

**The Faculty of Medicine of Harvard University
Curriculum Vitae**

Date Prepared: May 5, 2023
Name: Kohei Hasegawa, MD, MPH, PhD
Office Address: Department of Emergency Medicine, Massachusetts General Hospital
125 Nashua Street, Suite 920, Boston, MA 02114-1101
Home Address: 120 Beaconsfield Rd., #2, Brookline, MA 02445
Work Phone: (617) 726-5276
Work Email: khasegawa@mgh.harvard.edu
Place of Birth: Nigata, Japan

Education:

03/2000	B.A.	Policy Management	Keio University
03/2004	M.D., with <i>Summa Cum Laude</i>	Medicine	Tokai University, School of Medicine
11/2012	M.P.H.	Quantitative Methods	Harvard University
05/2021	M.S.	Computational Biology and Quantitative Genetics	Harvard University
03/2022	PhD	Medicine (advisor: Nakagawa)	Tokai University, School of Medicine

Postdoctoral Training:

05/04-04/06	Resident	Medicine	Tokai University Hospital
05/06-03/07	Resident	Pediatrics	Tokai University Hospital
04/07-03/08	Resident	Medicine	U.S. Naval Hospital, Okinawa
07/08-06/12	Resident	Emergency Medicine	Massachusetts General Hospital (MGH) and Brigham and Women's Hospital (BWH)
07/08-06/12	Clinical Fellow	Emergency Medicine	Harvard Medical School (HMS)
07/12-06/13	Research Fellow	Emergency Medicine (PI: Camargo)	MGH

Faculty Academic Appointments:

07/12-01/14	Instructor	Surgery	HMS
04/13-04/17	Adjunct Lecturer (non-voting)	Emergency Medicine	Kinki University, Osaka, Japan
01/14-09/14	Assistant Professor	Surgery	HMS
10/14-06/17	Assistant Professor	Emergency Medicine	HMS
06/17-	Associate Professor	Emergency Medicine	HMS

Appointments at Hospitals/Affiliated Institutions:

07/12-12/14	Assistant	Emergency Medicine	MGH
01/15-01/18	Assistant Physician	Emergency Medicine	MGH
01/18-	Associate Physician	Emergency Medicine	MGH
08/21-	The Camargo Family Endowed Scholar in Emergency Medicine Research	Emergency Medicine	MGH

Other Professional Positions:

2014-	Team Physician	Boston Bruins	7 days per year
2015-2022	Visiting Team Liaison Physician / City Lead	National Football League	7 days per year

Major Administrative Leadership Positions:**Local**

2017-	Faculty, Program in Quantitative Genomics	Harvard T.H. Chan School of Public Health
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International

2009-2017	Board Member / Co-Founder	Emergency Medicine Alliance
2009	Course Co-director	Emergency Airway Management. The EMA Education Course
2009-	Director / Founder	Japanese Emergency Medicine Network (formerly Japanese Emergency Medicine Research Alliance)
2018-	Director	Translational Research Unit, Emergency Medicine Network

Committee Service:**Local**

2013-2017	HAEMR Journal Club Committee	MGH, Department of Emergency Medicine
	2013-2017	Core Faculty
2020	Faculty Search Committee	MGH, Department of Emergency Medicine
	2020	Member

Regional

2015-2018	Steering Committee	Clinical and Public Health Research Network of Academics In (CRENAI) Boston
	2015-2018	Member, Steering Committee

National

2016-	MARC-35/43 Steering Committee	Multicenter Airway Research Collaboration / Emergency Medicine Network Member
2016-	Airways Outcome Working Group	NIH Environmental influences on Child Health Outcomes (ECHO) program Member Co-chair
2016-	Steering Committee	NIH ECHO Program PI designate
2016-	Biospecimens Working Group	NIH ECHO program Member
2016-	Chemical Exposure Working Group	NIH ECHO program Member
2017-2020	Microbiome Working Group	NIH ECHO program Member
2017-2018	Data Collection Protocol Working Group, Early Childhood Life Stage Subcommittee	NIH ECHO program Representative, the Airways Outcomes Working Group
2019-	Genetics and Epigenetics Working Group	NIH ECHO program Member
2019	Expert Consensus Panel	NIH/NIDA Clinical Trials Network Emergency Department-Initiated Buprenorphine Validation Network Trial Member
2020-2021	Planning Committee of NIH/NIAID Workshop	NIH/NIAID Co-chair
2021	Planning Committee of NIH ECHO Program session at the 2022 ATS Conference	NIH ECHO program Co-chair
2022	Expert Consensus Panel	NIH/NHLBI Novel Markers of Treatment Responsiveness for Pediatric Acute Asthma Exacerbations Member
2022-2023	Microbiome Data Group	NIH ECHO program Member
2022-2023	Omics Working Group	Society for Academic Emergency Medicine SAEM Consensus Conference, Precision Emergency Medicine: Setting a Research Agenda Member

International

2009-	Steering Committee 2009-	Japanese Emergency Medicine Network Chair
2017-2020	Steering Committee 2017-2020	Emergency Medicine Network (EMNet) At-Large Member
2020-	Delegate	The US-Japan Leadership Program United States-Japan Foundation Delegate
	2020-	

Professional Societies:

2007-	Japanese Association for Acute Medicine 2008-2017	Member, Educational Resource and ER Exploratory Committee
2008-	American College of Emergency Physicians	
2008-	Society for Academic Emergency Medicine 2014-2015 2015-	Member, Research Committee Member, Program Committee, Abstract Subcommittee
	2017-2018 2018-	Co-chair , Residency and Fellowship Fair Member, Research Committee
2008-	American Academy of Emergency Medicine 2017-2018	Member, Academic Affairs Committee
2008-	American Medical Association	
2008-	Massachusetts Medical Society	
2015-	American Thoracic Society	

Grant Review Activities:

2018-2019	Microbiome in Human Disease Grant Committee 2018-2019	Harvard Catalyst Reactor Program Ad hoc reviewer
2019-	Grant Committee 2019-	Harvard Catalyst Ad hoc reviewer
2020	ZAI1-MSA-W-S2: Rapid Investigation of Severe Acute Respiratory Syndrome Coronavirus 2 and Coronavirus Disease 2019 2020	NIH Ad hoc member
2020	ZAI1-MMF-X-S3: Rapid Investigation of Severe Acute Respiratory Syndrome Coronavirus 2 and Coronavirus Disease 2019 2020	NIH Ad hoc member
2021	ZAI1 TC-I: RFA-AI-20-007 Asthma and Allergic Diseases Cooperative Research Centers (U19)	NIH Ad hoc member

	2021	
2022	ZRG1 SCIL-D Small Business: Psychopathology, Addictions, and Community-based Interventions	NIH Ad hoc member

Editorial Activities:

- **Ad hoc Reviewer (32 journals)**

- Academic Emergency Medicine*
- Acute Medicine & Surgery*
- American Journal of Cardiology*
- American Journal of Medical Quality*
- American Journal of Respiratory and Critical Care Medicine*
- Annals of Emergency Medicine*
- BMC Emergency Medicine*
- BMC Medicine*
- BMC Research Notes*
- BMJ*
- Circulation*
- Clinical and Experimental Allergy*
- Critical Care Medicine*
- Disaster Medicine and Public Health Preparedness*
- Emergency Medicine Journal*
- European Respiratory Journal*
- Frontier in Medicine*
- Health Affairs*
- JAMA*
- Journal of the American College of Cardiology*
- Journal of Asthma*
- Journal of Allergy and Clinical Immunology: In Practice*
- Journal of Emergency Medicine*
- Journal of Medical Virology*
- Nature Communications*
- Pediatrics*
- Pediatric Infectious Disease Journal*
- Pediatric Research*
- Respiratory Care*
- Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine*
- Society for Academic Emergency Medicine*
- Western Journal of Emergency Medicine*

- **Other Editorial Roles**

2015-	Associate Editor	<i>Acute Medicine & Surgery: an official journal of the Japanese Association for Acute Medicine</i>
2016-2021	Associate Editor	<i>BMC Emergency Medicine</i>
2020-	Associate Editor Member of the Board of Pulmonary Medicine	<i>Frontiers in Medicine</i>
2021-	Associate Editor	<i>Annals of Clinical Epidemiology</i>

Honors and Prizes:

2004	President Award	Tokai University School of Medicine	Academic
2008	Resident of the Year Award	United States Naval Hospital Okinawa	Clinical
2008	Spirit Award	United States Naval Hospital Okinawa	Clinical
2011	John E. Thayer III Award	The Japan Society of Boston	Disaster relief
2011	Best Scientific Paper Award	Japanese Association for Acute Medicine	Research
2013	Fellowship (FAAEM)	American Academy of Emergency Medicine	Clinical/research
2015	Fellowship (FACEP)	American College of Emergency Physicians	Clinical/research
2016	Best Scientific Paper Award	Japan Primary Care Association	Research
2016	Young Investigator Award	Society for Academic Emergency Medicine	Research
2018	Patient Experience Award	MGH	Clinical
2019	Carlos A. Camargo Jr. Award for Outstanding Achievement in Research	MGH Emergency Medicine	Research
2019	Faculty Excellence in Patient Experience Award	MGH Emergency Medicine	Clinical
2020	Faculty Excellence in Patient Experience Award	MGH Emergency Medicine	Clinical
2020	Carlos A. Camargo Jr. Award for Outstanding Achievement in Research	MGH Emergency Medicine	Research
2021	Best Pediatric Emergency Medicine Best Abstract	The Pediatric Emergency Medicine Interest Group of the Society for Academic Emergency Medicine	Research
2022	Mid-Career Investigator Award	Society for Academic Emergency Medicine	Research
2022	Winner of Project Competition (\$150,000 award)	Mass General Research Institute, Bridging Academia and Industry Program	Research

Report of Funded and Unfunded Projects

Past

2011-2012 The Japanese Emergency Airway Network I Study: a multi-center prospective observational study of emergency airway management

- St. Luke's Life Science Institute Clinical Research Grant
PI
 The major goal of the study was to document the current emergency airway management in Japanese emergency departments using a multi-center registry.
- 2011-2012 The Japanese Emergency Airway Network I Study: a multi-center prospective observational study of emergency airway management
 Richard Wuerz Emergency Medicine Research Grant
PI
 The major goal of the study was to document the current emergency airway management in Japanese emergency departments using a multi-center registry.
- 2013-2014 The Japanese Emergency Airway Network III Study: a multi-center observational study of acute asthma in emergency department.
 St. Luke's Life Science Institute Clinical Research Grant
PI
 The major goal of the study was to describe the current acute asthma management in Japanese emergency departments using a multi-center network.
- 2013-2014 Adult emergency department patients with acute asthma and survey of local asthma centers: 36th Multicenter Airway Research Collaboration (MARC-36) study
 Novartis
 Co-investigator (PI, Carlos Camargo) – Investigator initiated
 The major goal of this multicenter study was to describe adult emergency department patients with acute asthma, with a focus on the characteristics of patients with a high number of emergency department asthma visits in the 12 months before their index visit.
- 2013-2014 Acute asthma in US emergency departments, 2006-2010
 The Eleanor and Miles Shore Fellowship Program for Scholars in Medicine
PI
 The major goal of this study was to characterize asthma patients with a high number of ED visits and to determine the associated factors.
- 2014-2015 Epidemiology and inpatient management of patients hospitalized for acute asthma: 37th Multicenter Airway Research Collaboration (MARC-37) Study
 Novartis
 Co-investigator (PI, Carlos Camargo) – Investigator initiated
 The major goal of this multicenter study was to describe adult and pediatric patients hospitalized with acute asthma, with a focus on the characteristics of patients with a high number of asthma hospitalization in the 12 months before their index hospitalization.
- 2015 The role of airway microbiota in the development of near-fatal bronchiolitis in young children
 Milton Fund
PI
 The major goal of this project was examine the role of the airway microbiota of children in the development of near-fatal bronchiolitis (i.e., bronchiolitis requiring mechanical ventilation) in a diverse cohort.
- 2014-2016 The Japanese Emergency Airway Network II Study: A Multi-Center Prospective Observational Study of Emergency Airway Management.
 St. Luke's Life Science Institute
Multi-PI (Hasegawa/Hagiwara)

- The major goal of the study was to document the current emergency airway management in Japanese emergency departments using a multi-center registry.
- 2014-2016 Faculty Development Grant
Department of Emergency Medicine, MGH
PI
- 2016 Emergency department management of patients with food or insect sting allergies: the 38th Multicenter Airway Research Collaboration (MARC-38) study
Mylan
Co-Investigator (PI, Carlos Camargo) – Investigator initiated
The major goal of this multicenter study was to describe children and adults presenting to the emergency department with food or insect sting-related acute allergic reaction.
- 2015-2017 The 39th Multicenter Airway Research Collaboration (MARC-39) Study
Teva Branded Pharmaceutical Products ABS-AS-40091
PI (\$291,281 direct costs)
The major goals of the project were to prospectively examine the epidemiology of emergency department patients with asthma exacerbation and to develop biorepositories.
- 2015-2018 Cytokines & transcriptomes in rhinovirus bronchiolitis and risk of incident asthma
NIH/NHLBI R21 HL129909
PI (\$379,200 direct costs)
The major goal of this project was, in the airway of infants hospitalized with rhinovirus bronchiolitis, to discover modifiable factors that predict incident asthma.
- 2016-2017 Prospective cohort study of severe bronchiolitis and recurrent wheezing
NIH/NIAID U01 AI-87881
Co-Investigator (PI, Carlos Camargo)
The major goals were to determine, among children with severe bronchiolitis, the relation of clinical and laboratory factors to the development of recurrent wheezing by age 3.
- 2016-2018 Airway microbiome and age 6y asthma phenotypes in 2 diverse multicenter cohorts
NIH/OD UG3 OD-023253
Co-Investigator (PI, Carlos Camargo)
The major goals were to determine the relation of longitudinal patterns of the airway microbiome to risk of childhood asthma in the two prospective multicenter cohorts (MARC-35/43).
- 2014-2019 Infant specific-IgE, rhinovirus-C bronchiolitis, and incident asthma in MARC-35
NIH/NIAID R01 AI114552
Co-Investigator (PI, Carlos Camargo)
The major goal of this project was to investigate the relationship between two infant factors (specific IgE and rhinovirus type C bronchiolitis) and the development of asthma in a diverse US cohort.
- 2015-2020 Comparative Effectiveness Research on Hospital Readmissions for COPD
AHRQ R01 HS023305
Co-Investigator (PI, Carlos Camargo)

- The major goal of this project was to investigate both clinical and methodologic aspects of comparative effectiveness research on COPD readmission.
- 2017-2020 The 41th Multicenter Airway Research Collaboration (MARC-41) Study
Novartis Pharmaceuticals Corporation, CIGE025AUS48T
PI (\$360,258 direct costs) – Investigator initiated
The major goals of the project were to develop a novel hospital-initiated asthma care bundle and examine its effectiveness on post-hospitalization asthma care and patient outcomes.
- 2017-2021 Mid-Career Faculty Department Award
Department of Emergency Medicine, MGH
PI (\$60,000 direct costs)
- 2019-2020 Administrative Supplement for “Airway metagenome & metabolome in bronchiolitis and risk of asthma: MARC-35 cohort”
NIH/NIAID R01 AI-134940-03
PI (\$243,800 direct costs)
In an ongoing prospective cohort of children with bronchiolitis, this project defined the role of the circulating proteome in bronchiolitis severity and development of asthma by using state-of-art proteomics approaches.
- 2016-2021 Nasal microRNA during bronchiolitis and age 6y asthma phenotypes: MARC-35 cohort
NIH/NIAID R01 AI-127507
Co-Investigator (PI, Carlos Camargo)
The major goals are to examine the relation of nasal airway microRNAs in early infancy to risk of developing asthma and to phenotype/endotype asthma at age 6 years.

Current

- 2017-2023 Airway metagenome & metabolome in bronchiolitis and risk of asthma: MARC-35 cohort
NIH/NIAID R01 AI-134940
PI (\$2,674,814 direct costs)
In an ongoing prospective cohort of children with bronchiolitis, this R01 project will define the role of airway microbe-host interrelations in bronchiolitis severity and development of asthma by using metagenomic and metabolomic approaches.
- 2018-2023 Airway dual-transcriptomics in bronchiolitis and risk of asthma: MARC-35 cohort
NIH/NIAID R01 AI-137091
PI (\$3,028,242 direct costs)
In an ongoing prospective cohort of children with bronchiolitis, this R01 project will define the role of airway microbe-host interrelations in bronchiolitis severity and development of asthma by using dual-transcriptomic approaches.
- 2018-2023 Airway microbiome and age 6y asthma phenotypes in 2 diverse multicenter cohorts
NIH/OD UH3 OD-023253
Co-Investigator (PI, Carlos Camargo)
The major goals are to determine the relation of longitudinal patterns of the airway microbiome to risk of childhood asthma in the two prospective multicenter cohorts (MARC-35/43).
- 2020-2024 Infant blood epigenome and risks of IgE sensitization, obesity, and asthma: MARC-35/43 cohorts
NIH/NIAID R01 AI-148338

Multi-PI (Hasegawa/Liang) (\$2,516,444 direct costs)

In two ongoing prospective cohorts of children, this R01 project will define the role of blood epigenome in the development of allergic sensitization, overweight/obesity, and asthma.

2021-2026 Proteomics profiling in hypertrophic cardiomyopathy and cardiac event prediction

NIH/NHLBI R01 HL-13129763

Co-Investigator (PI, Shimada)

The R01 aims to define the interrelations of host genetics and circulating proteomics, as well as their integrated contributions to the development of major cardiac event in adults with hypertrophic cardiomyopathy.

2021-2023 Administrative Supplement for "Airway dual-transcriptomics in bronchiolitis and risk of asthma: MARC-35 cohort

NIH/NIAID R01 AI-137091-04

PI (\$136,998 direct costs)

In an ongoing prospective cohort of children with bronchiolitis, this project will define the role of the longitudinal proteome in the development of asthma by using state-of-art proteomics approaches.

2022-2026 Microbiome-host interplay in viral respiratory infections: A tracheostomy cohort

NIH/NIAID R01AI-173142

Co-Investigator (PI, Mansbach)

Building on the R56 above, this R01 project aims to define the to define the interrelations of respiratory viruses, airway microbiome, and host response, as well as their integrated contributions to the development of acute respiratory infection in children with tracheostomy and home ventilation.

Projects Submitted for Funding

Pending; NIH/NINDS (PI, Van Haren).

Submitted Vitamin D supplementation for the prevention of inflammatory brain lesions in ALD
2/2022 boys

The project aims to examine the effectiveness of oral vitamin D3 supplementation to prevent the development of brain lesions in boys with ALD and to identify the mechanisms biomarkers that mediate the effect

Pending; NIH/NHLBI (PI, Shimada)

Submitted Transcriptomics, pathobiology, and cardiac event in hypertrophic cardiomyopathy
3/2022 Co-I

The aims are focused on performing transcriptomics profiling to reveal signaling pathways that are dysregulated in hypertrophic cardiomyopathy, especially in patients who subsequently develop major adverse cardiovascular events

Percentile 13.

Pending; NIH/NIAID

Submitted PI. Direct cost requested - \$2,677,179
6/2022

Infancy proteome, bronchiolitis, and risk of childhood asthma: MARC-35/43 cohorts
In two ongoing cohorts of children, we will study the circulating proteome in early childhood—in conjunction with multi-level omics data—to learn how the proteome influences the pathobiology of severe bronchiolitis and the development of childhood asthma (and its major subtypes).

Training Grants and Mentored Trainee Grants

- 2015-2016 Clinical epidemiology of geriatric emergencies in Japan
St. Luke's Life Science Institute, Center for Clinical Epidemiology
Mentor of Dr. Tadahiro Goto
The major goal was to examine the current status of geriatric emergencies in Japan.
- 2016-2017 Airway microbiome and risk of relapse in infants with severe bronchiolitis
The Uehara Memorial Foundation
Mentor of Dr. Tadahiro Goto
The major goal was to determine the associations between upper airway microbiome profile and risks of relapse in infants with severe bronchiolitis.
- 2017-2018 Kamiyama Fellowship Grant
The Kamiyama Foundation
Mentor of Dr. Sarah Kyuragi Luthe
The major goal was to provide a general support to the research fellowship of the awardee.
- 2017-2018 The Joint Japan/World Bank Graduate Scholarship
World Bank
Mentor of Dr. Sarah Kyuragi Luthe
The major goal was to provide a general support to the research fellowship of the awardee.
- 2018-2019 Airway microbiota in STEPS cohort
Finnish Medical Foundation
Mentor of Dr. Laura Toivonen
The major goal was to examine the longitudinal microbiota in the airway.
- 2018-2019 The nasal metabolome, microbiome, risk of respiratory infections and asthma in children
Päivikki and Sakari Sohlberg Foundation
Mentor of Dr. Laura Toivonen
The major goal was to examine the metabolome and microbiome in the airway.
- 2017-2019 The nasal microbiome and the risk of recurrent wheezing and asthma
Foundation for Pediatric Research, Postdoctoral Fellowship Grant
Mentor of Dr. Laura Toivonen
The major goal was to examine the relations between nasal microbiome and the risk of recurrent wheezing and asthma
- 2018-2019 The nasal microbiome and the risk of recurrent wheezing
Tampere Tuberculosis Foundation Grant
Mentor of Dr. Laura Toivonen
The major goal was to examine the relations between nasal microbiome and the risk of recurrent wheezing
- 2019 The nasal microbiome and the risk of asthma
Paulo Research Foundation, Postdoctoral Fellowship Grant
Mentor of Dr. Laura Toivonen
The major goal was to examine the relations between nasal microbiome and the risk of asthma
- 2019 The nasal metabolome and the risk of asthma
Hospital District of Southwest Finland Grant 13289
Mentor of Dr. Laura Toivonen
The major goal was to examine the relations between nasal metabolome and the risk of asthma
- 2019 The nasal metagenome and the risk of asthma
Juho Vainio Foundation Grant
Mentor of Dr. Laura Toivonen

The major goal was to examine the relations between nasal metagenome and the risk of asthma
 2019-2020 Research Fellowship grant
 Research Training Grant from KMS Corporation
 Mentor of Dr. Michimasa Fujiogi
 2019-2020 Saitama Medical University Faculty of Medicine Alumni Association Grant
 Mentor of Dr. Michimasa Fujiogi
 The major goal was to provide a general support to the research fellowship of the awardee.
 2019 The nasal metabolome, microbiome, risk of respiratory infections and asthma in children
 Allergy Research Foundation
 Mentor of Dr. Laura Toivonen
 The major goal was to examine the associations between nasal metabolome, microbiome, risk of respiratory infections and asthma
 2019-2023 The nasal metabolome, microbiome, risk of respiratory infections and asthma in children
 Academy of Finland (324626)
 Mentor of Dr. Laura Toivonen
 The major goal is to examine the associations between nasal metabolome, microbiome, risk of respiratory infections and asthma in children
 2019-2022 The nasal metabolome, microbiome, risk of respiratory infections and asthma in children: A multi-omic study
 Emil Aaltonen Foundation Project Grant
 Mentor of Dr. Laura Toivonen
 The major goal is to examine the associations between metabolome, microbiome, risk of respiratory infections and asthma in children
 2020-2023 The nasal metabolome, microbiome, risk of respiratory infections and asthma in children
 Sigrid Juselius Foundation
 Mentor of Dr. Laura Toivonen
 The major goal is to examine the associations between nasal metabolome, microbiome, risk of respiratory infections and asthma in children
 2021 Airway dual-transcriptomics and risk of asthma in infants with severe bronchiolitis
 The Uehara Memorial Foundation
 Mentor of Dr. Michimasa Fujiogi
 The major goal is to determine the associations between upper airway microbiome and transcriptome profile and risks of asthma development in infants with severe bronchiolitis.
 2021 Integrating the genome, metabolome, and microbiome for childhood asthma: Risk and endotypes
 NIH/NIAID, K01
 Mentor of Zhaozhong Zhu
 The major goals are to train Dr. Zhu to be an independent researcher through integrated omics projects in asthma.
 2021-2028 Applying advanced medicine via integration of artificial intelligence and omics data.
 Japan Science and Technology Agency, Sohatsu grant
 Mentor of Dr. Tadao Ooka
 The major goal is to determine the role of artificial intelligence and omics data in preventive medicine
 2022-2024 Integrated omics analysis toward primary prevention of atopic dermatitis
 Japanese Dermatological Association Grant
 Mentor of Dr. Hideaki Miyachi

Unfunded Current Projects

2018 Infant genome, bronchiolitis severity, and risk of incident asthma
Unfunded
PI
The goal of the project to investigate the relationships of infant genotypes with the bronchiolitis severity and the development of childhood asthma in the MARC-35/43 cohorts

Report of Local Teaching and Training

Teaching of Students in Courses:

2009	Introduction to the Profession 1 st year medical students	HMS Tutor, 6 hours
2010	Introduction to the Profession 1 st year medical students	HMS Tutor, 6 hours
2010	Simulation, Partners Health International -Tokyo Medical and Dental University Education Alliance Medical students	HMS Tutor, 3 hours
2011	Simulation, the Harvard Premedical Society Premedical student	HMS Tutor, 3 hours
2011	Integrated Human Physiology 1 st year medical students	HMS Tutor, 6 hours
2011	Simulation, Partners Health International -Tokyo Medical and Dental University Education Alliance Medical student	HMS Tutor, 6 hours
2011	Introduction to the Profession 1 st year medical students	HMS Tutor, 6 hours
2013	Association between advanced airway management and outcomes in patients with cardiac arrest	Harvard School of Public Health (ID265) Lecturer, 1 hour

Formal Teaching of Residents, Clinical Fellows and Research Fellows (post-docs):

2008	Takotsubo cardiomyopathy Faculty, fellows, residents, students	MGH Emergency Medicine 1-hour lecture
2009	Dermatomyositis Faculty, fellows, residents, students	MGH Emergency Medicine 1-hour lecture
2010	Disaster relief Faculty, fellows, residents, students	MGH Emergency Medicine 1-hour lecture
2011	Advent of advanced cardiac life support Faculty, fellows, residents, students	MGH Emergency Medicine 1-hour lecture
2013	Advanced Cardiac Life Support Residents, Fellows, Faculty	MGH 3.5 hours
2013	Controversies in Resuscitation	MGH Emergency Medicine 1-hour lecture
2014	Advanced Cardiac Life Support	MGH

2015	Residents, Fellows, Faculty Basic approach to airway management	3.5 hours MGH
2015	Residents HAEMR Airway Course (STRATUS)	2-hour lecture and simulation BWH/MGH
2015	Residents Creating a research career / insights & advice	5-hour lecture and simulation MGH
2016	Fellows, Faculty HAEMR Airway Training Program	1-hour lecture
2016	Residents HAEMR Airway Course (STRATUS)	BWH/MGH 5-hour lecture and simulation
2019-	Research Fellows Seminar Series	BWH/MGH 5-hour lecture and simulation MGH 1-hour lecture every week (i.e., approximately 50 hours per year)

Clinical Supervisory and Training Responsibilities:

2012-	Emergency Department Attending - Emergency medicine residents - Fellows (e.g., Pediatric Emergency Medicine fellows from BCH) - Medical students	MGH Approximately 16 hours per week (for 50 weeks per year)
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Research Supervisory and Training Responsibilities:

2012-	Supervision of post-doctoral research fellows (average 3-4 fellows per year)	MGH 1:1 research meeting one hour per week per fellow
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Formally Mentored Harvard Medical, Dental and Graduate Students:

2018-2020	Yoshihiko Raita, MD, MPH, MSc / HMS Class of 2020 Currently Research Fellow in my laboratory. <i>Mentoring role:</i> Primary mentor of the HMS MMSc program (graduated with Gordon Gold Award and Best Thesis Award) and primary research mentor of the Research Fellowship. <i>Accomplishments:</i> Multiple first-authored publication of mentored research
2020	Qian Xiao, MS / HSPH Class of 2020 <i>Thesis:</i> "A Bayesian Genome-Wide Association Study for Identifying Shared Genetics between Child Obesity and Asthma". <i>Role:</i> Research mentor and Thesis Committee member.
2021	Baturay Aydemi, MD with <i>Cum Laude</i> / HMS Class of 2021 <i>Thesis:</i> "An analysis of patient outcomes based on deviations from the usual care for vasopressor initiation in the emergency department". <i>Role:</i> Honors examiner
2023	Jinglun Li, MS / HSPH Class of 2023 <i>Thesis:</i> "Plasma metabolites mediating the shared genetic architecture of BMI and asthma in adults and children". <i>Role:</i> Thesis Committee member.

Other Mentored Trainees and Faculty:

- 2014 Eva Tovar Hirashima, MD, MPH / Faculty, University of Maryland, Baltimore, MD
Career stage: resident. *Mentoring role:* research advisor. *Accomplishments:* co-authored publication of mentored research.
- 2014-2015 Samantha Stoll, MD, MPH / Attending physician, Northshore Medical Center, Salem, MA
Career stage: resident. *Mentoring role:* research advisor. *Accomplishments:* multiple co-authored publications of mentored research.
- 2014-2015 Ken Bernard, MD, MBA / Chief of Emergency Medicine, Tuba City Regional Health Center, Indian Health Service, Tuba City, AZ
Career stage: resident. *Mentoring role:* mentored research. *Accomplishments:* co-authored publication of mentored research and a research grant from Massachusetts College of Emergency Physicians.
- 2014-2016 Jason Ahn, MD, MPA / Chief Development Officer, Equity Health Network, Los Angeles, CA
Career stage: resident. *Mentoring role:* research advisor. *Accomplishments:* multiple co-authored publications of mentored research.
- 2014-2017 Yusuke Tsugawa, MD, MPH, PhD / Associate Professor of Medicine, UCLA, Los Angeles, CA
Career stage: MPH/PhD student, post-doctoral fellow. *Mentoring role:* research mentor. *Accomplishments:* multiple co-authored publication of mentored research, research grants from the Abe Fellowship.
- 2014-2017 Yuichi Shimada, MD, MPH / Assistant Professor, Cardiology, Columbia University Medical Center. New York City, NY
Career stage: cardiology fellow and faculty. *Mentoring role:* research mentor. *Accomplishments:* multiple co-authored publications of mentored research, research grants from the American Heart Association and an NIH grant.
- 2015-2016 Jason Sanders, MD, PhD / Physician Investigator, Vertex Pharmaceuticals, Boston, MA
Career stage: resident. *Mentoring role:* research advisor. *Accomplishments:* co-authored publication of mentored research.
- 2015-2018 Tadahiro Goto, MD, MPH, PhD / Faculty, University of Tokyo, Tokyo, Japan
Career stage: research fellow. *Mentoring role:* research advisor and primary mentor. *Accomplishments:* multiple co-authored publications of mentored research, research grants from the St. Luke's Life Science Institute and the Uehara Memorial Foundation, the Best Paper Award from the American College of Emergency Physicians, and MPH at HSPH
- 2016-2018 Atsushi Hirayama, MD, MPH / Staff physician, Osaka Center for Cancer and Cardiovascular Disease Prevention, Osaka, Japan
Career stage: research fellow. *Mentoring role:* research advisor and primary mentor. *Accomplishments:* research grant from Fulbright Scholarship, multiple first-authored publications of mentored research, and MPH at HSPH.
- 2017-2018 Sarah Kyuragi Luthé, MD, MPH, PhD / Resident, Indiana University School of Medicine, Indianapolis, IN
Career stage: MPH student. *Mentoring role:* research mentor. *Accomplishments:* research grants from Kamiyama Foundation and the Joint Japan/World Bank Graduate Scholarship Program, multiple first-authored publications of mentored research, and MPH at HSPH.
- 2017 Christopher Bennett, MD, MA / Assistant Professor, Stanford University. Palo Alto, CA.

- Career stage:* resident. *Mentoring role:* career advisor. *Accomplishments:* first-authored publication of mentored research.
- 2017 Jason Bowman, MD / Attending, Brigham and Women's Hospital and Dana Farber Cancer Institute, Boston, MA
- Career stage:* resident. *Mentoring role:* resident advisor.
- 2017-2020 Laura Toivonen, MD, PhD / Fellow, Turku University Hospital, Turku, Finland
Career stage: research fellow. *Mentoring role:* research advisor and co-primary mentor. *Accomplishments:* Multiple research and training grants and multiple first-authored publication of mentored research.
- 2018-2019 Mariam Olivia Fofana, MD, PhD / Post-doctoral fellow, Yale School of Public Health, New Haven, CT.
Career stage: resident. *Mentoring role:* advisor
- 2018-2019 Melissa Zhao, MD / Resident, Brigham and Women's Hospital, Boston, MA
Career stage: MS student at Harvard T.H. Chan School of Public Health. *Mentoring role:* research mentor. *Accomplishments:* First-authored publication of mentored research.
- 2018-2019 Yushi Tang, MS / PhD candidate, Princeton University, Princeton, NJ
Career stage: MS student at Harvard T.H. Chan School of Public Health. *Mentoring role:* research mentor. *Accomplishments:* co-authored publication of mentored research.
- 2018 Kazuki Yoshida, MD, ScD / Instructor, Brigham and Women's Hospital, HMS
Career Stage: PhD student, junior faculty. *Mentoring role:* Research and career mentor. *Accomplishments:* Multiple co-authored publications of mentoring research
- 2018- Yoshihiko Raita, MD, MPH / Staff physician, Okinawa Chubu Hospital, Japan
Career stage: MMSci student at HMS and research fellow at MGH. *Mentoring role:* Primary research mentor. *Accomplishments:* Multiple first-authored publications of mentored research, graduation of HMS MMSci program with Gordon Award
- 2018- Zhaozhong Zhu, PhD / Assistant Professor, HMS
Career stage: Post-doctoral fellow and young faculty. *Mentoring role:* Co-primary research mentor. *Accomplishments:* Multiple first-authored publications of mentored research, NIH K01 grant.
- 2019 Dana Im, MD / Faculty, Brigham and Women's Hospital.
Career stage: resident. *Mentoring role:* career advisor
- 2019- Michihiko Fujiogi, MD / Fellow, Massachusetts General Hospital
Career stage: Research fellow at MGH. *Mentoring role:* Primary research mentor. *Accomplishments:* multiple first-authored publications of mentored research, research a grant from the Uehara Memorial Foundation
- 2020 Nicholas Reisner / Stanford University
Career stage: Student. *Mentoring role:* Primary research mentor. *Accomplishments:* Multiple abstract presentations at international meetings.
- 2020- Tadao Ooka, MD, PhD / Research Fellow, MGH
Career stage: Research fellow at MGH. *Mentoring role:* Primary research mentor. *Accomplishments:* first-authored publication of mentored research
- 2020- Makiko Nanishi, MD / Research Fellow, MGH
Career stage: Research fellow at MGH. *Mentoring role:* Primary research mentor. *Accomplishments:* multiple first-authored publications of mentored research
- 2021 Mitsuru Mukaigawara / PhD candidate, Harvard University
Career stage: MPP student, Harvard Kennedy School
Mentoring role: Career mentor.
- 2022- Ryohei Shibata, MD, PhD / Research Fellow, MGH

- 2022- *Career stage:* Research fellow at MGH. *Mentoring role:* Primary research mentor. *Accomplishments:* first-authored publication of mentored research
Michihito Kyo, MD, PhD / Research Fellow, MGH
- 2022- *Career stage:* Research fellow at MGH. *Mentoring role:* Primary research mentor. *Accomplishments:* first-authored publication of mentored research
Hideaki Miyachi, MD, PhD / Assistant Professor, Chiba University
- 2022 *Career stage:* Faculty at Chiba University. *Mentoring role:* Award Foundation funding
Mathias Elsner Melgaard, MD / Visiting student, Herlev and Gentofte Hospital, University of Copenhagen. *Mentoring role:* research mentor
- 2022- Heidi Makrinioti, MD, PhD / Research Fellow, MGH. MPH student at Harvard T.H. Chan School of Public Health. *Mentoring role:* research mentor.
Accomplishments: multiple co-authored publication of mentored research.
- 2023 Joe Hakim / PhD candidate, Harvard-MIT Health Sciences and Technology.
Mentoring role: StartMIT mentor. *Accomplishments:* Development of a StartMIT project.

Formal Teaching of Peers (e.g., CME and other continuing education courses):

- No presentations below were sponsored by 3rd parties/outside entities*
- Those presentations below sponsored by outside entities are so noted and the sponsor(s) is (are) identified.*

2012	Out-of-Hospital Cardiac Arrest, what's the way forward? Emergency Medicine Update HMS CME	Single presentation Boston
2013	Resuscitation science up-to-date Emergency Medicine Update HMS CME	Single presentation Boston
2014	Controversies in resuscitation Emergency Medicine Update HMS CME	Single presentation Boston

Local Invited Presentations:

- No presentations below were sponsored by 3rd parties/outside entities*
- Those presentations below sponsored by outside entities are so noted and the sponsor(s) is (are) identified.*

2011	Earthquake and disaster response in Japan / Global Health Seminar Harvard School of Public Health	
2011	Earthquake and disaster response in Japan Board of Directors Meeting HMS	
2011	Crisis in Japan / Global Health Seminar MGH	
2017	Airway microbiome, viruses, and host immunity among infants with bronchiolitis: Interactions on the path to asthma / Grand Rounds MassGeneral Hospital for Children	
2017	Bronchiolitis and primary prevention of asthma / Pediatrics Residency Conference MassGeneral Hospital for Children	

- 2018 EMNet bronchiolitis and asthma research / Chiefs' Council Meeting
Massachusetts General Hospital
- 2019 PI Presentation / Partners Research Management
Partners HealthCare
- 2020 COVID-19: A view from the frontline of the pandemic / Invited presentation
MGH/MEEI
- 2022 Developing targeted treatment strategies against infant bronchiolitis / Invited
presentation
MGH/MEEI
- 2022 GranuloSight: Experience of the Bridging Academia and Industry Program / MGH
Research Council meeting
MGH
- 2022 GranuloSight: Experience of the Bridging Academia and Industry Program / MGH
Board of Trustees Research & Education Subcommittee meeting
MGH

Report of Regional, National and International Invited Teaching and Presentations

- No presentations below were sponsored by 3rd parties/outside entities*
- Those presentations below sponsored by outside entities are so noted and the sponsor(s) is (are) identified.*

Regional

- 2010 Ischemic ECG changes predict myocardial injury in patients with intracerebral
hemorrhage (selected Plenary abstract)
Northeast Cerebrovascular Consortium Annual Summit
Boston, MA
- 2016 Bronchiolitis Phenotypes & Primary Prevention of Asthma: Virome and Microbiome
Approaches / invited presentation
Newton, MA (Morningside)
- 2018 Career development in academics / invited presentation
Clinical and Public Health Research Network of Academics
Boston, MA
- 2018 Research career development / invited presentation
Career Development Seminar for Researchers
MIT
Cambridge, MA

National

- 2013 Trends in Bronchiolitis Hospitalizations in the US 2000-2009 (selected oral abstract)
The 2013 annual meeting of the Society for Academic Emergency Medicine
Atlanta, GA, USA
- 2014 Quality of Acute Asthma Care in 48 US Emergency Departments: Changes between
1997-2001 versus 2011-2012 (selected oral abstract)
The 2014 annual meeting of the Society for Academic Emergency Medicine
Dallas, TX, USA
- 2015 Bronchiolitis / Grand Rounds
Jacobi-Montefiore Emergency Medicine Residency Program
Bronx, NY

- 2015
 - Bronchiolitis: An overview and future directions / Grand Rounds
 - Creating a research career: Models of collaborative science / Faculty Lecture
 Department of Emergency Medicine, University of New Mexico
 Albuquerque, NM
- 2016
 - Overview of the 35th Multicenter Airway Research Collaboration / Grand Rounds
 Center for Asthma Research, Department of Medicine, Vanderbilt University
 Nashville, TN
- 2016
 - Bronchiolitis: Challenging the conventional wisdom / Grand Rounds
 Department of Emergency Medicine, University of Wisconsin-Madison School of
 Medicine and Public Health
 Madison, WI
- 2016
 - Airway Microbiome Workshop / NIH Workshop
 Airway microbiome, viruses, and host immunity among infants with bronchiolitis:
 Interactions on the path to asthma
 NIH / NIAID
 Bethesda, MD
- 2017
 - Airway microbiome in infants with bronchiolitis and risk of asthma / invited
 presentation
 Division of Allergy, Children's Hospital of Philadelphia
 Philadelphia, PA
- 2017
 - Airway microbiome in infants with bronchiolitis and risk of asthma / invited
 presentation
 Department of Emergency Medicine, Norton Children's Hospital
 Louisville, KY
- 2017
 - Emergency airway management, Scary Airways/ invited talk
 Rocky Mountain Winter Conference on Emergency Medicine
 Copper Mountain, CO
- 2017
 - Airway microbiome in infants with bronchiolitis and risk of asthma / invited
 presentation
 Department of Allergy/Immunology, Phoenix Children's Hospital
 Phoenix, AZ
- 2017
 - Associations of nasopharyngeal metabolome and microbiome with severity among
 infants with bronchiolitis: A multi-omic analysis (selected oral abstract)
 The 2017 annual meeting of the Society for Academic Emergency Medicine
 Orlando, FL, USA
- 2017
 - Emergency department patients with asthma exacerbation who ran out of their
 inhaled short-acting β -agonists: A multicenter study in Boston (selected oral abstract)
 The American Thoracic Society International Conference
 Washington, DC, USA
- 2018
 - Bronchiolitis Workshop. Respiratory viruses, microbiome, and host immunity in the
 pathogenesis of childhood asthma: MARC-35/43 cohorts / invited presentation
 NIAID / NIH
 Bethesda, MD
- 2019
 - Emergency Medicine, Discovery Panel / invited presentation
 World Medical Innovation Forum
 Boston, MA
- 2020
 - EMNet translational research / invited presentation
 Department of Medicine
 David Geffen School of Medicine, UCLA
 Los Angeles, CA
- 2021
 - Endotyping infants with respiratory syncytial virus bronchiolitis / invited presentation
 Pediatric Emergency Medicine Interest Group, Society for Academic Emergency
 Medicine

2021 Multi-omics research in bronchiolitis / invited presentation
 CREW Steering Committee Meeting, Department of Pediatrics, University of Wisconsin
 Madison, WI

2021 Machine learning in emergency medicine research / Grand Rounds
 Department of Emergency Medicine, University of California, San Francisco
 San Francisco, CA

2021 Airways Outcome Working Group Full Member Meeting / Moderator
 NIH Environmental influences on Child Health Outcomes (ECHO) Program

2021

- Research power hour—Outcomes Working Groups / moderator
- Panel discussion for Working Groups / invited presentation
- Planning impactful science / invited presentation

 NIH ECHO 2021 Spring Meeting

2021 Integrated omics endotyping of infants with respiratory syncytial virus bronchiolitis
 (selected Plenary abstract)

2021 2021 Society for Academic Emergency Medicine (SAEM) Annual Meeting
 NIH / NIAID: New Insights into the Origins of Childhood Asthma—New insights into
 the link between severe bronchiolitis in infancy and the development of asthma
 Invited primary speaker
 2021 American Academy of Allergy, Asthma & Immunology (AAAAI) Annual Meeting
 Virtual

2021 NIH-ATS symposium. Environmental influences on Child Health Outcomes (ECHO):
 Insights into origins of lung diseases
 Identifying severe bronchiolitis endotypes with integrative omics approaches
 Primary speaker
 2021 American Thoracic Society (ATS) International Conference
 Virtual

2022 NIH Environmental influences on Child Health Outcomes (ECHO): Program gaps and
 goals for Y6 and Y7. Research priorities and gaps
 Panelist
 2022 ECHO-wide Cohort Spring Meeting
 Virtual

2022 NIH-ATS symposium. Environmental influences on Child Health Outcomes (ECHO):
 Insights into origins of airway diseases
 Airway metatranscriptome endotypes in infant bronchiolitis, distinct host immune
 profiles, and differential asthma risks
 Speaker
 2022 American Thoracic Society (ATS) International Conference
 San Francisco

2022 NIH Environmental influences on Child Health Outcomes (ECHO): Outcome Working
 Groups
 Moderator
 2022 April ECHO-wide Cohort Fall Meeting
 Bethesda, MD

2022 NIH/NIAID Analytical Challenges in OMICS Research on Childhood Asthma and
 Allergy Workshop

- Co-organizer, Workshop
- Moderator, Causal inference in omics research session
- Speaker, State of the art: Causal inference in omics of childhood asthma and
 allergy
- Speaker, Analytic approaches: Challenges & lessons learned

 Virtual

International

Some invited presentations were in Japan while I had an adjunct (*non-voting*) appointment in Japan between April 2013 and April 2017.

- 2009 Morbidity and Mortality Conferences in the U.S / Grand Rounds
Nagoya Ekisaikai Hospital, Nagoya, Japan
- 2010 Residency and Career Satisfaction Among Emergency Medicine Residency in Japan
(selected Plenary abstract)
Korean-Japanese Joint Session for Acute Medicine, Tokyo, Japan
- 2010 Fundamentals of Biostatistics / Grand Rounds
Shonan Kamakura General Hospital, Yokohama, Japan
- 2011 Emergency Airway Management in Japan: A Multi-center Prospective Observational
Study (selected oral abstract)
Mediterranean Emergency Medicine Congress
Kos, Greece
- 2011
 - Simulation Training for Emergency Physicians (selected oral abstract)
 - Anglo-American Style Emergency Medicine Conference (selected oral
abstract)The 39th Annual Meeting of The Japanese Association for Acute Medicine, Tokyo,
Japan
- 2011 Science of Cardiac Arrest Resuscitation/ Grand Rounds
Shonan-Kamakura General Hospital, Kanagawa, Japan
- 2012
 - Emergency Medicine Training in the US / Grand Rounds
 - Multidisciplinary Emergency Care in the US / Grand RoundsKinki University School of Medicine, Osaka, Japan
- 2012 Advent in Emergency Medicine Training in the US / Grand Rounds
Kinki University School of Medicine, Osaka, Japan
- 2013 Health services research in emergency medicine / Grand Rounds
Fujita Health University School of Medicine, Aichi, Japan
- 2013 Emergency medicine research in US and Japan / Grand Rounds
Yahata Municipal Hospital, Fukuoka, Japan
- 2013 How to develop research question? / Grand Rounds
Tokyo Bay Urayasu/Ichikawa Medical Center, Chiba, Japan
- 2013 Resuscitation research update / Grand Rounds
Kinki University School of Medicine, Osaka, Japan
- 2013 Airway Management in Out-of-hospital Cardiac Arrest / (selected oral abstract)
The 41st Annual Meeting of Japanese Association for Acute Medicine, Tokyo, Japan
- 2013 Emergency Medicine Grand Rounds / Grand Rounds
Keio University Hospital, Tokyo, Japan
- 2013 Airway and respiratory emergencies/ Grand Rounds
Kinki University, School of Medicine, Tokyo, Japan
- 2013 Airway and respiratory emergencies/ Grand Rounds
Kameda Medical Center, Tateyama, Japan
- 2015 Building emergency medicine research collaborations in the U.S. and Japan / Grand
Rounds
Kyoto University, Kyoto, Japan
- 2015 Emergency Medicine Grand Rounds / Invited Speaker, Grand Rounds
Fukui University Medical Center, Fukui, Japan
- 2019 Building independent research career in emergency medicine / invited presentation
Yokohama Rosai Hospital / Emergency Medicine Alliance Meeting
Yokohama, Japan

- 2019 MARC cohort studies and machine learning in omics research / Grand Rounds
Turku University
Turku, Finland
- 2020 MARC cohort studies / invited presentation
ISARIC Member Assembly 2020 “Clinical Research Networks Addressing COVID-19
& Future Challenges”
Annecy, France
- 2021 Causal inference in omics research / invited presentation
TXP Medical, Tokyo, Japan
- 2021 Issue-driven research / invited presentation
TXP Medical, Tokyo, Japan
- 2021 Clinical research in the United States / invited presentation
Annual Meeting of The Japanese Association for Acute Medicine
Tokyo, Japan
- 2021 - Severe bronchiolitis in infancy and development of recurrent wheeze and asthma:
Examination of the pathological link
- Five essentials for clinical research
Tokai University Hospital
Isehara, Japan
- 2022 Career of a physician-scientist / invited presentation
TXP Medical, Tokyo, Japan
- 2022 EAACI & NIAID/NIH joint symposium: advances on the role of the microbiome in
allergic diseases
Airway microbiome in infants with severe bronchiolitis and its relationship with the risk
of childhood asthma
Invited Speaker
2022 European Academy of Allergy and Clinical Immunology (EAACI) Conference
Prague, Czech Republic
- 2023 - Microbiome-host interplay in acute respiratory infections
- Virus - microbiome interplay in bronchiolitis
Invited Speaker
U.S.-Japan Cooperative Medical Sciences Program (USJCMSP) International
Conference on Emerging Infectious Diseases in the Pacific Rim
Manilla, Philippines

Report of Clinical Activities and Innovations

Current Licensure and Certification:

- 2004 Japanese Medical License
- 2007 Educational Commission For Foreign Medical Graduates Certificate
- 2011 Massachusetts Board of Registration in Medicine
- 2013 American Board of Emergency Medicine

Practice Activities:

2012-	Emergency care	Emergency Department MGH	16 clinical hours/week (FTE 50%)
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Clinical Innovations:

Advanced airway management and out-of-hospital cardiac arrest (2012-2013)

In 2012, I hypothesized that advanced airway management (such as tracheal intubation and supraglottic airway placement) by prehospital emergency responders leads to worse neurological and survival outcomes after out-of-hospital cardiac arrest. I reported the *first* prospective data of a nationwide population-based cohort at the American Heart Association (AHA) meeting and published it in *JAMA*. The findings have been confirmed by others worldwide, and contributed to national and international guidelines (e.g., AHA, European Resuscitation Council ACLS guidelines) suggesting caution in prehospital airway management.

Risks of repeated intubation attempts in the ED (2013-)

In 2013, I reported, for the *first* time, that repeated intubation attempts in the emergency department leads to an increased risk of adverse events. I published the first data in *Ann Emerg Med*; this finding has been subsequently validated by others worldwide. This innovative research has made a significant impact on the development of standard care of airway management in the ED—e.g., the importance of “first-pass success” and strategies to maximize its likelihood—and influenced international guidelines (e.g., Difficult Airway Society guidelines). After establishing and implementing this standard care, our multicenter study (published in *Resuscitation*) subsequently demonstrated improved quality of airway management and outcomes over seven years.

Airway and gut microbiome and severe bronchiolitis in infants (2016-)

In 2016, for the *first* time, I demonstrated the interrelations between the airway and gut microbiome, respiratory viruses, and host immune response in infants, and their associations with the risk of developing bronchiolitis and higher severity. I published related findings in major journals, such as *Am J Respir Crit Care Med*, *Allergy*, *Pediatrics*, *Eur Respir J*, and *J Allergy Clin Immunol*. These findings have offered a new avenue of treatment and prevention for acute respiratory infection in children (e.g., modification of the microbiome). Multiple clinical trials are underway.

Severe bronchiolitis endotypes and the risk of developing asthma (2019-)

Based on my work in the microbiome, host genome, and host immune response in the earlier years (e.g., published in *Allergy*, *JAMA Pediatr*, and *J Allergy Clin Immunol*), I hypothesized the presence of bronchiolitis endotypes (or molecular subtypes) in infants (median age, 3 months) that have a differential risk for subsequently developing asthma. I published the *first* integrated omics (genome, transcriptome, virome, metabolome, and metabolome) data in 2020 (*J Allergy Clin Immunol*) and again confirmed in 2021 (*Nat Commun*). These findings have offered new avenues for primary prevention of childhood asthma (e.g., early identification of children at risk for asthma, early use of immunomodulators such as anti-IgE monoclonal antibodies). Multiple clinical trials are underway.

Airway microbiome and development of childhood asthma (2019-)

Both in the US and Finland, we have demonstrated that the longitudinal changes in the airway microbiome affect the subsequent risk of child’s lung health, including the development of recurrent wheeze and asthma. The series of work is published in several leading journals (e.g., *J Allergy Clin Immunol*, *Pediatrics*, *Thorax*). We have also shown, for the first time, that the effect of early-life exposure to systemic antibiotics on asthma

development is mediated by the change in the airway microbiome (*Clin Infect Dis*). This finding lends significant support to guidelines that discourage unnecessary use of antibiotics, particularly in young children.

Report of Teaching and Education Innovations

EMA web https://www.emalliance.org/education 2009-	Online collection of emergency medicine literature and resources An updateable online collection of emergency medicine literature and journal clubs containing primary research and review articles relevant to practice in the emergency department (1,392,284 page views in January-August 2021)
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Report of Education of Patients and Service to the Community

- No presentations below were sponsored by 3rd parties/outside entities*
- Those presentations below sponsored by outside entities are so noted and the sponsor(s) is (are) identified.*

Activities

2011	Tokushukai Medical Assistance Team, MGH Global Health / Physician Participated in disaster relief activity (The Great East Japan Earthquake and Tsunami)
2014	Boston Athletic Association, Boston Marathon / Physician Participated in course medical coverage

Report of Scholarship

Peer-Reviewed Scholarship in print or other media:

Research Investigations

1. Hagiwara Y, **Hasegawa K**, Watase H, Chiba T. Career satisfaction in emergency medicine residency: The EM Alliance study of emergency medicine residents in Japan. *J Jpn Assoc Acute Med* 2010;21:889-898.
2. **Hasegawa K**, Fix ML, Wendell L, Schwab K, Ay H, Smith EE, Greenberg SM, Rosand J, Goldstein JN, Brown DFM. Ischemic-appearing electrocardiographic changes predict myocardial injury in patients with intracerebral hemorrhage. *Am J Emerg Med* 2012;30:545-552.
3. **Hasegawa K**, Hagiwara Y, Chiba T, Watase H, Walls RM, Brown DFM, Brown III CA. Emergency airway management in Japan: Interim analysis of a multi-center prospective observational study. *Resuscitation* 2012;83:428-433.
 - Editorial: Wang HE. Emergency airway management: The need to refine – and redefine –the “state of the art”. *Resuscitation* 2012;83:405-506
4. **Hasegawa K**, Shigemitsu K, Hagiwara Y, Chiba T, Watase H, Brown III CA, Brown DFM. Association between repeated intubation attempts and adverse events in emergency departments: An analysis of multicenter prospective observational study. *Ann Emerg Med* 2012 60:749-754.
 - Editorial: Zane RD. Repeated attempts at intubation are associated with adverse events. *NEJM Journal Watch* 2012 Dec
5. Imamura T, Brown III CA, Ofuchi H, Yamagami H, Branch J, Hagiwara Y, Brown DFM, **Hasegawa K**. Emergency airway management in geriatric and younger patients: Analysis of a multicentre prospective observational study. *Am J Emerg Med* 2013;31:190-196.
6. **Hasegawa K**, Hiraide A, Chang Y, Brown DF. Association of prehospital advanced airway management with neurologic outcome and survival in patients with out-of-hospital cardiac arrest. *JAMA* 2013;309:257-266.
 - Editorial: Wang HE, Yealy DM. Managing the airway during cardiac arrest. *JAMA* 2013;309:285-6
 - Editorial: Pallin DJ. Is prehospital advanced airway management harmful for cardiac arrest patients? *NEJM Journal Watch* 2018 Jan
7. **Hasegawa K**, Tsugawa Y, Camargo CA Jr, Hiraide A, Brown DF. Regional variability in survival outcomes of out-of-hospital cardiac arrest: The All-Japan Utstein Registry. *Resuscitation* 2013;84:1099-1107.
8. **Hasegawa K**, Hagiwara Y, Imamura T, Chiba T, Watase H, Brown III CA, Brown DFM. Increased incidence of hypotension in elderly patients who underwent emergency airway management: An analysis of a multi-centre prospective observational study. *Int J Emerg Med* 2013;6:12.
9. **Hasegawa K**, Tsugawa Y, Brown DFM, Mansbach JM, Camargo CA Jr. Trends in bronchiolitis hospitalizations in the United States, 2000-2009. *Pediatrics* 2013;132:28-36.
10. **Hasegawa K**, Tsugawa Y, Brown DFM, Camargo CA Jr. Childhood asthma hospitalizations in the United States, 2000-2009. *J Pediatr* 2013;163:1127-113. NIHMSID: NIHMS477702.
11. **Hasegawa K**, Chiba T, Hagiwara Y, Watase H, Tsugawa Y, Brown DFM, Camargo CA Jr. Quality of care for acute asthma in emergency departments in Japan: A multicenter observational study. *J Allergy Clin Immunol Pract* 2013;1:509-515.
 - Editorial: Tsai CL. Raising the bar for asthma care in the emergency department. *J Allergy Clin Immunol Pract*;1:516-7

12. **Hasegawa K**, Tsugawa Y, Brown DFM, Mansbach JM, Camargo CA Jr. Temporal trends in emergency department visits for bronchiolitis in the United States, 2006-2010. *Pediatr Infect Dis J* 2014;33:11-8.
13. **Hasegawa K**, Tsugawa Y, Brown DFM, Camargo CA Jr. A population-based study of adults who frequently visit the emergency department for acute asthma. *Ann Am Thorac Soc* 2014;11:158-66
14. Hagiwara Y, **Hasegawa K**, Watase H, Chiba T. Residency and career satisfaction among Anglo-American model emergency medicine residents in Japan. *Acute Med Surg* 2014;1:44-52
15. **Hasegawa K**, Brown DFM, Tsugawa Y, Camargo CA Jr. Epidemiology of emergency department visits for opioid overdose: A population-based study. *Mayo Clin Proc* 2014;89:462-71.
 - Editorial: Berge KH, Burkle CM. Opioid overdose: when good drugs break bad. *Mayo Clin Proc* 2014;89:437-9.
16. **Hasegawa K**, Brenner BE, Clark S, Camargo CA Jr. Emergency department visits for acute asthma by adults who ran-out of their inhaled medications. *Allergy Asthma Proc* 2014;35:42-50.
17. **Hasegawa K**, Mansbach JM, Teach SJ, Fisher ES, Hershey D, Koh JY, Clark S, Piedra PA, Sullivan AF, Camargo CA Jr. Multicenter study of viral etiology and relapse in hospitalized children with bronchiolitis. *Pediatr Infect Dis J* 2014;33:809-813.
18. Kawano T, **Hasegawa K**, Watase H, Morita H, Yamamura O. Infectious disease frequency among evacuees at shelters after The Great Eastern Japan Earthquake and Tsunami: A retrospective study. *Disaster Med Public Health Prep* 2014;8:58-6.
19. Goto Y, Watase H, Brown III CA, Tsuboi S, Kondo T, Brown DFM, **Hasegawa K**. Emergency airway management by resident physicians in Japan: An analysis of multicentre prospective observational study. *Acute Med Surg* 2014;1:214-221.
20. **Hasegawa K**, Espinola JA, Brown DFM, Camargo CA Jr. Trends in U.S. emergency department visits for opioid overdose, 1993-2010. *Pain Med* 2014;15:1765-70.
21. **Hasegawa K**, Tsugawa Y, Tsai CL, Brown DFM, Camargo CA Jr. Frequent utilization of the emergency department for acute exacerbation of chronic obstructive pulmonary disease. *Respir Res* 2014;15:40.
22. **Hasegawa K**, Sullivan AF, Hirashima ET, Gaeta TJ, Fee C, Turner SJ, Massaro S, Camargo CA Jr, on behalf of the MARC-36 Investigators. A multicenter observational study of US adults with acute asthma: Who are the frequent utilizers in the emergency department? *J Allergy Clin Immunol Pract* 2014;2:733-740.
23. Sullivan AF, **Hasegawa K**, Linnemann RW, Long AA, Teuber SS, Turner SJ, Massaro S, Camargo CA Jr, on behalf of the MARC-36 Investigators. An update on U.S. asthma centers: 2013. *Ann Allergy Asthma Immunol* 2014;113(4):484-486.
24. **Hasegawa K**, Tsugawa Y, Camargo CA Jr, Brown DFM. Frequent utilization of the emergency department for acute heart failure syndrome: A population-based study. *Circ Cardiovasc Qual Outcomes* 2014;7:735-42.
25. **Hasegawa K**, Tsugawa Y, Lopez BL, Smithline HA, Sullivan AF, Camargo CA Jr. Body mass index and risk of hospitalization among adults presenting with asthma exacerbation to the emergency department. *Ann Am Thorac Soc* 2014;11:1439-1444.
26. Goto T**, Koyama Y, Kondo T, Tsugawa Y, **Hasegawa K**. A comparison of the force applied on oral structures during intubation attempts between the Pentax-AWS airwayscope and the Macintosh laryngoscope: a high-fidelity simulator-based study. *BMJ Open* 2014;8;4:e006416.
27. **Hasegawa K**, Sullivan AF, Tsugawa Y, Turner SJ, Massaro S, Clark S, Tsai CL, Camargo CA Jr, on behalf of the MARC-36 Investigators. Comparison of U.S. emergency department acute asthma care quality, 1997-2001 and 2011-2012. *J Allergy Clin Immunol* 2015;135:73-80. PMID 25263233.

28. **Hasegawa K**, Pate BM, Mansbach JM, Macias CG, Fisher ES, Piedra PA, Espinola JA, Sullivan AF, Camargo CA Jr. Risk factors for requiring intensive care among children admitted to ward with bronchiolitis. *Acad Pediatr* 2015;15:77-81.
29. **Hasegawa K**, Cydulka RK, Sullivan AF, Langdorf MI, Nonas SA, Nowak RM, Wang NE, Camargo CA Jr. Improved management of acute asthma among pregnant women presenting to the emergency department. *Chest* 2015;147:406-14.
30. **Hasegawa K**, Jarthi T, Mansbach JM, Laham FR, Jewell AM, Espinola JA, Piedra PA, Camargo CA Jr. Respiratory syncytial virus genomic load and disease severity among children hospitalized with bronchiolitis: Multicenter cohort studies in the US and Finland. *J Infect Dis* 2015; 211(10):1550-9.
31. Kubota Y, **Hasegawa K**, Taguchi H, Kitamura T, Nishiyama C, Iwami T, Nishiuchi T, Hiraide A. Characteristics and trends of emergency patients with drug overdose in Osaka. *Acute Med Surg* 2015;2(4):237-43.
32. Goto T**, Watase H, Morita H, Nagai H, Brown CA III, Brown DFM, **Hasegawa K**. Repeated tracheal intubation attempts by a single intubator associated with decreased success rates in emergency departments: An Analysis of Multicentre Prospective Observational Study. *Emerg Med J* 2015;32(10):781-6.
33. Goto T**, Gibo K, Hagiwara Y, Morita H, Brown DFM, Brown III CA, **Hasegawa K**. Multiple failed intubation attempts are associated with decreased success rates on the first rescue intubation in the emergency department: A retrospective analysis of multicentre observational data. *Scand J Trauma Resusc Emerg Med* 2015;23:5.
34. Nakao S, Hagiwara Y, Kimura A, **Hasegawa K**. Trauma airway management in emergency departments: A multicenter, prospective, observational study in Japan. *BMJ Open* 2015;5:e006623.
35. **Hasegawa K**, Tsugawa Y, Chang Y, Camargo CA Jr. Risk of an asthma exacerbation after bariatric surgery in adults. *J Allergy Clin Immunol* 2015;136(2):288-94.
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** Articles first-authored by mentee. + Articles first-authored by HMS student

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Letters to the Editor

1. **Hasegawa K**, Hiraide A, Brown DFM. Prehospital advanced airway management for out-of-hospital cardiac arrest. *JAMA* 2013;309:1888-1890; author reply 1889-1890.
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** Letters first-authored by mentee

Professional educational materials or reports, in print or other media:

- Web educational material **Hasegawa K**. Rapid sequence intubation. Available at: <https://vimeo.com/18770396>. Accessed January 17, 2013.
- Web educational material **Hasegawa K**. How to review scientific articles. Available at: <https://vimeo.com/36668674>. Accessed January 17, 2013.
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Thesis:

Hasegawa K. *Severe bronchiolitis in infancy and development of recurrent wheeze and asthma: Examination of the pathological link* [PhD thesis]. Isehara, Kanagawa, Japan: Tokai University School of Medicine, 2022.

Abstracts, Poster Presentations and Exhibits Presented at Professional Meetings:

1. Zhu Z, Camargo CA Jr., Raita Y, Freishtat RJ, Fujiogi M, Hahn A, Mansbach JM, Spergel JM, Perez-Rosada M, **Hasegawa K.** Nasopharyngeal airway dual-transcriptome of infants with severe bronchiolitis and risk of childhood asthma. American Academy of Allergy, Asthma & Immunology Conference. Feb 2022, Phoenix, AZ, USA.
2. Miwa S, Nakajima M, Okamoto H, Goto T, Hagiwara Y, Watase H, **Hasegawa K.** Emergency airway management and its adverse event in emergency department patients with COVID-19. Japanese Association for Acute Medicine Annual Meeting. October 2021, Tokyo, Japan

Narrative Report

I am an academic emergency physician with clinical expertise in airway/respiratory emergencies, such as 1) acute respiratory infection, 2) asthma, and 3) emergency airway management. My primary appointment is at MGH, where I serve as the Director of the Translational Research Unit of Emergency Medicine Network (EMNet)—an international research consortium consisting of 247 hospitals. I am also an attending physician at the MGH Department of Emergency Medicine and the Camargo Family Endowed Scholar in Emergency Medicine Research at MGH. My HMS area of excellence is Clinical Expertise and Innovation; my significant supporting activity is Investigation.

I have been actively involved in clinical care, teaching, and oversight at the MGH Emergency Department. My area of excellence is **Clinical Expertise and Innovation** for my national/international reputation in the management of **1) acute respiratory infection** (e.g., infant bronchiolitis), **2) asthma**, and **3) emergency airways**.

First, my work has challenged the conventional belief that bronchiolitis is a single disease entity by demonstrating the presence of distinct clinical and molecular subtypes (endotypes) with a differential risk of morbidities. The series of work has moved the bronchiolitis science forward—e.g., the new development of bronchiolitis task force in the European Respiratory Society.

Second, my work has identified early (e.g., infancy) identification of modifiable causal factors (e.g., host immune response, airway microbiome) for childhood asthma by applying systems approaches, and defined a new field in asthma research. The series of work has made significant contributions to the development of asthma prevention strategies (e.g., modification of the host response and microbiome) in young children.

Third, my emergency airway work has not only led to the development of *standard care* of airway management (e.g., the 2015 Difficult Airway Society guidelines) but also had a major impact on the prehospital field—e.g., highlighting the importance of basic airway support and high-quality chest compressions for patients with out-of-hospital cardiac arrest—and influenced international guidelines (e.g., the 2015 European Resuscitation Council ACLS guidelines).

I have also published two textbooks, 46 reviews/textbook chapters, and invited reviews related to these airway/respiratory diseases (e.g., *UpToDate*, Tintinalli's Emergency Medicine). Furthermore, my clinical expertise is reflected by national/international invited presentations in these areas (e.g., NIH sessions at ATS and AAAAI Meetings), invited reviews, and Fellowship status in professional societies. My leadership in these areas is demonstrated by the service as co-Founder/Board Member of a professional organization (Emergency Medicine Alliance—a professional organization of >3,500 emergency physicians) and Director of clinical research consortium (e.g., Japanese Emergency Medicine Network [JEMNet]), and service as Co-chair and member of 10+ NIH committees/expert panels.

My Significant Supporting Activity is **Investigation**. I have been conducting clinical, epidemiological, and translational research. Much of this work is done through EMNet and JEMNet, multidisciplinary collaborations that aim to advance public health through diverse projects, particularly multicenter clinical research. EMNet (international) includes 247 emergency departments (EDs); JEMNet (Japan) includes 40+ EDs. My three major investigative interests are:

1. Acute respiratory infection (e.g., infant bronchiolitis) research that integrates both clinical and multi-level omics information to uncover its pathobiology
2. Asthma research that determines the early and modifiable causal factors of the development of childhood asthma
3. Airway management research that focuses on emergency airways, including one of the largest registries of ED airway management in the world (>20,000 ED intubations to date).

I have served as PI of federal (e.g., three NIH R01s, one R21, two Administrative Supplements), foundation, and industry grants, and have published 250 original research papers (160+ as the first or senior authors) in these areas. As PI of most of these studies—in parallel to Director of the EMNet Translational Research Unit and Director of JEMNet—I have played a leadership role in all

studies. I have published our work as the leading or senior author on high-impact journals, including *Am J Respir Crit Care Med*, *Clin Infect Dis*, *JAMA*, *JAMA Pediatr*, *J Allergy Clin Immunol*, and *Resuscitation*. My research expertise is also supported by service on editorial boards, national committees (e.g., four NIH study sections), and steering committees of national/international research projects as well as invited lectures (e.g., multiple NIH Workshops), and awards (e.g., Young and Mid-Career Investigator Awards from the Society for Academic Emergency Medicine in 2016 and 2022, respectively).

In addition to regular clinical **teaching** for students, residents, and clinical fellows at MGH ED (~600 hours/year), my other focus is research training and mentoring for 30+ students, residents, fellows, and faculty members. The career trajectory of several mentees has been exceptional, with multiple first-author publications in leading journals (e.g., *J Am Coll Cardiol*, *Lancet Respir Med*), national research awards, completion of advanced degrees with honors (e.g., HMS Gordon Gold Award), training grants (e.g., NIH K funding), and research independence (e.g., NIH R01 grants).

In **summary**, my clinical, investigative, and teaching efforts have given me a sustained national/international reputation as an expert in the area of airway/respiratory diseases—based on a record of high-impact scholarship, a sustained record of extramural funding, and ongoing service as a clinical expert, researcher, and effective mentor. In the years ahead, I will continue to lead the multidisciplinary work and to perform innovative research, which will, in turn, offer new avenues for diagnosis, treatment, and prevention of airway/respiratory diseases.