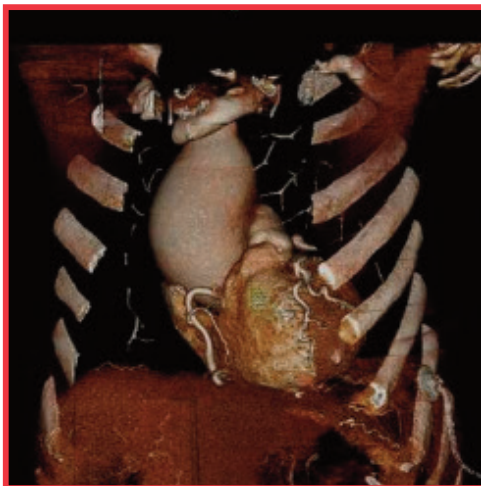


# CARDIOVASCULAR CT IMAGING

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*Intensive Level II Training Course and Introduction to  
3D Vascular Angiography & Stress Perfusion CT*

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**MOHIT BHASIN, MD**

*Course Director*

- Accredited for 58.75 CME hours
- Emphasis on Liability Reduction, Artifacts & Pitfalls  
- not Board Minutiae
- Comprehensive Cardiac Interpretation
- Typical & Tertiary Referral Cases
- Cath, IVUS, ICE, Nuclear, MRI, & Echo Correlations



**BAYVIEW**  
PHYSICIANS GROUP

**EVMS**  
Eastern Virginia Medical School

CARDIOVASCULAR CT IMAGING

## COURSE INFORMATION

Multiple approaches to evaluation of cardiovascular CT studies exist with varying accuracy depending on the type of workstation, type of scanner, referral population, patient selection, and training mentor preferences. Few courses offer an algorithmic, comprehensive approach to interpretation and offer coronary cath/ IVUS, echo, and MRI correlations or review extracardiac thoracic interpretation or the application of CTA to peripheral angiography. Cardiovascular Associates and Bayview Physicians Group have joined together to design a comprehensive course to provide a unified educational program based on the standards co-developed by the ACC and SCCT.

A distinguished faculty will conduct a five day program acquiring and interpreting cardiovascular CT angiographic studies in a focused environment offering (1) an algorithmic, comprehensive approach to interpretation of up to 210 studies, with emphasis on elimination of interpretation errors (2) invasive angiographic correlations for most cases (3) instruction in extracardiac thoracic interpretation, and (4) instruction in CT peripheral angiography and MRA angiography.

## COURSE FORMAT

The emphasis will be hands-on interpretation of teaching cases with correlation to clinical history, outcome, other imaging studies, as well as interpretation of daily consecutive cases with appropriate reporting in a small group format limited to 9 participants per week. One physician will be assigned to each state-of-the-art workstation. In addition, the format will utilize a combination of lectures on clinical and operational subject matter, live patient preparation and acquisitions, videotaped acquisitions, 20 minute intermittent 'chalk talks', and daily and self-assessment questions to underscore key material, pitfalls, and artifacts.

A certificate of course participation toward ACC and SCCT Level II or III certification will include the number of contrast and non-contrast cases covered, the number of cases with correlation to invasive coronary angiography, the number of hours of CME credits, live patient acquisitions and an anonymous patient list using case numbers enumerating and identifying the indication and diagnosis.

## TARGET AUDIENCE

CARDIOVASCULAR DISEASE SPECIALISTS, RADIOLOGISTS,  
FELLOWS-IN-TRAINING, CARDIOTHORACIC & VASCULAR  
SURGEONS

*Multiple prior course participants have agreed to discuss their training experiences with potential attendees, upon request.*

### OBJECTIVES

*After the activity, participants will be able to:*

- Operate a 3-dimensional workstation to extract pertinent information from a thoracic volume of interest (VOI), then analyze and interpret the cardiovascular findings systematically, using the VRT-MIP-MPR method, to construct a complete and accurate Cardiovascular CT Report
- Judge the quality of Cardiovascular CT studies and its relationship to cardiac CT technical factors including the advantages and disadvantages of various types of cardiovascular CT scanners: 32 slice, 64 slice, 256 slice, dual source CT, and PET-CT hybrid imaging
- Formulate an acquisition protocol for CT contrast administration, recognizing the kinetics of triphasic injection and caveats in special patient populations such as those with valvular disease, a history of adverse reactions to contrast media, intra-cardiac shunts, and high BMI
- Cite CT radiation dose reduction strategies, radiation risk measures, and published radiation dose values in comparison to other cardiac modalities, and manipulate CT scan collimation, temporal resolution, and the three fields-of-view for cardiac patients to minimize risks to the patient
- Characterize plaque density and vulnerability for individual lesions, difference between abnormal findings and image artifact, and caveats of stenosis estimation including the effect of window and level view settings
- Evaluate regional contractility, calculated estimation of ejection fraction, myocardial resting perfusion, native and mechanical valves, and pericardial disease
- Evaluate typical and complex tertiary referral studies including acute aortic syndromes, pulmonary embolism, simple congenital heart disease, post-aortic surgery studies, pre and post electrophysiologic intervention, and cardiac masses, etc. (see table of typical and tertiary cases presented)
- Interpret extracardiac thoracic structures such as pleural effusions, lung nodules, lymphadenopathy, infiltrates and cite the Fleischner Society guidelines for Management of Small Pulmonary Nodules Detected on CT Scans
- Construct an appropriate workflow and staff training program, utilizing the patient SPARR (Selection, Preparation, Acquisition, Reconstruction, and Reporting) system including the appropriate integration into clinical care

## ACCREDITATION STATEMENT

This activity has been planned and implemented in accordance with the Essential Areas and policies of the Accreditation Council for Continuing Medical Education (ACCME) through the joint providership of Eastern Virginia Medical School, Cardiovascular Associates and Bayview Physicians Group. Eastern Virginia Medical School is accredited by the ACCME to provide continuing medical education for physicians.

## CREDIT DESIGNATION

Eastern Virginia Medical School designates this live activity for a maximum of 58.75 *AMA PRA Category 1 Credits*<sup>TM</sup>. Physicians should only claim credit commensurate with the extent of their participation in the activity.

## CARDIOVASCULAR ASSOCIATES

Cardiovascular Associates (CVAL) is a 26 physician consultant cardiology practice providing comprehensive consultative, diagnostic and therapeutic services to patients of Virginia Beach, Norfolk, and Chesapeake, Virginia. As one of the largest cardiology groups in the Mid-Atlantic region, CVAL offers a full spectrum of cardiology services and expertise in all specialties of cardiac care and is a major participant in many national research studies.

### Course Location

Sentara Heart Hospital Cardiac Diagnostic Unit and Children's Hospital of the King's Daughters, located at 600 Gresham Drive, Norfolk, Virginia.

### Course Dates

**2019:** Jan 21-25, Feb 18-22, Mar 18-22, May 20-24

September 16-20, October 14-20, November 11-15

Additional dates to be posted at [www.cval.org](http://www.cval.org)

*CVAL reserves the right to cancel a course at the discretion of the Course Director.*

### Tuition

\$3,600 for Practicing Physicians; \$1,800 for Fellows-in-training with letter of verification from the Program Director. Tuition includes digital course syllabus on thumb drive, interpretation manual, and CME certification.

## REGISTRATION

Space availability is limited to 9 participants and registrations are accepted on a first payment-received basis. The deadline for registration is 45 days prior to the start of each course. Please call the Course Coordinators at **(757) 819-1127** to confirm a course date, then complete the enclosed registration form and send it along with your payment to:

**Course Coordinators, Cardiovascular Associates**  
**612 Kingsborough Square, Suite 100, Chesapeake, VA 23320**

If paying by credit card, you may fax the completed registration form to the Course Coordinators, at **Fax (757) 419-3476**.

Upon receipt of your registration, a confirmation letter and list of accommodations will be mailed and emailed to the addresses listed on your Registration form.

Cancellation for any reason over 6 weeks prior to the course date will result in a complete refund of tuition. Between 4-6 weeks prior to the course date, 50% of the tuition will be refunded. Between 2-4 weeks prior to the course date, 25% of the tuition will be refunded. No refunds will be made for cancellations within 2 weeks of the course start date.

### **Hotel Accommodations**

Hotel accommodations are available in downtown Norfolk where one can enjoy a broad spectrum of shopping and nightlife activities or on the Virginia Beach oceanfront, which is a short drive from Sentara Heart Hospital. Early reservations are encouraged. Information on hotel accommodations in the Norfolk/Virginia Beach area, that are available at discounted rates, is available by contacting the Course Coordinators at **(757) 819-1127**, on the website at **[www.cval.org](http://www.cval.org)** or at E-mail: **[cvalcourse@cval.org](mailto:cvalcourse@cval.org)**.

### **Special Accommodations**

The Americans with Special Disabilities Act of 1990 requires that all individuals regardless of disability have equal access. If special arrangements are required to attend this course due to a disability, contact a Course Coordinator.

### **CONTACT INFORMATION**

Course Coordinators: **(757) 819-1127**

Course website: **[www.cval.org](http://www.cval.org)**

Email: **[cvalcourse@cval.org](mailto:cvalcourse@cval.org)**

**MONDAY SCHEDULE** – *Live acquisitions throughout the day*

**0730-1000** Buttonology 101: Extracting pertinent information from a thoracic volume of interest (VOI) by vessel walking via VRT-MIP-MPR: Bhasin

**1000-1015** Quick Stretch Break

**1015-1215** Buttonology 102: Workstation Navigation and Manipulation for efficient algorithmic reading in 4 dimensions: Bhasin

**1215-1245** Lunch

**1245-1545** CT hardware basics and Quality Acquisitions by SPARRR: Bhasin

**1545-1600** Coffee Break

**1600-1830** Intrathoracic VRT Anatomy of normal and Small group Interpretation of typical cases using vessel walking and perfusion analysis for hypoattenuation: Bhasin

**1830-1915** Dinner

**1915-2115** Avoiding Photons, Perfusion Scanning Configurations for simultaneous anatomy and ischemia

**TUESDAY SCHEDULE** – *Live acquisitions throughout the day*

**0700-0710** Quick Review of 4D software and vessel walking principles: Bhasin

**0710-1010** Case Unknowns I: Bhasin

**1010-1015** Quick Stretch Break

**1015-1215** Case Unknowns II: Bhasin

**1215-1245** Lunch

**1245-1545** Anatomic and VRT Pitfalls and Artifacts; Acute Aortic Syndromes and planning transcatheter AVR: Bhasin

**1545-1600** Coffee Break

**1600-1830** Coronary Anomalies and Case Unknowns III: Bhasin

**1830-1915** Dinner

**1915-2115** Case Unknowns IV: Bhasin

**WEDNESDAY SCHEDULE** – *Live acquisitions throughout the day*

**0700-0710** Quick review of Pitfalls and Acute Aortic Syndrome principles: Bhasin

**0710-1010** Iatrogenic Imperfecta I: Aorto-Coronary and Valvular Trauma: Bhasin

**1010-1015** Quick Stretch Break

**1015-1215** Iatrogenica Imperfecta II: TEVAR, TAVR, and Systemic and Pulmonary Veins: Bhasin

**1215-1245** Lunch

**1245-1545** Refining the basics: Qualitative and Quantitation assessment of stenosis severity, total occlusions, bypass grafts, stents; Non-coronary cardiac findings; Extracardiac structures: Bhasin

**1545-1600** Coffee Break

**1600-1830** Case Unknowns V: Bhasin

**1830-1915** Dinner

**1915-2115** Case Unknowns VI: Bhasin

**THURSDAY SCHEDULE** - *Live acquisitions throughout the day*

**0700-0710** Quick review Iatrogenica Imperfecta principles: Bhasin

**0710-1010** Adult and Pediatric Congenital Heart Disease I: Segmental Sequential algorithm with echo correlation and application to common lesions: Sinus Venosus repaired and unrepaired, secundum ASDs, and The Pancreas of the Chest: Bhasin

**1010-1015** Quick Stretch Break

**1015-1215** Adult and Pediatric Congenital Heart Disease II: Segmental Sequential algorithm and application to cases with a twist: D-TGA, cc-TGA, Situs Inversus Totalis, and Heterotaxy Syndromes: Bhasin

**1215-1245** Lunch

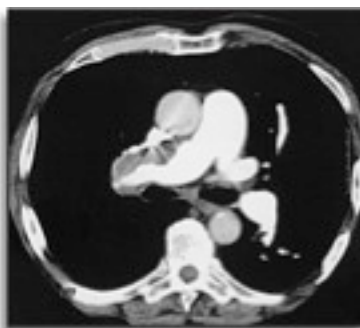
**1245-1545** Adult and Pediatric Congenital Heart Disease III: Single Ventricle Imaging Ridiculously Rare Cases: Bhasin

**1545-1600** Coffee Break

**1600-1830** Liability, Board Minutiae LVADs, Artificial Heart, EP imaging, Masses, Pulmonary Emboli: Bhasin

**1830-1915** Dinner

**1915-2115** Stress Perfusion CT I: Correlation with stress perfusion MRI: Bhasin



**FRIDAY SCHEDULE** - *Live acquisitions throughout the day*

**0700-0710** Quick review Adult Congenital principles: Bhasin

**0710-1010** Stress Perfusion CT II: Caveats of Interpretation and software: Bhasin

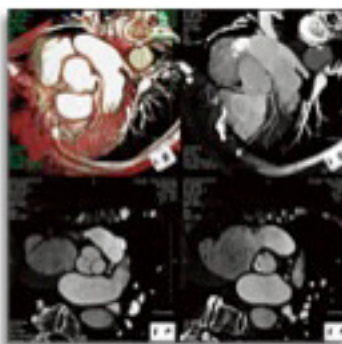
**1010-1015** Quick Stretch Break

**1015-1215** Cardiac MRI pathologic and technical correlation: Bhasin

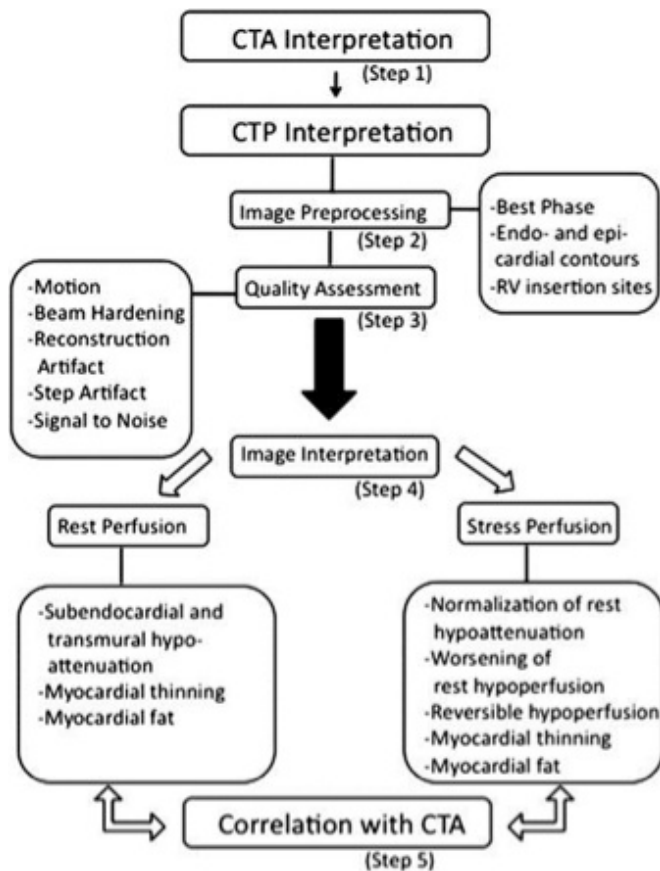
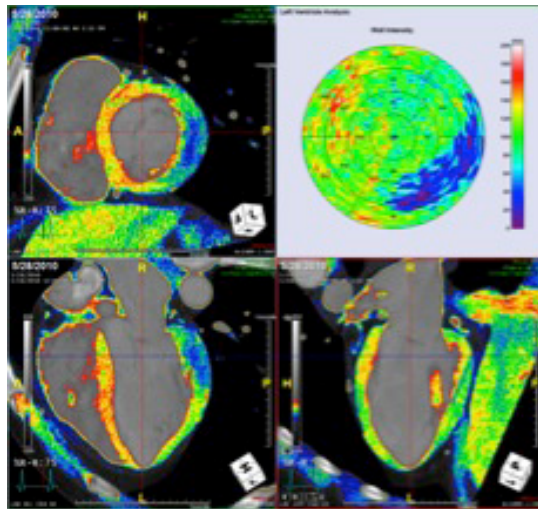
**1215-1245** Lunch

**1245-1545** Case Unknowns VII: Bhasin

**1545-1600** Participant and Course Director Interview, evaluations and feedback



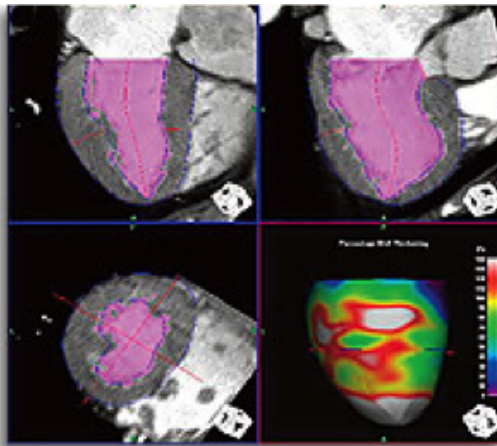
# MYOCARDIAL CT PERFUSION





## TYPICAL & REFERRAL CASES

- Acute Aortic Syndromes: Ascending and Descending aortic dissection, intramural hematoma, penetrating atherosclerotic ulcer
- Pulmonary Embolism
- Coarctation of the aorta: repaired & unrepaired
- Patent Ductus Arteriosus
- Pre-surgical evaluation: pre-minimally invasive valve surgery, pre Tetralogy of Fallot pulmonic valve replacement
- Post-surgical evaluations: Anastomotic pseudoaneurysm post dissection repair
- Left ventricular assist device: Heart Mate II
- Transposition of the great arteries (D-TGA), s/p Mustard; Congenitally Corrected TGA
- Pre-atrial fibrillation left atrium and pulmonary vein angiography
- Post atrial fibrillation pulmonary vein stenosis
- Subaortic membrane
- Prosthetic valve
- LA myxoma
- RA pseudotumor
- Left atrial appendage thrombus
- Sinus venosus ASD with PAPVR
- Ductus diverticulum
- Diverticulum of Kommerell
- Cardiac Sarcoidosis
- Takayasu's Aortitis
- TAVR Complications





## MOHIT BHASIN, MD

*Mohit Bhasin, MD attended medical school at Emory University School of Medicine in Atlanta as a Robert Woodruff Scholar in Medicine. He then completed an Internal Medicine Residency and Cardiovascular Disease Fellowship and served as Chief Cardiovascular Fellow while pursuing two years of specialized training in the field of Cardiovascular MRI and CT imaging. A former George Starbuck Fellow at Boston University in Creative Writing and winner of the William Carlos Williams Prize from the Center for Human Values in Medicine, he has become a recognized leader in heart photography.*

*Dr. Bhasin directs a level III one year apprenticeship for cardiologists in cardiovascular MRI and CT, teaches a monthly course on 3D imaging to visiting cardiologists and radiologists, and serves as the Medical Director of Cardiovascular CT and MRI Imaging at Sentara Heart Hospital and as co-director of Pediatric Cardiovascular MRI imaging at Children's Hospital of the King's Daughters. He directs the CVAL Clinic for the Aorta as part of his clinical cardiovascular practice, and specializes as well in adult congenital heart disease, multimodality tertiary referral cases such as cardiac masses, as well as general cardiology problems.*

*Dr. Bhasin is Board certified in Internal Medicine, Echocardiography, Cardiovascular Diseases, Nuclear Cardiology, and Cardiovascular Computed Tomography. He was voted one of the Top Cardiologists in Hampton Roads by his peers.*

## SENTARA HEART HOSPITAL

Heart and Heart Surgery services at Sentara Heart Hospital rank among the top 50 cardiac programs in the nation. The cardiac program at Sentara Heart Hospital ranks 33rd out of the top 50 hospitals listed. Additionally, Sentara Heart Hospital boasts a Mortality Ratio that is superior to eight of the top ten programs in the nation.

Sentara Heart Hospital opened in 2006 as the region's only dedicated heart hospital, is unlike any facility within hundreds of miles. It unites a long-standing team of cardiac subspecialists within an advanced setting built from the ground up for superior cardiac care. Patients receive comprehensive cardiac services—from diagnostics to open heart surgery and transplants—at one location.

Located on the Campus of Sentara Norfolk General Hospital, Sentara Heart Hospital features 112 private inpatient rooms and 45 pre/post-op procedure rooms for patients undergoing interventional cardiac procedures. Sentara Heart Hospital has five dedicated cardiac operating rooms, six cardiac catheterization labs, and the region's first dedicated Cardiovascular CT and MRI.



SENTARA HEART HOSPITAL

# REGISTRATION

## Please Check One

Nov 12-16, 2018     Jan 21-25, 2019     Feb 18-22, 2019     Mar 18-22, 2019     May 20-24, 2019     Sep 16-20, 2019     Oct 14-20, 2019     Nov 11-15, 2019

**For other dates, check the Course website at [www.cval.org](http://www.cval.org)**

## Cardiovascular CT Imaging

**\$3,600 for Practicing Physicians; \$1,800 for Fellows-in-training with letter of verification from the Program Director**

Full Name \_\_\_\_\_ Degree \_\_\_\_\_

Address \_\_\_\_\_ City \_\_\_\_\_ State/Zip \_\_\_\_\_

Preferred Mailing Address \_\_\_\_\_ City \_\_\_\_\_ State/Zip \_\_\_\_\_

Daytime Telephone \_\_\_\_\_ Fax \_\_\_\_\_ Email \_\_\_\_\_

Profession \_\_\_\_\_ Primary Specialty \_\_\_\_\_

Organization Affiliation \_\_\_\_\_ Last 4 digits of your Social Security # (for CME hours filing) \_\_\_\_\_

Check made payable to Bayview Physicians Group is enclosed.

**Please mail it with this Registration form to:**

Course Coordinators • Cardiovascular Associates • 612 Kingsborough Square, Suite 100 • Chesapeake, Virginia

Bill my credit card:     VISA     MASTERCARD    Card # \_\_\_\_\_ - \_\_\_\_\_ - \_\_\_\_\_ - \_\_\_\_\_ Exp. Date \_\_\_\_\_

Signature \_\_\_\_\_ Date \_\_\_\_\_

Updated information is available at [www.cval.org](http://www.cval.org), [www.BayviewPhysicians.com](http://www.BayviewPhysicians.com)

or by contacting the Course Coordinators at **(757) 819-1127**; by Email at [cvalcourse@cval.org](mailto:cvalcourse@cval.org) or by Fax at **(757) 419-3476**