

# CV – ATUL MALHOTRA

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## University of California San Diego Curriculum Vitae

**Date Prepared:** February 2016  
**Name:** Atul Malhotra  
**Office Address:** UCSD Pulmonary and Critical Care Medicine  
9300 Campus Point Drive, MC 7381, La Jolla, CA 92037  
**Home Address:**  
**Work Phone:** 858-657-6159  
**Work Email:** [amalhotra@ucsd.edu](mailto:amalhotra@ucsd.edu)  
**Work FAX:** [858-657-5021](tel:858-657-5021)  
**Place of Birth:** Edmonton, Alberta, Canada (Visa Status: Green Card)

### Education

6/1988	B.S.	Major: Chemistry	University of Alberta, Edmonton, Alberta, Canada
6/1992	M.D.	Medicine	University of Alberta

### Postdoctoral Training

7/1992- 6/1993	Intern	Transitional	St. Thomas Medical Center, Akron, OH
7/1993- 6/1996	Resident	Internal Medicine	Mayo Clinic, Rochester, MN
7/1996- 6/2000	Clinical and Research Fellow	Pulmonary/Critical Care Medicine	Harvard Medical School (HMS) Combined Program: Massachusetts General Hospital (MGH), Brigham and Women's Hospital (BWH), Beth Israel Deaconess Medical Center , BIDMC), and West Roxbury VA Medical Center, Boston, MA
5/1998- 6/2000	Research Fellow	Medicine PI: David P. White	Harvard Medical School

### Faculty Academic Appointments

2000-03	Instructor	Medicine	Harvard Medical School,
2003-2008	Assistant Professor	Medicine	Harvard Medical School
2008-2013	Associate Professor	Medicine	Harvard Medical School
2013-	Professor	Medicine	UC San Diego School of Medicine

### Appointments at Hospitals/Affiliated Institutions

6/1999-6/2013	Staff Physician	Sleep	Sleep Health Centers, Boston, MA
7/2000-6/2013	Assistant in Medicine	Medical ICU	Massachusetts General Hospital
7/2000-6/2013	Associate Physician	Medicine (Sleep Medicine, Pulmonary & Critical Care Medicine	Brigham and Women's Hospital
7/2003-6/2013	Staff Physician	Pulmonary/Critical Care	Beth Israel Deaconess Medical Center
2/2012-	Attending Physician	Intensive Care Unit	King Faisal Hospital, Kigali, Rwanda
7/2013-	Attending Physician	Pulmonary & Critical Care Medicine	UC San Diego Health System
6/2014-	Attending Physician and ICU co-director	Pulmonary & Critical Care Medicine	Temecula Valley Hospital

**Major Administrative Leadership Positions**

**Local**

2/2000-	Co-Director, Health Science and Technology Respiratory Physiology and Pathophysiology (HST 100)	Massachusetts Institute of Technology and Harvard Medical School, Boston, MA
7/2000-	Co-Founder and Co-Organizer of weekly teaching session for Pulmonary and Critical Care and Anesthesia fellows	MGH, BWH, BIDMC
4/2006-2012	Medical Director	Sleep Disorders Research Program Brigham and Women's Hospital
4/2006-2012	Clinical Chief	Division of Sleep Medicine, Brigham and Women's Hospital
4/2008-	Co-Director	American Academy of Sleep Medicine (AASM) Comprehensive Academic Sleep Program of Distinction for Brigham and Women's Hospital
2/2011-2013	Director of Clinical Training for HMS Sleep Division T32 Training Grant	Sleep Medicine Division, Harvard Medical School
2015-	Monthly San Diego City Wide clinical conference, outreach to referring providers Pulmonary, critical care and sleep medicine Co-organizer, co-director and lecturer	VA UCSD Medical Center

## **National**

2005-2008	Director and Organizer, National Sleep Medicine Course	American Academy of Sleep Medicine (AASM), held in Chicago, IL or Denver, CO
2010	Chairman and Organizer	National Heart Lung and Blood Institute (NHLBI) workshop on Molecular Mechanisms Underlying Sleep Apnea, Bethesda, MD
2010-2011	Co-Founder and Co-Organizer/Director	Sleep State of the Art Course for the American Thoracic Society (ATS), held in Miami, FL or San Diego, CA

## **Committee Service**

### **Local**

2006-	Accreditation Council for Graduate Medical Education (ACGME) Fellowship Selection Committee	Member, Brigham and Women's Hospital
2006-2012	Clinical Directors of Department of Medicine	Member, Brigham and Women's Hospital
2007-	Editorial Board, Sleep and Health Education	Member, Harvard Medical School
2007-	Training Grant Writing Committee	Member, Brigham and Women's Hospital and Harvard Medical School, Co-Chairman since 2011- (received priority score of 15, funded)
2007-	Tracking and Evaluation Sub-Committee	Member, Harvard Medical School Sleep Medicine Division
2007-	Trainee Selection Committee	Member, Brigham and Women's Hospital

2009-	Faculty Review Committee	Member, Harvard Medical School Sleep Medicine Division
2013-	Jacobs Planning and Transition Committee	Member, UCSD
2013-	Department of Medicine Executive Committee	Member, UCSD
2013-	Medicine Council	Member, UCSD
2013-	Cardiovascular Council, Sulpizio	Member, UCSD
2013-	Search Committee for Associate Director of CTRI	Member, UCSD
2014-	International Core of the UCSD Center for AIDS Research	Member, Advisory Board
2014-	Institute of Engineering in Medicine (IEM), UCSD	Member, review panel Galvanizing Engineering and Medicine phase I
2014-2015	Critical Care Executive Committee/Council	Chair, UCSD
2014-	Professional Standards Committee	Member UCSD
2015-	DOM Finance Committee/ Compensation Committee	Member UCSD
2016-	Search committee, for Chief of Division of Hospital Medicine	Member, UCSD
2016-	PhD advisory and examination committee for Kelsie Full	Member, UCSD
<b>National</b>		
2005-	Abstract Reviewer	Association of Professional Sleep Societies Member
2008-2009	Program Committee	International Sleep and Breathing Meeting, Pittsburgh, PA Member
2008-2009	Advisory Committee	International Dyspnea Symposium Member
2009-	End Point Adjudication Committee	Pfizer, New York
2010	Data Safety Monitoring Board (DSMB)	University of Pennsylvania, Cardiovascular Effects of Obstructive Sleep Apnea (COSAS) study Member
2011	Future Research Needs in the Diagnosis of Obstructive Sleep Apnea	Agency for Healthcare Research and Quality (AHRQ) Expert Member

2011	DSMB	University of Pennsylvania Program Project Grant, Philadelphia, PA Member
2011	Advisory Committee	Comparative Outcomes Management with Electronic Data Technology (COMET) Study, Stanford University, Palo Alto, California Expert Member
2011	DSMB	American Lung Association study Member
2012-	Abstract Review	American Society of Clinical Investigation (ASCI) and American Association of Physicians (AAP) Reviewer for annual meeting
2012-	Sleep and Circadian Rhythm External Advisory Group	Canadian Institute of Health Research (CIHR) Member
2012-	Founding Member	Society of Anesthesia and Sleep Medicine
2013-	Nominating Committee	Society of Anesthesia and Sleep Medicine
2014-	Endpoints Committee in Congestive Heart Failure	American Heart Association writing committee

#### **International**

2006	PhD Thesis Review Committee	University of Melbourne, Victoria, Australia Member
2006	Program Committee	International Sleep and Breathing Meeting, Queensland, Australia Member
2010-	Expert Advisory Panel - Respiratory	Treatment Strategies - The Cambridge Research Centre (Cambridge, UK) Member
2011	Expert Review Panel	Biomedical Research Council: Agency for Science, Technology and Research, Singapore Member
2011	PhD Thesis Review Committee	All India Institute of Medical Sciences, New Delhi, India Member
2012	PhD Thesis Review Committee	University of Manitoba, Canada Member
2012	PhD Thesis Review Committee	University College Dublin, Ireland
2014	PhD Thesis Review Committee	Imperial College London, UK
2014-	Deputy Editor	Sleep

#### **Professional Societies**

Society of Critical Care Medicine	1994-	Member
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	2006-2009	Adult Multidisciplinary Critical Care Knowledge Assessment Program Member
	2010-2013	Research Committee Member
American College of Chest Physicians	1996-	Member
Royal College of Physicians and Surgeons of Canada	1997-	Fellow
American Academy of Sleep Medicine	1998-	Member
	2004-2007	National Sleep Medicine Course Director
	2005	Nominating Committee of Sleep Disorders Breathing Section Chairman
	2007-	Academic Affairs Committee Member
	2010-	Academic Affairs Committee Vice Chairman
	2010-2011	AASM Future of Sleep Medicine Task Force Invited Member
	2011-	Fellow
Sleep Research Society (SRS)	2005-2008	Member
American Thoracic Society (ATS)	1996-2001-2008	Member Program Committee for Respiratory Neurobiology and Sleep Member (2003-2005)
	2003-2005	Program Committee for Respiratory Neurobiology and Sleep Chairman
	2004-	Respiratory Neurobiology of Sleep Executive Committee Member
	2005-2008	Training Committee Member
	2005-2008	Review of Educationally Focused Proposals, Education Committee Chair
	2006-2009	Leadership Group of American Thoracic Society and European Respiratory Society Member
	2006-2009	International Conference Advisory Group Member
	2006-2009	Education Committee Chairman
	2006-2009	Documents Committee Member
	2006-2009	Clinician's Advisor Committee Member
	2006-2008	Website Editorial Board Member
	2007-2008	Nominating Committee for Respiratory

	2008-2011	Neurobiology of Sleep Assembly Elected Member Sleep and Respiratory Neurobiology Assembly Elected Chairman
	2009-2011	Board of Directors Elected Member
	2010-2011	Documents Review Board of Directors Chairman
	2011-2012	Comparative Effectiveness Research Group Member
	2012-	Membership Committee Member
	2012-2017	Member, Executive Committee
	2012	Elected Secretary Treasurer
	2013	Vice-President Member, Finance Committee
	2014	President-Elect Chairman, Finance Committee
	<b>2015</b>	<b>President</b> Member of all 27 committees, ex officio
	2016	Past-President
Society of Anesthesia and Sleep Medicine (SASM)	2011	Founding Member
	2012-	Continuing Education Committee Member
	2012-	Research and Clinical Committee Member
	2015-	Conference and Education Committee
American Society of Clinical Investigation and American Association of Physicians	2012-	Abstract reviewer for annual meeting
Critical Care Society Collaborative (CCSC)	2012-	Executive Committee Member
Association of Pulmonary and Critical Care medicine Program Directors/ ACCP/ATS Education Research Award (AERA) Review Committee	2012-	Member, representative from ATS Executive Committee
<b><u>Grant Review Activities</u></b>		
2003	Grant & Thesis Reviewer	Health Research Board, Dublin, Ireland
2005	Grant Reviewer (ad hoc), Study Section	National Institute of Diabetes and Digestive and Kidney Disease (NIDDK), National Institutes of Health (NIH), Bethesda, MD
2005	Grant Reviewer	University of Western Australia, Perth, Australia
2006-	Grant Reviewer, Study Section Standing Member (2006-2009)	American Heart Association (AHA), Dallas, TX

2006-2009	Ad hoc reviewer 2011- Grant Reviewer, Beeson Grant Study Section Standing Member	National Institute of Aging (NIA), National Institutes of Health, Bethesda, MD
2008	Grant Reviewer, Program Project	National Heart Lung and Blood Institute (NHLBI)
2008-	Grant Reviewer, Loan Repayment (annually) Standing Member	National Institute of Aging, Bethesda, MD
2009-2011	K23 Study Section Standing Member	National Institutes of Health
2009-	Respiratory Integrative Biology and Translational Research (RIBT) Study Section Ad Hoc Reviewer Standing Member 2011	National Heart Lung and Blood Institute, NIH
2009-	Grant Reviewer	National Institute of Aging (NIA)
2010	Ad Hoc Reviewer	NIDDK
2011-	Ad Hoc Reviewer	NHLBI R13 applications
2011-	Review Committee Member, Vision Grants	Society of Critical Care Medicine
2011	Grant Reviewer	National Medical Research Council Singapore
2012-	Sleep and Circadian Rhythm External Advisory Group (grant review)	Canadian Institute of Health Research (CIHR)
2013-	GEM projects Galvanizing Engineering in Medicine	UCSD School of Engineering and Medical School

### **Editorial Activities**

2009-	Associate Editor	Sleep
2013-	Deputy Editor	Sleep

### **Ad Hoc Reviewer**

Mayo Clinic Proceedings  
Sleep  
European Respiratory Journal  
New England Journal of Medicine  
Journal of Applied Physiology  
Journal of Clinical Endocrinology and Metabolism  
Archives of Internal Medicine  
Sleep Medicine Reviews  
Circulation  
American Journal of Epidemiology  
Anesthesiology  
Respiratory Research  
Critical Care  
Journal of the American College of Cardiology  
American Journal of Physiology  
Journal of the American Medical Association (JAMA)  
Annals of Medicine  
Medical Hypotheses

### **Other Editorial Roles**

2005-	Member, Editorial Board	Chest
2005-	Member, Editorial Board	American Journal of Respiratory and Critical Care Medicine
2008-	Member, Editorial Board	Sleep
2009	Guest Editor	Progress in Cardiovascular Diseases, issues 51(4) and 51(5)
2015-	Member, Editorial Board	Journal of Thoracic Disease
2015-	Member, Editorial Board	Indian Journal of Medical Research

### **Honors and Prizes**

1984-88	Province of Alberta Scholarship	Alberta Government	First Class Standing and named to Dean's Honor Roll in undergraduate sciences
1992	Rajcoomarie Singh Memorial Achievement Award	Rajcoomarie Singh Memorial	Outstanding achievement in medical school
1992	Ciba book prize for academic achievement	Ciba Pharmaceuticals	Outstanding achievement in medical school
1992	First Class Standing	University of Alberta Medical School	
1992-93	Intern of the Year	St. Thomas Medical Center	
1996	Gold Medal	Mayo Clinic	Outstanding Achievement Award in Residency
2000	Trainee Research Merit Award	Associated Professional Sleep Societies, Las Vegas, NV	Outstanding Research

2001	Teacher of the Year	Massachusetts General Hospital	Internal Medicine Residents Visiting Teaching Award
2001	Teacher of the Year	Harvard Combined Fellowship (BWH, MGH, BIDMC)	Pulmonary and Critical Care fellowship award
2003-	International Health Professional of the Year	International Biographic Centre, Cambridge, UK	
2005	Young Investigator Award, Respiratory Neurobiology and Sleep	American Thoracic Society International Conference, San Diego, CA	Outstanding research potential
2006	Certificate of Appreciation	American Thoracic Society	Outstanding contribution
2008	Presidential Citation	Society of Critical Care Medicine	Outstanding contribution
2008	The Harvard Pulmonary and Critical Care Senior Fellows' Teaching Appreciation Award	Harvard Medical School	Award for outstanding teaching and dedication to teaching
2009	Certificate of Appreciation	American Thoracic Society	Session on "How to pick a mentor"
2009	Certificate of Appreciation	National Heart Lung and Blood Institute	E-mentoring initiative
2010	Certificate of Appreciation	American Thoracic Society	Center for Fellows and Junior Professionals
2010	Top Reviewer Award	Chest	Top 5% of journal reviewers
2010	Best Doctors in America	Best Doctors	Selected by peers
2011	Fellow	American Academy of Sleep Medicine	FAASM (Fellow of the American Academy of Sleep Medicine)
2011	Outstanding Contribution	American Thoracic Society	ATS Board of Directors
2011	Member	American Society for Clinical Investigation (ASCI)	Council member for honorific society (convocation 4/11)

2012	Member	Leading Health Professionals of the World	Selected by International Biographical Centre (IBC) Cambridge, England
2013	Member	Galvanizing Engineering in Medicine	Selection Committee, UCSD
2013	Member	Engineering School Liaison	UCSD
2013	Chairman	Critical Care Council	UCSD
2013	Member	Center for Circadian Biology	UCSD
2014	Member	Who's Who in Medicine Higher Education	Selected
2014	Member	<b>San Diego's Physicians of Exceptional Excellence</b>	Selected
2014-	Member	<b>Top Doc's Award San Diego Magazine</b>	Selected
2015	Member	<b>The Leading Physicians of the World</b>	Selected
2015	Member	<b>Leading Physicians of the World International Association of Health Care Professionals</b> <findatopdoc.com>	Selected
2015	Professorship	<b>Honorary Professor, Lima Peru</b>	Awarded

## **Report of Funded and Unfunded Projects**

### **Funding Information**

#### **Past**

1998-2008	Harvard Center on Sleep Neurobiology and Sleep Apnea NIH/NHLBI P50 HL060292 (SCOR – Specialized Center of Research) Co-Investigator (1998-2006), Total Direct Costs \$1.3M Major Goal: To study the basic and physiological mechanisms underlying sleep and sleep apnea.
2000-2002	The Influences of Aging, Gender and Obesity on Upper Airway Structure, Function and Ventilatory Stability American Heart Association Beginner's Grant in Aid Principal Investigator, Total Direct Costs \$100K Major Goal: To define the mechanisms underlying epidemiological risk factors for sleep apnea.
2000-2003	The Influences of Aging, Gender and of Obesity on Upper Airway Structure, Function and Ventilatory Stability Medical Research Council Canada, Clinician Scientist Award Principal Investigator, Total Direct Costs \$135,327 Major Goal: To define the mechanisms underlying epidemiological risk factors for sleep apnea.

- 2001-2005 The Influences of Aging, Gender and Obesity on Upper Airway Structure, Function and Ventilatory Stability  
American Heart Association Scientific Development Grant  
Principal Investigator, Total Direct Costs \$304, 912  
Major Goal: To define the mechanisms underlying epidemiological risk factors for sleep apnea.
- 2003-2010 Sleep Apnea and Obesity: Cardiovascular Risk Assessment  
R01 HL73146  
Principal Investigator, Total Direct Costs \$1,086,487  
Major Goal: To understand the independent roles of sleep apnea and obesity on cardiovascular biomarkers.
- 2004-2008 The Mechanisms Underlying the Aging Predisposition to Obstructive Sleep Apnea  
National Institutes of Aging, Paul B. Beeson Award AG024837  
Principal Investigator, Total Direct Costs \$697,727  
Major Goal: To understand why people develop sleep apnea with aging.
- 2006-2008 Sleep and the Control of the Pharyngeal Musculature  
P50 HL060292-09  
Principal Investigator, Total Direct Costs \$ 477,335 (for 2 years)  
Major Goal: To understand the interactions between pharyngeal anatomy, upper airway muscle control and ventilatory instability in the pathogenesis of sleep apnea.
- 2008-2009 Sepracor: Use of Eszopiclone to Alter Upper Airway mechanics  
Principal Investigator, Total Direct Costs \$261K to SHC  
Major Goal: To assess the role of eszopiclone on upper airway mechanics in rodents and in humans
- 2007-2008 Philips Respironics: Positive Airway Pressure for the Treatment of Asthma  
Principal Investigator, Total Direct Costs \$200K to SHC  
Major Goal: To perform pilot studies using Bi-Flex with Auto to determine whether lung stretch can affect bronchomotor tone during sleep
- 2007-2008 Philips Respironics: Use of Bi-Flex with Auto to Rescue Patients with a poor initial experience with CPAP  
Principal Investigator, Total Direct Costs \$89K  
Major Goal: To test the hypothesis that newer technology is better than standard of care CPAP to treat patients with a poor initial experience with CPAP
- 2011-2012 Sleep Group Solutions: Using of acoustic pharyngometry to assess patients at risk of sleep apnea and adherence to CPAP therapy  
Principal Investigator, Total Direct Costs \$51K  
Major Goal: To assess rhinometry and pharyngometry in patients undergoing a protocol for occupational sleep medicine assessment with a view towards defining objective indices to predict OSA (without the need for subjective report) and possibly to predict adherence with CPAP therapy.

- 2008-2012 Targeted Sleep Apnea Therapy by Identifying Underlying Mechanisms  
0840159N  
American Heart Association (AHA) Established Investigator Award  
Principal Investigator, Total Direct Costs \$454, 545  
Major Goal: To identify potential therapeutic targets for sleep apnea by defining underlying mechanisms
- 2012-2013 Apex Medical, Hypoglossal Nerve Stimulator Study (HGNS)  
Overall PIs: Malhotra, Kezirian; Direct Costs: depend on patient enrollment  
Major Goal: To perform a multinational randomized trial to study HGNS for treatment of obstructive sleep apnea
- Current**
- 2008-2018 Single Motor Unit Genioglossus Recordings to Understand Sleep Apnea Pathogenesis  
R01 HL085188-01A2  
Principal Investigator, Total Direct Costs \$1,022,456  
Major Goal: To perform newer electrophysiological techniques on the upper airway muscles with a view towards defining new therapeutic targets for sleep apnea.
- 2009-2014 Mechanisms Underlying the Aging Predisposition to Obstructive Sleep Apnea  
R01 HL090897-01A2  
Principal Investigator, Total Direct Costs \$1M  
Major Goal: To characterize thoroughly the various mechanisms underlying sleep apnea with a view towards defining why older people are susceptible to sleep apnea
- 2009-2015 Assessment of Upper Airway Mechanics Using Newer Electromyographic Techniques  
K24 HL 093218 – 01 A1  
Principal Investigator, Total Direct Costs \$803K  
Major Goal: A mentoring award to protect the PI's research time for development of young trainees
- 2009-2014 Program Project Grant  
1 P01 HL 095491 - 01 A1  
Mechanisms of State Switching in Sleep and Sleep Apnea  
Overall PI: Saper, PI of Project 2: Malhotra; Total Direct Costs \$1.25M for Brigham Site  
Major Goal: To identify the neural circuitry involved in arousal from sleep and to assess the possible role of arousal in the pathogenesis of sleep apnea.
- 2010-2015 The Modifying the Impact of ICU-Associated Neurological Dysfunction (MIND-USA) Multicenter Clinical Trial  
R01- AG035117-01  
Overall PI: Ely, Brigham PI: Malhotra; Total Costs: \$1.5M/year  
Major Goal: To test the hypothesis that anti-psychotic therapy leads to improvement in outcomes among critically ill patients with delirium.
- 2011-2016 Obstructive Sleep Apnea Increases Cardiovascular Risk in Type 2 Diabetes  
1R01HL110350-01A1  
MPIs: Malhotra and Veves; Total Costs: \$871K/year  
Major Goal: To assess the impact of sleep apnea on cardiovascular outcomes in patients with diabetes.

- 2012-2016 Esophageal Pressure to Guide Mechanical Ventilation in acute respiratory distress syndrome (ARDS)  
UM1HL108724  
PIs: Talmor and Loring; Brigham PI: Malhotra; Total Costs: \$1.5M  
Major Goal: To test the role of esophageal manometry in setting mechanical ventilator in ICU patients with acute respiratory distress syndrome.
- 2014-2016 Resmed Foundation  
Sleep Disordered Breathing in Mozambique  
Overall PI: Malhotra

### **Report of Local Teaching and Training**

#### **Teaching of Students in Courses**

1997-	Patient-Doctor II – Respiratory System Medical School Students	Harvard Medical School 5 hours preparation time per session, 5-10 sessions per year
1998-	Health Science and Technology – Respiratory Physiology and Pathophysiology for MD and PhD students	Massachusetts Institute of Technology and Harvard Medical School 20 hours preparation time per lecture, 3 lectures per year 15 hours preparation time per session, 6 sessions per year

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

2000-	Weekly lecture to Pulmonary & Critical Care and Anesthesiology fellows regarding current clinical and research topics in current basic and clinical literature	MGH, BWH, BIDMC (in addition to duties as co-director and organizer), 10 hours of preparation per week
2000-2013	Regular lectures to house officers at all of the major teaching hospitals including BWH, MGH and BIDMC, roughly 1-2 per month (Pulmonary, Critical Care, Sleep Medicine)	BWH, MGH and BIDMC

#### **Clinical Supervisory and Training Responsibilities**

1999-2000	Attending Physician, Intensive Care Unit, Medical and Surgical	West Roxbury VA Medical Center	One month per year
2000-2002	Attending Physician, Surgical Intensive Care Unit	Brigham and Women's Hospital	6-8 weeks per year
2000-2004	Attending Physician Medical Intensive Care Unit	Massachusetts General Hospital	8 weeks per year

2005-2008	Attending Physician Medical Intensive Care Unit	Beth Israel Deaconess Medical Center	8 weeks per year
2006-	Preceptor Sleep Medicine fellows	Brigham and Women's Hospital	1-2 half days per week
2006-	Polysomnography Interpretations, supervision of fellows	Brigham and Women's Hospital	1 half day per week
2013-	Chief of Pulmonary and Critical Care	University of California San Diego	10 hours per week
2013-	Director of Sleep Medicine	University of California San Diego	5 hours per week
2014-	Co-director ICU	Temecula Valley Hospital	5 hrs per week

### **Laboratory and Other Research Supervisory and Training Responsibilities**

**2000- Mentor/advisor to trainees/junior faculty from all major Boston teaching hospitals 3-4 hours per week**

Based on the breadth of my research and my substantial contacts within my field, I frequently serve as a mentor/advisor to trainees at all of the major teaching hospitals in Boston. I have provided advice to many trainees about manuscript preparation, data synthesis/interpretation, mentor/mentee conflicts, granting mechanisms, response to reviewers and faculty position negotiations. Based on the success of my trainees, I am frequently called upon to serve in this role from individuals from diverse backgrounds/experience. In total I spend roughly 3-4 hours per week in this role and have an open door policy for these types of interactions. These interactions began in 2000 and became more frequent in 2006-present when I achieved the position of Medical Director of the Sleep Disorders Research Program.

### **Formally Supervised Trainees**

1999 Stephanie Crowley (summer student)  
Current position: Assistant Professor, Rush University, Chicago, IL

2001 Stan Lazic (summer student)  
Current position: Research scientist, Hoffman La-Roche Laboratories, Lausanne, Switzerland

2001- Andrew Wellman, MD (post-doctoral fellow)  
**Received RO1 funding from NHLBI**  
Current position: Instructor in Medicine, Harvard Medical School (promotion pending)

2002-04 Michael Stanchina, MD (post-doctoral fellow)  
Current position: Assistant Professor, Brown University, Providence, Rhode Island

2003-05 Amy Jordan, PhD (post-doctoral fellow and Instructor in Medicine), Harvard Medical School  
Received **AHA** Scientific Development Grant funding (co-mentor: Malhotra)  
Amy has 58 publications to date, including 39 with Malhotra as co-author  
Current position: Roper Fellow at University of Melbourne, Melbourne, Australia

2005-06 Kate Steiner, MD (post-doctoral fellow)  
Current position: Attending Physician, UMass Medical Center, Worcester, MA

- 2005-06 Andrew Nguyen, MD (post-doctoral fellow)  
Current position: Attending Physician, McGill University, Montreal, Quebec, Canada
- 2005-06 Ednan Bajwa, MD (resident and fellow)  
**K23 funded from NHLBI (co-mentor: Malhotra).**  
**RO1 funded from NHLBI currently**  
Current position: Director, Massachusetts General Hospital, Medical Intensive Care Unit
- 2005-07 Matthias Eikermann, MD (post-doctoral fellow)  
Has 73 publications to date, with the majority as first or last author.  
Current position: Assistant Professor of Anesthesiology, Massachusetts General Hospital
- 2005-08 Susie Yim Yeh, MD (post-doctoral fellow)  
Won the **Pickwick Fellowship** from the National Sleep Foundation and **Young Investigator Award** from International Sleep & Breathing (Primary Mentor: Malhotra)  
Current position: Attending Physician, Kaiser Permanente, Anaheim, CA
- 2006-07 Yulun Lo, MD (post-doctoral fellow)  
Current position: Assistant Professor, University of Taiwan, Taipei, Taiwan
- 2006-08 Shilpa Rahangdale, MD (post-doctoral fellow)  
Awarded a research grant from the **American Sleep Medicine Foundation** (Primary Mentor: Malhotra).  
Current position: Attending Physician, North Shore University Health System, Chicago, IL
- 2006-08 Suzanne Bertisch, MD, MPH (post-doctoral fellow)  
Received her **K23** award in July 2009 (co-mentor: Malhotra).  
Current position: Instructor in Medicine, Harvard Medical School
- 2006-2009 Danny Eckert, PhD (post-doctoral fellow)  
Won the **Allen & Hanbury** and **CJ Martin Awards** (Australia) and was funded with an **AHA** Scientific Development Grant (primary mentor: Malhotra).  
Current position: University of Sydney junior faculty, Sydney, Australia with 3 awards from NHMRC
- 2007-2012 Lisa Campana, BS, PhD  
PhD completed, Boston University, Boston, MA (primary mentor: Malhotra)  
Current position: engineer working at start-up Respiratory Motion
- 2007- Julian Saboisky, PhD, post-doctoral fellow  
Awarded **AHA funding** and SRS travel award for his research (Primary mentor: Malhotra).  
Current position: Research Fellow, University of Sydney, Australia
- 2008- Robert Owens, MD  
Pulmonary and Critical Care Fellow, Brigham and Women's Hospital  
Received a **National Research Service Award** in July 2009 and received his **K23 from NHLBI in September 2011** (primary mentor: Malhotra).  
**Awarded James Skatrud Outstanding Young Investigator Award, American Thoracic Society**  
Current position: Assistant Professor in Medicine, Harvard Medical School
- 2008- Lichuan Ye, RN, PhD  
Awarded a grant from **Sigma Theta Tau Honor Society of Nursing** and **received a fundable score on an NIH R15 grant.**  
Current position: Assistant Professor, Boston College, Chestnut Hill, MA

- 2008- Shamim Nemati, BEng  
Current position: Graduate Student, Massachusetts Institute of Technology, Cambridge, MA, defended PhD at MIT December 2012 (co-mentor Malhotra)  
**Awarded a James S. McDonnell Foundation Postdoctoral Fellowship Program**
- 2008- Ina Djonlagic, MD  
 Research fellow and junior faculty  
 Awarded two grants from the American Sleep Medicine Foundation and recently a **K23 from NHLBI** (primary mentor: Malhotra)  
Current position: Instructor in Medicine, HMS; Division of Sleep Medicine, BWH
- 2009-2010 Jay Balachandran, MD  
 Pulmonary and Critical Care Fellow, Brigham and Women's Hospital  
Current position: Assistant Professor, University of Chicago, Chicago, IL
- 2009- Bradley Edwards PhD, Melbourne, Australia (post-doctoral fellow)  
 Won the **Allan & Hanbury** and **CJ Martin, ATS travel** award, ATS unrestricted research grant and Anne Surratt Young Investigator Award for his research proposal (primary mentor: Malhotra).  
Current position: Instructor in Medicine, Sleep Disorders Program, BWH/HMS
- 2010- David McSharry, MBBS  
 Received **AHA post-doctoral fellowship and ATS travel award** (primary mentor: Malhotra)  
Current position: Consultancy in Letterkenney, Ireland
- 2010- Jessie Bakker, PhD  
 Received **AHA scientific development grant, American Thoracic Society grant**  
 Current position: Instructor in medicine Harvard Medical School
- 2010- Mary Rice, MD  
**Received NRSA from NIH, fundable score for K23**  
 Co-mentor: Malhotra  
 Current position: post-doctoral fellow Harvard medical school
- 2010- Scott Sands, PhD student, Monash University, Melbourne, Australia  
 Received **AHA** post-doctoral fellowship award (co-mentor: Malhotra)  
 Received **CJ Martin research award and ATS travel award**  
Current position: research post-doctoral fellow, BWH/HMS
- 2010- Jessica Noggle, PhD, Boston, NIH **F32 award** (co-mentor: Malhotra)  
Current position: post-doctoral fellow, BWH/HMS
- 2010- Eric Kezirian, MD, MPH  
**Received K12 award** (remote mentor: Malhotra)  
Current position: Assistant Professor of Otolaryngology, UCSF, San Francisco, CA
- 2011- Pedro Genta, MD  
 Received Sao Paulo Research Foundation (FAPESP) grant (primary mentor: Malhotra) and **American Heart Association** post-doctoral fellowship.  
Current position: post-doctoral fellow, Malhotra laboratory
- 2011- Mihaela Teodorescu  
 Received: **Merit Award from the Department of Veteran Affairs (VA)** (remote mentor: Malhotra).  
Current position: Associate Professor with tenure, University of Wisconsin (Madison), Madison, WI

- 2011- Karim Awad, MD  
Received: **AHA Fellow to Faculty Award** (Primary Mentor: Malhotra, award relinquished by choice).  
Current position: Attending Physician, Harvard Medical School
- 2012- Natalie Shaw, MD  
Received **K23 award from NIH** (co-mentor: Malhotra),  
Current position: Instructor in Medicine, Harvard Medical School
- 2012- Puja Kohli, MD  
Received NRSA from NIH  
Current position: fellow Harvard Medical School
- 2013- Kathleen Corey, MD  
Received **K23 award from NIH** (co-mentor Malhotra)  
Current position: Instructor in Medicine, Harvard Medical School
- 2013- Jeremy Orr, MD  
Awarded CESAMH fellowship VA health system  
Current position: UCSD pulmonary and critical care fellow
- 2013- Katie Sarmiento, MD, MPH  
Awarded American Sleep Medicine Foundation grant  
Current position: Assistant Professor of Medicine UCSD
- 2014- Rachel Jen, MD  
Received UBC Clinician Investigator Program award (mentor: Malhotra)  
Current position: incoming post-doctoral fellow UCSD
- 2014- Sylvia Li, MD  
ENT surgeon from China  
Visiting scholar
- 2014- Naomi Deacon, PhD student  
Current position: post-doctoral fellow Malhotra laboratory
- 2015- Wonchul Shin, MD  
Visiting scholar, Korea

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

No presentations below were sponsored by outside entities.

2000-2003	Harvard Advances in Sleep Medicine CME Course Meet the Professors Session topic: sleep apnea	One lecture per course Boston, MA
2001-2004	Massachusetts General Hospital Pulmonary and Critical Care Unit CME Course Topic: Sleep apnea and meet the professors	One lecture per course Boston, MA
2008	Harvard Obesity Surgery Symposium	Invited talk

	topic: sleep apnea	Boston, MA
2009	Harvard Trauma ICU CME Course Topic: mechanical ventilation in acute respiratory distress syndrome (ARDS)	Lecture Boston, MA
2009-2011	Harvard CME Course on Obesity topic: sleep apnea	One lecture per course Boston, MA
2011	Brigham and Women's Pulmonary and Critical Care video CME Course topic: sleep apnea	Lecture Boston, MA

### **Local Invited Presentations**

No presentations below were sponsored by outside entities.

1996-2004	Medical House Staff Lectures/ Resident Report/ "Firm Chief" Rounds, Massachusetts General Hospital various topics in pulmonary, critical care, sleep medicine, ~ 5 per year
1996-98	Pulmonary Grand Rounds, ~ 5 per year Massachusetts General Hospital clinical topics in pulmonary and critical care medicine
1997-2000	Harvard Combined Pulmonary and Critical Care Fellowship Lectures, ~ 3 per year
2000-2004	Medical Intensive Care Unit Teaching Lectures, roughly 1 per month Massachusetts General Hospital topics include acid/base, hemodynamics, ARDS, sepsis
2000	Rheumatology Case Conference Brigham and Women's Hospital
2000	Anesthesiology Grand Rounds Brigham and Women's Hospital topic: mechanical ventilation
2001	Trauma Grand Rounds Brigham and Women's Hospital topic: ARDS
2001	Surgical Grand Rounds, Mortality and Morbidity Conference Brigham and Women's Hospital topic: ARDS
2001	Sleep Grand Rounds Sleep Medicine Division, Brigham and Women's Hospital topic: upper airway physiology
2001	Neurogroup Meeting Harvard School of Public Health
2001	Pulmonary and Critical Care Grand Rounds Massachusetts General Hospital Topic: upper airway physiology

2001-2005 Surgical ICU Course: Current State of Critical Care Medicine  
Brigham and Women's Hospital  
various topics in critical care medicine

2002 Medical Grand Rounds  
Massachusetts General Hospital  
topic: sleep disordered breathing in congestive heart failure

2002 Neurology Critical Care Conference  
Massachusetts General Hospital  
topic: acid/base

2002 Anesthesiology Teaching Conference  
Massachusetts General Hospital  
topic: heart/lung interactions

2004 Anesthesiology Grand Rounds  
Beth Israel Deaconess Medical Center, Boston, MA  
topic: heart/lung interactions

2005-2007 Partners Healthcare Physicians' Day lecture/discussion and small group sessions  
Boston, MA

2006 Pulmonary Grand Rounds  
Longwood Medical Area  
Boston, MA  
topic: clinical update on sleep disorders

2006 Anesthesiology Grand Rounds  
Brigham and Women's Hospital  
topic: controversies in critical care

2006 Cardiology Grand Rounds  
West Roxbury VA Medical Center, West Roxbury, MA  
topic: sleep in the cardiac patient

2007 Allergy/Immunology Grand Rounds  
Massachusetts General Hospital  
topic: sleep apnea

2007 Anesthesiology Grand Rounds  
Beth Israel Deaconess Medical Center  
topic: mechanical ventilation

2007 Diabetes Research Meeting  
Massachusetts General Hospital  
topic: sleep apnea

2008 Obesity Grand Rounds  
Massachusetts General Hospital  
topic: sleep apnea

2008 Pediatric Sleep Conference  
Massachusetts General Hospital  
topic: upper airway

- 2009 Pulmonary and Critical Care Grand Rounds  
Brigham and Women's Hospital  
topic: future of sleep apnea therapy
- 2009 Anesthesiology Grand Rounds  
Massachusetts General Hospital  
topic: mechanisms underlying sleep apnea
- 2009 Pulmonary and Critical Care Grand Rounds  
Massachusetts General Hospital  
topic: sleep apnea pathogenesis
- 2010 Pulmonary Grand Rounds  
Brigham and Women's Hospital  
topic: Controversies in critical care
- 2010 Endocrinology Grand Rounds  
Massachusetts General Hospital  
topic: endocrine aspects of pulmonary/critical care and sleep medicine
- 2010 Fish Center for Women, invited lecture  
Brigham and Women's Hospital, Boston, MA  
topic: interactive discussion about sleep disorders
- 2010 Medical Grand Rounds  
Faulkner Hospital, Boston, MA  
topic: sleep apnea
- 2010- Primary Care Outpatient lectures (~ quarterly)  
Brigham and Women's Hospital  
various topics in pulmonary/critical care and sleep medicine
- 2011 Anesthesiology Grand Rounds  
Brigham and Women's Hospital  
topic: future of sleep apnea therapy
- 2011 Center for Functional Pulmonary Imaging, invited lecture  
Brigham and Women's Hospital  
topic: novel therapeutic targets in the upper airway
- 2011 Endocrinology Grand Rounds  
Brigham and Women's Hospital  
topic: endocrine aspects of pulmonary/critical care and sleep medicine
- 2012 Oral and Maxillofacial Surgery Grand Rounds  
Massachusetts General Hospital  
topic: sleep apnea therapeutic targets
- 2012 Pulmonary and Critical Care Grand Rounds  
Massachusetts General Hospital  
topic: controversies in critical care
- 2012 Sleep and Shift Work: Optimizing Productivity and Health Management in the 24/7 Global Economy conference, invited lecture and panel discussion  
Harvard School of Public Health

- 2012 Anesthesiology Grand Rounds  
Massachusetts General Hospital  
Topic: sleep deprivation and fatigue
- 2013 Anesthesia, Critical Care and Pain Medicine Grand Rounds  
Beth Israel Deaconess Medical Center  
Topic: perioperative risk of sleep apnea
- 2013 Anesthesiology Critical Care Grand Rounds  
New England Medical Center  
Tufts University, Boston, MA  
Topic: high frequency oscillatory ventilation
- 2013 Pulmonary Grand Rounds  
University of California, San Diego, La Jolla, CA  
Topic: ARDS
- 2013 Cardiovascular Center Grand Rounds  
UCSD Sulpizio Center  
Topic: Sleep disorders
- 2013 UCSD internal medicine residency  
La Jolla, CA  
Topic: acid base
- 2014- UCSD Internal medicine residency  
La Jolla, CA  
Morning report, regular contributor

**Report of National and International Invited Teaching and Presentations**

No presentations below were sponsored by outside entities.

**Invited Presentations and Courses**

**Regional:**

- 2001-2003 Cardiopulmonary pathophysiology (undergraduate course, one lecture annually)  
Boston University, Boston, MA  
topic: upper airway physiology
- 2002 Pulmonary Grand Rounds  
St. Elizabeth's Hospital, Boston, MA  
topic: 10 things to think about in sepsis
- 2002 Pulmonary Grand Rounds  
St. Anne's Hospital, Fall River, MA  
topic: sleep apnea
- 2002 Medical Grand Rounds  
Southern New Hampshire Medical Center, Nashua, NH  
topic: idiopathic pulmonary fibrosis
- 2004 Cardiology Grand Rounds  
Boston University, Boston, MA  
topic: cardiovascular complications of sleep apnea

- 2004 Medical Grand Rounds  
Shattuck Hospital (Tufts University), Jamaica Plain, MA  
topic: chronic obstructive pulmonary disease
- 2004- General Systems Physiology Lecture  
Massachusetts Institute of Technology, Cambridge, MA  
topic: control of breathing
- 2004 Pulmonary Research Conference  
Brown University, Providence, RI  
topic: sleep apnea pathogenesis
- 2005 North East Sleep Society, invited lecturer  
Stamford, CT  
topic: upper airway physiology
- 2009 Pulmonary Journal Club  
Boston University, Boston, MA  
topic: mechanical ventilation
- 2010 Future of Clinical Sleep Medicine meeting, invited discussant  
Sleep HealthCenter, Dedham, MA  
topic: panel discussion
- 2010 Cardiometabolic Health Congress (CMHC), invited speaker  
Boston, MA  
topic: sleep apnea
- 2011 Institute of Electrical and Electronics Engineers (IEEE) Engineering in Medicine and Biology  
Society 33<sup>rd</sup> annual meeting, invited lecture  
Boston, MA  
topic: control of breathing
- 2011 Future of Clinical Sleep Medicine meeting, invited lecturer  
Sleep HealthCenter, Dedham, MA  
topic: sleep apnea therapy
- 2012 Critical Care Grand Rounds  
Tufts Medical Center, Boston, MA  
Topic: critical care controversies

- 2012 American Association of Sleep Technologists meeting  
Boston, MA  
topic: central sleep apnea
- 2013 Experimental Biology (FASEB)  
Boston, MA  
Topic: sleep apnea biomarkers
- 2013 Program Project Grant (PI: Haddad)  
invited laboratory meeting presentation UCSD  
Topic: sleep apnea
- 2014 UCSD Heart Failure Symposium  
Invited lecture and panel discussion, annually  
Topic: sleep apnea
- 2014 UCSD Pulmonary CME  
Invited lecture and panel discussion chair  
Topic: sleep apnea
- 2014 San Diego Heart Failure Symposium  
Advanced in the Recognition and Treatment of Heart Failure  
Invited lecture: Sleep Apnea

- 2014 2014 Critical Care Summer Session, San Diego, CA  
Topic: ARDS  
**Keynote speaker**
- 2014 Pulmonary and Critical Care Grand Rounds  
University of Southern California  
Topic: sleep apnea
- 2015 Annual Course: Continuous Renal Replacement Therapy and Acute Kidney Injury  
Topic: abdominal compartment syndrome  
Invited lecture
- 2015 Biomarkers in Cardiovascular Disease  
Topic: sleep apnea in congestive heart failure  
Invited speaker
- 2015 6<sup>th</sup> Annual Center for Circadian Biology Symposium  
Topic: future of sleep apnea  
Invited speaker, Sanford Consortium
- 2015 7<sup>th</sup> Annual Critical Care Symposium MemorialCare Health  
Featured Speaker,  
Topic: ARDS
- 2015 Medical Grand Rounds  
Sharp Memorial Hospital  
Topic: sleep apnea
- 2015 UCSD research retreat  
Speaker and Co-Organizer  
Multidisciplinary 3 day event including visiting speakers, mentoring sessions and networking
- 2015 Undergraduate lecture, UCSD  
BILD40 Introduction to Biomedical Research
- 2016 UCSD Sleep/Hypoxia/Cancer Research Retreat  
Moderator and Co-Organizer (with Scott Lippman, MD)  
2 day event including local plus outside speakers  
Networking and collaboration building plus mentoring
- 2016 Preventive Medicine, invited lecture, UCSD  
Topic: Sleep Disorders
- 2016 22<sup>nd</sup> Annual Heart Failure Symposium, San Diego, CA  
Invited lecture

## National

- 2002 Meet the Professors Session  
American Thoracic Society, Atlanta, Georgia  
topic: central sleep apnea
- 2002 Pulmonary and Critical Care Medicine Grand Rounds  
New York University, New York, NY  
topic: sleep apnea pathogenesis
- 2003 Laboratory for Biomedical Science  
North Shore Long Island Jewish Hospital, New York  
topic: autonomic physiology in sleep apnea
- 2004 American College of Cardiology annual meeting, New Orleans, LA  
topic: sleep apnea and hypertension and sleep apnea in congestive heart failure
- 2004 Mayo Clinic, Rochester, MN, invited speaker  
topic: sleep apnea pathogenesis
- 2004 Pulmonary Grand Rounds  
University of California, San Francisco, CA  
topic: sleep apnea pathogenesis
- 2004 Surgery, Sleep, and Breathing Meeting, invited speaker  
Milwaukee, WI  
topic: cardiovascular complications of apnea
- 2004 National Sleep Medicine Course: Central Sleep Apnea  
American Association of Sleep Medicine, Chicago, IL
- 2005 University of Michigan, Ann Arbor, MI, invited speaker  
topic: sleep apnea pathogenesis
- 2005 Advanced Sleep Medicine Course  
American Association of Sleep Medicine, Miami, FL  
topic: central sleep apnea and stump the expert
- 2005 National Sleep Medicine Course  
Chicago, IL  
topic: respiratory physiology and central sleep apnea
- 2005 Review Course, Sleep 2005, invited lecturer and Meet the Professors Session  
Phoenix, Arizona  
topic: sleep apnea pathogenesis/sleep apnea treatment
- 2005 Carolina Sleep Society, **Keynote Speaker**  
Myrtle Beach, SC  
topic: cardiovascular complications of sleep apnea
- 2005 Vascular Biology Conference, Visiting Professor and invited lecturer  
University of Alabama, Birmingham, Alabama  
topic: cardiovascular complications of sleep apnea
- 2005 Pulmonary Grand Rounds  
Mt. Sinai Hospital, New York, NY  
topic: sleep apnea pathogenesis

- 2006 Society of Critical Care Medicine, invited lecturer  
San Francisco, CA  
topic: post-extubation failure
- 2006 Surgery Sleep and Breathing Meeting, invited lecturer  
Chicago, IL  
topic: upper airway mechanics and the evidence for CPAP
- 2006 Sleep 2006, invited lecturer  
Salt Lake City, UT  
topic: year in review
- 2006- National Sleep Medicine Course, invited lecturer (2 lectures)  
Chicago, IL  
topic: sleep apnea
- 2006- Annual Sleep Board Review, invited lecturer  
(speaker ranked highest for content and presentation several times)  
American College of Chest Physicians  
Orlando, FLA or Phoenix, AZ  
topics: obstructive and central sleep apnea
- 2006 92<sup>nd</sup> American College of Surgeons meeting, invited lecturer  
Chicago, IL  
topic: intensive insulin therapy
- 2007 Society of Critical Care Medicine, invited lecture (3 lectures) and co-chair for 2 sessions Orlando, FL  
various critical care topics
- 2007 Scripps Clinic, Visiting Professor and invited lecturer  
San Diego, CA  
topic: sleep apnea pathogenesis
- 2007 National Sleep Medicine Course, Meeting Chairman/Organizer and invited lecturer  
(2 lectures)  
Denver, CO  
topic: sleep apnea
- 2007 American College of Chest Physicians (ACCP) Sleep Board Review, invited lecturer  
(2 lectures)  
Phoenix, AZ  
topics: sleep apnea epidemiology and sleep apnea treatment
- 2007 Medical Grand Rounds  
St. Luke's Hospital, NY, NY  
topic: future of sleep apnea treatment and cardiovascular complications of sleep apnea
- 2007 Sleep Apnea Board Review, ACCP Meeting, invited lecturer  
Chicago, IL  
topic: sleep apnea, obstructive and central, and board review
- 2007 Visiting Professor  
Mayo Clinic, Rochester, MN  
topic: controversies in critical care

- 2008 Medical Grand Rounds  
Pennsylvania State University, Hershey, PA  
topic: cardiovascular complications of sleep apnea
- 2008 Pulmonary Grand Rounds  
Columbia University, NY, NY  
topic: cardiovascular complications of sleep apnea
- 2008 Ohio Siesta meeting (ranked best speaker)  
Kent State University, OH  
topics: complex apnea and cardiovascular complications of apnea
- 2008 Medical Grand Rounds  
Stamford Hospital, Stamford, CT  
topic: cardiovascular complications of apnea
- 2008 American College of Chest Physicians Board Review, invited lecturer (2 lectures)  
Orlando, FL  
topic: sleep apnea
- 2008 American Academy of Dental Sleep Medicine, invited lecturer (2 lectures)  
Baltimore, MD  
topic: sleep apnea
- 2008 Sleep Society of Atlanta, GA, **Keynote address**  
topic: sleep apnea
- 2008 American College of Chest Physicians Board Review, invited lecturer (2 lectures)  
Orlando, FL  
topic: sleep apnea
- 2008 National Sleep Medicine Course, invited lecturer  
Chicago, IL  
topic: central sleep apnea
- 2008 Critical Care Department, Mayo Clinic, Visiting Professor  
Rochester, MN  
topic: controversies in critical care
- 2008 Geriatrics & Biological Sciences Department, Univ. of Wisconsin, Visiting Professor Madison, WI  
topic: aging and sleep apnea
- 2008 Grand Rounds, Scripps Clinic, Visiting Professor  
San Diego, CA  
topic: cardiovascular complications of sleep apnea
- 2008 American Association of Respiratory Care meeting, invited lecturer (3 lectures)  
Anaheim, CA  
various topics in sleep medicine
- 2009 Society of Critical Care Medicine meeting, invited lecturer and 2 professor walk-round sessions  
Nashville, TN  
topic: non-invasive ventilation

- 2009 American Association of Sleep Technologists (AAST), invited lecturer (2 lectures and a discussion section)  
Cincinnati, OH  
topic: sleep apnea
- 2009 American Thoracic Society, invited lecturer and session chair (4 lectures)  
San Diego, CA  
Various pulmonary/critical care and sleep topics
- 2009 Associated Professional Sleep Societies meeting, invited lecturer and and chair for 2 sessions  
Seattle, WA  
topic: sleep apnea
- 2009 American College of Chest Physicians Board Review, invited lecturer (2 lectures)  
Phoenix, AZ  
topic: sleep apnea
- 2009 Sleep Medicine Grand Rounds and Fellows' Lecture  
Stanford University, Stanford, CA  
topics: sleep apnea pathogenesis and cardiovascular complications of sleep apnea
- 2009 New Jersey Sleep Society Annual Education Symposium, invited lecturer  
New Brunswick, NJ  
topic: complex sleep apnea
- 2009 Sleep Grand Rounds  
University of Pittsburgh Medical Center, Pittsburgh, PA  
topic: future of sleep apnea therapy
- 2009 Pulmonary Grand Rounds  
Ohio State University, Columbus, OH  
topic: controversies in critical care
- 2009 American Association of Respiratory Care meeting  
San Antonio, TX  
topic: central sleep apnea
- 2010 American Academy of Dental Sleep Medicine, Webinar leader  
topic: sleep apnea
- 2010 Pulmonary Grand Rounds  
University of Miami, Miami, FL  
topic: future of sleep apnea therapy
- 2010 Case Western Reserve University, invited lecturer (2 lectures)  
Cleveland, OH  
topics: sleep and critical care sleep apnea and ARDS
- 2010 Wayne State University, Visiting Professor and invited lecturer (2 lectures)  
Detroit, MI  
various pulmonary/critical care and sleep topics
- 2010 Tennessee Sleep Society meeting, **Keynote Speaker**  
Nashville, TN  
topic: sleep apnea

- 2010 American College of Chest Physicians Board Review, invited lecturer (2 lectures)  
Orlando, FL  
topic: sleep apnea
- 2010 8<sup>th</sup> Annual Northern New England Critical Care Conference, **Keynote Speaker** Burlington, VT  
topic: controversies in critical care
- 2010 National Heart Lung and Blood Institute workshop: Molecular Mechanisms Underlying Sleep Apnea, invited lecturer (3 lectures)  
Bethesda, MD  
topic: sleep apnea mechanisms
- 2010-11 Sleep State of the Art Course, American Thoracic Society, invited lecturer (~3-4 lectures per annual course)  
Miami, FL, or San Diego, CA  
various topics in sleep apnea
- 2011 American Academy of Facial Pain meeting, **Featured Speaker**  
New Orleans, LA  
topic: sleep apnea
- 2011 Pulmonary Grand Rounds, University of California at San Diego, San Diego, CA  
topic: future of sleep apnea therapy
- 2011 New York State Thoracic Society meeting, invited speaker  
NY, NY  
topic: sleep apnea
- 2011 Pulmonary & Critical Care Grand Rounds, Univ. of Wisconsin, Visiting Professor Madison, WI  
topic: sleep apnea and mechanical ventilation
- 2011 University of Wisconsin Veterinary School, Visiting Professor and invited Neuroscience lecturer  
Madison, WI  
topics: sleep apnea and mechanical ventilation
- 2011 Associated Professional Sleep Societies meeting, invited lecturer and session co-chair  
Minneapolis, MN  
topic: sleep apnea
- 2011 Stanford University, invited lecturer and Visiting Professor  
Palo Alto, CA  
topic: sleep apnea mechanisms
- 2011 American College of Chest Physicians Board Review, invited lecturer (2 lectures)  
San Antonio, TX  
topic: sleep apnea
- 2011 American Association of Oral and Maxillofacial Surgeons, invited lecturer  
Chicago, IL  
topic: sleep apnea biomarkers
- 2011 Society of Anesthesia and Sleep Medicine (SASM) inaugural meeting, **Keynote Speaker**  
Chicago, IL  
topic: future research priorities for anesthesia and sleep medicine

- 2011 Pulmonary and Critical Care Grand Rounds  
Stanford University, Palo Alto, CA  
topic: controversies in critical care
- 2011 Sleep Summit, invited lecturer  
Las Vegas, NV  
topic: sleep apnea therapy
- 2011 Pulmonary Grand Rounds  
Dartmouth-Hitchcock Medical Center, Hanover, NH  
topic: future of sleep apnea therapy
- 2011 Critical Care Grand Rounds  
Dartmouth-Hitchcock Medical Center, Hanover, NH  
topic: controversies in critical care
- 2012 Seattle Sleep Medicine and Technology Program, invited lecturer  
Seattle, WA  
topic: sleep apnea therapy
- 2012 Pulmonary Fellows' Teaching Conference, invited lecturer  
University of Washington, Seattle, WA  
topic: sleep apnea
- 2012 Carolinas 2nd Annual Sleep Symposium  
Charlotte, NC  
topic: sleep apnea therapy
- 2012 18<sup>th</sup> annual Advances in Diagnosis and Treatment of Sleep Apnea and Snoring meeting, invited lecturer (3 lectures)  
University of California at San Francisco, San Francisco, CA  
topic: sleep apnea
- 2012 University of California, San Diego, CA  
Invited lecture for special seminar  
topic: sleep apnea
- 2012 Case Western Reserve University, Cleveland, Ohio  
Invited lecture Pulmonary and Critical Care Grand Rounds  
topic: sleep apnea
- 2012 American Academy of Otolaryngology, invited lecturer  
Washington, DC  
topic: sleep apnea mechanisms
- 2012 University of California, San Diego, CA  
Pulmonary and Critical Care Grand Rounds  
Topic: critical care controversies
- 2012 University of Pennsylvania, Philadelphia, PA  
Invited lecture  
Topic: sleep apnea
- 2012 Sleep Disorders: Diagnosis and Management, St. Luke's and Roosevelt, NYC  
Invited lecture  
Topic: cardiovascular complications of sleep disorders

- 2012 Society of Anesthesia and Sleep Medicine, invited lecturer and session chair  
Washington, DC  
topic: peri-operative complications of sleep apnea
- 2013 University of Chicago, invited lecture  
Pulmonary and Critical Care Grand Rounds  
Topic: sleep apnea
- 2013 Tiger 21, invited lecture and panel discussion  
Group of high net worth investors meeting to discuss investments and personal health  
Palm Beach, Florida  
topic: sleep deprivation and human performance
- 2013- University of Pennsylvania and UCSF  
Annual Advances in Diagnosis and Treatment of Sleep Apnea and Snoring  
4 invited lectures and panel discussion, annually  
Location alternates between Orlando and San Francisco  
Topic: Sleep apnea
- 2013 Mayo Clinic, Rochester, MN  
Invited lecture, David Dines Annual Lecture  
Pulmonary and Critical Care Grand Rounds  
Topic: career as clinician scientist
- 2013 International Society for Heart Research (ISHR)  
San Diego, California  
Invited lecture
- 2013 American College of Chest Physicians Board Review  
San Antonio, TX  
2 invited lectures
- 2013 American Heart Association  
Dallas, TX  
Invited lecture
- 2013 10th Annual Afternoon Siesta  
Keynote Speaker  
Canton, Ohio  
Topic: sleep apnea
- 2013 Society of Anesthesia and Sleep Medicine,  
American Society of Anesthesiology, San Francisco, CA  
Topic: sleep apnea
- 2013 Stanford University  
Pulmonary and Critical Care Grand Rounds  
Topic: ARDS

2013 California Sleep Society  
San Francisco, CA  
Topic: sleep apnea

2014 National Association for Medical Direction of Respiratory Care (NAMDRC)  
Monterey, CA  
Topic: sleep apnea

2014 National Heart Lung and Blood Institute workshop  
Invited lecture  
Topic: circadian rhythms in lung disease

2014 American Thoracic Society  
3 invited lectures and session co-chair  
Topic: career development, resident boot camp, lung disease, resuscitation

2014 Association of Professional Sleep Societies (APSS)  
Minneapolis, MN  
2 invited lectures plus session co-chair  
**Invited plenary lecture**  
Topic: sleep apnea

2014 California Sleep Society  
San Diego, CA  
Invited lecture  
Topic: year in review

2014 American College of Chest Physicians Board Review Course  
Chicago, IL  
2 invited lectures  
Topic: sleep apnea

2014 Society of Anesthesia and Sleep Medicine (SASM)  
New Orleans, LA  
Invited lecture  
Topic: Sleep apnea

2015 American Thoracic Society Denver, Colorado  
4 invited lectures, 1 small group address  
Presidential Inauguration lecture

2015 Association of Professional Sleep Societies  
Seattle, WA  
Meet the professors lunch seminar

2015

- 2015 University of Miami Pulmonary and Critical Care Grand Rounds  
Topic: acute respiratory distress syndrome  
Miami, Florida
- 2015 Hawaii Sleep Society  
2 invited lectures  
Waikiki, Hawaii
- 2016 UCSF and Penn Annual CME course  
2 invited lectures and panel discussion  
San Francisco, CA
- 2016 California Thoracic Society  
2 invited lectures, **keynote**  
Judge of posters, opening and closing statements  
Carmel, CA

## International

- 2001 McGill University, Visiting Professor  
Montreal, Quebec  
topic: sleep apnea pathogenesis
- 2003 Upper Airway Physiology Meeting, invited speaker  
University of Melbourne, Melbourne, Australia  
Topic: upper airway pharmacology
- 2003 Physiology Conference, invited speaker  
Alfred Hospital, Victoria, Australia  
Topic: upper airway reflexes
- 2004 Ross University, invited speaker  
Dominica, West Indies  
topic: upper airway physiology
- 2004 Chiba University, invited speaker  
Chiba, Japan  
topic: upper airway physiology
- 2004 Sleep Apnea Meeting, **Keynote Speaker**  
Tokyo, Japan  
topic: sleep apnea complications
- 2005 University of Toronto, Visiting Professor  
Ontario, Canada  
topic: sleep apnea pathogenesis
- 2005 University of Calgary, Visiting Professor  
Alberta, Canada  
topic: future of sleep apnea treatment/ upper airway physiology
- 2005 Continuous Positive Airway Pressure (CPAP) Annual Conference, **Keynote Speaker** Nagoya,  
Japan  
topic: cardiovascular complications of apnea
- 2007 University of British Columbia, invited speaker  
Vancouver, British Columbia, Canada  
topic: finite element analysis in the upper airway
- 2007 Vancouver General Hospital, Visiting Professor  
Vancouver, Canada  
topic: future of sleep apnea treatment
- 2007 Upper Airway Symposium, invited speaker  
Perth, Australia  
topic: brain stem reflexes in OSA
- 2007 Pulmonary Grand Rounds, invited speaker  
Royal Brompton Hospital, London, UK  
topic: future of sleep apnea treatment/
- 2007 Pulmonary Board Review, invited speaker  
San Juan, Puerto Rico  
Topic: various pulmonary, critical care, sleep board review questions

- 2007 Chilean Thoracic Society, **Keynote Speaker**, invited lecturer (4 lectures)  
Santiago, Chile  
various sleep science topics
- 2007 Critical Care Research Day, Visiting Professor  
McGill University, Montreal, Quebec  
topic: controversies in critical care
- 2007 International Sleep and Breathing meeting, invited lecturer and discussion leader  
Palm Cove, Queensland, Australia  
topic: brainstem reflexes in OSAs
- 2007 British Sleep Society, **Keynote Address**  
Cambridge, UK  
topic: future of sleep apnea treatment
- 2008 Harvard Medical School Dubai Center International, invited lecturer (4 lectures)  
Dubai, United Arab Emirates  
various critical care topics
- 2009 Israeli Sleep Society, **Keynote speaker** (postponed due to war)  
Haifa, Israel  
topic: sleep apnea pathogenesis
- 2009 World Congress on Sleep Apnea, invited speaker and discussion leader  
Seoul, South Korea  
topic: arousal threshold in sleep apnea
- 2010 Upper Airway meeting, invited lecturer  
Port Stephens, New South Wales, Australia  
topic: pharmacology of sleep apnea
- 2010 Ranbaxy Foundation, Visiting Professor and **Keynote Speaker**  
New Delhi, India  
various sleep apnea topics
- 2010 Patel Chest Institute, invited lecturer  
New Delhi, India  
topic: sleep apnea
- 2010 All India Institute of Medical Sciences (AIIMS), Visiting Professor  
New Delhi, India  
topic: sleep apnea
- 2011 International Sleep & Breathing Meeting, session chair,  
Barcelona, Spain
- 2011 University of Alberta, invited lecture and Visiting Professor  
Edmonton, Alberta, Canada  
topic: future of sleep apnea therapy
- 2011 University of Grenoble, invited lecturer and Visiting Professor  
Grenoble, France  
topic: therapy of OSA in the future

- 2011 University of Manitoba, invited lecturer and Visiting Professor  
Canada  
topic: therapy for OSA using a mechanistic approach
- 2011 Instituto de Sono, invited lecturer  
Sao Paulo, Brazil  
topic: sleep apnea
- 2011 University of Sao Paulo, Visiting Professor  
Sao Paulo, Brazil  
topic: sleep apnea
- 2011 Federal University of Sao Paulo, invited lecturer and Visiting Professor  
Sao Paulo, Brazil  
Cardiovascular Complications of Sleep Apnea
- 2012 King Faisal Hospital, attending physician and invited lecturer  
Kigali, Rwanda  
various critical care topics
- 2012 Toronto Critical Care Symposium  
Toronto, Ontario, Canada  
topics: mechanical ventilation, upper airway mechanics
- 2012 NAPCON invited lecture (National Pulmonary meeting)  
Topic: sleep apnea  
**Keynote Speaker**  
Bhubanaswar, India
- 2012 All India Medical Institute invited lecture  
Medical Grand Rounds  
Topic: Lung Mechanics
- 2013 American College of Physicians Puerto Rico  
San Juan, Puerto Rico  
topic: sleep apnea
- 2013 University of Toronto  
Medical Grand Rounds  
topic: sleep apnea
- 2013 Upper Airway Symposium  
Margaret River near Perth, Australia  
Topic: sleep apnea, 2 invited lectures  
Keynote speaker
- 2013 Turkish Thoracic Society, invited lecture  
Antalya, Turkey  
Topic: Sleep apnea

- 2013 Alberta Lung Association  
Edmonton, Canada  
**Keynote speaker**  
Topic: sleep apnea  
<*voted top speaker by attendees*>
- 2013 NAPCON Meeting  
Chennai, India  
2 Invited lectures  
Topic: Sleep Apnea
- 2014 Medical Grand Rounds  
Invited lecture  
Maputo, Mozambique
- 2014 Gulf Thoracic Congress  
Dubai, UAE  
Invited lecture  
Topic: sleep in asthma
- 2014 European Respiratory Society  
Munich, Germany  
Session co-chair  
Topic: sleep apnea
- 2014 ALAT meeting  
2 invited lectures  
Topic: sleep apnea  
Medellin, Columbia
- 2014 Royal Brompton Hospital, London UK  
Invited Seminar  
Topic: Sleep Apnea
- 2014 University of Lisbon, Portugal  
Invited grand rounds  
Topic: Sleep Apnea
- 2014 Asia Pacific Respiratory Society (APSR)  
Bali, Indonesia  
Invited lecture
- 2014 NAPCON meeting  
3 Invited lectures  
Topic: sleep apnea, critical care, mechanical ventilation  
Agra, India

- 2014 Major General Amir Chand Oration  
Awarded lecture  
New Delhi, India
- 2014 Medical Grand Rounds  
All India Institute of Medical Sciences  
Invited lecture, New Delhi, India
- 2015 Japanese Respiratory Society  
Invited speaker, 2 talks  
Tokyo, Japan
- 2015 UCSD Symposium in Cuzco, Peru  
Co-organizer and invited lecture
- 2015 International Ambassador's Symposium  
Co-organizer, 2 invited lectures  
Lima, Peru
- 2015 invited lecture, Hawaii Sleep Society  
Waikiki, HI
- 2015 Chinese Association of Chest Physicians  
2 invited lectures  
Qingdao, China
- 2015 UCSD High Altitude Symposium in Cuzco, Peru  
Menjo Medico Integral del Turista  
Invited lecture and co-organizer
- 2015 International Society of Respiratory Disease (ISRD)  
Keynote address: Update in Pulmonary Critical Care and Sleep Medicine  
Chengdu, China
- 2015 UCSD Pulmonary Symposium at Social Security Hospital,  
Lima, Peru  
Co-organizer and 2 invited lectures
- 2015 Asia Pacific Society of Respirology  
2 invited lectures  
Kuala Lumpur, Malaysia
- 2015 Perdana University Symposium  
Organizer and Chairman  
2 invited lectures  
Kuala Lumpur, Malaysia
- 2015 NAPCON, Jaipur India  
2 invited lectures: Meet the expert and invited talk

- 2015 American College of Chest Physicians  
5 invited lectures, 2 discussion groups  
Montreal, PQ, Canada
- 2016 Gulf Thoracic Congress  
Invited lecture  
Dubai, UAE

## **Report of Clinical Activities and Innovations**

### **Current Licensure and Certification**

- 1996 Massachusetts License  
1996 American Board of Internal Medicine  
1997 Fellow Royal College of Physicians of Canada (FRCPC)  
1998 American Board of Medical Specialties: Pulmonary Disease  
1999 American Board of Medical Specialties: Critical Care Medicine  
2000 Royal College of Physicians of Canada, Special Certification in Respiriology  
2007 American Board of Medical Specialties: Sleep Medicine

### **Practice Activities**

My practice activities involve outpatient and inpatient work related to pulmonary, critical care and sleep medicine. My work involves seeing patients, overseeing fellows, and leading the clinical Sleep Program at BWH. Over the past 10 years, I have also had attending/teaching responsibilities in the ICUs at BWH, MGH and BIDMC. This work involves directing rounds with a team of trainees including fellows, residents, interns, medical students, nurses, pharmacists and respiratory therapists. In 2012, I attended in the ICU of King Faysal Hospital in Kigali, Rwanda. I have also overseen the pulmonary fellows in outpatient clinics and seen patients in the Center for Chest Disease at the Brigham.

1999-2000	Intensive Care Unit, Medical and Surgical	West Roxbury VA Medical Center	One month per year
2000-2002	Surgical Intensive Care Unit	Brigham and Women's Hospital	6-8 weeks per year
2000-2003	Interstitial Lung Disease Clinic	Brigham and Women's Hospital	One half day per week
2000-	Medical Intensive Care Unit	Massachusetts General Hospital	0-8 weeks per year
2005-	Medical Intensive Care Unit	Beth Israel Deaconess Medical Center	0-8 weeks per year
2006-	Sleep Medicine Clinic	Brigham and Women's Hospital	1-2 half days per week
2006-	Polysomnography Interpretations	Brigham and Women's Hospital	1 half day per week
2012-	Surgical Intensive Care Unit	King Faysal Hospital, Kigali, Rwanda	24/7 coverage for 2 weeks

### **Clinical Innovations**

**2003-present**

I have implemented our ACGME clinical sleep fellowship to allow for the effective oversight of medical education as well as patient care. This process required a restructuring of our clinics to allow for our sleep trainees to receive excellent teaching as well as patient care experience. I have also adapted our clinical sleep program to the changing times such that clinical care pathways are altered based on new technology, changes in reimbursement, or evolving data regarding best available evidence. For example, home sleep testing was essentially unavailable five years ago, but now is the standard of care for many of our sleep apnea patients. Over this time, we have also developed programs to screen for high risk patients including people with heart failure, type 2 diabetes mellitus, and bariatric surgery patients among others. These innovations were recognized when the Brigham and Women's was awarded an Academic Program of Distinction by the American Academy of Sleep Medicine (co-directors Czeisler and Malhotra). Our clinical care model has been incorporated into clinical practice guidelines which are now being implemented around the world.

**Report of Education of Patients and Service to the Community**  
**Educational Materials for Patients and the Lay Community**

No materials below were sponsored by outside entities.

There are numerous articles, interviews, and information products in the national and global popular media (on-line, in print, broadcast news, etc.) related to my work or for which I have served as a contributor, including:

1. Kowalczyk L. "You don't snooze, you lose." Boston Globe, July 20, 2009. Available at [http://www.boston.com/news/health/articles/2009/07/20/dr\\_atul\\_malhotra\\_discusses\\_sleep\\_disorders/](http://www.boston.com/news/health/articles/2009/07/20/dr_atul_malhotra_discusses_sleep_disorders/)
2. Radio interviews, including National Public Radio (US) and Winnipeg (Canada) stations
3. TV interviews, including New England Cable News (NECN)
4. *Apnea: Understanding and Treating Obstructive Sleep Apnea*. The Apnea Website. Launched April 1, 2011. Produced by the Harvard Medical School Division of Sleep Medicine and WGBH Educational Foundation. (The overall goal of this project is to translate medical and scientific research on sleep in a way that makes it accessible and useful to the general audience.)
5. *Shaq Attacks Sleep Apnea*. YouTube video featuring basketball star Shaquille O'Neal, in which I am interviewed. Posted May 5, 2011. Available at <http://www.youtube.com/watch?v=4JkiWvWn2aU>. (O'Neal has been a Sleep Medicine patient at BWH.)
6. Trinder J, **Malhotra A**. "Sleep Apnea." *Scholarpedia*. Available at [http://www.scholarpedia.org/article/Sleep\\_apnea](http://www.scholarpedia.org/article/Sleep_apnea)
7. The Asahi Shimbun Globe, Japanese newspaper, "A Good Night's Sleep", interview and story September 3, 2011
8. Boston Globe.com August 19, 2012 "Aging baby boomers, who once neglected their sleep, are now finding it harder to come by", interview with Atul Malhotra
9. CBS television interview regarding the importance of good sleep, broadcast on CBS affiliates throughout North America
10. Healthy & Active Aging, Keynote Address, UCSD, San Diego, CA, lay public, 2013
11. National Public Radio - radio live interview, 2015  
<http://www.kpbs.org/news/2015/jan/27/sleep-deprivation-and-your-health/>
12. KSPS television – live interview, 2015
13. American Lung Association interview: Doctors for Climate Health  
<http://www.lung.org/associations/states/california/advocacy/climate-change/doctors-for-climate-health.html>
14. interview, MedScape Neurology, released during European Respiratory Society Sleep & Breathing meeting, 2015

15. San Diego Tribute: correspondence on e-cigarette use in children  
<http://www.utsandiego.com/news/2015/apr/26/u-t-san-diego-letters-to-the-editor-for-april-27/>
16. American Lung Association in California, Air Quality Report: 16<sup>th</sup> Annual State of the Air 2015  
[www.lung.org/california](http://www.lung.org/california), local news release
17. Regular media interviews during ATS international conference, 2015
18. CBS News (June 15, 2015) How much sleep is best for your health? <<http://www.cbsnews.com/news/how-much-sleep-is-best-for-your-health/>>
19. Reuters Health (June 15, 2015) Americans, their physicians should take sleep seriously: chest doctors<<http://www.reuters.com/article/2015/06/15/us-health-sleep-thoracic-statement-idUSKBN0OV24J20150615>>
20. Canadian Broadcasting (June 15, 2015) Get a good night's sleep! <<http://www.cbc.ca/radio/whitecoat/blog/get-a-good-night-s-sleep-1.3113981>>
21. The Reuters story was picked up by dozens of small outlets across the country. All the major clips to our website at <http://www.thoracic.org/about/newsroom/ats-in-the-news.php>.
22. Medical News Today: Healthy Sleep: top doctors draw up list of recommendations.  
<http://www.medicalnewstoday.com/articles/295259.php>
23. KPBS interview, clean air interview June 2015
24. "Local dignitaries gather to announce San Diego's Clean Air Challenge", American Lung Association press conference, clean air initiative <http://www.wtrf.com/story/29446334/local-dignitaries-gather-to-announce-san-diegos-clean-air-challenge>
25. Patient Information Sessions, Moore's Cancer Center, community outreach for Pulmonary, Critical Care and Sleep Medicine, UCSD Health System, roughly 2-3 per year.
26. Rancho Bernardo High School, Future Doctors of America, invited lecture
27. Alpha-One Anti-Trypsin foundation with the American Thoracic Society, Public Advisory Roundtable, patient-session, co-organizer and speaker and discussion session moderator, San Diego, CA.

## **Recognition**

1984-88	Certificate of Appreciation for volunteer work	Grandview Extended Care Center, Edmonton, Canada	Outstanding contribution
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## **Report of Scholarship**

### **Publications**

#### **Peer reviewed publications in print or other media**

## Research Investigations

1. Schwartz D, Maroo A, Malhotra A, Kesselman H. Negative pressure pulmonary hemorrhage. *Chest* 1999; 115(4): 1194-8. PMID: 10208229.
2. Fogel RB, Malhotra A, Shea SA, Edwards JK, White DP. Reduced genioglossal activity with upper airway anesthesia in awake patients with OSA. *J Appl Physiol* 2000; 88(4):1346-54. PMID: 10749829.
3. Malhotra A, Fogel R, Edwards J, Shea SA, White DP. Local mechanisms drive pharyngeal muscle dilator activation in obstructive sleep apnea. *Am J Respir Crit Care Med* 2000; 161(5):1746-9. PMID: 10806181.
4. Malhotra A, Pillar G, Fogel R, Beauregard J, Edwards JK, Slamowitz DI, Shea SA, White DP. Genioglossal but not palatal muscle activity relates closely to pharyngeal pressure. *Am J Respir Crit Care Med* 2000; 162(3): 1058-62. PMID: 10988130.
5. Pillar G, Malhotra A, Fogel R, Beauregard J, Schnall R, White DP. Airway mechanics and ventilation in response to resistive loading during sleep: influence of gender. *Am J Respir Crit Care Med* 2000; 162(5):1627-32. PMID: 11069787.
6. Pillar G, Malhotra A, Fogel R, Beauregard J, Slamowitz, D, Shea SA and White DP. Upper airway muscle responsiveness to rising PCO<sub>2</sub> during NREM Sleep. *J Appl Physiol* 2000; 89(4): 1275-82. PMID: 11007559.
7. Fogel RB, Malhotra A, Pillar G, Pittman SD, Dunaif A, White DP. Increased prevalence of obstructive sleep apnea syndrome in obese women with polycystic ovary syndrome. *J Clin Endocrinol Metab* 2001; 86(3):1175-80. PMID: 11238505.
8. Malhotra A, Pillar G, Fogel R, Beauregard J, Edwards JK, White DP. Upper airway collapsibility: measurements and sleep effects. *Chest* 2001; 120(1):156-61. PMID: 11451832.
9. Pillar G, Fogel R, Malhotra A, Beauregard J, Edwards JK, Shea SA, White DP. Genioglossal inspiratory activation: central respiratory versus mechanoreceptive influences. *Respir Physiol* 2001; 127(1): 23-38. PMID: 11445198.
10. Hilton MF, Chappell MJ, Bartlett WA, Malhotra A, Beattie JM, Cayton RM. The sleep apnoea/hypopnoea syndrome depresses waking vagal tone independent of sympathetic activation. *Eur Respir J* 2001; 17(6): 1258-66. PMID: 11491174.
11. Fogel RB, Malhotra A, Pillar G, Edwards JK, Beauregard J, Shea SA, White DP. Genioglossal activation in patients with obstructive sleep apnea versus controls: mechanisms of muscle control. *Am J Respir Crit Care Med* 2001; 164(11): 2025-30. PMID: 11739130.
12. Malhotra A, Pillar G, Fogel R, Edwards J, Ayas N, Akahoshi T, Hess D, White DP. Pharyngeal pressure and flow effects on genioglossus activation in normal subjects *Am J Respir Crit Care Med* 2002;

165(1):71-7. PMID: 11779733.

13. Fisher D, Pillar G, Malhotra A, Peled N, Lavie P. Long-term follow-up of untreated patients with sleep apnea syndrome. *Respir Med* 2002; 96(5): 337-43. PMID: 12113384.
14. Stanchina M, Malhotra A, Fogel R, Ayas N, Edwards JK, Schory K, White DP. Genioglossal muscle responsiveness to chemical and mechanical loading during non-rapid eye movement sleep. *Am J Respir Crit Care Med* 2002; 165(7): 945-9. PMID: 11934719.
15. Karpaliotis D, Kosmidou I, Ingenito EP, Hong K, Malhotra A, Sunday ME, Haley KJ. Angiogenic growth factors in the pathophysiology of a murine model of acute lung injury. *Am J Physiol Lung Cell Mol Physiol* 2002; 283(3): L585-95. PMID: 12169578.
16. Snow A, Gozal E, Malhotra A, Tiosano D, Perlman R, Vega C, Shahar E, Gozal D, Hochberg Z, Pillar G. Severe hypersomnolence after pituitary/hypothalamic surgery in adolescents: clinical characteristics and potential mechanisms. *Pediatrics* 2002; 110(6): e74. PMID: 12456941.
17. Malhotra A, Huang Y, Fogel RB, Pillar G, Edwards JK, Kikinis R, Loring SH, White DP. The male predisposition to pharyngeal collapse: importance of airway length. *Am J Respir Crit Care Med* 2002; 166(10):1388-95. PMID: 12421747.
18. Wellman A, Malhotra A, Fogel RB, Edwards JK, Schory K, White DP. Respiratory system loop gain in normal men and women measured with proportional-assist ventilation. *J Appl Physiol* 2003; 94(1):205-12. PMID: 12391042.
19. Ayas N, White DP, Manson JE, Stampfer MJ, Speizer FE, Malhotra A, Hu F. A prospective study of sleep duration and coronary heart disease in women. *Arch Intern Med* 2003; 163(2): 205-9. PMID: 12546611.
20. Pillar G, Schusheim G, Weiss R, Malhotra A, McCowen KC, Shlitner A, Peled N, Shehadeh N. Interactions between hypoglycemia and sleep architecture in children with type 1 diabetes mellitus. *J Pediatr* 2003; 142(2):163-8. PMID: 12584538.
21. Patel SR, White DP, Malhotra A, Stanchina ML, Ayas NT. Continuous positive airway pressure therapy for treating sleepiness in a diverse population with obstructive sleep apnea: results of a meta-analysis. *Arch Intern Med* 2003;163(5): 565-71. PMID: 12622603.
22. Berry RB, White DP, Roper J, Pillar G, Fogel RB, Stanchina M, Malhotra A. Awake negative pressure reflex response of the genioglossus in OSA patients and normal subjects. *J Appl Physiol* 2003; 94(5): 1875-82. PMID: 12533492.
23. Malhotra A, Muse V, Mark E. Case records of the Massachusetts General Hospital. Weekly clinicopathological exercise Case 12-2003: An 82-year-old man with dyspnea and pulmonary abnormalities. *New Engl J Med* 2003; 348(16): 1574-85. PMID: 12700378.

24. Fogel RB, Trinder J, Malhotra A, Stanchina M, Edwards JK, Schory KE, White DP. Within-breath control of genioglossal muscle activation in humans: effect of sleep-wake state. *J Physiol (Lond)* 2003; 550(3):899-910. PMID: 12807995 PMCID: 2343065.
25. Stanchina ML, Malhotra A, Fogel RB, Trinder J, Edwards JK, Schory K, White, DP. The influence of lung volume on pharyngeal mechanics, collapsibility, and genioglossus muscle activation during sleep. *Sleep* 2003; 26(7):851-6. PMID: 14655919.
26. Fogel R, White DP, Pierce R, Malhotra A, Edwards J, Dunai J, Kleverlaan D, Trinder J. Control of upper airway muscle activity in younger versus older men during sleep onset. *J Physiol (Lond)* 2003; 553(2): 533-44. PMID: 12963804 PMCID: PMC2343562.
27. Ayas NT, Patel SR, Malhotra A, Schulzer M, Malhotra M, Jung D, Fleetham J, White DP. Auto-titrating versus standard continuous positive airway pressure for the treatment of obstructive sleep apnea: results of a meta-analysis. *Sleep* 2004; 27(2): 249-53. PMID: 15124718.
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29. Pittman SD, Ayas NT, MacDonald MM, Malhotra A, Fogel RB, White DP. Using a wrist-worn device based on peripheral arterial tonometry to diagnose obstructive sleep apnea: in-laboratory and ambulatory validation. *Sleep* 2004; 27(5):923-33. PMID: 15453551.
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34. Jordan AS, Wellman DA, Edwards JK, Schory K, Dover L, MacDonald M, Patel SR, Fogel RB, Malhotra A, White DP. Respiratory control stability and upper airway collapsibility in men and women with obstructive sleep apnea. *J Appl Physiol* 2005; 99(5): 2020-7. PMID: 15994243. PMCID: PMC3496786
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- sleep onset on upper airway muscle activity in patients with sleep apnoea versus controls. *J Physiol (Lond)* 2005; 564(2):549-62. PMID: 15695240 PMCID: PMC1464430.
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  42. Yinon D, Lowenstein L, Suraya S, Belooseski R, Zmora O, Malhotra A, Pillar G. Pre-eclampsia is associated with sleep disordered breathing and endothelial dysfunction. *Eur Respir J* 2006; 27(2):328-33. PMID: 16452588. PMCID: PMC3496926
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- Genioglossal muscle response to CO<sub>2</sub> stimulation during NREM sleep. *Sleep* 2006; 29(4):470-7. PMID: 16676780. PMCID: PMC3500386
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### **Clinical Guidelines and Reports**

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### **Narrative Report**

I am a Pulmonary Intensivist with expertise in the field of Sleep Medicine and Critical Care and devote much of my effort to research. The rest of my time is spent on clinical, leadership and administrative duties, as well as numerous teaching/training activities.

As a result of my investigative work, OSA is no longer considered a single entity but instead is understood as one with multiple physiological mechanisms. This critical expansion in knowledge allows for the successful individualization of therapy. Some patients get sleep apnea for primarily anatomical issues, and such individuals respond to anatomical manipulations such as upper airway surgery. Using computational modeling and enlisting surgical collaborators, we have identified individuals who are likely to respond to such manipulations. Other patients have issues primarily with pharyngeal dilator motor control, and they respond to efforts to change hypoglossal motor output (e.g., hypoglossal nerve stimulation). Another identifiable group has instability in ventilatory control (elevated loop gain); we have shown that they respond to interventions such as oxygen or acetazolamide. There is probably a subset of OSA patients in whom many underlying mechanisms exist. Such patients likely respond to combination therapy addressing several therapeutic targets. Our work has paved the way to successful pharmacological therapy for OSA, a key step forward. I am currently PI for several major NIH grants.

Based on my background in applied physiology, I have also been working in other areas of respiratory biology, most notably in mechanical ventilation as it pertains to ARDS. My role for this work is primarily one of a mentor, whereby I help many junior people get involved in and excited about physiological research. I have received teaching awards from the residents and fellows at Harvard-affiliated institutions, as well as commendations for best presentations at many professional meetings. I have also participated in teaching by giving Grand Rounds and lecturing in CME courses from local to international settings. From 2000-2013, I co-directed HST 100 in Advanced Respiratory Physiology (with Professor Jeffrey Drazen and Stephen Loring).

I am active clinically, having attended in the ICUs at all of the major Harvard teaching hospitals, and since moving to UCSD provide patient care in the inpatient consults, Thornton and Hillcrest ICUs and outpatient setting. Recently, I also attended in the ICU at King Faisal Hospital in Rwanda and in Maputo Hospital in Mozambique. My work with the ACGME clinical sleep fellowship has led to better trainee education and improved patient care, resulting in an AASM Academic Program of Distinction Award for BWH. Our clinical care model is being implemented globally.

I have multiple administrative duties. In 2015, I am President of the American Thoracic Society, the world's leading respiratory organization. This work involves national and international leadership responsibilities focused on advancing lung health. I have also been involved in founding and co-organizing major national sleep courses. I have participated in numerous committees for U.S. and international organizations and institutions, including many grant review roles. Locally, I served as a long-standing member of 7 Harvard and Brigham committees, including as Co-Chair of the Training Grant Writing Committee. At UCSD, I have participated in many different committees including department of medicine executive committee, leadership council, search committees etc. As Chief of Pulmonary and Critical Care and Director of Sleep Medicine at UCSD, I have continued these activities including clinical, administrative, leadership, advocacy and research.