

Expert No.: 28179

Mahesh S. Mulumudi, MD, FACC, FSCAI

Medical Imaging Technologies Expert

Dr. Mahesh S. Mulumudi is an interventional cardiologist in Everett, Washington with expertise in treating peripheral vascular diseases and coronary artery diseases. He is affiliated with multiple hospitals in the area, including UW Medicine-Harborview Medical Center and Providence Regional Medical Center Everett. He received his medical degree from Kurnool Medical College and has been in practice for more than 20 years.

As it relates directly to this matter...

Imaging Experience:

- Utilize and assess medical images acquired through 3D Ultrasound, gated Computerized Tomography (CT), and Magnetic Resonance Imaging (MRI) for the assessment and treatment of cardiac and vascular structures.
- Proficient in image processing and manipulation techniques to determine the appropriate sizing of valves and other devices, ensuring precise anatomical placement.
- Extensive expertise in utilizing ultrasound guidance for safe vascular access, facilitating entry into arteries and veins, and navigating medical equipment securely to the desired implantation site or area of interest.

Virtual Reality/Augmented Reality With Biofeedback

- Invented an innovative virtual reality (VR) application that leverages biofeedback to offer mindfulness exercises aimed at reducing stress and enhancing focus.
- Created a VR-enhanced telemedicine solution designed to enhance remote healthcare delivery by providing an immersive and realistic experience. This groundbreaking

technology enables meaningful and engaging interactions between patients and healthcare providers, making remote healthcare delivery more enriching than ever before.

Expert Witness

- 2001 - Acted as the primary medical expert witness in a case investigating the role of neck flexion as a cause of pituitary trauma leading to diabetes insipidus.
- 2007 - Provided expert testimony to evaluate the efficacy of embolic protection devices in preventing strokes during carotid stent interventions.
- 2020 - Conducted a comprehensive review as a medical expert witness to establish the standard of care regarding the interpretation of angiographic images during the transcatheter catheter aortic valve implantation for the treatment of aortic stenosis.

Dr. Mulumudi requires a retainer and is available for engagement through Cahn Litigation Services at the hourly rate of \$700 for all work.

Curriculum Vitae

Maresh S. Mulumudi, MD, FACC, FSCAI

Imaging Experience

Utilize and assess medical images acquired through 3D Ultrasound, gated Computerized Tomography (CT), and Magnetic Resonance Imaging (MRI) for the assessment and treatment of cardiac and vascular structures.

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2007 - Provided expert testimony to evaluate the efficacy of embolic protection devices in preventing strokes during carotid stent interventions.

2020 - Conducted a comprehensive review as a medical expert witness to establish the standard of care regarding the interpretation of angiographic images during the transcatheter catheter aortic valve implantation for the treatment of aortic stenosis.

Leadership Experience

2013 – Present

President and Chief Executive Office, StratoScientific Inc.

2012-2021

Division Chief of Medicine, Providence Regional Medical Center, Everett, WA

2012-Present

Section Head of Cardiology, Providence Regional Medical Center, Everett, WA

2006 – 2012

Facilities Medical Director, Departments of Heart & Vascular, Neurology, and Nephrology at The Everett Clinic, Everett, WA

2007 – Present

Director, Vascular Laboratory, Heart & Vascular Department, The Everett Clinic, Everett, WA

December 2010 – Present

Medical Director of Interventional Cardiology and Chest Pain Programs, Providence Regional Medical Center, Everett, WA

Education

July 2003-2005

Fellowship in Cardiac and Peripheral vascular intervention at The Ochsner Clinic Foundation, New Orleans, LA.

July 2000 _ June 2003

Cardiology fellowship at the Ochsner Clinic Foundation, New Orleans, LA.

July 1994 – June 1997

Residency in Internal Medicine at Detroit Medical Center, Wayne State University, Detroit, Michigan.

Jan 1992 – May 1994

PhD student in the Department of Pharmacology and Toxicology. University of Texas at Austin, Texas.

Sep 1990 – Sep 1991

Internship, Government General Hospital, Kurnool Medical College, Kurnool, AP, India.

Aug 1985 – July 1990

M.B.B.S (Bachelor of Medicine and Bachelor of Surgery). Kurnool Medical College, S.V.University, AP, India.

Aug 1983- Mar 1985

Intermediate (Pre-Med equivalent), V.R.College, Nellore, AP, India.

Board Certification

Cardiovascular Disease, December 2013, (American Board of Internal Medicine).

Interventional Cardiology November 2005 (American Board of Internal Medicine)

Research

Clinical

2000 - 2005

Role of abciximab, a glycoprotein IIb IIIa receptor blocker, in improving myocardial blush after primary coronary intervention for acute ST segment elevation myocardial infarction

Concept of Kidney Frame Counts (KFC) in the renal angiography and its usefulness in predicting outcomes after renal artery stenting.

Relationship of Tissue Myocardial perfusion to the intravascular ultrasound of the epicardial coronary arteries in orthotopic heart transplant patients.

1998

Principal investigator for the Phase IIIb clinical trial of Rofecoxib© (a cyclooxygenase inhibitor) versus naproxen sodium in the treatment of osteoarthritis.

May 1992 – Dec 1993

Effects of multiple oral doses of ICI D2138 on allergen induced bronchoconstriction. Phase I and Phase II Clinical studies at Health Quest Research, Austin, Texas.

Principal Investigator 2005-Present

- Champion-Platform Trial: A Clinical Trial Comparing Cangrelor to Clopidogrel Standard Therapy in Subjects Who Require Percutaneous Coronary Intervention (PCI) (CHAMPION PHOENIX) (CHAMPION)

- Prospective, Single Blind, Rand Controlled Study to Evaluate the Safety & Effectness of Tryton Side Branch Stent Used With DES Treatmt of de Novo Bifurcation Lesions in MB & SB in Native Coronaries (TRYTON)
- SAPHIRE Worldwide: Stenting and Angioplasty With Protection in Patients At High-Risk for Endarterectomy
- Translate ACS Study
- ABSORB III Trial: A Clinical Evaluation of Absorb™ BVS, the Everolimus Eluting Bioresorbable Vascular Scaffold in the Treatment of Subjects With de Novo Native Coronary Artery Lesions.
- ACURATE IDE: Safety and Effectiveness Study of ACURATE Valve for Transcatheter. To evaluate safety and effectiveness of the ACURATE Transfemoral Aortic Valve System for transcatheter aortic valve replacement (TAVR) in subjects with severe native aortic stenosis who are indicated for TAVR.
- SPYRAL AFFIRM Global Study of RDN With the Symlicity Spyral RDN System in Subjects With Uncontrolled HTN

Basic Science

Feb 1992 – May 1994

Cyclophosphamide induced bladder damage: role of mercapturic acids and other metabolites in hemorrhagic cystitis. High Performance Liquid Chromatography (HPLC) separation of Mercapturates. Also cell culture for toxicity studies. University of Texas at Austin, Texas.

July – Sep 1995

The Prothymosin and Thymosin α -1 levels and their significance in Hepatitis B transfected human hepatoblastoma, nude mouse and SV40 cell lines. HPLC separation of Prothymosin and Thymosin α -1 and quantification by solid phase and competitive ELISA. Wayne State University, Detroit, Michigan.

Publications

Patents

Endoprosthesis Stent Delivery System and Method of Using the Same. US 8439962 B2 May 14 2013, and US 20130204346 A1, filed March 15 2013; Mahesh S. Mulumudi and Ali Aboufares.

- Devices and methods for measuring anatomic regions

Patent number: 11311206

Abstract: A guidewire insertion tool configured to measure a length of an anatomic region. The tool can include a housing, a light chamber, and a track at least partially extending through the light chamber. The track is adapted to guide a guidewire as it is advanced through the insertion tool. The tool can also include an optical sensor assembly in optical communication with the light chamber. The optical sensor assembly can include one or more light sources, an optical sensor, and a magnifier. The one or more light sources can be adapted to direct light toward a portion of the guidewire within the track, and the optical sensor can be adapted to receive reflected light from the portion of the guidewire within the track. A processing unit can analyze data from the optical sensor assembly to determine the length of the anatomic region and output the measurement to a display.

Type: Grant

Filed: March 18, 2019

Date of Patent: April 26, 2022

Inventors: Suman K. Mulumudi, Mahesh S. Mulumudi

- Acoustic collection system for handheld electronic devices

Patent number: 10898161

Abstract: A mounting system is provided to allow the attachment of an acoustic collector to a handheld electronic device such that sound is conducted directly to the device's microphone. A fitted case or band encloses part of the device and includes a tube running from the collector to the device's microphone. In certain embodiments, the tube may be embedded in the case, and a detachable mount may be provided to connect the collector to the case. The collector may be a stethoscope chestpiece, or an open air collector, such as a parabolic collector.

Type: Grant

Filed: April 22, 2019

Date of Patent: January 26, 2021

Assignee: StratoScientific, Inc.

Inventors: Suman K. Mulumudi, Mahesh S. Mulumudi

- DEVICES AND METHODS FOR MEASURING ANATOMIC REGIONS

Publication number: 20200015704

Abstract: A guidewire insertion tool configured to measure a length of an anatomic region. The tool can include a housing, a light chamber, and a track at least partially extending through the light chamber. The track is adapted to guide a guidewire as it is advanced through the insertion

tool. The tool can also include an optical sensor assembly in optical communication with the light chamber. The optical sensor assembly can include one or more light sources, an optical sensor, and a magnifier. The one or more light sources can be adapted to direct light toward a portion of the guidewire within the track, and the optical sensor can be adapted to receive reflected light from the portion of the guidewire within the tract. A processing unit can analyze data from the optical sensor assembly to determine the length of the anatomic region and output the measurement to a display.

Type: Application

Filed: March 18, 2019

Publication date: January 16, 2020

Inventors: Suman K. Mulumudi, Mahesh S. Mulumudi

- ACOUSTIC COLLECTION SYSTEM FOR HANDHELD ELECTRONIC DEVICES

Publication number: 20190247009

Abstract: A mounting system is provided to allow the attachment of an acoustic collector to a handheld electronic device such that sound is conducted directly to the device's microphone. A fitted case or band encloses part of the device and includes a tube running from the collector to the device's microphone. In certain embodiments, the tube may be embedded in the case, and a detachable mount may be provided to connect the collector to the case. The collector may be a stethoscope chestpiece, or an open air collector, such as a parabolic collector.

Type: Application

Filed: April 22, 2019

Publication date: August 15, 2019

Inventors: Suman K. Mulumudi, Mahesh S. Mulumudi

- Devices and methods for measuring anatomic regions

Patent number: 10271763

Abstract: A guidewire insertion tool configured to measure a length of an anatomic region. The tool can include a housing, a light chamber, and a track at least partially extending through the light chamber. The track is adapted to guide a guidewire as it is advanced through the insertion tool. The tool can also include an optical sensor assembly in optical communication with the light chamber. The optical sensor assembly can include one or more light sources, an optical sensor, and a magnifier. The one or more light sources can be adapted to direct light toward a portion of the guidewire within the track, and the optical sensor can be adapted to receive reflected light from the portion of the guidewire within the tract. A processing unit can analyze data from the optical sensor assembly to determine the length of the anatomic region and output the measurement to a display.

Type: Grant

Filed: October 23, 2014

Date of Patent: April 30, 2019

Inventors: Suman K. Mulumudi, Mahesh S. Mulumudi

- Acoustic collection system for handheld electronic devices

Patent number: 10271816

Abstract: A mounting system is provided to allow the attachment of an acoustic collector to a handheld electronic device such that sound is conducted directly to the device's microphone. A

fitted case or band encloses part of the device and includes a tube running from the collector to the device's microphone. In certain embodiments, the tube may be embedded in the case, and a detachable mount may be provided to connect the collector to the case. The collector may be a stethoscope chestpiece, or an open air collector, such as a parabolic collector.

Type: Grant

Filed: December 28, 2017

Date of Patent: April 30, 2019

Assignee: STRATOSCIENTIFIC, INC.

Inventors: Suman K. Mulumudi, Mahesh S. Mulumudi

• ACOUSTIC COLLECTION SYSTEM FOR HANDHELD ELECTRONIC DEVICES

Publication number: 20180116627

Abstract: A mounting system is provided to allow the attachment of an acoustic collector to a handheld electronic device such that sound is conducted directly to the device's microphone. A fitted case or band encloses part of the device and includes a tube running from the collector to the device's microphone. In certain embodiments, the tube may be embedded in the case, and a detachable mount may be provided to connect the collector to the case. The collector may be a stethoscope chestpiece, or an open air collector, such as a parabolic collector.

Type: Application

Filed: December 28, 2017

Publication date: May 3, 2018

Inventors: Suman K. Mulumudi, Mahesh S. Mulumudi

• Acoustic collection system for handheld electronic devices

Patent number: 9855019

Abstract: A mounting system is provided to allow the attachment of an acoustic collector to a handheld electronic device such that sound is conducted directly to the device's microphone. A fitted case or band encloses part of the device and includes a tube running from the collector to the device's microphone. In certain embodiments, the tube may be embedded in the case, and a detachable mount may be provided to connect the collector to the case. The collector may be a stethoscope chestpiece, or an open air collector, such as a parabolic collector.

Type: Grant

Filed: June 19, 2017

Date of Patent: January 2, 2018

Assignee: StratoScientific, Inc.

Inventors: Suman K. Mulumudi, Mahesh S. Mulumudi

• ACOUSTIC COLLECTION SYSTEM FOR HANDHELD ELECTRONIC DEVICES

Publication number: 20170281120

Abstract: A mounting system is provided to allow the attachment of an acoustic collector to a handheld electronic device such that sound is conducted directly to the device's microphone. A fitted case or band encloses part of the device and includes a tube running from the collector to the device's microphone. In certain embodiments, the tube may be embedded in the case, and a detachable mount may be provided to connect the collector to the case. The collector may be a stethoscope chestpiece, or an open air collector, such as a parabolic collector.

Type: Application

Filed: June 19, 2017

Publication date: October 5, 2017

Inventors: Suman K. Mulumudi, Mahesh S. Mulumudi

• Acoustic collection system for handheld electronic devices

Patent number: 9706975

Abstract: A mounting system is provided to allow the attachment of an acoustic collector to a handheld electronic device such that sound is conducted directly to the device's microphone. A fitted case or band encloses part of the device and includes a tube running from the collector to the device's microphone. In certain embodiments, the tube may be embedded in the case, and a detachable mount may be provided to connect the collector to the case. The collector may be a stethoscope chestpiece, or an open air collector, such as a parabolic collector.

Type: Grant

Filed: July 6, 2016

Date of Patent: July 18, 2017

Assignee: StratoScientific, Inc.

Inventors: Suman K. Mulumudi, Mahesh S. Mulumudi

• Acoustic collection system for handheld electronic devices

Patent number: 9602917

Abstract: An acoustic collection system for handheld electronic devices is disclosed having a fitted casing with a chestpiece, and a passageway for conducting sound from the chestpiece to a microphone. In one embodiment, the configuration of the passageway can be actively varied by the user to selectively transmit frequencies of interest to the device. In another embodiment, materials with different sound propagation properties may be used to augment or dampen sound within the passage. In another embodiment, a microphone may be placed within the passageway and its position therein varied by the user.

Type: Grant

Filed: February 9, 2015

Date of Patent: March 21, 2017

Assignee: StratoScientific, Inc.

Inventors: Suman K. Mulumudi, Mahesh S. Mulumudi

• ACOUSTIC COLLECTION SYSTEM FOR HANDHELD ELECTRONIC DEVICES

Publication number: 20160310100

Abstract: A mounting system is provided to allow the attachment of an acoustic collector to a handheld electronic device such that sound is conducted directly to the device's microphone. A fitted case or band encloses part of the device and includes a tube running from the collector to the device's microphone. In certain embodiments, the tube may be embedded in the case, and a detachable mount may be provided to connect the collector to the case. The collector may be a stethoscope chestpiece, or an open air collector, such as a parabolic collector.

Type: Application

Filed: July 6, 2016

Publication date: October 27, 2016

Applicant: StratoScientific, Inc.

Inventors: Suman K. Mulumudi, Mahesh S. Mulumudi

- Acoustic collection system for handheld electronic devices

Patent number: 9414155

Abstract: A mounting system is provided to allow the attachment of an acoustic collector to a handheld electronic device such that sound is conducted directly to the device's microphone. A fitted case or band encloses part of the device and includes a tube running from the collector to the device's microphone. In certain embodiments, the tube may be embedded in the case, and a detachable mount may be provided to connect the collector to the case. The collector may be a stethoscope chestpiece, or an open air collector, such as a parabolic collector.

Type: Grant

Filed: October 15, 2013

Date of Patent: August 9, 2016

Assignee: StratoScientific, Inc.

Inventors: Suman K. Mulumudi, Mahesh S Mulumudi

- ACOUSTIC COLLECTION SYSTEM FOR HANDHELD ELECTRONIC DEVICES

Publication number: 20150156583

Abstract: An acoustic collection system for handheld electronic devices is disclosed having a fitted casing with a chestpiece, and a passageway for conducting sound from the chestpiece to a microphone. In one embodiment, the configuration of the passageway can be actively varied by the user to selectively transmit frequencies of interest to the device. In another embodiment, materials with different sound propagation properties may be used to augment or dampen sound within the passage. In another embodiment, a microphone may be placed within the passageway and its position therein varied by the user.

Type: Application

Filed: February 9, 2015

Publication date: June 4, 2015

Applicant: STRATOSCIENTIFIC, INC.

Inventors: Suman K. Mulumudi, Mahesh S. Mulumudi

- DEVICES AND METHODS FOR MEASURING ANATOMIC REGIONS

Publication number: 20150119702

Abstract: A guidewire insertion tool configured to measure a length of an anatomic region. The tool can include a housing, a light chamber, and a track at least partially extending through the light chamber. The track is adapted to guide a guidewire as it is advanced through the insertion tool. The tool can also include an optical sensor assembly in optical communication with the light chamber. The optical sensor assembly can include one or more light sources, an optical sensor, and a magnifier. The one or more light sources can be adapted to direct light toward a portion of the guidewire within the track, and the optical sensor can be adapted to receive reflected light from the portion of the guidewire within the tract. A processing unit can analyze data from the optical sensor assembly to determine the length of the anatomic region and output the measurement to a display.

Type: Application

Filed: October 23, 2014

Publication date: April 30, 2015

Inventors: Suman K. Mulumudi, Mahesh S. Mulumudi

• ACOUSTIC COLLECTION SYSTEM FOR HANDHELD ELECTRONIC DEVICES

Publication number: 20150104027

Abstract: A mounting system is provided to allow the attachment of an acoustic collector to a handheld electronic device such that sound is conducted directly to the device's microphone. A fitted case or band encloses part of the device and includes a tube running from the collector to the device's microphone. In certain embodiments, the tube may be embedded in the case, and a detachable mount may be provided to connect the collector to the case. The collector may be a stethoscope chestpiece, or an open air collector, such as a parabolic collector.

Type: Application

Filed: October 15, 2013

Publication date: April 16, 2015

Inventors: Suman K. Mulumudi, Mahesh S. Mulumudi

• Electronic device case with stethoscope

Patent number: D746802

Type: Grant

Filed: October 15, 2013

Date of Patent: January 5, 2016

Assignee: StratoScientific, Inc.

Inventors: Suman K Mulumudi, Mahesh S Mulumudi

• Electronic device casing

Patent number: D758350

Type: Grant

Filed: November 12, 2014

Date of Patent: June 7, 2016

Assignee: StratoScientific, Inc.

Inventors: Suman K. Mulumudi, Mahesh S. Mulumudi

• Electronic device case with stethoscope

Patent number: D772215

Type: Grant

Filed: October 29, 2015

Date of Patent: November 22, 2016

Assignee: StratoScientific, Inc.

Inventors: Suman K. Mulumudi, Mahesh S. Mulumudi

• Electronic device case with stethoscope

Patent number: D858758

Type: Grant

Filed: August 22, 2016

Date of Patent: September 3, 2019

Assignee: StratoScientific, Inc.

Inventors: Suman K. Mulumudi, Mahesh S. Mulumudi

Scientific

Papers and Abstracts

1. Appropriate Use Criteria (AUC) Programs in a Large Health System Reduce Inappropriate Rates of Percutaneous Coronary Intervention (PCI) in Patients with Stable Ischemic Heart Disease (SIHD). Stephanie C. Fine¹, MA; Michael A. Wilson², MD; Tyler J. Gluckman², MD; Kathryn J. Zerr¹, RN, MBA; Linda L. Crawford¹, AAS; Mahesh S. Mulumudi³, MD; Ara G. Tilkian⁴, MD; Lian Wang¹, MS; Gary L. Grunkemeier¹, PhD 1. Regional Heart and Vascular Data Services/Medical Data Research Center, Portland, OR; 2. Providence St. Vincent Medical Center, Portland, OR. First Prize NCDR 2013,3. Providence Regional Medical Center Everett, WA; 4. Providence Holy Cross Medical Center, Mission Hills, CA
2. Milani RV, Lavie CJ, Gilliland YE, Cassidy MM, Bernal JA, Mulumudi M Effect of pulmonary artery systolic pressure on mortality in patients with mitral regurgitation and normal systolic function. J Am Coll Cardiol 2003; 41: 511.
3. Mulumudi MS, White CJ. Kidney Frame Count: An angiographic assessment of renal perfusion. TCT, 2003.
4. Potluri S, Ventura HO, Mulumudi M, Mehra MR. Cardiac troponin levels in heart failure. Cardiol Rev 2004;12:21-25.
5. Mulumudi MS, Potluri SP, White CJ. Role of abciximab in the preservation of myocardial microcirculation during mechanical reperfusion for acute ST-segment elevation myocardial infarction. JACC 2002;30:5.
6. Mulumudi MS and Vivekananthan K. Perioperative Evaluation and Management of Cardiac Patients Undergoing Noncardiac Surgery, in Expert Guide to Cardiovascular Diseases. Publishers ACP-ASIM (in press) (Book chapter).
7. Mulumudi MS, Vivekananthan K. Mysteries of mitral valve prolapse: proper treatment requires consideration of all clues. Postgrad Med 2001;110:
8. Kuruvanka TS, Mulumudi MS, Vivekananthan K, Francis JF, Delaney P, Jaffrani W, Ventura HO. Patterns of electrocardiograms in a multispecialty clinic: differences between primary care and cardiology settings. ACC, Louisiana chapter, 2001.
9. Mulumudi MS, Ramee SR, Foley RW, Collins TJ, Jenkins SJ, White CJ. Low-contrast technique: a safe alternative in patients with renal insufficiency. ACC, Louisiana Chapter 2001.
10. Mulumudi MS, Kuruvanka TS, Vivekananthan K, and Ventura HO. Serum troponin I level as a predictor of coronary atherosclerosis in patients with ischemic events. ACC, Louisiana Chapter 2001.
11. Kuruvanka TS, Mulumudi MS, Vivekananthan K, Lavie CJ, Milani RV, and Ventura HO. Racial differences in the concordance of stress ECG and stress echocardiographic studies. ACC, Louisiana Chapter 2001.
12. Mulumudi M, Shah M, Alexander L. Air embolization in the portal vein: Hospital Physician, April 1996; 32: 51-53.
13. K. Vanga, M. Mulumudi, G. Pollidori Choledochal Cyst: "The Missed Diagnosis in Childhood". American College of Physicians, Michigan Chapter, Associates meeting, May 1997 (oral presentation).

14. Mulumudi MS, Charochak A, and Kareem MY. Hungry bone syndrome in a patient with endstage renal disease without parathyroidectomy. American College of Physicians, Michigan Chapter, Associates meeting, May 1995.
15. M.Mulumudi and J.P.Kehrer. Possible roles for 3-oxopropyl and 3-Hydroxypropyl mercapturic acids in cyclophosphamide induced bladder damage. The Toxicologist 1994;14:369

Literary

“Mantle of Memories”: an essay in the Indian Express, India

“Shunned by Sound”: an essay in the Indian Express, India.

Medical License

Washington State Medical License

Professional Memberships and Awards

American College of Cardiology

Society of Coronary Angiography and Interventions

Charles B. Moore research award 2003

First Prize (college level), awarded by the Indian Academy of Pediatrics for The Pediatric Quiz.