Healthcare Engineering Lecture Series

Title: Engineering and Interventional Radiology - Evolution in the treatment of venous thromboembolism
Speaker: Raj Khalsa, MD, Vascular and Interventional Radiologist, Vascular and Interventional Specialists of Orange County, Providence St. Joseph Hospital, Orange, California

Education:
- Fellowship, Vascular and Interventional Radiology, Dotter Interventional Institute, Oregon Health & Science University
- Residency, Diagnostic Radiology, Medical Center, University of California, Irvine
- Internship, General Surgery, Medical Center, University of California - Irvine
- M.D., School of Medicine, University of California - Irvine
- B.S., Biomedical Engineering, University of Southern California

Qualifications:
- Program Director, Interventional Oncology, Providence St. Joseph Orange Center for Cancer Prevention and Treatment
- Chief Medical Officer, Omnigence Corporation, Scientific and Medical Operations Automation
- Partner, Numeracy, Health Tech Startup Accelerator
- Medical Device Consultant
- Research: Investigator on active studies in venous thromboembolism, including site principal investigator for the CTRACT (Chronic Venous Thrombosis: Relief with Adjunctive Catheter-Directed Therapy) clinical trial

Abstract
This lecture will cover a brief introduction to the field of Vascular and Interventional Radiology, with a focus on venous thromboembolism. Topics covered will include an overview of the concept of image-guided interventions, and specific discussion about deep vein thrombosis and pulmonary embolism, including an overview of the disease state, rationale for treatment, and evolution in treatment options.

Biography
Bhavraj (Raj) Khalsa is a Vascular and Interventional Radiologist who specializes in minimally invasive image-guided procedures with a special interest in endovascular treatment of arterial and venous disease. Dr. Khalsa is a California native, graduating Magna Cum Laude in Biomedical Engineering from the University of Southern California as an Engineering Merit and Presidential Scholar.

Dr. Khalsa completed his medical school, General Surgery internship and Radiology residency training at the University of California, Irvine, where he served as Chief Resident and was awarded the Resident of the Year Award as well as the Radiological Society of North America Resident Research Award.

He completed his fellowship training in Vascular and Interventional Radiology at the Dotter Interventional Institute, also known as the birthplace of Interventional Radiology. Dr. Khalsa has authored multiple peer-reviewed publications and is a principal investigator on several clinical trials in the fields of minimally invasive arterial and venous interventions. He has been awarded grants in academic development and research, and has led numerous medical
device development projects. Most importantly, Dr. Khalsa believes in a patient-centered and technology-enabled approach to healthcare.

Conditions treated/procedures performed:

- Arterial interventions:
  - Stroke thrombectomy
  - Chronic limb threatening ischemia (CLTI)
  - Lifestyle-limiting claudication
  - Non-healing ulcers
  - Pedal loop reconstruction
  - Deep venous arterialization for no-option CLTI

- Venous interventions:
  - Varicose veins
  - Venous insufficiency
  - Post-thrombotic syndrome
  - Venous ulceration
  - Deep vein thrombosis
  - Pulmonary thrombectomy
  - Central venous reconstruction

- Women’s Health:
  - Uterine fibroid embolization
  - Pelvic congestion syndrome

- Men’s Health:
  - Prostate artery embolization (BPH)
  - Varicocele embolization

- Interventional Oncology:
  - Hepatic thermal ablation
  - Transarterial chemoembolization
  - Transarterial radioembolization

Host/Organizer:
Ming Chyu, PhD, PE
Professor, Department of Mechanical Engineering
Adjunct Professor, School of Medicine
Founder, College of Engineering Graduate Healthcare Engineering Option Texas Tech University
Founding Editor-in-Chief, Journal of Healthcare Engineering
Founding President, Healthcare Engineering Alliance Society (HEALS)