BIOGRAPHICAL SKETCH

NAME: Chugh, Sumeet S., MD, FAHA, FHRS, FACC

eRA COMMONS USER NAME (credential, e.g., agency login): chughs

POSITION TITLE: Professor of Medicine-in-Residence, David Geffen School of Medicine at UCLA; Pauline and Harold Price Endowed Chair in Cardiac Electrophysiology Research, Cedars-Sinai, Los Angeles

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
D.A.V. College, Chandigarh, India	BS	1983	Pre-Medical Studies
Government Medical College, Patiala, Punjab, India	MD	1988	Medicine

A. Personal Statement

As a clinician-scientist, I have been involved in population-based investigation of sudden cardiac death (SCD) for over 15 years. In 2002, I initiated, and continue to direct the Oregon Sudden Unexpected Death Study (Oregon SUDS), a prospective evaluation of all residents (~1 million) of the Portland, Oregon metro area. With 300,000-350,000 SCDs in US/year making up 50% of all cardiovascular mortality, the lack of community-based studies represented a significant knowledge gap. The Oregon SUDS effort was designed to close this knowledge gap. Due to a seamless collaboration between Oregon SUDS researchers, emergency medical responders (Jonathan Jui MD, Director Emergency Medical Services, Co-investigator), the medical examiner network (Karen Gunson MD, State Medical Examiner, collaborator) and 16 hospitals of the Portland Oregon metro area, this study has been conducted successfully for >13 years, and is ongoing. In 2015 we expanded this effort to include a new population cohort of 850,000 in Ventura County, California (Prediction of Sudden Death in Multi-ethnic Communities, PRESTO Network) that will allow for race and ethnicity-specific evaluation of sudden death risk predictors. As a consequence we have gained significant experience in community-based SCD investigative methodology and the actively growing clinical database contains detailed phenotyping information on >2500 SCD cases plus matched controls with a DNA/blood/tissue sample archive. The implantable cardioverter- defibrillator has been a major contribution to SCD prevention methodology but there is increasing recognition of the fact that current clinically utilized methods of predicting SCD risk (largely measurement of the left ventricular ejection fraction, LVEF<35%) are inadequate. In fact, the vast majority of patients who suffer SCD have preserved LVEF. The overall goal of our effort is to identify novel risk markers that will enhance the clinical approaches to prediction and prevention of this condition. Over the past decade we have reported on several such novel determinants of SCD risk that include phenotypic markers, genetic variants as well as other biomarkers. I have authored >120 peer-reviewed publications in the fields of cardiac electrophysiology and sudden cardiac death.

B. Positions and Honors

Positions and Employment

1989-1991 Research Assistant, Hematology, Tufts New England Medical Center, Boston, MA
1991-92 Resident, Internal Medicine, Tufts Newton-Wellesley Hospital, Newton, MA
1992-94 Resident, Internal Medicine, Hennepin County Medical Center, Mpls, MN
1994-1997 Fellow, Cardiovascular Medicine, University of Minnesota, Mpls, MN
1997-1999 Fellow, Clinical Cardiac Electrophysiology, Mayo Clinic, Rochester, MN
1999-2003 Assistant Professor of Medicine, Oregon Health & Science University, Portland, OR
2002-2008 Director, Fellowship Training Program, Clinical Cardiac Electrophysiology, Oregon Health & Science University, Portland, OR
2003-2008 Associate Professor of Medicine, Oregon Health & Science University, Portland, OR
2006-2008 Section Chief, Clinical Cardiac Electrophysiology, Health & Science University, Portland, OR

2006-2008 Director, Cardiac Arrhythmia Center, Oregon Health & Science University, Portland, OR
2008-2011 Professor of Medicine-in-Residence, David Geffen School of Medicine at UCLA, Los Angeles, CA
2008- Professor of Medicine, Cedars-Sinai Professorial series
2008- Associate Director of the Heart Institute, Cedars-Sinai Medical Center, Los Angeles, CA
2008- Section Chief, Clinical Electrophysiology, Cedars-Sinai Medical Center, Los Angeles, CA
2008- Pauline and Harold Price Chair in Cardiac Electrophysiology Research
2009- Professor of Emergency Medicine (Affiliate), Oregon Health & Science University, Portland, OR
2010- Director, Heart Rhythm Center of Excellence, Cedars-Sinai Medical Center
2010- Professor of Human Genetics, Cedars-Sinai Professorial Series
2011- Professor of Medicine-in-Residence Step III, David Geffen School of Medicine at UCLA
2014- Professor of Medicine-in-Residence Step IV, David Geffen School of Medicine at UCLA

Other Professional Membership

1993 Diplomate, American Board of Internal Medicine
1999 Diplomate, American Board of Internal Medicine (Cardiovascular Disease)
2000 Diplomate, American Board of Internal Medicine (Clinical Cardiac Electrophysiology)
2000 Fellow, American College of Cardiology
2005-2007 Member, Steering Committee, Functional Genomics IWG, American Heart Association
2009 Fellow, Heart Rhythm Society
2009 Fellow, American Heart Association

Honors

2000 New Investigator Award, American Heart Association
2001 Doris Duke Innovation in Clinical Research Award
2003 Accelerated promotion to Associate Professor (2003) and Professor (2008)
2004 Donald W. Reynolds Visiting Professor, the Johns Hopkins University Division of Cardiology
2005 Heart Researcher of the Year Award, Oregon Health & Science University
2007-2008 Excellence in Teaching Award, School of Medicine, Oregon Health and Science University, Portland OR
2008- Chair, World Health Organization Panel on Global Disease Burden Assessment of Arrhythmias and Conduction System Disorders
2011 Elected Member, Association of University Cardiologists
2012 Elected Fellow, International Academy of Cardiovascular Sciences
2013 Howard Morgan Award for Distinguished Achievements in Cardiovascular Research (The International Academy of Cardiovascular Sciences)
2014 Simon Dack Award for Outstanding Scholarship (The Journal of the American College of Cardiology)
2015 Elected Member, American Society for Clinical Investigation

Peer Review Experience

2006 Reviewer (Ad hoc), Special Emphasis Panel (ZRG1 CVS D-90), Center for Scientific Review, National Institutes of Health
2007- Reviewer (Ad hoc), Electrical Signaling, Ion Transport, and Arrhythmias Study Section (ESTA), Center For Scientific Review, National Institutes of Health
2007- Reviewer (Ad hoc), Bioengineering, Technology and Surgical Sciences Study Section (BTSS), Center For Scientific Review, National Institutes of Health
2007- Reviewer (Ad hoc), Special Emphasis Panel, Vascular Cell and Molecular Biology Study Section (VCMB), Center For Scientific Review, National Institutes of Health
2008-2012 Charter member, Electrical Signaling, Ion Transport, and Arrhythmias Study Section (ESTA), Center For Scientific Review, National Institutes of Health
2008-2009 Member, American Heart Association Peer Review committee for Electrophysiology Research (National)
2010- Member, American Heart Association Peer Review committee for Genomics and Observational Epidemiology (National)
2013- Phase 1 reviewer, 2013 NIH Director's New Innovator Award Program (ZRG1 MOSS-C)
2014- Member, Scientific Advisory Committee, National Registry for Sudden Death in the Young

C. Contribution to Science

My career has been dedicated to understanding sudden cardiac death (SCD): how often it occurs, the underlying causes, and the identification of novel risk factors with the overall goal of improving prevention. Toward this goal I have employed population science as a means of identifying and following up on pathways to SCD risk that would be meaningful from a clinical and public health standpoint. I offer a description of my contributions, with selected corresponding publications.

1) As a resident in internal medicine (1992-94) I was fortunate to be mentored in autopsy-based evaluations of sudden unexpected death and continued this work as a fellow in cardiovascular medicine (1994-97) and clinical electrophysiology (1997-99). In 2000 I published a paper on sudden death with apparently normal heart that drew attention to the subgroup of patients with autopsy-negative unexplained sudden death. This initial work led to two original investigations in these patients both in 2004. One described a novel condition in young adults – idiopathic myocardial fibrosis – that led to SCD in the absence of any other etiologies. The second represents what may be the first report of successful molecular autopsies from postmortem tissue in SCD cases, leading to a diagnosis of familial arrhythmia syndromes.

- *Chugh SS, Kelly KL, Titus JL. Sudden Cardiac Death with Apparently Normal Heart. Circulation 2000;102(6):649-54.* ***(188 citations)***
- *John B, Titus JL, Edwards WD, Shen W-K, Chugh SS. Global Remodeling of Ventricular Interstitium in Idiopathic Myocardial Fibrosis and Sudden Cardiac Death. Heart Rhythm 2004; 1(2):141-9.* ***(27 citations)***
- *Chugh SS, Senashova O, Watts A, Tran PT, Zhou Z, Gong Q, Titus JL and Hayflick SJ. Postmortem Molecular Screening in Unexplained Sudden Death. J Am Coll Cardiol 2004; 43(9):1625-9.* ***(149 citations)***

2) In 2002 I initiated and continue to direct, a real-time prospective, population-based evaluation of sudden cardiac arrest (deceased and surviving patients) in an entire community of approximately 1 million residents of the Portland, Oregon metro area, the Oregon Sudden Unexpected Death Study (Oregon SUDS). This was accomplished by bringing together the emergency medical services, 16 hospitals, the fire and police departments as well as the medical examiner's office. In 2004 we reported that population-based analysis of SCD is conducted far more effectively using prospective methodology rather than using retrospective death certificate based data. This approach has set the standard for population-based approaches to SCD and has since informed the initiation of similar population based efforts around the world. In 2009 we performed a population based analysis of SCA in children.

- *Chugh SS, Jui J, Gunson K, Stecker EC, John BT, Thompson B, Ilias N, Vickers C, Dogra V, Daya M, Kron J, Zheng Z-J, Mensah G, McAnulty J. Current Burden of Sudden Cardiac Death: Multiple Source Surveillance Versus Retrospective Death Certificate-Based Review in a Large US Community. J Am Coll Cardiol 2004;44(6):1268-75.* ***(437 citations)***
- *Chugh SS, Reinier K, Balaji S, Uy-Evanado A, Vickers C, Mariani R, Gunson K, Jui J. Population-Based Analysis of Sudden Death in Children: The Oregon Sudden Unexpected Death Study. Heart Rhythm 2009;6(11):1618-22.* ***(54 citations)***

3) We also started the practice of obtaining the lifetime clinical history (including all tests/treatments performed) of each SCD case that was ascertained and populated a clinical database with >800 variables. Matched controls from the same geographic area are also recruited on an ongoing basis so that case-control analyses can be performed to identify risk predictors for SCA. In 2006 we published observations from this study that highlighted the relatively large proportion (at least two-thirds, possibly higher in women) of patients that suffer SCA with preserved left ventricular ejection fraction, highlighting the importance of extending beyond the LV ejection fraction in order to meaningfully enhance risk stratification for SCD.

- *Stecker EC, Vickers C, Waltz J, Socoteanu C, John BT, Mariani R, McAnulty JH, Gunson K, Jui J, Chugh SS. Population-based analysis of sudden cardiac death with and without left ventricular systolic dysfunction: two-year findings from the Oregon Sudden Unexpected Death Study. J Am Coll Cardiol 2006;47(6):1161-6.* ***(199 citations)***
- *Chugh SS, Evanado A, Teodorescu C, Reinier K, Mariani R, Gunson K and Jui J. Women have a lower prevalence of structural heart disease as a precursor to sudden cardiac arrest: The Ore-SUDS (Oregon Sudden Unexpected Death Study). J Am Coll Cardiol 2009;54(22):2006-11.* ***(54 citations)***

4) Leveraging this clinical database which we also linked to a biobank (with DNA, blood and myocardial tissue available for analysis), we have made several inroads into identifying clinical, genetic and blood-based markers of SCA risk, that extend beyond the LV ejection fraction.

- *Chugh SS, Socoteanu C, Reinier K, Waltz J, Jui J, Gunson K. A Community-Based Evaluation of Sudden Death Associated with Therapeutic Levels of Methadone. Am J Med 2008;121(1):66-71* ***(117 citations)***
- *Chugh SS, Reinier K, Singh T, Evanado A, Socoteanu C, Peters Dawn, Mariani R, Gunson K, Jui J. Determinants of Prolonged QT Interval and Their Contribution to Sudden Death Risk in Coronary Artery Disease. Circulation 2009;119(5):663-70* ***(138 citations)***
- *Panikkath R, Reinier K, Uy-Evanado A, Teodorescu C, Hattenhauer J, Mariani R, Gunson K, Jui J, Chugh SS. Prolonged Tpeak to Tend interval on the resting electrocardiogram is associated with increased risk of sudden cardiac death. Circulation Arrhythmia and Electrophysiology 2011 Aug;4(4):441-7.* ***(85 citations)***
- *Marijon E, Uy-Evanado A, Reinier K, Teodorescu C, Narayanan K, Jouven X, Gunson K, Jui J, Chugh SS. Sudden Cardiac Arrest during Sports Activity in Middle Age. Circulation. 2015 Apr 21;131(16):1384-91.*

Complete List of Published Work in MyBibliography:
http://www.ncbi.nlm.nih.gov/myncbi/browse/collection/48121312/?sort=date&direction=ascending

D. Research Support

Ongoing Research Support

R01HL122492 (PI - Chugh) 11/14/14 – 11/13/18
NIH NHLBI
Total Costs: $ 2,357,464
Sudden Cardiac Death in Middle Age (This study is a population-based translational approach to identify novel mechanisms of ventricular arrhythmogenesis in middle-aged residents of a large community)

Sumeet S. Chugh as Primary Mentor

(PI Adriana Huertas-Vazquez PhD)
Scientist Development Grant (1/1/13 - 12/30/16)
American Heart Association
Evaluation of Three Genetic Loci Associated with Sudden Cardiac Death (The Oregon Sudden Unexpected Death Study)

(PI Eric C. Stecker MD)
National Institutes of Health K-12 Scholar award (7/1/2013 – 6/30/2017)
Influence of pre-existing cardiovascular disease on response to cardiac arrest resuscitation (The Oregon Sudden Unexpected Death Study)

Pending

R01HL126938 (PI - Chugh) (**Scored 8 percentile**, Council review pending)
NIH NHLBI
Total Costs: $ 3,644,537
Sudden Cardiac Death with Preserved Left Ventricular Ejection Fraction (This study will evaluate mechanisms of sudden cardiac arrest in patients with preserved left ventricular systolic function).

1U01HL131909-01 (PI - Chugh) (IRG review pending)
NIH NHLBI
Total Costs: $ 3,722,922

Prediction and Prevention of Sudden Death in the Young (Using a combination of the National Registry for Sudden Death in the Young as well as the PRESTO Network, this project will investigate specific novel mechanisms of sudden cardiac death in the 0-19 year age group).

Completed Research Support (Selected)

R01 HL105170 (Chugh) 7/1/10 - 3/30/14
NIH NHLBI
Prolonged Ventricular Depolarization and Sudden Death in the Community
This study is a population-based translational approach to evaluate the role of prolonged QRS duration as a predictor of sudden cardiac death in the general population.

R01 HL088416 (Chugh) 7/13/07 - 4/31/12
NIH NHLBI
Determinants of Sudden Death Risk with Left Ventricular Hypertrophy
This study is a population-based translational approach to identifying mechanisms of fatal arrhythmia among subjects with left ventricular hypertrophy.

Cardiovascular Clinical Research Center, Johns Hopkins University (Marban) 7/1/03 – 6/31/09
Donald W. Reynolds Foundation
Genomic Determinants of Sudden Cardiac Death: The goals of this study were to discover the genetic underpinnings of sudden cardiac death in patients with coronary artery disease
Role: Co-investigator

Emergency Prehospital Investigative Consortium (EPIC). National Heart Lung and Blood Institute HL-04-001 (7/1/2004 – 6/30/2009). Role: Co-Investigator (5%). PI Jerris Hedges MD

US Centers for Disease Control and Prevention, Project TS 0660. Principal Investigator (20%) Total costs $838,442; 2001-2004 for **Mechanisms of Unexplained Sudden Cardiac Death: A Population-Based Cohort Study in Multnomah County, Oregon**