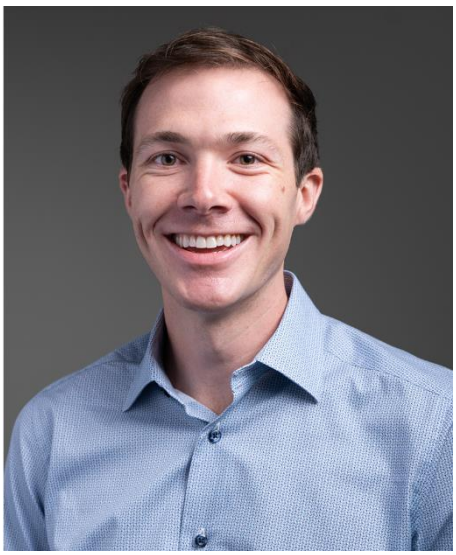
Research Aid Award

Dr. Adam Hoxie, *University of North Carolina, Adams School of Dentistry*

Biography



Dr. Adam Hoxie is a second-year orthodontics resident at the University of North Carolina Adams School of Dentistry. Originally from Minnesota, he graduated from Wake Forest University *summa cum laude* and conducted research in both the Communications and Chemistry Departments. He then earned his Doctor of Dental Surgery degree from University of North Carolina Adams School of Dentistry, where he created a methodology for validating caries activity using micro-computed tomography with his mentor. His research now focuses on caries detection in intraoral scanners commonly found in the orthodontic office.

Project Description

Common orthodontic intraoral scanners now include near infrared imaging (NIRI) technology, which is advertised as a powerful tool to identify caries-active or high caries risk patients prior to initiating orthodontic treatment. NIRI technology sends near infrared wavelength light into the tooth and uses a CCD sensor to capture images to be interpreted for caries presence. Given the significant presence of intraoral scanning in orthodontic offices, orthodontists (if not already) will soon be in a unique position to screen for interproximal caries using scans they capture for many of their patients. NIRI appears to offer a non-invasive, radiation-free, efficient method to detect early interproximal caries. Whether or not orthodontists should plan to use this information depends on the reliability of NIRI to detect interproximal caries.

This study aims to assess the validity of NIRI intraoral scanners and the reliability of practicing clinicians in interpreting NIRI images. Using an *ex vivo* model, extracted human teeth with interproximal carious lesions and sound controls will be scanned via micro-CT as gold standard, and then mounted to simulate interproximal contacts. Each interproximal contact will be captured via NIRI intraoral scan and via bitewing radiographs, using micro-CT as the gold standard. A survey will be created allowing practicing clinicians to evaluate the NIRI scan without and with BWR. Evaluating the validity and reliability of NIRI will allow for a better understanding of how this technology should be used clinically.

Significance of AAOF Support

This project will contribute to our understanding of NIRI technology provided in the intraoral scanners we use every day in orthodontics. Dr. Hoxie is grateful to receive support from AAOF, which will not only contribute to this project directly through covering the costly micro-computed tomography gold standard scans, but also to the development of his academic and orthodontic career. Dr. Hoxie has hopes to contribute to academic orthodontics through research and teaching throughout career.