



**2024 OFDFA
Dr. Min Kyeong Lee, University of Illinois-Chicago**

Short biography

Dr. Min Kyeong “Irene” Lee is an Associate Professor at University of Illinois Chicago Department of Orthodontics. She received her DMD, DMSc, and certificate in orthodontics from Harvard School of Dental Medicine in Boston, MA. Dr. Lee was the recipient of the Harvard University Presidential Scholarship from 2010 to 2014, which provided full tuition support for her DMSc in oral biology and orthodontics residency training. Following her residency training, she completed a clinical fellowship in Craniofacial and Special Needs Orthodontics at Children’s Hospital Los Angeles. In 2016, she was the recipient of the American Association of Orthodontists Craniofacial Anomalies and Special Care Training Award in. Dr. Lee is a big data analytics researcher with an interest in examining hospital-related outcomes using nationwide datasets such as the Nationwide Inpatient Sample and Nationwide Emergency Department Datasets.

A brief description of the project

Cleft lip repair is the first surgery performed on patients with cleft lip with or without cleft palate and is a crucial procedure that restores both form (esthetics) and function (feeding). While patients and parents may prefer earlier surgery to normalize their faces, surgeons defer the procedure until patients are 3 to 5 months old when they are big enough to undergo general anesthesia. As neonatology and pediatric anesthesia advanced, earlier surgery in neonates has become possible. Earlier surgery may help caregivers bond with their newborns, normalize growth and development for patients, and result in less scarring and thus better surgical outcomes. This study aims to (1) identify trends in neonatal cleft lip repair in the United States and to (2) evaluate safety of cleft lip repair in neonates by examining post-surgical complications. Machine learning models that effectively process the big datasets will be developed to better adjust for patient and hospital factors to identify risk factors for complications following neonatal cleft lip repair.

How orthodontic education will benefit from your award

The proposed study will use supervised machine learning (neural network) approach to adjust for confounders. Using this approach will enable us to account for multiple confounders and correlated variables which would be impossible to adjust using traditional analytical methods. The study findings can be used to improve pathways in delivery of care to realize good outcomes in patients undergoing cleft lip repair surgery.

In the era of big data and artificial intelligence, traditional analytical methods that are prevalent in orthodontic research have been stretched to their limits. Supervised machine learning

techniques developed in this project will help advance data analysis in orthodontic research that forms the foundation of orthodontic education.

Why the Foundation is important to your project

The Foundation funding will play a key role in the success of this project. The OFDFA funding will be used to clean the data, set up of the final dataset analysis, and write the machine learning codes to analyze the data. The funding will also support travel expenses to present and disseminate study findings at national meetings.

How Foundation funding is expected to benefit your career

As an early career faculty in academic orthodontics aspiring to become a life-long clinician-scientist, I have a set of skill sets as a researcher, educator, and clinician that I would like to develop. A portion of the Foundation funding will support my engagement in didactic activities to enhance my research skills, clinical judgment, and teaching abilities. I hope to build upon successful completion of this Foundation-supported project for future research projects.