

Curriculum Vitae and Bibliography

Karthik Balakrishnan, MD, MPH, FAAP, FACS

Personal Information

Citizenship: United States of America
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Present Academic Rank and Position

Associate Professor of Otolaryngology – Stanford University 01/2020 - Present
Medical Director for Surgical Performance Improvement – Lucile Packard Children's Hospital 01/2020- Present

Education

Gilman School, Baltimore, Maryland 1991 - 1995
Harvard University, Cambridge, Massachusetts - AB 1995 - 1999
Johns Hopkins University School of Medicine, Baltimore, Maryland - MD 2000 - 2005
University of Washington, Seattle, Washington - Resident, Otolaryngology 2005 - 2012
University of Washington School of Public Health and Community Medicine, Seattle, Washington - MPH, Health Services 2006 - 2008
Cincinnati Children's Hospital, Cincinnati, Ohio - Graduate Fellowship, Pediatric Otolaryngology 2012 - 2014

Additional Education

Postgraduate Pediatric Flexible Bronchoscopy 2013
Cincinnati Children's Hospital, Cincinnati, Ohio

Certification

Board Certifications

American Board of Otolaryngology

Otolaryngology - Head and Neck Surgery 2013 - 2023

Mayo Clinic Quality Academy

Mayo Clinic Quality Fellow: Bronze Level Certification 2014

Mayo Clinic Quality Fellow: Silver Level Certification 2017

Licensure

California C165904 (Medical)
Minnesota 57963 (Medical)
Washington ML20008190 (Medical) 06/2005 - 2012
Ohio 35.098513 (Medical) 01/2012 - 2015
Wisconsin 68843 - 20 (Medical) 02/2018 - Present
North Dakota 14975 (Medical) 03/2018 - Present

Honors and Awards

| | |
|---|-------------------|
| John Harvard Scholarship - Harvard College, Cambridge, Massachusetts | 1996 - 1999 |
| Phi Beta Kappa - Phi Beta Kappa Honor Society | 1999 |
| Summa cum laude, Anthropology - Harvard College, Cambridge, Massachusetts | 1999 |
| Franklin P. Mall Anatomy Award - Johns Hopkins University School of Medicine, Baltimore, Maryland | 2001 |
| Alpha Omega Alpha Honor Society - Alpha Omega Alpha | 2005 |
| W. Barry Wood Research Prize - Johns Hopkins University School of Medicine, Baltimore, Maryland | 2005 |
| K30/Clinical and Translational Sciences Award program fellowship - NIH / University of Washington Institute of Translational Health Sciences | 2006 - 2008 |
| Charles Ferguson Clinical Research Prize - American Society of Pediatric Otolaryngology | 2013 |
| Travel scholarship, 2013 BMJ/IHI International Forum on Quality and Safety in Healthcare - British Medical Journal / Institute for Healthcare Improvement, London, England | 2013 |
| Travel scholarship, 2014 BMJ/IHI International Forum on Quality and Safety in Healthcare - British Medical Journal / Institute for Healthcare Improvement, Paris, France | 2014 |
| Magna Cum Laude Award, ASNR 2016 Electronic Educational Exhibits - American Society of Neuroradiology H&N Vascular Anomalies and Syndromes: Why Image? M Ho, M Tollefson, S Cofer, K Balakrishnan, H Bjarnason, D DeLone American Society of Neuroradiology 2016 Annual Meeting, Washington, DC | 2016 |
| Star Reviewer, 2016, 2017, 2018 - Otolaryngology - Head and Neck Surgery journal One of eleven peer reviewers selected for excellence, insight, and timeliness. Selected for three years running. | 2016 - 2018 |
| 2016 Film/Video Bronze Award - 37th Annual Telly Awards The Telly Awards annually showcase the best work of the most respected media organizations in the world. This is one of the media industry's top recognitions, with over 12,000 entries from all 50 states and many foreign countries. Awarded for "What To Expect if Your Child Has a Tracheostomy". | 2016 |
| Gold Award - Health Information Resource Center - National Health Information Awards Physician leader for development of patient education video; highest national award for consumer health information materials and programs. | 10/2016 - Present |
| Mayo Quality Fellows Silver Certification - Mayo Clinic Quality Academy | 2017 - Present |
| Silver Award - Health Information Resource Center - National Health Information Awards Physician leader for development of patient education handout on pediatric airway reconstruction; second-highest national award for consumer health information and education materials and programs. | 09/2017 - Present |
| 2017-2018 MN Monthly top doctors - Minnesota Monthly's Top Doctors | 2017 - Present |
| Selected for 2018 Top Doctors list - Minnesota Monthly's Top Doctors | 2018 - Present |
| Merit Award - National Health Information Awards Physician champion and creator, patient education flyer: "A Letter From a Parent About Your Child's Tracheostomy" | 09/2018 - Present |
| Scientific abstract selected for "Best of oral presentations" session - American Academy of Otolaryngology - Head and Neck Surgery, Atlanta, Georgia | 10/2018 - Present |

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| Committee Excellence Award - American Academy of Otolaryngology - Head and Neck Surgery Given "for distinguished service on the Patient Safety and Quality Improvement Committee" | 10/2018 - Present |
| Honorable mention for dictation quality - Good Author Project - Dictation Quality Recognition Group | 03/2019 - Present |
| Outstanding Poster Award: People's Choice - Early Hearing Detection and Intervention Meeting, Chicago, Illinois Dumanch KA et al, "Ensuring timely congenital cytomegalovirus testing and follow-up for babies who do not pass newborn hearing screening at Mayo Clinic: insights one year later". | 03/2019 - Present |
| 2019 Minnesota Top Doctors - Minnesota Monthly's Top Doctors | 05/2019 - Present |
| AAO-HNSF Honor Award - American Academy of Otolaryngology - Head and Neck Surgery Honor award recognizing variety and longevity of leadership and contribution to scientific, education, and quality efforts of the American Academy of Otolaryngology. | 09/2019 - Present |

Previous Professional Positions and Major Appointments

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|---|-------------------|
| Senior Associate Consultant - Division of Pediatric Otolaryngology, Department of Otorhinolaryngology, Mayo Clinic, Rochester, Minnesota | 09/2014 - 09/2017 |
| Senior Associate Consultant - Mayo Clinic, Mayo Clinic | 10/2014 - 09/2017 |
| Consultant - Department of Otorhinolaryngology, Mayo Clinic, Rochester, Minnesota | 06/2015 - 12/2019 |
| Associate Professor of Otolaryngology - Mayo Clinic College of Medicine and Science | 01/2019 – 12/2019 |
| Surgical Director, Neonatal Intensive Care Unit - Mayo Clinic in Rochester, Mayo Clinic | 07/2019 – 12/2019 |

Service

Community Memberships and Services

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|--|-------------------|
| Indo-US Joint Airway Group Volunteer Surgeon | 10/2017 - Present |
| Medical Review for Immigrants Volunteer Physician | 2018 - Present |
| Migrant Clinicians Network Volunteer | 2018 - Present |

Professional Memberships and Societies

Professional Memberships and Services

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|--|----------------|
| Aerodigestive Research Collaborative Executive Committee, Founding Co-Chair | 2018 - Present |
| American Academy of Otolaryngology - Head and Neck Surgery Member | 2006 - Present |
| American Academy of Otolaryngology Head and Neck Surgery Pediatric Otolaryngology Committee Member | 2017 - 2019 |
| American Academy of Pediatrics Fellow | 2016 - Present |

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| American Academy of Pediatrics Section on Advances in Therapeutics and Technology | |
| Member | 2017 - Present |
| American Academy of Pediatrics, Council on Quality Improvement and Patient Safety | |
| Member | 2016 - Present |
| American Academy of Pediatrics, Section on Otolaryngology - Head & Neck Surgery | |
| Member | 2016 - Present |
| American Academy of Pediatrics, Section on Otolaryngology - Head & Neck Surgery, Education Committee | |
| Member | 03/2018 - Present |
| American Academy of Pediatrics, Section on Otolaryngology, Quality Improvement Committee | |
| Committee Member | 2016 - Present |
| American Broncho-Esophagological Association | |
| Member | 03/2018 - Present |
| American College of Surgeons | |
| Fellow | 2016 - Present |
| American Society for Pediatric Otolaryngology | |
| Member | 2017 - Present |
| American Society of Pediatric Otolaryngology; Laryngology Research Committee | |
| Member | 2017 - Present |
| American Society of Pediatric Otolaryngology Quality and Safety Committee | |
| Member | 2017 - 2020 |
| Beryl Institute | |
| Member | 2017 - Present |
| Dysphagia Outcomes after Congenital Cardiac Surgery working group | |
| Founding Member | 06/2018 - Present |
| International Broncho-Esophagological Society | |
| Member | 10/2016 - Present |
| International Network of Pediatric Airway Teams | |
| Member | 2017 - Present |
| International Pediatric Otolaryngology Group | |
| Member | 2016 - Present |
| International Society for the Study of Vascular Anomalies | |
| Member | 2016 - Present |
| Patient Safety & Quality Improvement Committee | |
| American Academy of Otolaryngology - Head & Neck Surgery Committee Member | 10/2015 - 09/2018 |
| Pediatric Head and Neck Surgical Society | |
| Member | 03/2018 - Present |
| Society for Ear, Nose, and Throat Advances in Children | |
| Member | 2015 - Present |
| Society of University Otolaryngologists - Head and Neck Surgeons | |
| Member | 2016 - Present |
| Triological Society | |
| Candidate Fellow | 03/2018 - Present |

Vascular Anomalies Task Force
 American Society of Pediatric Otolaryngology
 Co-Director 2015 - Present

Study Sections

American Academy of Otolaryngology - Head & Neck Surgery
 Invited Reviewer, CORE Grants 03/2019

Journal Responsibilities

Journal Editorial Responsibilities

Frontiers in Pediatrics
 Guest Editor 2019 - Present

OTO Open journal
 Editorial Board Member 2016 – 02/2020

Otolaryngology - Head and Neck Surgery journal
 Editorial Board Member 2016 – 02/2020
 Associate Editor 08/2018 – 02/2020

Journal Other Responsibilities

American Academy of Pediatrics
 Guideline Reviewer 2016 - Present

Annals of Otology, Rhinology & Laryngology
 Referee/Reviewer 2016 - Present

European Annals of Otorhinolaryngology
 Referee/Reviewer 2017 - Present

European Journal of Obstetrics & Gynecology and Reproductive Biology
 Referee/Reviewer 2016 - Present

Otolaryngology - Head and Neck Surgery
 Referee/Reviewer 2015 - Present

Pediatric Pulmonology
 Journal Peer Reviewer 2017 - Present

Scientific Reports
 Peer Reviewer 2017 - Present

The Laryngoscope
 Referee/Reviewer 2016 - Present

Education Interests and Accomplishments

Curriculum and Course Development

Pediatric Otolaryngology resident curriculum, Mayo Clinic 09/2016 - 12/2019
 Director, otolaryngology resident pediatric otolaryngology core curriculum

Resident QI curriculum, Mayo Clinic 09/2019-12/2019
Director, otolaryngology resident QI curriculum

2018 World Congress on Bronchoesophagology / International
 Bronchoesophagological Society meeting 10/2016 - 06/2018
 Program Committee member
 2018 World Congress on Bronchoesophagology
 Rochester, Minnesota

2019 ASPO Summer Meeting 09/2018 - 07/2019
 Program committee member and scientific session moderator

2019 ASPO Summer Meeting
Vail, Colorado

03/2020-present

**Otolaryngology resident QI education, Stanford University
Director / Faculty lead**

03/2020-present

ENT in a Nutshell – otolaryngology educational podcast
Pediatric section faculty lead

Teaching

| | |
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| Tutor Anthropology, biology, inorganic and organic chemistry, physics. Harvard University Bureau of Study Counsel | 1996 - 1999 |
| Volunteer Teacher Piano Teacher Harvard University | 1998 - 1999 |
| Full-Time Faculty Biology, physics, physical science. Coach/founder, National Ocean Sciences Bowl team (2000 regional champions). Assistant coach, varsity /JV track & field. Community Relations Group. Advisor, Indian Cultural Club. Gilman School Baltimore, Maryland | 1999 - 2000 |
| First year medical student anatomy Teaching assistant Johns Hopkins University School of Medicine Baltimore, Maryland | 2002 - 2005 |
| Otolaryngology Resident Boot Camp Instructor Cincinnati Children's Hospital Cincinnati, Ohio | 2012 - 2014 |
| Midwest Airway Course Instructor Cincinnati Children's Hospital Cincinnati, Ohio | 2013 |
| Pediatric Head & Neck Masses Friday morning didactic session for ENT residents Mayo Clinic College of Medicine | 11/07/2014 |
| Congenital and Acquired Airway Lesions Friday morning didactic session for ENT residents Mayo Clinic College of Medicine | 12/05/2014 |
| Pediatric Sleep Surgery Friday morning didactic session for ENT residents Mayo Clinic College of Medicine | 03/27/2015 |
| Pediatric airway pearls for PM&R Invited presentation to Mayo Clinic Department of Physical Medicine and Rehabilitation Mayo Clinic College of Medicine | 06/16/2015 |
| Neonatal Airway Obstruction Invited presentation to NICU residents, fellows, and staff Mayo Clinic College of Medicine | 07/16/2015 |
| Pediatric tracheostomy Invited presentation to pediatrics residents Mayo Clinic College of Medicine | 08/11/2015 |

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| Introduction to pediatric airway reconstruction Invited lecture to PICU residents and fellows Mayo Clinic College of Medicine | 08/17/2015 |
| Introduction to slide tracheoplasty Invited lecture to cardiac CRNAs Mayo Clinic College of Medicine | 08/31/2015 |
| MCHS-Franciscan Healthcare Physician Noon Conference-Grand Rounds Common Pediatric ENT Problems MCHS-Franciscan La Crosse, Wisconsin | 10/2015 |
| Introduction to pediatric airway reconstruction Pediatric Professional Development Days - PICU/NICU RNs and RTs Mayo Clinic College of Medicine | 10/2015 - 11/2015 |
| Pediatric otolaryngology - the best of all worlds Invited lecture to medical student otolaryngology interest group Mayo Clinic College of Medicine | 12/2015 |
| Common pediatric airway procedures In-service lecture - EOPO/Airway staff professional development | 01/11/2016 |
| Introduction to open pediatric airway reconstruction In-service lecture - EOPO/Airway staff professional development | 01/18/2016 |
| Pediatric tracheostomy Invited talk to MCR pediatric RT group | 04/2016 |
| Fetal head and neck masses Invited lecture to maternal-fetal medicine group | 08/04/2016 |
| Common causes of neonatal and pediatric stridor ENT for the Primary Care Provider: Updates and Insights | 08/2016 |
| Pediatric chronic sinusitis ENT for the Primary Care Provider: Updates and Insights | 08/2016 |
| Practical pediatric head and neck radiology ENT for the Primary Care Provider: Updates and Insights | 08/2016 |
| Basic biostatistics, epidemiology, and study design for the surgeon Otolaryngology resident didactic lecture | 09/23/2016 |
| Pediatric deep neck space infections Invited talk to Mayo Clinic Health System division of community otolaryngology | 09/2016 |
| Health care costs and financing Otolaryngology resident didactic lecture | 09/30/2016 |
| Fetal airway anomalies Invited lecture to maternal-fetal medicine group | 10/06/2016 - Present |
| Cognitive bias and quality improvement Didactic lecture for otolaryngology residents | 10/07/2016 - Present |
| Neonatal airway obstruction Invited talk to MCR pediatric RT and transport group | 10/10/2016 - Present |
| Pediatric head & neck malignancies, including imaging and pathology review Didactic lecture for otolaryngology residents | 10/21/2016 - Present |
| Open (and endoscopic) airway reconstruction Didactic lecture for otolaryngology residents | 11/11/2016 - Present |
| Common neonatal airway problems, transport tips, and EXIT Invited presentation Pediatric and neonatal transport RT retreat | 03/2017 - Present |

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| Common airway operations: post-procedural care and therapies Invited lecture Pediatric PM&R conference | 03/2017 - Present |
| Congenital laryngeal and tracheal anomalies and their correction Pediatrics grand rounds - invited presentation Pediatrics grand rounds, Mayo Clinic Rochester, Minnesota | 06/2017 - Present |
| Normal and Abnormal Embryonic/Fetal Development of the Airway and Neck NICU Fellows' didactic presentation | 02/2018 - Present |
| Acquired abnormalities of the neonatal airway NICU fellows' didactic presentation | 03/2018 - Present |
| Pediatric Airway Reconstruction Didactic presentation for 2018 pediatric nursing Professional Development Days | 10/2018 |
| Deep neck space infections Didactic lecture for ENT residents Pediatric Otolaryngology Core Curriculum | 11/2018 |
| Key pediatric otolaryngology papers from 2018 Didactic presentation for ENT residents Pediatric Otolaryngology Core Curriculum | 12/2018 |
| Cognitive and Implicit Bias in Medical Decision-Making Pediatric Grand Rounds invited speaker Mayo Clinic Pediatrics Grand Rounds | 04/2019 |
| Cognitive and Implicit Bias Invited education presentation to Mayo Clinic medical school admissions committee | 08/07/2019 |
| Cognitive and Implicit Bias in Medical Decision-Making Neurology department conference invited speaker | 08/2019 |
| Introduction to Pediatric Otolaryngology Medical student didactic lecture | 02/2020 |
| Working Toward Zero Harm in the Time of COVID-19: Strategies for Reducing Infectious Transmission Invited panelist, Global Tracheostomy Collaborative international seminar | 03/2020 |
| Pediatric Airway Surgery Multi-institution resident didactic lecture | 03/2020 |
| Introduction to Common Pediatric Airway Procedures Education for LPCH OR staff | 04/2020 |
| Normal and Abnormal Development of the Neck and Airway Resident Didactic Lecture | 04/2020 |
| Complex airway cases: airway management, patient management, and reconstruction Resident Didactic Lecture | 04/2020 |

Mentorship

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| Ekbom, Dale (Consultant) Description: Mentored Dr Ekbom through his Triological Society thesis project, for membership in the premier otolaryngology research society. | 02/2015 – 12/2017 |
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Current Status: Division chair, Dysphonia & Dysphagia (laryngology)

Outcome: Dr Ekbohm successfully submitted his Triological Society thesis in September 2017. Thesis was accepted in early 2018. Manuscript from this thesis has been accepted to the Laryngoscope journal.

Olson, Michael (Resident)

04/2015 – 06/2016

Description: Mentored Dr Olson on research project examining cost savings associated with ED sedation for ear foreign body removal

Current Status: Mayo Clinic faculty

Outcome: Manuscript published in International Journal of Pediatric Otorhinolaryngology

Menapace, Deanna (ENT Resident)

07/2015 – 12/2019

Description:

Current Status: ENT resident

Outcome: Dr Menapace plans to apply to facial plastic and reconstructive surgery fellowships. I provided general mentoring for her residency performance and progress.

Massa, Sean (Resident)

12/2016 – 12/2017

Description: Mentoring through Resident Reviewer Development Program for Otolaryngology - Head & Neck Surgery Journal. Objective is to mentor residents through the process of becoming an independent peer reviewer.

Current Status: Otolaryngology resident, Saint Louis University

Outcome: Mentee successfully graduated program and became independent reviewer for top-level otolaryngology journal (Otolaryngology - Head & Neck Surgery).

Anzalone, C. Lane (Resident)

12/2016 – 06/2019

Description: Working with Dr Anzalone to develop, fund, and implement a resident "business of medicine" curriculum.

Current Status: Otolaryngology resident

Outcome: Submitted Graduate Medical Education Program Innovation Award application

Oliver, Jeremie (Medical Student)

03/2017 - Present

Description:

Current Status: Medical student

Outcome: Mentored project led to student's presenting at international meeting and manuscript published.

May, Matthew (Resident)

07/2017 – 09/2019

Description: Mentored resident on two research projects

Current Status: Otolaryngology resident

Outcome: Dr May presented a poster at one international meeting (ISSVA 2018) and had a very well-received oral presentation at a second international meeting (ESPO 2018). Manuscript for both projects were submitted.

Kiessling, Patrick (Medical Student)

04/2018 - Present

Description: Ongoing 4-year career advising/mentorship relationship

Current Status: MCSOM MS2

Outcome: Mr Kiessling has submitted one manuscript for publication (in collaboration with Dr Lisa Schimmenti); he has prepared a second manuscript for submission to Mayo Clinic Proceedings (submission pending manuscript review by other authors). He has written an excellent grant proposal with me for the Discovery to Practice program in the Mayo Children's Center.

Trousdale, William (Medical Student)

04/2018 – 09/2019

Description: Ongoing 4-year career advising/mentorship relationship

Current Status: MCSOM MS2

Outcome: Mr Trousdale has had one manuscript published in a peer-reviewed journal; further projects are in progress

Yang, Charles (Resident)

04/2018 - Present

Description: Mentoring through Resident Reviewer Development Program for Otolaryngology - Head & Neck Surgery Journal. Objective is to mentor residents

through the process of becoming an independent peer reviewer.

Current Status: ENT resident, US military

Outcome: Successful graduation as independent reviewer

Henry Creppel, Nicole (Visiting Medical Student)

05/2018 - 07/2018

Description: Mentored Mrs Creppel through the Mayo College of Medicine's Summer Research Fellowship program. Providing direct career mentoring and mentoring for a clinical project; connected her to two basic science/translational projects with Dr Jan Kasperbauer.

Current Status: Medical student

Outcome: Mentorship ongoing; expect 2-3 manuscripts and/or presentations.

Barnes, Jason (Resident)

07/2018 - Present

Description:

Current Status: Otolaryngology resident at Mayo Clinic

Outcome: As part of our collaboration Dr Barnes applied for, and won, a \$150,000 competitive grant from the Mayo Clinic Development to Practice mechanism to study robotic tracheal reconstruction. He has also published a report of a novel technique for bronchial stenting in a cardiac patient.

Smith, Alyssa (Resident)

07/2018 – Present

Description:

Current Status: Otolaryngology resident, Mayo Clinic

Outcome: Dr Smith and I continue to collaborate on several projects, two of which she has/will present at national meetings; manuscripts are in preparation.

Low, Christopher (Resident)

2019-present

Description: Faculty research mentor

Current status: Otolaryngology resident, Mayo Clinic

Outcome: Dr Low sought my mentorship due to mutual interests in health services and social determinants of health. We have submitted for publication two major studies of the effects of social determinants of health in clinical care decisions and outcomes for sinonasal malignancies and pediatric thyroid cancer.

Gutierrez, Claudia (Medical and Graduate Students)

12/2018 - Present

Description:

Current Status: Medical student, Mayo Clinic

Outcome: I have provided Ms Gutierrez career mentorship including rotation, sub-I, and residency application selection. I have also provided sponsorship in getting her connected to other faculty with whom she is pursuing a research project.

Rutter, Christopher (Undergraduate / Graduate Student)

01/2019 - Present

Description:

Current Status: Undergraduate, Kenyon College

Outcome: I worked with Mr Rutter on development of several of his medical device ideas both prior to and during his summer fellowship at Mayo Clinic. We have developed a prototype device with plans for him to eventually file a patent application. I also provided sponsorship in connecting him to other faculty who might be well-suited for some of his other research ideas.

Compton, Rebecca

05/2019 - Present

Description: Mentoring through Resident Reviewer Development Program for Otolaryngology - Head & Neck Surgery Journal. Objective is to mentor residents through the process of becoming an independent peer reviewer.

Current Status: Otolaryngology resident, Tufts Medical Center

Outcome: Dr Compton has completed two of three required reviews to graduate from the program; the third should occur in the near future.

Su, Brooke (Resident)

07/2019 – Present

Description: Informal mentoring

Current Status: Otolaryngology resident, UCLA

Outcome: Dr Su and I established a mentoring relationship in July after I

gave a talk at UCLA in June that aligned with some of her interests. She sought me out for mentoring in QI and in specialty choice. I have provided career mentoring and some coaching thus far. She has since developed a QI curriculum at her residency, joined her program's quality committee, and has become involved in hospital-level QI work. She is currently applying for pediatric otolaryngology fellowships.

Qian, Jason (Resident)

2020-present

Description: Faculty research mentor

Current Status: Otolaryngology research resident, Stanford

Outcome: Dr Qian sought me out as a mentor due to our shared interest in QI and PI. We are currently working to develop a modular surgical QI curriculum for trainees, in collaboration with SMCI staff. I am also mentoring Dr Qian on two health services research projects. We have submitted a significant "big data" research study for publication examining factors affecting outcomes of pediatric tracheostomy care and are working on a second project examining the effect of distance traveled for health care of pediatric surgical outcomes.

2020-present

Kim, Grace (Resident)

Description: Faculty research mentor

Current Status: Otolaryngology resident, Stanford

Outcome: Dr Kim sought me out due to mutual interests in social determinants of health, healthcare disparities, and value in health care. We are currently planning major projects looking at language disparities in telehealth use and the role of shared decision making in the setting of language barriers.

2020-present

Ayoub, Noel (Resident)

Description: Faculty research mentor

Current Status: Otolaryngology resident, Stanford

Outcome: Dr Ayoub sought me out due to mutual interests in value in health care. We are currently planning a project to comprehensively measure value in thyroid surgery care, including all components of the value equation (clinical outcomes, patient experiences, PROMs, direct costs, indirect costs).

Academic Career Development

New Physician & Scientist - The Leadership Effect

- 02/2015

New Physician & Scientist - Leading with Emotional Intelligence

- 06/2015

New Physician & Scientist - Professionalism & Values II

- 06/2015

New Physician & Scientist - Mayo Leader 360

- 07/2015

New Physician & Scientist - Publishing Your Research

- 11/2015

New Physician & Scientist - Professionalism & Values III

- 08/2016

**Certified Professionals in Healthcare Quality
Institute for Healthcare Improvement Open School**

2012 - 2013

New Physician & Scientist - Presentation Skills

2015

**Value Measurement in Health Care
Harvard Business School
Cambridge, Massachusetts**

04/2015

Managing Executive Presence with the Alexander Technique

11/2017

**Quality and Patient Safety Leadership Academy
Intermediate-level course
Minnesota Hospital Association
Minneapolis, Minnesota**

03/2018 – 09/2018

Institutional/Departmental Administrative Responsibilities, Committee Memberships and Other Activities

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|---|------------------------|
| Stanford University | |
| Department of Otolaryngology – Head & Neck Surgery | 03/2020-present |
| Faculty lead for resident QI/PI education | |
| Currently developing curriculum in collaboration with SMCI staff | |
| Department of Otolaryngology – Head & Neck Surgery | 04/2020 |
| Residency Evaluations Committee | |
| Maternal and Child Health Research Institute, Member | 02/2020-present |
| Lucile Packard Children's Hospital | |
| Surgical Specialties PPEC member | 02/2020-present |
| Serious Safety Events review group | 02/2020-present |
| Provider Onboarding Task Force | 03/2020-present |
| Mayo Clinic | |
| American College of Surgeons Children's Surgery Verification project | |
| Director | 11/2017 – 12/2019 |
| Leading Children's Center-wide effort to qualify for ACS Children's Surgery Verification; director of ACS PIPS committee | |
| Led development of a comprehensive surgical and surgical critical care quality and safety monitoring program for pediatric patients. Led team credentialing all pediatric surgical and procedural providers at Mayo Clinic Rochester. | |
| Ask Mayo Expert - Otorhinolaryngology Knowledge Content Board | |
| Chair | 2016 – 12/2019 |
| KCB Chair since 2017. We completed all pending topics when I took over KCB lead, have completed multiple further topics, planned several more, and have two care process models soon to be developed. | |
| Ask Mayo Expert - Otorhinolaryngology Knowledge Content Board | |
| Lead/Chair | 09/2016 – 12/2019 |
| Led national enterprise-wide team to develop standardized care pathways and clinical content to guide primary care, emergency care, and referring providers in management of major adult and pediatric otolaryngologic conditions | |
| Children's Center Safety Event Committee, Surgical/Procedural Care Section | |
| Section Leader | 02/2018 – 12/2019 |
| Fetal airway/EXIT-to-airway team | |
| Co-Director | 06/2015 – 12/2019 |
| Conceptualized and assembled multidisciplinary team to plan and execute multiple successful EXIT/OOPS-to-airway and fetal airway procedures. We have had no failures to date. Lead airway specialist for initiation and ongoing growth of Mayo FETO program. | |
| Mayo Clinic Children's Center Quality & Safety Executive Committee | |
| Surgical Member; Surgical Lead | 2018 – 12/2019 |
| Mayo Clinic Children's Center, Serious Safety Events Workgroup | |
| Surgical Member; Surgical Lead | 06/2019 – 12/2019 |
| Mayo Clinic Children's Center; Anesthesia Procedure Coordination Group | |
| Anesthesia Procedure Coordination Group | |
| Co-Leader | 2016 - 2018 |
| Co-led multidisciplinary group under Children's Center auspices to | |

develop a communication and care coordination process for children undergoing multiple procedures and/or diagnostic tests under a single anesthetic

Mayo Clinic Task Forces/Work Groups

General Medicine/Surgery Formulary Task Force

Otolaryngology representative

11/2017 – 12/2019

Midwest Surgical Quality Subcommittee

Member

01/2019 – 12/2019

Surgical quality leadership group for entire Midwest Mayo healthcare system

Pediatric Pulmonology Recruitment Committee

Member

2016 - 2017

Pediatric SPI working group

Member

2015 – 12/2019

Plummer Project - Pediatric Otorhinolaryngology

Subject Matter Expert

2016 – 2018

Quality Improvement Committee

Chair

08/2015 – 09/2019

Developed new format for department M&M conference with formal RCA strategy, adopted at MCR and MCHS and at other non-Mayo programs, connected with new QI project database. Collaborated with research committee chair to integrate QI projects into ENT resident research rotations. Integrated QI education and skills evaluation and cognitive and implicit bias education into resident curriculum. Integrated all parts of department, including non-clinical staff, into QI committee. Lead for first surgical department empathic communication program for faculty and staff (with Office of Patient Experience team). Worked with patient education team to develop multiple new patient education materials, including innovative tracheostomy education handout for parents and national award-winning video. Physician lead/champion for only Mayo ENT silver or gold-certified quality project in last several years. Leading or coordinating multiple other ongoing QI projects including likely enterprise-wide/gold-level laryngectomy care improvement project.

Mayo Clinic in Rochester

Center for Science of Healthcare Delivery

2014 – 12/2019

Facilitated several collaborative large-scale outcomes and cost studies between department and CSHCD, leading to peer-reviewed manuscripts submitted and an accepted Triological Society thesis (candidate: Dr Dale Ekbohm).

Department of Nursing

Division Committees

Neonatal Intensive Care Unit Quality and Safety Committee

Surgical Member

11/2018 – 12/2019

Surgical liaison to NICU Q&S committee

Department of Otorhinolaryngology

Clinical Practice Committee

Member

2014 – 12/2019

Executive Committee

Member

2016 – 12/2019

Pediatric ENT Patient Family Advisory Council

Member/Faculty Lead

2014 – 12/2019

Quality Assurance Committee

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| Member | 2014 - 2015 |
| Research and Academic Productivity Committee | |
| Member | 2014 – 12/2019 |
| Department of Otorhinolaryngology - Head and Neck Surgery | |
| Education and Program Evaluation Committee | |
| Member | 12/2014 – 12/2019 |
| Department of Pediatric and Adolescent Medicine | |
| Pediatric Surgical Interest Group | |
| | 2016 – 12/2019 |
| QI /PI lead | |
| Activities at Other Institutions | |
| Cincinnati Children's Hospital | |
| Clinical Practice Committee | |
| Member | 2013 - 2014 |
| Cincinnati Children's Hospital Pediatric Otolaryngology | |
| Fellowship Training Committee | |
| Member | 2012 - 2014 |
| Housestaff Quality and Safety Council | |
| University of Washington | |
| Founding Member | 2011 - 2012 |
| University of Washington | |
| Graduate Medical Education Committee | |
| Member | 2011 - 2012 |

Presentations Extramural

National or International

Invited

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| Outcomes in orbital and transorbital endoscopic surgery Balakrishnan K, Moe KS. American Association of Otolaryngologists of Indian Heritage Annual Meeting Boston, Massachusetts | 2010 |
| Common causes of neonatal and pediatric stridor 2016 Mayo Clinic ENT Update Sedona, Arizona | 10/29/2016 |
| Update in the management of common head & neck vascular anomalies 2016 Mayo Clinic ENT Update Sedona, Arizona | 10/29/2016 |
| Pediatric airway reconstruction outcomes: Delphi project update Balakrishnan K, Sidell DR International Network of Pediatric Airway Teams meeting Genoa, Italy | 04/2017 |
| Building a QI program Cincinnati Children's Hospital 2017 Fellow Reunion | 05/2017 |
| Best practice management of the pediatric ICU patient failing extubation Panel presenter, Cotton-Fitton panel American Society of Pediatric Otolaryngology Annual Meeting | 05/2017 |
| Pediatric airway reconstruction outcomes: Delphi project update Balakrishnan K International EndoDays Meeting Paris, France | 06/2017 |

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| Aspiration from the otolaryngologist's perspective Invited panel lecture at full-day multidisciplinary postgraduate course at 2018 American Thoracic Society meeting, led by Paul Boesch. American Thoracic Society 2018 Annual Meeting San Diego, California | 05/2018 |
| Case presentation: posterior glottis diastasis and type 2 laryngeal cleft Case presentation as part of full-day multidisciplinary postgraduate course at 2018 American Thoracic Society meeting, led by Paul Boesch. American Thoracic Society 2018 Annual Meeting San Diego, California | 05/2018 |
| Operative management of tracheomalacia Invited lecture during full-day multidisciplinary postgraduate course at 2018 American Thoracic Society meeting, led by Paul Boesch. American Thoracic Society 2018 Annual Meeting San Diego, California | 05/2018 |
| Indications for pediatric airway stenting 2018 World Congress of Bronchology and Interventional Pulmonology Rochester, MN | 06/2018 |
| Endoscopic Management of Pediatric Laryngotracheal Obstruction Co-chair of panel 2018 World Congress of Bronchology and Interventional Pulmonology Rochester, MN | 06/2018 |
| 3D printing and modeling in planning of tracheal reconstruction 2018 World Congress of Bronchology and Interventional Pulmonology Rochester, MN | 06/2018 |
| Lymphatic Malformations Invited panelist Medical, Surgical, and Minimally Invasive Management of Vascular Anomalies and Overgrowth Syndromes Atlanta, Georgia | 09/2018 |
| Vascular Anomalies Panel presentation 6th Annual ASPO Resident / Fellow Education Conference Atlanta, Georgia | 10/2018 |
| Glottic stenosis secondary to blunt laryngeal trauma Invited case management presentation Pediatric Head and Neck Surgery Society 2018 meeting Atlanta, Georgia | 10/2018 |
| Scientific Oral Presentations: Patient Safety and Quality Improvement Scientific session moderator 2018 AAO-HNSF Annual Meeting Atlanta, Georgia | 10/2018 |
| Multicenter Research: Where We Stand and Why: panel presentation Wootten (moderator), Balakrishnan K, Boesch RP, Rosen R, Young L 6th Annual Contemporary Management of Aerodigestive Disease in Children Nashville, Tennessee | 12/06/2018 |
| Perspectives on Oropharyngeal Dysphagia: panel discussion Boesch RP (moderator), Balakrishnan K, Miller C, Rosen R 6th Annual Contemporary Management of Aerodigestive Disease in Children Nashville, Tennessee | 12/08/2018 |
| Pediatric Chronic Sinusitis 2019 Mayo Clinic ENT Update | 03/20/2019 - 03/23/2019 |

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| Update on button battery ingestion 2019 Mayo Clinic ENT Update Sedona, Arizona | 03/20/2019 - 03/23/2019 |
| Delphi method; crowdsourcing consensus Balakrishnan K, Boesch RP World Congress of Pediatric ENT Buenos Aires, Argentina | 04/2019 |
| Management of congenital and acquired tracheal stenosis Keynote speaker 7th Asia Pacific Pediatric Otolaryngology Group Conference Bangkok, Thailand | 10/2019 |
| Embarking on a QI Project Yang CJ, Balakrishnan K SENTAC 2019 meeting San Diego, California | 2019 |
| Preventing oral aversions in NICU infants Ferrara L, Balakrishnan K SENTAC 2019 meeting San Diego, California | 2019 |
| Oral CPAP use is associated with ongoing insomnia but not with pre-existing insomnia. Reed B, Balakrishnan K, James KT, Weaver EM. SLEEP Associated Professional Sleep Societies Annual Meeting Minneapolis, Minnesota | 2007 |
| Outcomes in orbital and transorbital endoscopic surgery. Balakrishnan K, Moe KS. American Academy of Otolaryngology - Head & Neck Surgery Annual Meeting Boston, Massachusetts | 2010 |
| Graded exercise stress endoscopy for exercise-induced dyspnea following airway reconstruction. Sidell D, Balakrishnan K, Willging JP, Knecht S, Cotton RT, de Alarcon A. American Academy of Otolaryngology - Head & Neck Surgery Annual Meeting Vancouver, British Columbia, Canada | 2013 |
| Initial surgery and initial sclerotherapy produce similar outcomes in head and neck lymphatic malformations American Society of Pediatric Otolaryngology Annual Meeting | 2013 |
| Development of standardized outcome and reporting measures in head and neck lymphatic malformations American Society of Pediatric Otolaryngology Annual Meeting | 2014 |
| Human error and patient safety: managing cognitive and motivational bias in medical decision-making Miniseminar American Academy of Otolaryngology - Head & Neck Surgery Annual Meeting | 2014 |
| Outcomes and resource utilization of endoscopic mass-closure technique for laryngeal clefts American Academy of Otolaryngology - Head & Neck Surgery Annual Meeting | 2014 |
| Revision thoracic slide tracheoplasty for congenital tracheal stenosis: outcomes following unsuccessful prior tracheal reconstruction American Academy of Otolaryngology - Head & Neck Surgery Annual Meeting | 2014 |

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| Surgical management of pediatric posterior glottic diastasis American Broncho-Esophagological Association Annual Meeting | 2014 |
| Management of head and neck lymphatic malformations Instruction Course American Academy of Otolaryngology - Head & Neck Surgery Annual Meeting | 2015 |
| Thinking Differently About Thinking: Cognitive Bias and Medical Decision-Making Miniseminar addressing the effects and mitigation of cognitive and implicit bias in providers and patients that might affect medical decision-making. Endorsed by the AAO-HNSF PSQI Committee AAO-HNSF 2016 Annual Meeting San Diego, California | 09/2016 |
| Evidence-based update on management of head and neck lymphatic malformations Panel creator and moderator American Society of Pediatric Otolaryngology Annual Meeting | 05/2017 |
| Cognitive bias and error analysis in pediatric otolaryngology: a practical case-based review Panel moderator and presenter American Society of Pediatric Otolaryngology Annual Meeting Austin | 05/2017 |
| Interdisciplinary care for a complex thoracic, vascular, and tracheal problem Balakrishnan K, Boesch RP, Orvidas LJ American Society of Pediatric Otolaryngology Annual Meeting | 05/2017 |
| Enhancing Your Career with Quality Improvement Miniseminar 2017 AAO-HNSF Annual Meeting Chicago, Illinois | 09/13/2017 |
| How We Think About Patients, and How Patients Think About Us: Cognitive and Implicit Bias in Clinical Interactions Arjmand EM, Balakrishnan K, Boss EF, Thompson DM American Society of Pediatric Otolaryngology Annual Meeting National Harbor, District of Columbia | 05/2018 |
| Laryngeal application of topical tobramycin-dexamethasone ointment to facilitate extubation in the pediatric population May MM, Balakrishnan K European Society of Pediatric Otorhinolaryngology annual meeting Stockholm, Sweden | 06/2018 |
| Glottic stenosis secondary to blunt laryngeal trauma Pediatric Head and Neck Surgical Society 2018 meeting Atlanta, Georgia | 10/2018 |
| Outliers: predicting high cost of care for otolaryngology patients Balakrishnan K, Moriarty J, Rosedahl J, Driscoll CL, Borah B 2018 AAO-HNSF Annual Meeting; selected for "Best of Oral Presentations" section Atlanta, Georgia | 10/2018 |
| Pediatric Otolaryngology: Imaging Gently Miniseminar panel presentation 2018 AAO-HNSF Annual Meeting Atlanta, Georgia | 10/2018 |
| Exploring the relationship between crop and GERD: systematic review of the literature | 10/2018 |

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| Coughran A, Balakrishnan B, Vaezeafshar R, Capdarest-Arest N, Sidell DR 2018 AAO-HNSF Annual Meeting Atlanta, Georgia | |
| Tracheal Resection with Innominate Artery Transposition in Morquio Syndrome Helder MRK, Dearani JA, Matsumoto J, Stans AA, Balakrishnan K; video presentation Society of Thoracic Surgeons 55th Annual Meeting San Diego, California | 01/2019 |
| Heck's disease occurring after EBV-associated smooth muscle tumors in an immunosuppressed child Anderson K, Weiland C, Tyring S, Balakrishnan K, Joshi A, Tollefson M. Society for Pediatric Dermatology - Cases of the Year 2019 Austin, TX | 07/2019 |
| Conflict in Practice: Managing Emotion, Engagement, and Bias for Positive Outcomes Panelist 2019 ASPO Summer Meeting Vail, Colorado | 07/2019 |
| Strategies for Safety: Case Studies of Using the Electronic Health Record and Other Modern Tools to Improve Quality, Efficiency, and Time Management Panelist 2019 ASPO Summer Meeting Vail, Colorado | 07/2019 |
| 'Imaging Gently' in Pediatric Otolaryngology Panelist 2019 AAO-HNSF Annual Meeting New Orleans, Louisiana | 09/2019 |
| Fetoscopic tracheal occlusion for congenital diaphragmatic hernia Pediatric Head and Neck Surgical Society meeting New Orleans, Louisiana | 09/2019 |
| A Primer for Assessing Your Clinical Practice Using Quality Improvement Panelist 2019 AAO-HNSF Annual Meeting New Orleans, Louisiana | 09/2019 |
| Current Advances in Head and Neck Vascular Anomalies Panelist 2019 AAO-HNSF Annual Meeting New Orleans, Louisiana | 09/2019 |
| Utilization of speech language pathology before and after thyroplasty: a national US database study Orbelo DM, Ekbohm DC, Van Houten HK, Sangaralingham LR, Mwangi R, Bayan S, Balakrishnan K 2019 Fall Voice Conference | 10/2019 |
| Post-operative dysphagia following pediatric endoscopic laryngeal cleft repair Smith AJ, Kiessling P, Puccinelli C, Balakrishnan K SENTAC 2019 meeting San Diego, California | 2019 |
| Poster Hsp70 binds its own message as part of a self-limiting regulation mechanism. Balakrishnan K, De Maio A. | 2004 |

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| American Society for Cell Biology Annual Meeting Washington, District of Columbia | |
| Predicting CPAP use & outcome: a sleep apnea severity index. Balakrishnan K, James KT, Weaver EM. American Academy of Otolaryngology-Head and Neck Surgery Annual Meeting Washington, District of Columbia | 2007 |
| Preliminary validation of a comprehensive sleep apnea disease-severity index. Balakrishnan K, James KT, Weaver EM. SLEEP Associated Professional Sleep Societies Annual Meeting Minneapolis, Minnesota | 2007 |
| Comprehensive sleep apnea disease-severity indices predict CPAP use better than baseline apnea-hypopnea index or daytime sleepiness. Balakrishnan K, James KT, Weaver EM. SLEEP Associated Professional Sleep Societies Annual Meeting. Baltimore, Maryland | 2008 |
| Prenatal imaging parameters for airway assessment and management planning in fetuses with head and neck vascular anomalies Balakrishnan K, Chaturvedi A, Dighe M, Perkins JA. International Society for the Study of Vascular Anomalies Meeting Brussels, Belgium | 2010 |
| Perceived functional and symptom impacts of head and neck lymphatic malformations Balakrishnan K, Edwards TC, Perkins JA. American Society of Pediatric Otolaryngology Annual Meeting Chicago, Illinois | 2011 |
| Care cycle costs and unused capacity in ambulatory surgery: time-driven activity-based costing Balakrishnan K, Arjmand EM. BMJ International Forum on Quality and Safety in Healthcare London, England | 2013 |
| The nasogastric syndrome manifests differently in infants than in adults. Balakrishnan K, Hart CK, de Alarcon A. American Society of Pediatric Otolaryngology Annual Meeting. | 2013 |
| Addressing individual cognitive bias in provider performance management Balakrishnan K, Arjmand EM. BMJ International Forum on Quality and Safety in Healthcare Paris, France | 2014 |
| Education, exposure, and management in vascular anomalies in otolaryngology residency and pediatric otolaryngology fellowship American Society of Pediatric Otolaryngology Annual Meeting Boston, Massachusetts | 2015 |
| Obstructing pediatric nasopharyngeal lobular capillary hemangioma after adenoidectomy American Rhinologic Society Annual Meeting Boston, Massachusetts | 2015 |
| H&N Vascular Anomalies and Syndromes: Why Image? Electronic Educational Exhibit: authors M. Ho, M. Tollefson, S. Cofer, K. Balakrishnan, H. Bjarnason, D. DeLone American Society of Neuroradiology 2016 Annual Meeting Washington, DC | 2016 |
| Hyperbaric oxygen therapy to reduce hypergranulation tissue associated with self-expanding metal airway stents (SEMAS) in pediatric patients | 2016 |

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| Claus P, Cofer SA, Balakrishnan K, Boesch RP, Shields RC, Noel DB 2016 European Underwater and Baromedical Society annual meeting Geneva, Switzerland | |
| Multiple Pediatric Procedures Under One Anesthesia Balakrishnan K, Haile D, Huskins C, Hirsch S, Kane C 2017 Mayo Clinic Quality Conference | 2017 |
| Save My Airway: Enhancing the Care of Children with Tracheostomy Tubes Conlon P, Balakrishnan K, Rosenman J, Cambern K, Cofer S, Smith P, Boynton B, Barry T, Mullenbach D, Feigal S, Bosley CL, Rohlik G 2017 Mayo Clinic Quality Conference | 2017 |
| Save My Airway: Enhancing the Care of Children with Tracheostomy Tubes Conlon P, Balakrishnan K, Rosenman J, Cambern K, Cofer S, Smith P, Boynton B, Barry T, Mullenbach D, Feigal S, Bosley CL, Rohlik G 2017 Society of Pediatric Nurses conference | 04/2017 |
| Securing a definitive airway after pre-hospital supraglottic rescue airway insertion Western Pediatric Trauma Conference | 07/2017 |
| Tracheostomy and post-operative tonsillectomy bleeds Orvidas, LJ, Cofer SA, Balakrishnan K AAO-HNSF Annual Meeting Chicago, Illinois | 2017 |
| Breathe easy: Enhancing the care of children with tracheostomy tubes Boynton B, Smith P, Bosley C, Conlon P, Balakrishnan K, Rosenman J, Rohlik G, Cofer S, Barry T, Mullenbach D, Feigal S American Association for Respiratory Care Annual Congress Indianapolis, Indiana | 10/2017 |
| Primary cervical leiomyoma: a rare cause of a posterior neck mass in a pediatric patient Mentor for medical student abstract presentation SENTAC 2017 meeting Toronto, Ontario, Canada | 11/2017 |
| Multidisciplinary Approach to Hyperbaric Oxygen Therapy in a Pediatric Patient with Tracheal Fistula Multidisciplinary poster report including MDs, RNs, RTs from Mayo Children's Center 4th International Tracheostomy Symposium | 02/2018 |
| Tracheal Submucosal Lymphovenous Malformation Bourne MH, Kern RM, White D, Balakrishnan K American Thoracic Society 2018 annual meeting San Diego, California | 05/2018 |
| Utilization of indocyanine green fluorescence image guidance in an extensive lymphovenous vascular malformation of the airway May MM, Tollefson, MM, Balakrishnan K International Society for the Study of Vascular Anomalies annual meeting Amsterdam, Netherlands | 05/2018 - 06/2018 |
| Key outcome and reporting measures in pediatric airway reconstruction: international expert consensus Balakrishnan K, Sidell DR, et al European Society of Pediatric Otorhinolaryngology annual meeting Stockholm, Sweden | 06/2018 |
| Percutaneous suture suspension for peristomal tracheal collapse Prummer C, Balakrishnan K | 06/2018 |

European Society of Pediatric Otorhinolaryngology annual meeting
Stockholm, Sweden

A Multidisciplinary Approach to Rapid Succession of Spine and Tracheal Reconstruction in a Patient with Morquio Syndrome 11/2018 - 12/2018
Kiessler P, Stans A, Dearani J, Boesch RP, Fogelson J, Matsumoto J, Haile DT, Balakrishnan K
SENTAC 2018 meeting
Houston, Texas

Ensuring Timely Congenital Cytomegalovirus Testing and Follow-up for Babies Who Do Not Pass Newborn Hearing Screening at Mayo Clinic: Insights One Year Later 03/2019
Kelsey A. Dumanch, Au.D., Lee A. Belf, Au.D., Joscelyn R.K. Martin, Au.D., Lisa A. Schimmenti, M.D., W. Charles Huskins, M.D., K. Balakrishnan, M.D., M.P.H., and Gayla L. Poling, Ph.D.
Early Hearing Detection & Intervention 2019 meeting
Chicago, Illinois

Regional

Invited

Integrating Analysis of Individual Cognitive Bias into the Understanding of Medical Errors 06/2014
Invited presentation at annual citywide otolaryngology conference
Queen City Symposium
Cincinnati, Ohio

Congenital laryngotracheal problems and their surgical correction 06/2017
Invited presentation, Mayo Clinic Pediatric Grand Rounds

Poster

Laryngeal application of tobramycin-dexamethasone to facilitate extubation in the pediatric population 01/13/2018
Minnesota Academy of Otolaryngology 2018 conference

Fetoscopic Tracheal Occlusion To Regenerate Fetal Lungs in Congenital Diaphragmatic Hernia 06/2019
Ruano R, Ibirogba ER, Trinidad MC, Klinkner DB, Balakrishnan K, Colby CE, Kolbe AB, Arendt KW, Segura L, Sviggum HP, Lemens MA, Famuyide A, Terzic A
Regenerative Medicine Minnesota 4th Annual Celebration

Visiting Professorship

Visiting Professorships

Cincinnati Children's Hospital Medical Center - Division of Pediatric Otolaryngology 06/2016
Invited visiting professorship and lecture
Quality improvement in pediatric airway reconstruction
Cincinnati, Ohio

University of Minnesota Medical School 11/10/2016 - Present
Visiting faculty lecture with medical students in years MS1 through MS4.
Minneapolis-St. Paul, Minnesota

Cincinnati Children's Hospital Medical Center 08/2017 - Present
Visiting professor and invited lecturer
Cognitive & Implicit Bias & Medical Error in Pediatric Otolaryngology
Cincinnati, Ohio

Ann & Robert H. Lurie Children's Hospital 10/2017
Visiting professor and invited lecturer, surgical grand rounds
Cognitive and implicit bias in medical decision-making
Chicago, Illinois

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| Northwestern University Department of Otolaryngology Visiting professor and invited lecturer Pediatric airway reconstruction outcomes - Delphi consensus project update Chicago, Illinois | 10/2017 |
| Tribhuvan University Teaching Hospital Visiting professor/lecturer and surgeon Pediatric airway reconstruction – multiple lectures Kathmandu, Nepal | 10/2017 - 11/2017 |
| Stanford University/Lucile Packard Children's Hospital Visiting professor and grand rounds guest lecturer Cognitive and implicit bias in medical decision-making Palo Alto, California | 01/2018 - 02/2018 |
| Stanford University/Lucile Packard Children's Hospital Visiting professor and grand rounds guest lecturer Fetal and neonatal airway problems: a tour of my favorite diseases Palo Alto, California | 01/2018 - 02/2018 |
| UCLA Department of Otolaryngology - Head and Neck Surgery Visiting professor, grand rounds Comprehensive quality improvement as a pathway for airway surgery practice development Los Angeles, California | 05/27/2019 |

Clinical Practice, Interests, and Accomplishments

General pediatric otolaryngology, Pediatric airway and aerodigestive disorders, Pediatric laryngeal, glottic, subglottic, and tracheal stenosis (congenital and acquired, Complete tracheal rings, Laryngeal and laryngotracheal clefts, Endoscopic and laser airway surgery, Open pediatric airway reconstruction, Sleep-disordered breathing and upper airway obstruction, Pediatric voice and swallowing disorders, Pediatric vocal cord paralysis, Airway management in patients with genetic syndromes, Head and neck vascular anomalies, Lymphatic malformations, Hemangiomas and other vascular tumors, Pediatric head and neck malignancies, EXIT procedures and fetal airway management, Velopharyngeal insufficiency

Research Interests and Accomplishments

Safety and quality, Medical decision-making and cognitive bias, implicit bias and mitigation, Interaction of individuals and systems in medical error, Cost and value of care, Cost analysis in pediatric otolaryngology, Processes to reduce unused staff capacity

Research Grants Awarded

Completed Grants

Industry/State Grant

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| Program Director / Principal Investigator | Tracheal replacement study in porcine model utilizing 2-stage surgical protocol. Funded by Utah STAR program. (Rosivo 181469) | 08/2018 - 11/2019 |
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Mayo Clinic

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| Program Director / Principal Investigator | Measuring and mitigating implicit bias in otolaryngology. Funded by SGP - Small Grants Program <\$10K | 03/2018 - 03/2020 |
| Principal Investigator | Trans-cervical robotic tracheal reconstruction: a feasibility study. Funded by Mayo Clinic Children's Center Discovery to Practice Award | 01/2019 - 12/2020 |

Federal

Principal Investigator The comprehensive sleep apnea severity index as a predictor of CPAP use & outcome.. Funded by NIH/NHLBI. (F32 HL090226-01A1) 01/2008 - 01/2009

Foundation

Principal Investigator Research Training Fellowship for Medical Students.. Funded by Howard Hughes Medical Institute. (N/A) 01/2003 - 01/2004

Program Director / Principal Investigator Integrating Patients and Families into the Clinical and Outcomes Research Process. Funded by The Beryl Institute. (Beryl - 2017) 01/2017 - 12/2018

Mayo Clinic

Program Director / Principal Investigator Distribution of otolaryngology costs of care. Funded by SGP - Small Grants Program <\$10K 03/2016 - 05/2017

Other

Principal Investigator Composite severity indices reflect sleep apnea disease burden more comprehensively than the apnea-hypopnea index.. Funded by AAO-HNSF Health Services Research Grant 01/2006 - 01/2007

Other

#AskTheMayoMOM 02/2018
Invited guest on popular Mayo Facebook show

Mayo Clinic Radio co-host 2018 – 12/2019
Intermittent co-host for Mayo Clinic Radio outreach show

Bibliography

Peer-reviewed Articles

1. Aizawa H, Hu SC, Bobb K, **Balakrishnan K**, Ince G, Gurevich I, Cowan M, Ghosh A. Dendrite development regulated by CREST, a calcium-regulated transcriptional activator. *Science*. 2004 Jan 09; 303: (5655)197-202. PMID: 14716005 DOI: 10.1126/science.1089845
2. **Balakrishnan K**, De Maio A. Heat shock protein 70 binds its own messenger ribonucleic acid as part of a gene expression self-limiting mechanism. *Cell Stress Chaperones*. 2006 Spring; 11: (1)44-50. PMID: 16572728 PMCID: 1400612
3. **Balakrishnan K**, Perkins JA. Management of airway hemangiomas. *Expert Rev Respir Med*. 2010 Aug; 4: (4)455-62. PMID: 20658907
4. **Balakrishnan K**, Majesky M, Perkins JA. Head and neck lymphatic tumors and bony abnormalities: a clinical and molecular review. *Lymphat Res Biol*. 2011; 9: (4)205-12. PMID: 22196287 PMCID: 3391938
5. **Balakrishnan K**, Moe KS. Applications and outcomes of orbital and transorbital endoscopic surgery. *Otolaryngol Head Neck Surg*. 2011 May; 144: (5)815-20. PMID: 21493355 DOI: 10.1177/0194599810397285
6. Balakrishnan K, Edwards TC, Perkins JA. Functional and symptom impacts of pediatric head and neck lymphatic malformations: developing a patient-derived instrument. *Otolaryngol Head Neck Surg*. 2012 Nov; 147: (5)925-31. PMID: 22675002 DOI: 10.1177/0194599812450838
7. **Balakrishnan K**, Perkins J. Management of head and neck lymphatic malformations. *Facial Plast Surg*. 2012 Dec; 28: (6)596-602. PMID: 23188687
8. **Balakrishnan K, James KT, Weaver EM. Composite severity indices reflect sleep apnea disease burden more comprehensively than the apnea-hypopnea index. Otolaryngol Head Neck Surg. 2013 Feb; 148: (2)324-30. PMID: 23077154 PMCID: 5940927 DOI: 10.1177/0194599812464468**
9. Sidell DR, **Balakrishnan K**, Hart CK, Willging JP, Knecht SK, de Alarcon A. Pediatric exercise stress laryngoscopy following laryngotracheoplasty: a comparative review. *Otolaryngology - Head & Neck Surgery*. 2014; 150:1056-61.
10. * **Balakrishnan K**, Menezes MD, Chen BS, Magit AE, Perkins JA. Primary surgery vs primary sclerotherapy for head and neck lymphatic malformations. *JAMA Otolaryngol Head Neck Surg*. 2014 Jan; 140: (1)41-5. PMID: 24288004 DOI: 10.1001/jamaoto.2013.5849
11. Sidell DR, Zacharias S, **Balakrishnan K**, Rutter MJ, de Alarcon A. Surgical management of posterior glottic diastasis in children. *Annals of Otolaryngology, & Laryngology*. 2014. Epub 2014 Jul 25
12. * Harmon J, **Balakrishnan K**, de Alarcon A, Hart CK. The nasogastric tube syndrome in infants. *International Journal of Pediatric Otorhinolaryngology*. 2014; 78:882-4.
13. Longstreet B, **Balakrishnan K**, Saltzman B, Perkins JA, Dighe M. Prognostic value of a simplified anatomically based nomenclature for fetal nuchal lymphatic anomalies. *Otolaryngol Head Neck Surg*. 2015 Feb; 152 (2):342-7 Epub 2014 Nov 19 PMID: 25411310 PMCID: 4672725 DOI: 10.1177/0194599814559190
14. * **Balakrishnan K, Goico B, Arjmand EM. Applying cost accounting to operating room staffing in otolaryngology: time-driven activity-based costing and outpatient adenotonsillectomy. Otolaryngol Head Neck Surg. 2015 Apr; 152(4):684-90. Epub 2015 Jan 26. PMID: 25623288 DOI: 10.1177/0194599814568273**
15. **Balakrishnan K, Bauman N, Chun RH, Darrow DH, Grimmer JF, Perkins JA, Richter GT, Shin JJ, Shivaram GM, Sidell DR, Elluru RG. Standardized outcome and reporting measures in pediatric head and neck lymphatic malformations. Otolaryngol Head Neck Surg. 2015 May; 152 (5):948-53 Epub 2015 Mar 31 PMID: 25829389 DOI: 10.1177/0194599815577602**
16. * **Balakrishnan K, Cheng E, de Alarcon A, Sidell DR, Hart CK, Rutter MJ. Outcomes and Resource Utilization of Endoscopic Mass-Closure Technique for Laryngeal Clefts. Otolaryngol Head Neck Surg. 2015 Jul; 153 (1):119-23 Epub 2015 Mar 17 PMID: 25782984 DOI: 10.1177/0194599815576718**
17. **Kirkham EM, Edwards TC, Weaver EM, Balakrishnan K, Perkins JA. The Lymphatic Malformation Function (LMF) Instrument. Otolaryngol Head Neck Surg. 2015 Oct; 153 (4):656-62 Epub 2015 July 20 PMID: 26195574 PMCID: 5938064 DOI: 10.1177/0194599815594776**
18. **Balakrishnan K, James KT, Weaver EM. Predicting CPAP Use and Treatment Outcomes Using Composite Indices of Sleep Apnea Severity. J Clin Sleep Med. 2016 Jun 15; 12 (6):849-54 Epub 2016 June 15 PMID: 26857052 PMCID: 4877317 DOI: 10.5664/jcs.m.5884**

19. Chun R, Jabbour N, **Balakrishnan K**, Bauman N, Darrow DH, Elluru R, Grimmer JF, Perkins J, Richter G, Shin J. Education on, Exposure to, and Management of Vascular Anomalies During Otolaryngology Residency and Pediatric Otolaryngology Fellowship. *JAMA Otolaryngol Head Neck Surg.* 2016 Jul 1; 142 (7):648-51 PMID: 27124736 DOI: 10.1001/jamaoto.2016.0605
20. **Balakrishnan K**, Cofer S, Matsumoto JM, Dearani JA, Boesch RP. Three-dimensional printed models in multidisciplinary planning of complex tracheal reconstruction. *Laryngoscope.* 2017 Apr; 127 (4):967-970 Epub 2016 Oct 18 PMID: 27753107 DOI: 10.1002/lary.26353
21. Yeung JC, **Balakrishnan K**, Cheng ATL, Daniel SJ, Garabedian EN, Hart CK, Inglis AF Jr, Le Boulanger N, Liming BJ, Moreddu E, Nicollas R, Russell JD, Rutter MJ, Sidell DR, Spratley J, Soma M, Thierry B, Thompson DM, Triglia JM, Watters K, Wyatt M, Zalzal GH, Zur KB, Rahbar R. International Pediatric Otolaryngology Group: Consensus guidelines on the diagnosis and management of type I laryngeal clefts. *Int J Pediatr Otorhinolaryngol.* 2017 Oct; 101:51-56 Epub 2017 July 18 PMID: 28964310 DOI: 10.1016/j.ijporl.2017.07.016
22. Rutter MJ, Hart CK, Alarcon A, Daniel SJ, Parikh SR, **Balakrishnan K**, Lam D, Johnson K, Sidell DR. Endoscopic anterior-posterior cricoid split for pediatric bilateral vocal fold paralysis. *Laryngoscope.* 2018 Jan; 128 (1):257-263 Epub 2017 Mar 08 PMID: 28271539 DOI: 10.1002/lary.26547
23. * Oliver JD, Anzalone CL, **Balakrishnan K**. Primary cervical leiomyoma: A rare cause of a posterior neck mass in a pediatric patient. *Int J Pediatr Otorhinolaryngol.* 2018 Jan; 104:166-169 Epub 2017 Nov 20 PMID: 29287860 DOI: 10.1016/j.ijporl.2017.11.015
24. * **Hernandez MC, Antiel RM, Balakrishnan K, Zielinski MD, Klinkner DB. Definitive airway management after prehospital supraglottic rescue airway in pediatric trauma. J Pediatr Surg. 2018 Feb; 53 (2):352-356 Epub 2017 Oct 06 PMID: 29096887 DOI: 10.1016/j.jpedsurg.2017.10.004**
25. **Balakrishnan K, Arjmand EM, Nussenbaum B, Snyderman C. National Multispecialty Survey Results: Comparing Morbidity and Mortality Conference Practices within and outside Otolaryngology. Otolaryngol Head Neck Surg. 2018 Feb; 158 (2):273-279 Epub 2017 Oct 24 PMID: 29064313 DOI: 10.1177/0194599817737993**
26. ***Boesch RP, Balakrishnan K, Acra S, Benscoter DT, Cofer SA, Collaco JM, Dahl JP, Daines CL, DeAlarcon A, DeBoer EM, Deterding RR, Friedlander JA, Gold BD, Grothe RM, Hart CK, Kazachkov M, Lefton-Greif MA, Miller CK, Moore PE, Pentiuik S, Peterson-Carmichael S, Piccione J, Prager JD, Putnam PE, Rosen R, Rutter MJ, Ryan MJ, Skinner ML, Torres-Silva C, Wootten CT, Zur KB, Cotton RT, Wood RE. Structure and Functions of Pediatric Aerodigestive Programs: A Consensus Statement. Pediatrics** 2018 Mar; 141 (3) Epub 2018 Feb 07 PMID: 29437862 DOI: 10.1542/peds.2017-1701
27. Boesch RP, Baughn JM, Cofer SA, **Balakrishnan K**. Trans-nasal flexible bronchoscopy in wheezing children: Diagnostic yield, impact on therapy, and prevalence of laryngeal cleft. *Pediatr Pulmonol.* 2018 Mar; 53 (3):310-315 Epub 2017 Sept 14 PMID: 28910519 DOI: 10.1002/ppul.23829
28. * Trousdale WH, Boesch RP, Orvidas LJ, **Balakrishnan K**. Indirect management of full-thickness tracheal erosion in a complex pediatric patient. *Int J Pediatr Otorhinolaryngol.* 2018 Apr; 107:155-159 Epub 2018 Feb 07 PMID: 29501299 DOI: 10.1016/j.ijporl.2018.02.011
29. Ruano R, Klinkner DB, **Balakrishnan K**, Novoa Y Novoa VA, Davies N, Potter DD, Carey WA, Colby CE, Kolbe AB, Arendt KW, Segura L, Sviggum HP, Lemens MA, Famuyide A, Terzic A. Fetoscopic Therapy for Severe Pulmonary Hypoplasia in Congenital Diaphragmatic Hernia: A First in Prenatal Regenerative Medicine at Mayo Clinic. *Mayo Clin Proc.* 2018 Jun; 93 (6):693-700 PMID: 29803315 DOI: 10.1016/j.mayocp.2018.02.026
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* Indicates that the primary author was a mentee of this author.