and Craniofacial Research (AADOCR) is the leading professional community for multidisciplinary scientists who advance dental, oral, and craniofacial research. We appreciate the opportunity to share our thoughts on the National Institute of Dental and Craniofacial Research's (NIDCR) September 2024 proposed research initiatives. AADOCR recognizes and applauds NIDCR's effort to support early career researchers and research in significant and understudied areas of science as well as continually build upon NIDCR's research portfolio. To respond to this request for comments, AADOCR engaged its Science Information Committee and its Board of Directors.

Dental Primary Care Practice-Based Research Network to Support Research in Clinical Practices

The incidence of oral diseases is socially patterned, with the largest burden of disease occurring among children living in poverty, racial and ethnic minorities, frail elderly, and other socially marginalized groups, such as immigrant populations[11]. Therefore, **AADOCR supports specifically expanding this initiative, and collaborating with the Centers for Medicare and Medicaid Services** to create an open/de-identified data portal (similar to the NHANES or All of Us) for public research use, which may maximize future novel discoveries. New technologies, materials, and diagnostic methods increasingly demand ongoing learning after formal training. While Continuing Dental Education (CDE) programs provide some opportunities, the Practice-Based Research Network (PBRN) can also be a valuable resource. **Therefore, AADOCR supports studies that assess how PBRNs can enhance training and engagement with emerging technologies and innovations**.

Digital Twins for Advancing Innovation and Optimizing Clinical Outcomes in Dental, Oral, and Craniofacial (DOC) Medicine

AADOCR would like to congratulate NIDCR on an innovative initiative aimed to revolutionize patient care allowing the simulation of patient anatomy, disease progression, and treatment responses. This approach will optimize clinical decision-making by allowing practitioners to use predictive models for precise treatment planning thereby improving the accuracy of interventions. Studies have outlined that software should be developed with an eye toward solving real problems in practices,[1] this initiative provides a foundation for finer precision as compared to the traditional phenotype bases such as electronic medical records or clinical periodontal charting / probing. However, as oral health challenges vary over the lifespan[2], **AADOCR supports the tailoring of digital twin technologies to the unique needs of pediatric and elderly populations** to optimize outcomes in these sensitive age groups. **AADOCR also supports studies that discern best practices for teaching as well as best practices for patient education and engagement** to fully integrate the digital twin concept. The development of practitioner best practices could accelerate dental skills and expertise, and potentially shorten training periods and competency evaluations in a rigorous quantitative manner. Additionally, best practices for integrating patient-facing digital twin models that may educate patients on expected outcomes, risks, and personalized treatment plans may improve adherence and satisfaction with care[3]. As this technology may lead to a significant shift toward more effective, data-driven oral healthcare practices, **AADOCR supports the issuance of this research initiative**.

Integration of Medically Necessary Prevention, Treatment, and Monitoring of Oncologic-related Oral, Dental, and Craniofacial Complications.

This research initiative takes a necessary step to reduce dental and craniofacial complications associated with cancer treatments by integrating necessary dental care into oncology protocols. Xerostomia is one of the common complications among oncology patients[5]. Xerostomia may cause the change of oral microbiome which may cause caries, oral mucositis or periodontitis[6]. **Therefore, AADOCR supports expanded research into the oral microbiome related to xerostomia** in oncology patients. Radiation caries is a rapidly developing and highly destructive form of dental caries[7]. To prevent osteoradionecrosis after radiotherapy, current therapies include endodontic treatment (to avoid extraction) or hyperbaric oxygen therapy (to promote healing after extraction) is recommended[8]. However, both are very expensive and time-consuming. Therefore, **AADOCR supports research that discerns novel therapeutic strategies for radiation caries**. Therefore, **AADOCR supports the issuance of this research initiative** as it may additionally further demonstrate the need to make oral

health a mandatory component in the clinical trial design of preventive, treatment, and monitoring therapies of oncologic diseases.

Modulating the Microbiome Towards Health

Dentists are responsible for -prescribing up to 10% antibiotic prescriptions worldwide and recent data suggest that knowledge and prescribing practices need improvement[9]. The emergence of antimicrobial resistance species (or multidrug resistant, MDR) are a major threat to oral and general health.[10] Among various innovations in antimicrobial therapies, the use of a combination of light and chromophore (dye or nanoparticle), Photodynamic Therapy (PDT), has the specific advantage of targeting MDRs. **AADOCR supports further research to optimize the efficacy and delivery methods of PDT across varied microbial targets and clinical applications**.

AADOCR appreciates the opportunity to provide comments on NIDCR's September 2024 proposed research initiative. AADOCR stands ready to work with NIDCR to promote the continuous quality and improvement of dental, oral, and craniofacial research programs but also to further move the needle on the transfer of knowledge from this research initiative to policy making processes.

If you have any further questions, please contact Dr. Makyba Charles-Ayinde, Director of Science Policy, at mcayinde@iadr.org.

Sincerely,

Christopher H. Fox, DMD, DMSc
Chief Executive Officer

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