Stanford



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ACADEMIC CONTACT INFORMATION

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Bio

BIO

Dr. HyeRan Choo is a Clinical Associate Professor and Section Chief of Craniofacial Airway Orthodontics in the Department of Surgery, Division of Plastic and Reconstructive Surgery at Stanford University School of Medicine. She also serves as the Director of the Stanford Orthodontic Airway Plate Treatment Program for Pierre Robin Sequence (SOAP for PRS) at Lucile Packard Children's Hospital Stanford and is a faculty fellow at the Stanford Mussallem Center for Biodesign.

Dr. Choo earned her dental degrees from Seoul National University (combined Undergraduate and Graduate Dental Surgery program) and The University of Pennsylvania (Dental Medicine program). She completed her Post-graduate Orthodontic Residency and Master of Science degree at The University of Alabama in Birmingham. After a Craniofacial Fellowship at the National Institutes of Health / National Institute of Dental and Craniofacial Research, Dr. Choo served as Director of Craniofacial Orthodontics at The Children's Hospital of Philadelphia / The University of Pennsylvania.

In 2012, Dr. Choo relocated to the San Francisco Bay Area, where she became a craniofacial orthodontic provider for Kaiser Permanente Medical Centers in Oakland and Santa Clara. She joined the Stanford University faculty in 2016 as a part-time craniofacial orthodontist and clinical instructor and transitioned to a full-time position in 2019 as a craniofacial airway orthodontist and clinical assistant professor.

Her clinical expertise includes surgical and non-surgical craniofacial and airway orthodontic treatments for neonates, infants, and children with craniofacial dysmorphism and/or orofacial dysfunctions. Dr. Choo's treatment philosophy centers on providing minimally invasive yet highly effective treatments, grounded in a deep understanding of craniofacial growth and function. Her SOAP for PRS program is the first in the nation to non-surgically treat neonates with PRS using OAP, which she fabricates based on her innovative method of analyzing maxillomandibular computed tomography.

CLINICAL FOCUS

- Neonatal Robin Sequence / Obstructive Sleep Apnea / Small Jaw / Feeding & Breathing Difficulties - Stanford Orthodontic Airway Plate
- Neonatal Cleft Lip and Palate - Biocreative Alveolar Molding Plate
- Non-surgical and Surgical Orthodontics for Obstructive Sleep Apnea

- Non-surgical and Surgical Orthodontics for Facial Reconstructive Surgery
- 3D Craniofacial Imaging and Airway Analysis
- Orthodontics

ACADEMIC APPOINTMENTS

- Clinical Associate Professor, Surgery - Plastic & Reconstructive Surgery
- Member, Maternal & Child Health Research Institute (MCHRI)

ADMINISTRATIVE APPOINTMENTS

- Inaugural Director, SOAP for PRS, Lucile Packard Children's Hospital Stanford, (2024- present)
- Section Chief, Craniofacial Airway Orthodontics, Stanford University School of Medicine, (2019- present)

HONORS AND AWARDS

- David Precious Memorial Science Award, International Cleft Lip and Palate Foundation (ICPF) (10/8/2023)
- National Dental Honor Society, Omicron-Kappa-Upsilon (OKU) (5/17/2004)

PROFESSIONAL EDUCATION

- Diplomate, American Board of Dental Sleep Medicine (2021)
- Fellowship, Biodesign Faculty Fellowship, Stanford Byers Center for Biodesign , Biodesign (2021)
- Board Certification, American Board of Orthodontics (2008)
- Fellowship, Clinical Center, National Institutes of Health (NIH) / National Institute of Dental and Craniofacial Research (NIDCR) , Bethesda, MD (2008)
- MS, Post-Graduate Residency, Orthodontics and Dentofacial Orthopedics, University of Alabama in Birmingham , Birmingham, AL (2007)
- DMD, Graduate School of Dental Medicine, University of Pennsylvania , Philadelphia, PA (2004)
- DDS, Undergraduate School of Natural Sciences & Graduate School of Dental Surgery, Seoul National University , Seoul, South Korea (2002)

Publications

PUBLICATIONS

- **Computational fluid dynamics assessment of upper airway morphology and flow dynamics in infants with Robin sequence treated with the Stanford Orthodontic Airway Plate** *APPLIED MATHEMATICS IN SCIENCE AND ENGINEERING*
  Ryu, S., Choo, H., Kim, Y., Choi, Y., Kim, J., Forrest, C. R., Lee, J.
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- **The Stanford Orthodontic Airway Plate: Design and Clinical Implementation in 64 Consecutively Treated Infants With Pierre Robin Sequence.** *The Journal of craniofacial surgery*
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- **Comparative Analysis of Hospital Charges in Infants With Robin Sequence: Nonsurgical Orthodontic Airway Plate Versus Surgical Mandibular Distraction.** *The Cleft palate-craniofacial journal : official publication of the American Cleft Palate-Craniofacial Association*
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- **Psychosocial Outcomes of the Stanford Orthodontic Airway Plate (OAP) Treatment in Caregivers and Children With Pierre Robin Sequence.** *The Cleft palate-craniofacial journal : official publication of the American Cleft Palate-Craniofacial Association*
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- **Weight Gain in Infants With Pierre Robin Sequence: A Comparison of Nonsurgical Orthodontic Airway Plate Versus Surgical Mandibular Distraction Osteogenesis.** *The Cleft palate-craniofacial journal : official publication of the American Cleft Palate-Craniofacial Association*

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- **Biocreative Infant Orthodontics** *Biocreative Orthodontics*
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- **AI-enhanced predictive modeling for treatment duration and personalized treatment planning of cleft lip and palate therapy.** *International journal of computer assisted radiology and surgery*
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  2025

- **Growth of the maxillary apical base in post-adolescents with craniofacial dysmorphism using ATOZ™ orthodontic distraction osteogenesis** *SEMINARS IN ORTHODONTICS*
  Choo, H., Moon, S.
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- **Functional Matrix Theory and Stanford Orthodontic Airway Plate Treatment Program for Infants With Pierre Robin Sequence (SOAP for PRS).** *The Cleft palate-craniofacial journal : official publication of the American Cleft Palate-Craniofacial Association*
  Choo, H.
  2025: 10556656251318114

- **Developing a Machine Learning Algorithm to Predict the Outcome of the Biocreative Alveolar Molding Plate Treatment in Infants with Unilateral Cleft Lip and Palate: A Pilot Study** *SPIE-INT SOC OPTICAL ENGINEERING*
  Agaronyan, A., Olivares, M., Anwar, S., Choo, H.
  2025

- **Geometric Deep Learning for Automated Landmarking of Maxillary Arches on 3D Oral Scans from Newborns with Cleft Lip and Palate** *2025 IEEE 22nd International Symposium on Biomedical Imaging (ISBI)*
  Agaronyan, A., Choo, H., Linguraru, M. G., Anwar, S. M.
  2025

- **Stanford orthodontic airway plate treatment program for neonates with Pierre Robin sequence in the United States: non-surgical alternative to neonatal mandibular distraction osteogenesis.** *Journal of clinical sleep medicine : JCSM : official publication of the American Academy of Sleep Medicine*
  Choo, H.
  2024

- **Near-Normalized Maxillomandibular Relationship and Upper Airway in Infants with Robin Sequence Treated with Stanford Orthodontic Airway Plate: Computed Tomography Study.** *The Cleft palate-craniofacial journal : official publication of the American Cleft Palate-Craniofacial Association*
  Ahn, H., Choi, Y. J., Baek, W., Kim, H. Y., Chang, P. E., Choo, H.
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- **Nonsurgical improvement of severe upper airway obstruction in infants with Robin sequence and cleft palate using Stanford Orthodontic Airway Plate treatment.** *Journal of clinical sleep medicine : JCSM : official publication of the American Academy of Sleep Medicine*
  Choo, H., Sidell, D. R., Kim, J. W., Ahn, H. W., Day, H. S., Sullivan, S. S.
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- **Presurgical Reduction of the Cleft Palate: Serendipitous Benefit of the Stanford Orthodontic Airway Plate Treatment (SOAP) for Infants with Robin Sequence.** *The Cleft palate-craniofacial journal : official publication of the American Cleft Palate-Craniofacial Association*
  Kim, J. W., Wan, A., Kim, J. Y., Choo, H.
  2024: 10556656241261846

- **READER'S FORUM** *KOREAN JOURNAL OF ORTHODONTICS*
  Choo, H., Ahn, H.
  2024; 54 (3): 137-138

- **Weight Gain of Infants with Robin Sequence Treated Nonsurgically Using the Stanford Orthodontic Airway Plate (SOAP): 1-Year Follow-Up.** *The Cleft palate-craniofacial journal : official publication of the American Cleft Palate-Craniofacial Association*
  Choo, H., Davis, A. S., Bain, L. C., Ahn, H.

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- **Biocreative Alveolar Molding Plate Treatment (BioAMP) for neonatal unilateral cleft lip and palate with excessively wide alveolar cleft and maxillary arch width.** *Korean journal of orthodontics*
  Choo, H., Ahn, H.
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- **Effects of daily versus weekly teriparatide for medication-related osteonecrosis of the jaw: A case-control study.** *Oral diseases*
  Kim, K. M., Kim, S., Hwang, H., Kim, H. Y., Kim, D., Park, J. H., Choo, H., Kim, J. W.
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- **Miniscrews position for a tissue bone borne palatal C-expander affects the displacement pattern of nasomaxillary complex: a finite element study.** *Scientific reports*
  Choi, J., Choo, H., Kim, M., Chung, K., Kim, S.
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- **Development and systematic characterization of GelMA/alginate/PEGDMA/xanthan gum hydrogel bioink system for extrusion bioprinting.** *Biomaterials*
  Li, J., Moeinzadeh, S., Kim, C., Pan, C. C., Weale, G., Kim, S., Abrams, G., James, A. W., Choo, H., Chan, C., Yang, Y. P.
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- **Split orthodontic airway plate: An innovation to the utilization method of conventional orthodontic airway plate for neonates with Robin sequence** *KOREAN JOURNAL OF ORTHODONTICS*
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  Kim, S., Kim, K. B., Choo, H.
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- **Bio-Exercise (BioEx) - A biocreative orofacial myofunctional therapy: preliminary cephalometric study and clinical application.** *Dental press journal of orthodontics*
  Lim, L., Choo, H., Eto, L. F., Chung, K., Kim, S.
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- **Disruptive Therapy Using a Nonsurgical Orthodontic Airway Plate for the Management of Neonatal Robin Sequence: 1-Year Follow-up.** *The Cleft palate-craniofacial journal : official publication of the American Cleft Palate-Craniofacial Association*
  Choo, H., Galera, R. I., Balakrishnan, K., Lin, H. C., Ahn, H., Lorenz, P., Khosla, R. K., Profit, J., Poets, C. F., Lee, J. S.
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- **Root proximity of the anchoring miniscrews of orthodontic miniplates in the mandibular incisal area: Cone-beam computed tomographic analysis.** *Korean journal of orthodontics*
  Jeong, D., Oh, S. H., Choo, H., Choi, Y., Kim, S., Lee, J., Hwang, E.
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- **A Systematic Review of Mandibular Distraction Osteogenesis Versus Orthodontic Airway Plate for Airway Obstruction Treatment in Pierre Robin Sequence.** *The Cleft palate-craniofacial journal : official publication of the American Cleft Palate-Craniofacial Association*
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- **Evaluation of strategic uprighting of the mandibular molars using an orthodontic miniplate and a nickel-titanium reverse curve arch wire: Preliminary cephalometric study.** *Korean journal of orthodontics*
  Park, J., Choo, H., Choi, J., Chung, K., Kim, S.
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  Choo, H., Khosla, R. K., Meister, K. D., Wan, D. C., Lin, H. C., Feczko, R., Bruckman, K., Hopkins, E., Truong, M. T., Lorenz, H. P.
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- **Finite element analysis of C-expanders with different vertical vectors of anchor screws.** *American journal of orthodontics and dentofacial orthopedics : official publication of the American Association of Orthodontists, its constituent societies, and the American Board of Orthodontics*
  Choi, J., Choo, H., Oh, S. H., Park, J., Chung, K., Kim, S.
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- **Use of C-Tube Microplates for Controlling the Vertical Dimension During Maxillary Incisor Intrusion.** *Journal of clinical orthodontics : JCO*
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- **Non-extraction correction of Class II malocclusion using Biocreative Therapy** *Skeletal Anchorage in Orthodontic Treatment of Class II Malocclusion*
  Chung, K., Choo, H., Kim, S.
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  Choo, H., Maguire, M., Low, D. W.
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- **Modified Technique of Presurgical Infant Maxillary Orthopedics for Complete Unilateral Cleft Lip and Palate** *PLASTIC AND RECONSTRUCTIVE SURGERY*
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- **Treatment outcome analysis of speedy surgical orthodontics for adults with maxillary protrusion** *AMERICAN JOURNAL OF ORTHODONTICS AND DENTOFACIAL ORTHOPEDICS*
  Choo, H., Heo, H., Yoon, H., Chung, K., Kim, S.
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- **Novel application of the 2-piece orthodontic C-implant for temporary crown restoration after orthodontic treatment.** *American journal of orthodontics and dentofacial orthopedics : official publication of the American Association of Orthodontists, its constituent societies, and the American Board of Orthodontics*
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- **The effects of different pilot-drilling methods on the mechanical stability of a mini-implant system at placement and removal: a preliminary study** *KOREAN JOURNAL OF ORTHODONTICS*
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- **Practical applications of cone-beam computed tomography in orthodontics** *JOURNAL OF THE AMERICAN DENTAL ASSOCIATION*
  Mah, J. K., Huang, J. C., Choo, H.
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- **Distalization of the mandibular dentition with mini-implants to correct a Class III malocclusion with a midline deviation** *AMERICAN JOURNAL OF ORTHODONTICS AND DENTOFACIAL ORTHOPEDICS*
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- **Cone-beam computed tomography evaluation of orthodontic miniplate anchoring screws in the posterior maxilla.** *American journal of orthodontics and dentofacial orthopedics : official publication of the American Association of Orthodontists, its constituent societies, and the American Board of Orthodontics*
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- **Double-archwire mechanics using temporary anchorage devices to relocate ectopically impacted maxillary canines.** *World journal of orthodontics*
  Kim, S. H., Choo, H., Hwang, Y. S., Chung, K. R.
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- **Anterior torque control using partial-osseointegrated mini-implants: biocreative therapy type II technique.** *World journal of orthodontics*
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