BIOGRAPHICAL SKETCH

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NAME: **Naresh M. Punjabi, MD, PhD**

eRA COMMONS USERNAME (credential, e.g., agency login): npunjab1

POSITION TITLE: Chief of Pulmonary, Critical Care, and Sleep Medicine
Mary Jane and Lino Sertel Professorship in Pulmonary Disease

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
Northwestern University, Evanston IL	B.S.	1983 - 1987	Biomedical Engineering
University of Chicago School of Medicine, Chicago, IL	M.D.	1987 - 1991	Medical School
Johns Hopkins Hospital, Baltimore, MD		1991 - 1994	Internship and Residency
Johns Hopkins Hospital, Baltimore, MD		1995 - 1999	Postdoctoral Fellowship
Johns Hopkins University, Baltimore, MD	Ph.D.	1996 - 2001	Clinical Investigation

A. Personal Statement

My research focuses on the epidemiology and clinical consequences of sleep-disordered breathing (SDB), with a particular emphasis on the development of cardiovascular and metabolic diseases. I have over 25 years of experience in the clinical and research aspects of sleep disorders medicine, with a career devoted to understanding the risk factors, natural history, and sequelae of SDB. I have had the privilege of serving as the Principal Investigator of the Hagerstown field center for the Sleep Heart Health Study (SHHS), the longest-running epidemiological study of sleep apnea in the general population. Additionally, I have been a co-investigator for several major studies, including the (a) Atherosclerosis Risk in Communities (ARIC) Study, (b) Cardiovascular Health Study, (c) MESA Lung Study, and (d) the sleep component of the Study of Osteoporotic Fractures in Men (MrOS-Sleep). Furthermore, I have led several multicenter randomized clinical trials on the effects of positive airway pressure (PAP) therapy on cardio-metabolic outcomes in patients with obstructive sleep apnea, such as the GlycOSA and Heart-BEAT studies. Research in my clinical laboratory has focused on elucidating the mechanistic links between obstructive sleep apnea, insulin resistance, and impaired insulin secretion by defining the independent effects of intermittent hypoxia and sleep fragmentation. As a result, my research spans multiple disciplines, encompassing bench-to-bedside projects, large-scale epidemiological studies, and randomized clinical trials. I have worked directly with each of the co-investigators on this project. Dr. Bernal-Mizarchi and I have collaboratively generated the preclinical data supporting this proposal, while Dr. Abreu and I have worked together on the clinical data that motivate this application. Additionally, my prior and ongoing collaborations with Dr. Stefanovski, whose expertise in biostatistics will be pivotal for the project's success, provide the critical foundation necessary to complete this research. My extensive experience in conducting clinical, basic, and translational research in sleep disorders, combined with my training in epidemiology, provides a comprehensive perspective on the proposed research. This expertise, alongside a highly qualified team of experts in sleep medicine and endocrinology, will ensure the successful completion of the proposed investigation into the deleterious effects of calcium channel blockers on glucose metabolism in sleep apnea.

Ongoing and recently completed projects that I would like to highlight include:
P50 MD017347
Project PI at UM
09/01/2021 – 08/31/2026
Southeast Collaborative for Innovative and Equitable Solutions to Chronic Disease Disparities

Citations:
Google Scholar h-Index: 82 on 09/30/2024; Articles Cited 36,119 times
Web of Science h-Index: 67 on 09/30/2024; Articles Cited 18,660 times

1. Gottlieb DJ, **Punjabi NM.** Diagnosis and Management of Obstructive Sleep Apnea: A Review. JAMA. 2020;323(14):1389-1400. PMID: 32286648
2. Zhang L, Samet J, Caffo B, **Punjabi NM**. Cigarette smoking and nocturnal sleep architecture. American journal of epidemiology. 2006 Sep 15;164(6):529-37.
3. Zhang L, Samet J, Caffo B, Bankman I, **Punjabi NM**. Power spectral analysis of EEG activity during sleep in cigarette smokers. Chest. 2008 Feb 1;133(2):427-32.
4. **Punjabi NM**, Shahar E, Redline S, Gottlieb DJ, Givelber R, Resnick HE. Sleep-disordered breathing, glucose intolerance, and insulin resistance: The Sleep Heart Health Study. *Am J Epidemiol* 2004; 160(6): 521-30. PMID: 15353412.
5. Shaw JE, **Punjabi NM**, Naughton MT, Willes L, Bergenstal RM, Cistulli PA, Fulcher GR, Richards GN, Zimmet PZ. The Effect of Treatment of Obstructive Sleep Apnea on Glycemic Control in Type 2 Diabetes. Am J Respir Crit Care Med. 2016;194(4):486-92

B. Positions, Scientific Appointments, and Honors

Positions and Employment

2020 – Present	Chief of Pulmonary, Critical Care, and Sleep Medicine, University of Miami
	Mary Jane and Lino Sertel Professorship in Pulmonary Disease, University of Miami
	Chief of Pulmonary Service, Miami VA Health System
2010 – 2020	Professor, Departments of Medicine and Epidemiology, Johns Hopkins University
2005 – 2010	Associate Professor, Departments of Medicine and Epidemiology, Johns Hopkins University
2000 – 2005	Assistant Professor, Department of Medicine, Johns Hopkins University
1999 – 2000	Instructor, Department of Medicine, Johns Hopkins University
1994 – 1995	Staff Physician, Department of Medicine, Johns Hopkins Medical Services Corporation
1994 – 1995	Clinical Instructor, Department of Medicine, Johns Hopkins University and Hospital

Scientific Review Groups

2010 – 2016	Grant Review Committee, American Sleep Medicine Foundation
2009 – Present	Grant Review Committee, Sleep Research Society
2008 – 2012	Permanent Member, NIH Study Section
	Respiratory Integrative Biology and Translational Research
February 2010	Ad hoc reviewer, Research Grants Council, Hong Kong, China
September 2009	Ad hoc reviewer, Diabetes UK Scientific Grant Reviewer
November 2005	Ad hoc reviewer, The Wellcome Trust (London, UK) Grant Review Committee

Honors:
William C. Dement Academic Achievement Award, 2018
Fellow, American Academy of Sleep Medicine, 2002
Fellow, American College of Chest Physicians, 2002

Board Certification:
National Board of Medical Examiners, 1992
Diplomate, American Board of Internal Medicine, 1994 (Recertified 2005)
Diplomate, American Board of Subspecialty in Pulmonary Medicine, 1998 (Recertified 2005, 2017)
Diplomate, American Board of Subspecialty in Critical Care Medicine, 2000 (Recertified 2005, 2019)
Diplomate, American Board of Sleep Medicine, 2002 (Recertified 2019)

C. Contributions to Science

1. Sleep apnea and cardiovascular disease: My research has focused on the clinical and public impact of SDB on cardiovascular outcomes including stroke, incident congestive heart failure and all-cause mortality. I have been the principal investigator of the Sleep Heart Health Study (SHHS) and followed the local cohort for well over 15 years. The SHHS is a multi-center cohort study that was sponsored by the National Heart, Lung, and Blood Institute to determine the cardiovascular and non-cardiovascular consequences of sleep apnea. The study was motivated by the increasing recognition of the increasing frequency of sleep apnea in the general population and the mounting evidence that SDB may increase risk of hypertension, cardiovascular disease, and impaired quality of life. Over the last decade, the SHHS data have yielded pivotal finding on the implications of sleep apnea. Some of the seminal publications are as follows:

   a. **Punjabi NM**, Caffo BS, Goodwin JL, Gottlieb DJ, Newman AB, O'Connor GT, Rapoport DM, Redline S, Resnick HE, Robbins JA, Shahar E, Unruh ML, Samet JM. Sleep-disordered breathing and mortality: a prospective cohort study. PLoS Med. 2009; 6(8): e1000132.
   b. Redline S, Yenokyan G, Gottlieb DJ, Shahar E, O'Connor GT, Resnick HE, Diener-West M, Sanders MH, Wolf PA, Geraghty EM, Ali T, Lebowitz M, **Punjabi NM**. Obstructive Sleep Apnea Hypopnea and Incident Stroke: The Sleep Heart Health Study. *Am J Respir Crit Care Med* 2010; 182(2): 269-77.
   c. Aurora RN, Kim JS, Crainiceanu C, O'Hearn D, **Punjabi NM**. Habitual Sleep Duration and All-Cause Mortality in a General Community Sample. Sleep. 2016; 39(110L 1903-1909.
   d. Aurora RN, Crainiceanu C, Gottlieb DJ, Kim JS, **Punjabi NM**. Obstructive Sleep Apnea During Rapid Eye Movement Sleep and Cardiovascular Disease. Am J Respir Crit Care Med. 2018;197(5):653-660.

2. Data Mining of Physiological Signals During Sleep: Given my background in engineering and interest in using signal processing methods for complex physiological datasets, I have engaged a variety of endeavors applying these skills to analyses of time series data collected during sleep. These signals include the electroencephalogram and the electrocardiogram. Through this work, we have contributed to advance our understanding of these electrophysiological signals for outcomes such as hypertension and even how methadone may increase the risk of sudden cardiac death. The following represent key publications related to this field of research.

   a. Solhjoo S, **Punjabi NM**, Ivanescu AE, Crainiceanu C, Gaynanova I, Wicken C, Buckenmaier C, Haigney MC. Methadone Destabilizes Cardiac Repolarization During Sleep. Clin Pharmacol Ther. 2021 Oct;110(4):1066-1074. doi: 10.1002/cpt.2368.
   b. Heravi AS, Etzkorn L, Urbanek J, Crainiceanu C, **Punjabi NM**, Ashikaga H, Brown TT, Budoff MJ, D'Souza G, Magnani JW, Palella FJ Jr, Berger RD, Wu KC, Post WS. HIV Infection is Associated with Variability in Ventricular Repolarization: The Multicenter AIDS Cohort Study (MACS). Circulation. 2020; 141(3): 176-187.
   c. Swihart BJ, **Punjabi NM**, Crainiceanu CM. Modeling sleep fragmentation in sleep hypnograms: An instance of fast, scalable discrete-state, discrete-time analyses. Comput Stat Data Anal. 2015 Sep; 89:1-11.
   d. Langrock R, Swihart BJ, Caffo BS, **Punjabi NM**, Crainiceanu CM. Combining hidden Markov models for comparing the dynamics of multiple sleep electroencephalograms. Stat Med. 2013 Aug 30;32(19):3342-56.

3. Sleep Apnea and Metabolic Dysfunction: Over the last 25 years, much of my research effort has focused on examining the potential effects of SDB on metabolic dysfunction. There is growing recognition that disorders of sleep may increase the propensity for insulin resistance, glucose intolerance, and overt diabetes. Evidence from several observational and experimental studies suggests that disturbances of sleep imposed by conditions such as sleep apnea may confer additional risk for metabolic dysfunction. In fact, the past few years have witnessed an enormous growth in the scale of scientific activity devoted to assessing the possible link between sleep apnea and disorders of glucose metabolism. My laboratory has contributed epidemiological, clinical, and experimental evidence implicating sleep apnea in the pathogenesis of insulin resistance, impaired insulin resection, and glucose intolerance. The following represent key publications related to this field of research.

a. **Punjabi NM**, Sorkin JD, Katzel KI, Goldberg AP, Schwartz AR, Smith PL. Sleep-disordered breathing and insulin resistance in middle-aged and overweight men. *Am J Resp Crit Care Med* 2002; 165: 677-682. PMID: 11874813
b. Louis M, **Punjabi NM**. Effects of Acute Intermittent Hypoxia on Glucose Metabolism in Awake Health Volunteers. *J Appl Physiol* 2009;106(5):1538-44. PMID: 19265062
c. Stamatakis KA, **Punjabi NM**. Effects of sleep fragmentation on glucose metabolism in normal subjects. *Chest* 2010; 137(1): 95-101. PMID 20226732.
d. Polak J, Shimoda LA, Drager LF, Undem C, McHugh H, Polotsky VY, **Punjabi NM**. Intermittent hypoxia impairs glucose homeostasis in C57BL6/J mice: partial improvement with cessation of the exposure. Sleep. 2013; 36(10):1483-90. PMCID: PMC3773197

Complete List of Published Work in MyBibliography:

https://www.ncbi.nlm.nih.gov/myncbi/naresh.punjabi.1/bibliography/public/