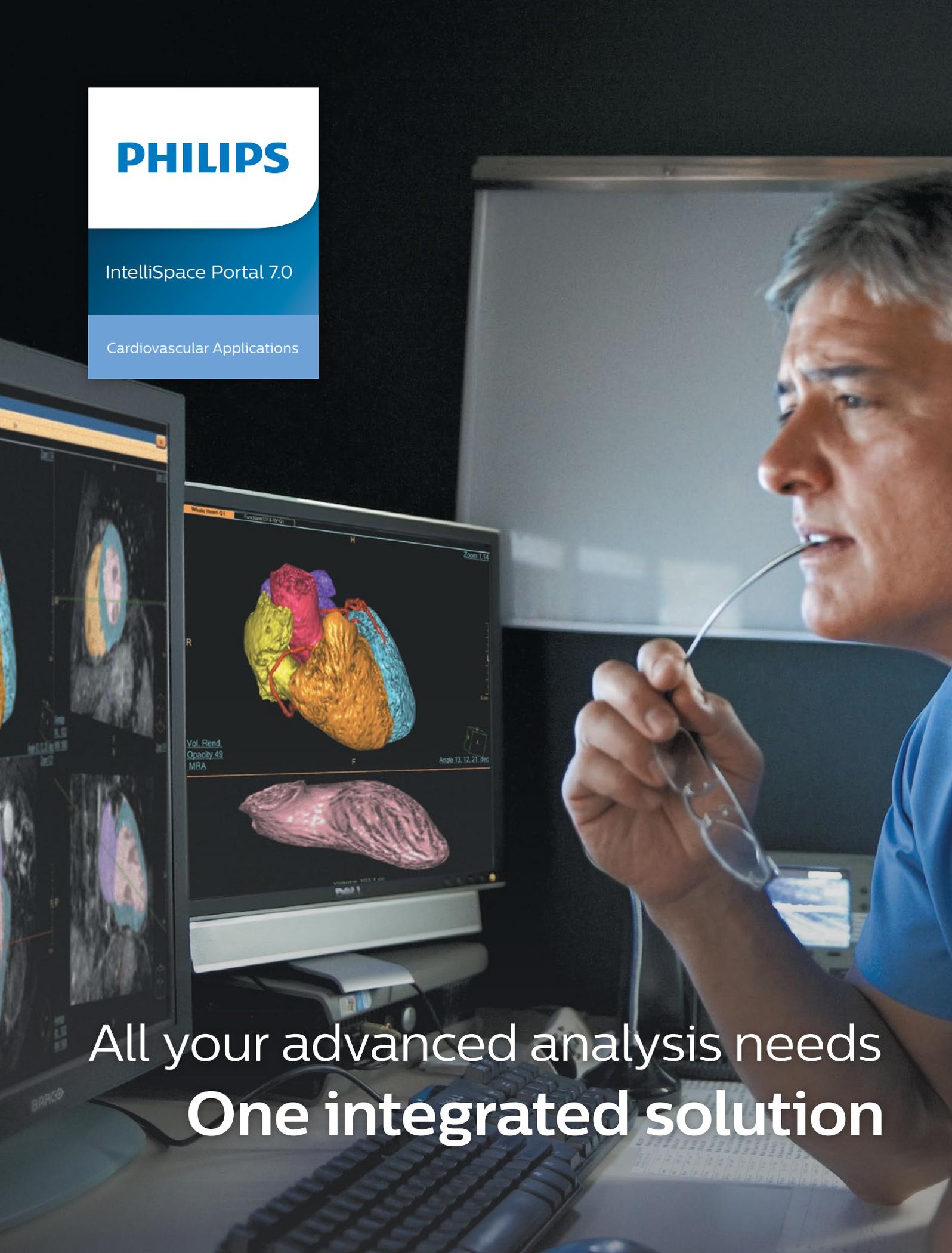


PHILIPS

IntelliSpace Portal 7.0

Cardiovascular Applications



All your advanced analysis needs
One integrated solution

As many as 62% of Cath lab patients have been shown NOT to have obstructive coronary artery disease.^[1]

With thorough, correct diagnosis, over 200 patients a day could have been spared catheterization in the U.S. In addition, studies have shown that advanced visualization tools can shorten the reading times of vascular anomalies by three to five times.^[2] Multi-modality cardiac imaging is becoming increasingly essential to provide accurate patient selection and in monitoring the interventional procedures in order to optimize the success rate and minimize the frequency of complications.^[3]

Do you have the tools needed to provide confident diagnoses quickly and effectively?

The IntelliSpace Portal 7.0 offers a rich, comprehensive suite of cardiovascular applications allowing you to diagnose and monitor cardiovascular diseases with confidence all in a single solution.

From diagnosis to treatment planning and follow-up, the Intellispace Portal 7.0 has the tools to help you obtain results faster, all from a single workspace.



Streamlined patient management, **from one chair**

Diagnosis

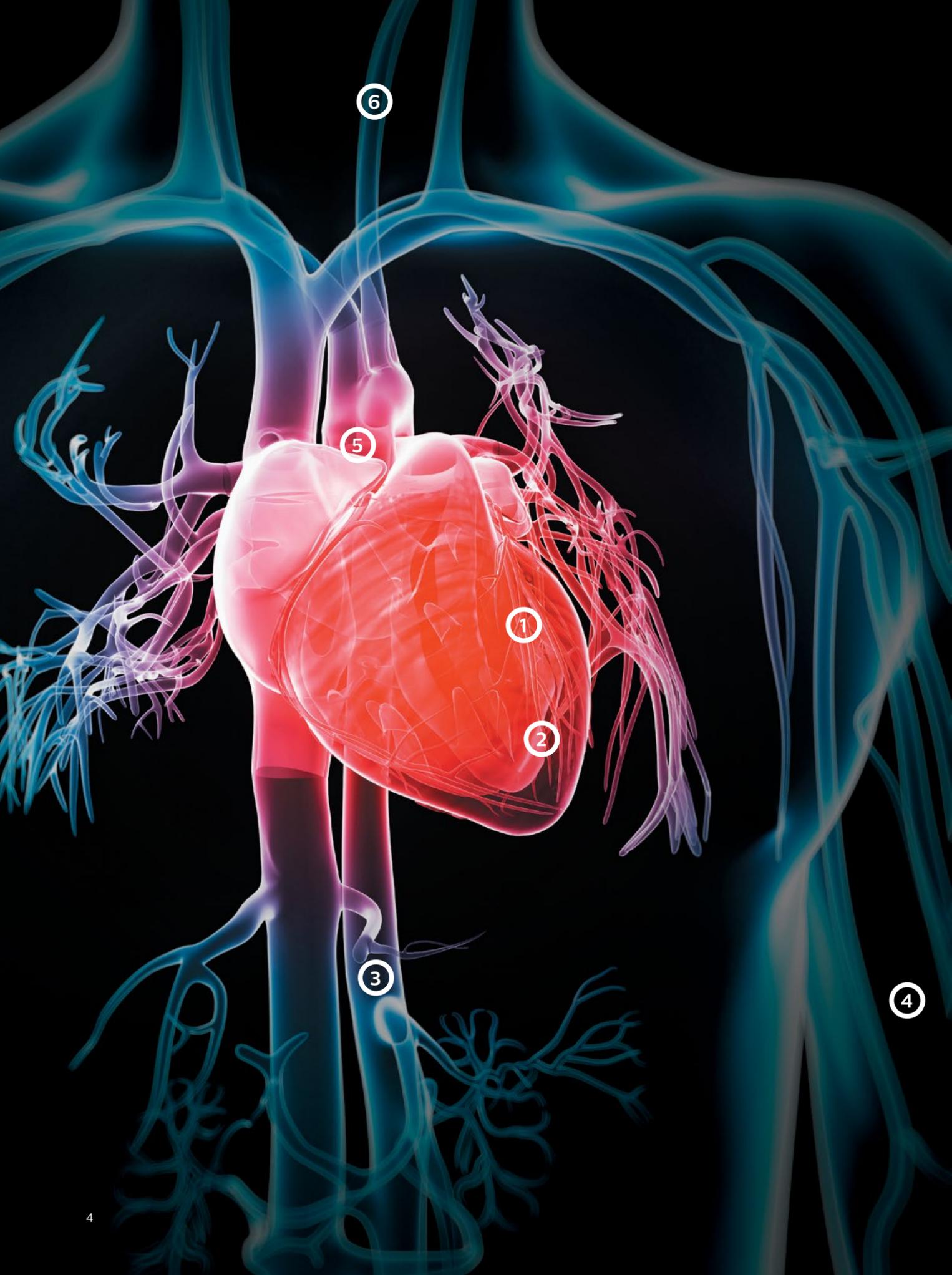
- **Multi-modality** – Patient diagnosis often takes into account multiple scans. The IntelliSpace Portal 7.0 includes viewing and advanced analysis of CT, MR, MI, US, DXR, and iXR images, from multiple vendors on one platform.^[4]
- **Speed time to results** – A unified user interface across all clinical applications with faster throughput features like task guidance, zero click processing, and pre-fetching for consistent and efficient workflows
- 3D and 4D image analysis to turn data into quantitative information for rich volumetrical and dynamic assessment

Treatment planning

- **The information you need** – Automatic measurements such as calculations of cath lab angles, and quickly discernable perfusion maps are a few of the time-saving tools which provide the information you need for treatment planning.
- **Mobile access** – Share bookmarks and results, and transfer studies hassle-free. Enjoy access to your studies virtually anywhere with Web Collaboration. It turns any mobile device into a true multi-modality viewer.^[5]
- Bring advanced diagnostic imaging closer to the interventional suite by integrating your Allura Interventional Suite with the IntelliSpace Portal 7.0.

Follow-up

- Robust quantification and visualization tools to measure and track disease states, providing greater insight into your patient's condition



Whether you're diagnosing heart failure, coronary artery disease, structural heart disease, aortic stenosis, or even peripheral vascular disease, the IntelliSpace Portal 7.0 offers a robust tool set to give you more information on patient condition for a quick, yet comprehensive diagnosis.

- 1 Coronary Artery Disease**
Detailed analysis of vessel fitness to help assess patient risk
- Multi Modality Advanced Vessel Analysis (AVA)
 - CT Comprehensive Cardiac Analysis (CCA)
 - CT Cardiac Plaque Assessment
 - CT Calcium Scoring
 - CT Dynamic Myocardial Perfusion (DMP)
 - MR QFlow
 - NM Viewer
 - NM Astonish Reconstruction
 - Corridor 4DM 2013^[6]
 - Cedars Sinai Cardiac Suite 2013
 - Emory Cardiac Toolbox (ECTb) 2013^[7]
 - Ultrasound Q-App General Imaging 3D Quantification
 - iXR Viewing (in MMV)

- 2 Heart Failure**
Get the full picture to quantify disease state and drive treatment planning
- CT Pulmonary Artery Analysis^[6]
 - CT Myocardial Defect Assessment
 - CT Comprehensive Cardiac Analysis (CCA)
 - CT Cardiac Plaque Assessment
 - Multi Modality Advanced Vessel Analysis (AVA)
 - CT EP Planning
 - CT Dynamic Myocardial Perfusion (DMP)
 - CT Cardiac Viewer
 - MR Cardiac
 - MR Cardiac Whole Heart
 - MR QFlow
 - MR Cardiac Temporal Enhancement
 - NM Viewer
 - NM Astonish Reconstruction
 - Corridor 4DM 2013^[6]
 - Cedars Sinai Cardiac Suite 2013
 - Emory Cardiac Toolbox (ECTb) 2013^[7]

- 3 Aortic Aneurism**
Tailor patient stent planning with 3D modeling, guided workflows, and automatic removal of non-target anatomy
- Multi Modality Advanced Vessel Analysis (AVA)
 - CT Calcium Scoring
 - CT Advanced Vessel Analysis (AVA) Stent Planning
 - Ultrasound Q-App Intima Media Thickness
 - Ultrasound Q-App MicroVascular Imaging

- 4 Peripheral Artery Disease**
Quantification and visualization tools to measure and track disease states
- Multi Modality Advanced Vessel Analysis (AVA)
 - CT Brain Perfusion
 - CT Body Perfusion
 - CT Calcium Scoring
 - MR T2* (Neuro) Perfusion
 - MR Diffusion
 - Ultrasound Q-App Vascular Plaque Quantification
 - Ultrasound Q-App Intima Media Thickness
 - Ultrasound Q-App Microvascular Imaging
 - Ultrasound Q-App General Imaging 3D Quantification

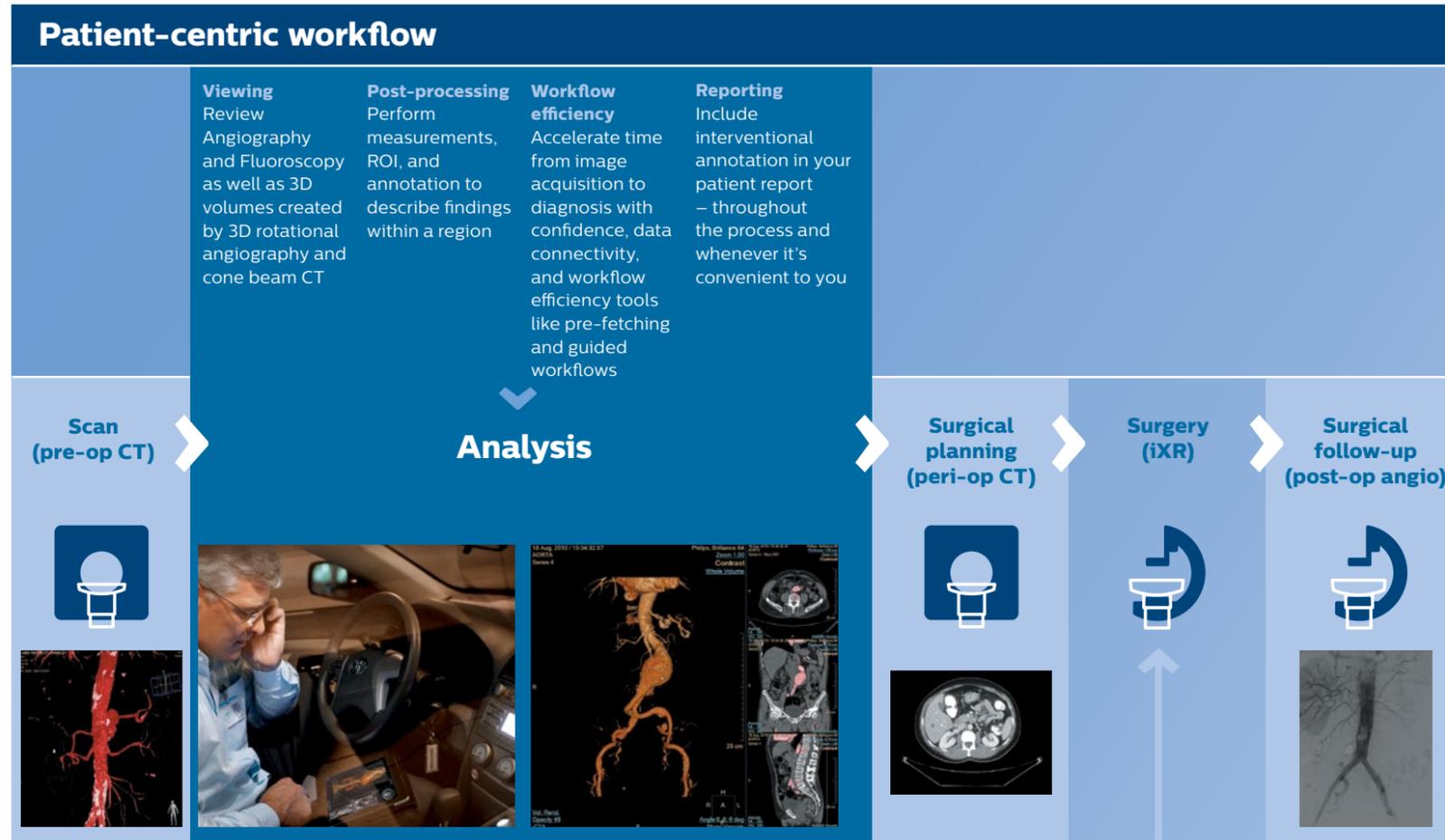
- 5 Structural Heart Disease**
3D viewing into patient condition with advanced tools for intervention planning
- CT TAVI Planning
 - CT Comprehensive Cardiac Analysis (CCA)
 - CT Advanced Vessel Analysis (AVA) Stent Planning
 - CT Calcium Scoring
 - CT Viewer
 - MR Cardiac Whole Heart
 - MR Cardiac Temporal Enhancement
 - MR QFlow
 - NM Astonish Reconstruction
 - Corridor 4DM 2013^[6]
 - Cedars Sinai Cardiac Suite 2013
 - Emory Cardiac Toolbox (ECTb) 2013^[7]

- 6 Neurovascular Disease**
Focus on the relevant anatomical structures to gather insight for confident diagnoses
- Multi Modality Advanced Vessel Analysis (AVA)
 - CT Brain Perfusion
 - MR T2* (Neuro) Perfusion
 - Ultrasound Q-App Vascular Plaque Quantification

“ We use the Comprehensive Cardiac Package on 100% of our cases.”

Dr. Tony Fuisz
 MedStar Washington Hospital Center,
 Washington, D.C., USA

Leverage the strengths of multiple modalities throughout the continuum of care on one imaging platform



Total patient overview from one seat

Compare your historical data from multiple imaging modalities (MR, CT, MI, US, DXR, and iXR) to get a comprehensive view of your patient. With a server based solution, there's no need for multiple workstations. Perform all your viewing and analysis in one session, on a single client, without leaving your chair. And the IntelliSpace Portal 7.0 can be accessed from virtually any computer in your department, your hospital, or even across your network.

The key to outstanding performance: integration with your hospital

Review and complete entire cases with the proven, open interfaces on the IntelliSpace Portal 7.0 that support connectivity with CVIS and RIS, while allowing you to work with PACS such as the IntelliSpace Cardiovascular Suite from Philips or others. Port clinical results directly into PACS or RIS using HL7, DICOM, or mXML. Save key images, notes, and tables directly to your reports, and combine many patient findings into a single patient level report to share results quickly.

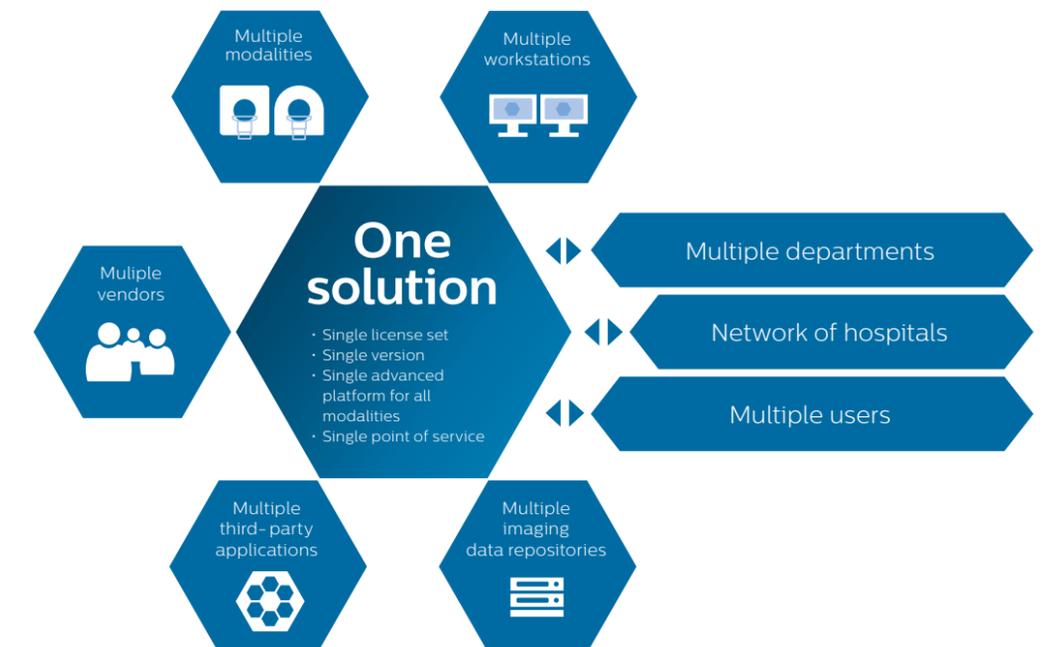
“ Cardiac MR and CT together (on the IntelliSpace Portal) have **lowered overall analysis time by 20%-30%.**”

*Dr. Gaby Weissman, M.D.
MedStar Washington Hospital Center, Washington, D.C., USA*



True patient-centric workflow

The integration between the IntelliSpace Portal 7.0 and Allura Interventional Suite allows you to automatically launch the relevant advanced analysis from IntelliSpace Portal 7.0, providing rich diagnostic information as the starting point of the procedure.



A full suite of cardiovascular applications



Application Highlight

Multi Modality Advanced Vessel Analysis (AVA) Enh.

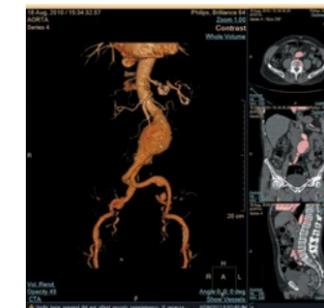
Reduce comprehensive vascular analysis planning to five minutes^[9]

Take advantage of multiple presets and user-defined options to reduce comprehensive vascular analysis planning to five minutes. The robust bone removal algorithm on Multi Modality Advanced Vessel Analysis (AVA) provides 3D visualization of the vessels. Additional automatic tools, such as bone removal and centerlines and vessel labeling as well as inner and outer lumen contours, contribute to fast, consistent results.

Easily navigate through multiple findings and when you're finished, export rich, customizable reports to your RIS or PACS without hassle.

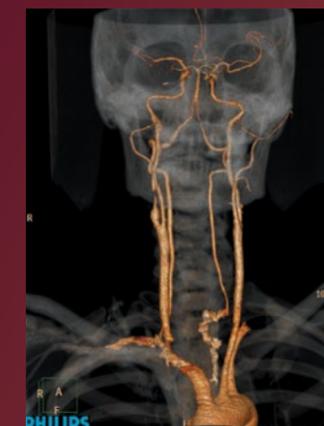
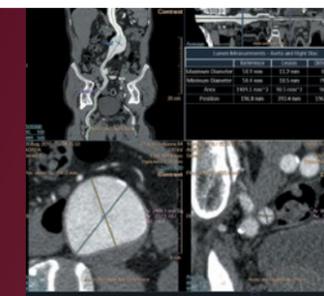
Clinical area

Vascular analysis



Benefits

- Examine and quantify vascular lesions from CTA and MRA studies
- Accommodate different modes of inspection and label different vascular lesions
- Reduce the time to produce end results with automatic creation of cMPR, cross-sectional, MPR, extracted centerlines, and volume images created even before you open your study
- Get exceptional visualization of vascular structures with simplified zero-click bone removal and visualize the carotid siphon with skull removal
- Enhance workflows for specific findings creation, like stenosis, aneurysm, and diameter measurements with customizable views



Speed up workflows by 77%

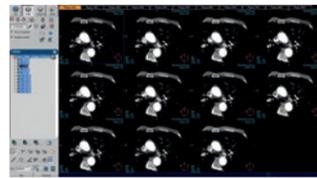
Multi Modality Advanced Vessel Analysis (AVA) reduces the manual time-to-results by 77% for neuro (head/neck) and body CT angiography (CTA) exams.^[b,c]

- Manual procedures
- MM Advanced Vessel Analysis (AVA) with ASC



^[b] Compared to the Philips EBW v4.x workstation

^[c] Kadavigere, R., Maiya, M., Rao, V., Read, K. Standardized Results of CT Angiography Obtained with Automated Postprocessing Using a Dedicated Server: A Workflow Optimization Study. A collaboration of Philips Healthcare and Kasturba Medical College at Manipal University, India. Radiological Society of North America 2011 Scientific Assembly and Annual Meeting, November 26 - December 2, 2011, Chicago IL.



Quick cardiac visualization

CT Cardiac Viewer provides a comprehensive set of tools that allows quick visualization of one or multiple cardiac phases, synchronization of multiple cardiac phases with interactive slab-MIP tools for review purposes, cine mode for cardiac axes views, and a simple "Area-Length" calculation of end systolic volume (ESV), end diastolic volume (EDV), cardiac output (CO) and ejection fraction (EF) for basic ventricular functional assessment.



Fast cardiac analysis

CT Comprehensive Cardiac Analysis and advanced LV/RV functional analysis provided endoluminal and epiluminal segmentation of the heart chambers to calculate ejection-fraction, stroke volume, cardiac output, and left and right ventricular mass. Visualize the entire coronary tree, vessel lumen via morphological analysis, and analyze free lumen diameter. Functional analysis of ventricles and analyze chamber and valve morphology in 3D and using dynamic cine mode. New added calculations include: Regurgitation volume and fraction index, RV/LV Early and Late (active and passive) filling volumes, Early/late LV filling ratio.



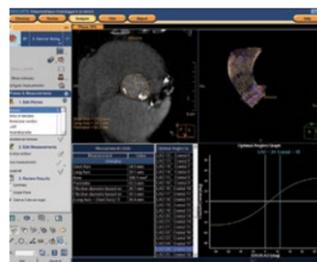
Fusing cardiac CT-MI

CT Comprehensive Cardiac Analysis (CCA) incorporates support for myocardial perfusion imaging (MPI). CCA with the CT-MI Fusion option allows loading both gated and un-gated rest, and gated and un-gated stress MI datasets simultaneously with the CT. The MI images are displayed in the short axis and the two long-axis planes. The axes definition is derived from the CT study.



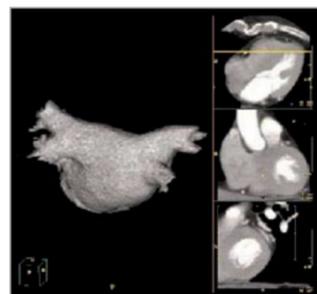
Quickly plan endovascular stent placement

CT Advanced Vessel Analysis (AVA) Stent Planning includes multiple preset and user-defined options to gain detailed information for use in stent planning, reducing overall planning time to five minutes compared to 30-45 minutes without the application. The application includes an option that allows results to be printed on a customized report.



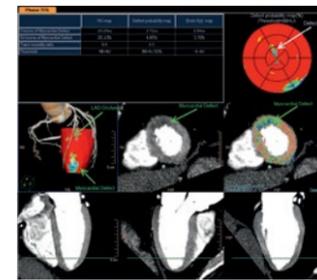
CT imaging in TAVI to advance patient care

CT TAVI Planning is a non-invasive post-processing application that provides semi-automatic measurements of the aorta and aortic valve that are useful for pre-TAVI planning. The application provides model-based segmentation of the aortic valve, ascending aorta and left ventricle, semi-automated detection of the coronary ostia, semiautomated planes detection and dimensions measurements of the aortic annulus, left ventricular outflow tract, sinotubular junction, sinus of valsalva, ascending aorta and distance to coronary ostia for TAVI-device sizing. The CT TAVI Planning application also provides a reasonable starting angle of the C-arm for device deployment, which allows for less time used for the TAVI procedure itself performed in the catheterization laboratory or hybrid operating room. Recently added automatic measurements include Left and Right coronary sinus height, Non-coronary sinus height, and aortic angulation.



Fast planning for EP procedures

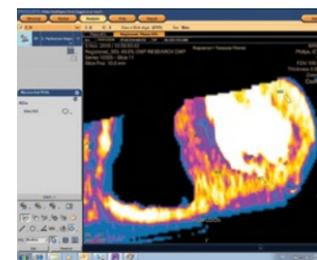
CT EP Planning provides fast, overall assessment of pulmonary vein, left atrial, and appendage anatomy, enabling the electrophysiologist to quickly identify anatomy that may complicate the EP procedure.



Assessing myocardial defects

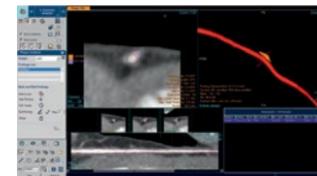
CT Myocardial Defect Assessment provides visual and quantitative assessment of segmented, low-attenuation defect areas within the myocardium from a single, gated cardiac CTA scan (retrospectively-gated spiral or Step and Shoot Cardiac). The ability to derive this information from a single cardiac CTA scan reduces the need for multiple scans. The application itself is based on the robust, automatic, model-based, whole heart segmentation from the Comprehensive Cardiac Analysis application. Myocardial Defect Assessment provides visual assessment of low-attenuation deficits within the left-ventricular myocardium via the following:

- Color maps shown in short-axis views
- Segmentation maps shown on short-axis and polar plots, displayed along with long-axis reference images
- Volumetric visualization of coronary arteries along with segmentation maps displayed as an overlay on top of a 3D myocardial surface



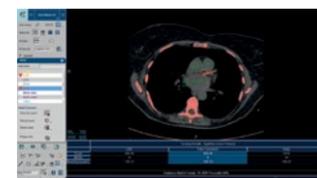
Dynamic color maps provide an assessment of myocardial risk

CT Dynamic Myocardial Perfusion (DMP) is intended for visualization, diagnostic assessment, and quantification of cardiac images focusing on the left ventricular myocardium: specifically providing quantitative myocardial blood flow measurements for CT images, including the ability to identify areas of decreased perfusion within the myocardium that may represent ischemia. The application supports axial, ECG-gated CT images, consisting of multiple time shots of the same myocardial region over time. CT DMP displays the results as a composite image (single image that is calculated from a set of time course images at a single location).



Evaluate plaque risk

CT Cardiac Plaque Assessment includes robust capabilities allowing quantification and characterization of coronary plaque from multidetector computed tomography (MDCT) data. This application gives the clinician the capability to assess plaque sites.

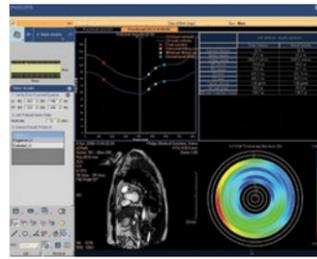


One-click 3D calcium segmentation

CT Calcium Scoring rapidly quantifies coronary artery calcifications (CAC) and includes mass, Agatston score, and volume scores. It enables paper or electronic results distribution of automated, customizable reports.

“CT TAVI Planning is outstanding – it delivers good segmentation and it’s easy to edit the automatic results for fine landmark positioning.”

Professor Philippe Douek
Hospices Civils de Lyon, France



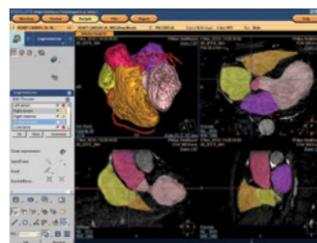
Detailed quantification of cardiac function

MR Cardiac facilitates easy visual scoring in various examination contexts. The package enables comprehensive functional volumetric analysis for the ventricles, e.g. w/o papillary muscle corrections, segmentations for generation of global functional parameters such as wall motion, thickness and thickening. Furthermore, identification of spatial enhancement based on intensity signal changes is included while bookmark functionality 'frames' any view on the data that is relevant for saving or communicating to other physicians.



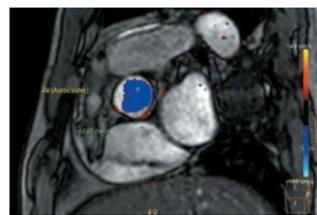
Assessing temporal enhancements of the myocardium

MR Cardiac Temporal Enhancement facilitates myocardial analysis of dynamically resolved cardiac data (multi-slice, dynamics) and enables comparison of rest and stress studies. Results are presented using either the AHA standardized or adapted bull's eye views. The package includes a correction algorithm and manual tools to correct frame-to-frame heart displacements caused by breathing.



Detailed 3D visualization of the segmented heart

MR Whole Heart performs automated segmentation of the heart into individual segments such as left-ventricle, right-ventricle, atria, and coronaries. Results can be presented in a high-quality 3D rendering.

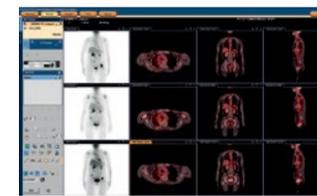


Visualizing and quantifying blood flow dynamics

MR QFlow enables review of QFlow data. The tooling creates 2D color flow overlay maps on anatomical references, e.g. to be used to calculate stroke volumes. The package includes automatic vessel contour detection for large vessels to quickly analyze vessel flow. Background correction allows for offset correction required for QFlow data of certain MR vendors.

“The IntelliSpace Portal MR Cardiac package is used on all our MR cardiac cases, and we feel it supports us in delivering analyses of **consistently high quality.**”

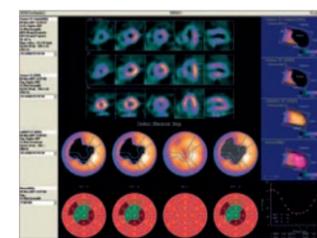
*Dr. Vimal Raj
Narayana Hrudayalaya Hospitals, India*



Enterprise-wide NM review

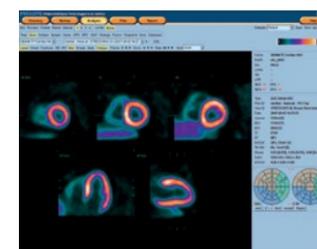
NM Viewer provides a powerful yet simple to use MI and multi-modality image review and analysis environment for clinical evaluation of MI planar, SPECT, SPECT/CT, PET/CT, and PET/MR examinations. The application offers:

- The ability to add studies to the review list and batch viewing
- MPR, MIP and fused 3D volume display
- Slab Viewer to view oblique slices
- 2D and 3D SUV measurements: SUV Body Weight, SUV Lean Body Mass, SUV Body Surface Area, and SUV Body Mass Index Automated 3D segmentation of lesions based on SUV value or percentage of SUV max, and the ability to export 3D contours in DICOM-RT Structure Set format to radiation therapy planning systems
- A layout editor for personalized display



SPECT and PET cardiovascular quantification, review and reporting

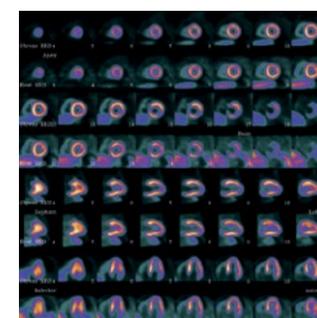
Corridor4DM⁶ⁱ v2013 is designed for advanced cardiovascular quantification and image display and includes intelligent workflow and quality assurance measures for increased confidence. Quantify myocardial perfusion, function, and viability using multiple review screens, with integrated reporting through customizable templates. Corridor4DM⁶ⁱ v2013 also includes CT coronary calcium scoring to enhance diagnostic confidence. Now includes coronary flow reserve measurements.



Advanced cardiac quantification

Developed at Cedars-Sinai Medical Center in Los Angeles, California, **Cedars-Sinai Cardiac Suite 2013** provides comprehensive cardiac quantification tools for gated, perfusion, and blood pool SPECT, and quantitative PET. Widely accepted by clinicians worldwide, the Cedars-Sinai Cardiac Suite 2013 application provides efficient workflow for study interpretation with exclusive integration of perfusion and function.

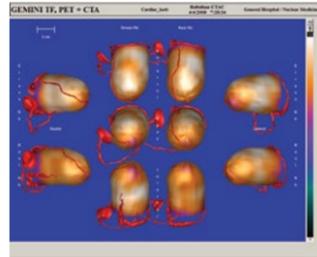
- Quantitative gated SPECT (QGS)
- Quantitative perfusion SPECT (QPS)
- Quantitative blood-pool SPECT (QBS)
- Quantitative PET (QPET)
- CT Fusion
- DICOM Multiframe Secondary Capture (MFSC)



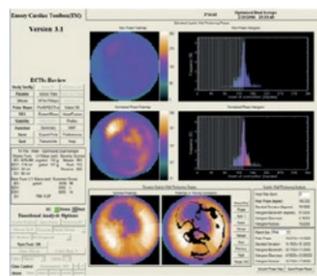
Cardiac analysis

The Emory Cardiac Toolbox (ECTb)⁷ⁱ v4.0 provides advanced tools for cardiac SPECT and PET analysis including comparison of perfusion to viability data, display of 3D images with coronary overlays and gated 3D cine, normal limits for agent match/mismatch, and optional phase analysis for wall motion and evaluation of thickening.

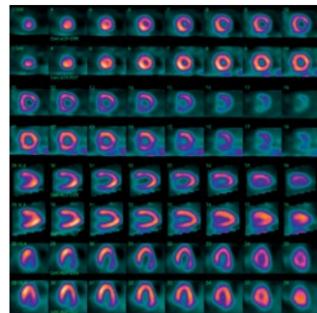
- Normal limits for rubidium, ammonia, and FDG protocols
- Ability to display endocardial and epicardial edges on gated images
- Ability to add user-defined normal files to the toolbox



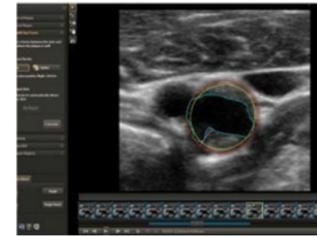
Evaluate fused coronary anatomy
ECTb HeartFusionTM tool offers fusion of a patient's coronary tree from cardiac CT angiography with Molecular Imaging perfusion images to correlate stenosis with perfusion defects and identify muscle mass at risk.



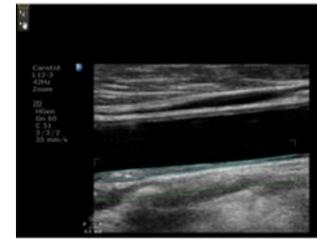
Assess cardiac mechanic dyssynchrony
ECTb SyncToolTM provides an objective evaluation of left ventricular (LV) dyssynchrony using phase analysis. It also provides the cardiologist with additional prognostic information that can be obtained from 3D perfusion images, such as the presence and location of scar tissue. The SyncTool review screen includes phase polar maps, phase histograms, and a summary of systolic wall thickening analysis including peak phase and standard deviation of the phase distribution.



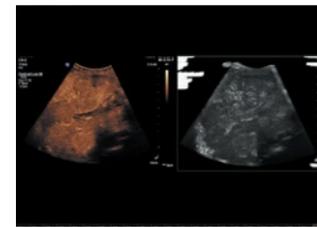
Enhance SPECT resolution and reduce scan times
NM Astonish Reconstruction is an advanced reconstruction algorithm that uses a Philips-patented matched dual filtering technique to minimize noise and improve reconstructed image resolution and uniformity. Additionally, a CT attenuation map can be used in conjunction with Astonish to provide attenuation correction. By improving signal-to-noise ratio, it can provide equivalent image quality with shortened SPECT scan times, to achieve increased throughput, enhanced patient comfort and reduced motion-induced artifacts. Astonish Reconstruction Suite is compatible with the following Philips cameras only: CardioMD (acquisition software v2.x), Forte, BrightView, BrightView X, BrightView XCT, SkyLight and Precedence.



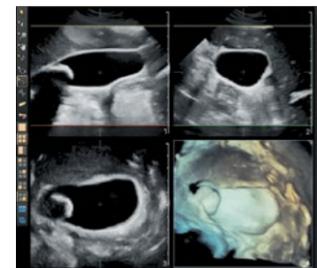
A novel measurement of atherosclerotic plaque volume
Ultrasound Q-App Vascular Plaque Quantification (VPQ) helps you perform comprehensive volume analysis for carotid plaque analysis, a significant indicator in cardiovascular disease. Automatically measure plaque composition throughout a captured volume, percent area vessel reduction and other characteristics using 3D technology. Results may be posted to patient exams.



Help determine cardiovascular disease risk
Ultrasound Q-App Intima Media Thickness (IMT) provides easy and consistent measurement of intima media thickness in carotids and other superficial vessels. Report IMT values and appended to patient reports.

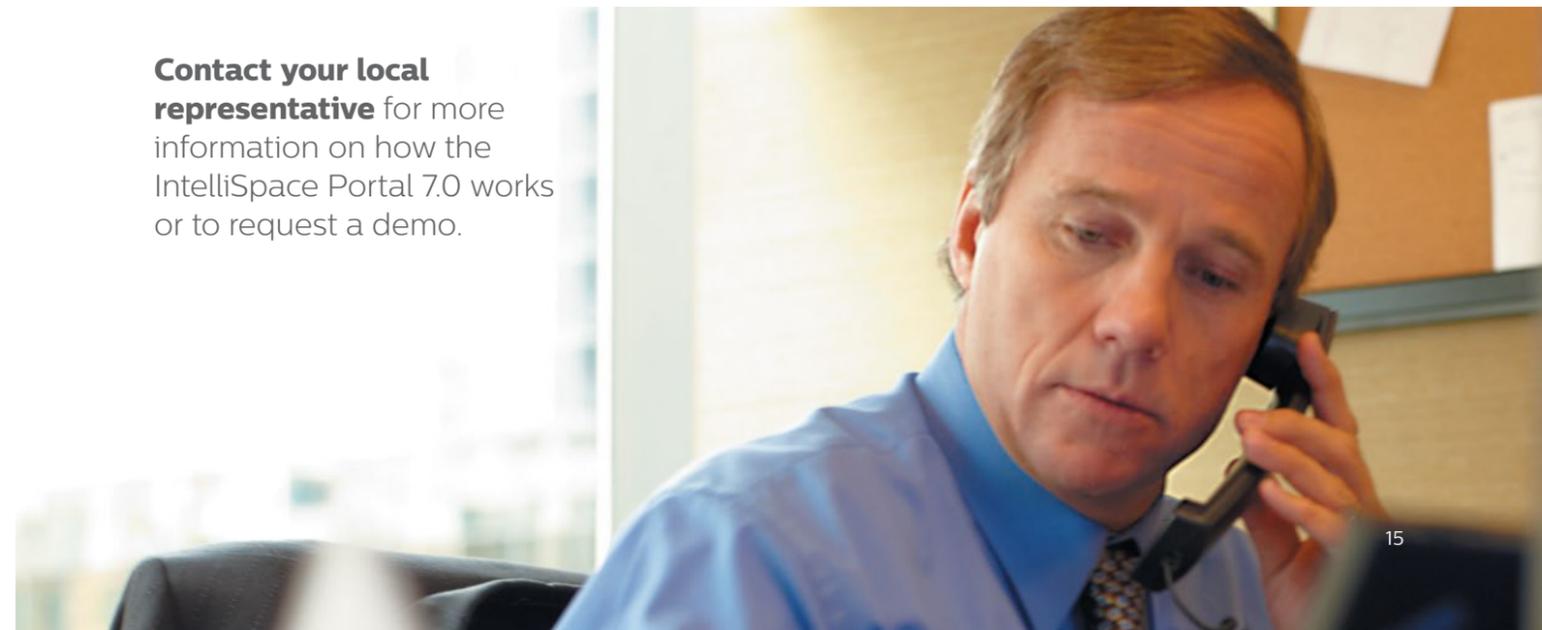


Enhanced vessel conspicuity
Ultrasound Q-App Microvascular Imaging (MVI) allows you to map contrast agent progression with contrast enhanced ultrasound (CEUS) for tumor assessment and monitoring.



Perform advanced visualization and quantification of ultrasound volume
US Q-App GI 3DQ is designed to provide advanced viewing, manipulation, and quantification of 3D data sets. Users can perform advanced functions such as MPR interrogation, iSlice tomographic imaging, and volume rendering. Clinicians can also perform volumetric measurements using multiple methods including semi-automated tools. Results generated from this tool can be appended to the patient's exam for complete documentation.

Contact your local representative for more information on how the IntelliSpace Portal 7.0 works or to request a demo.



References

- ^[1] Pate MR, et. Al, "Low Diagnostic Yield of Elective Coronary Angiography," New England Journal of Medicine, 362:10, 886-895, March 11, 2010
- ^[2] <http://www.ncbi.nlm.nih.gov/pubmed/23238153> (accessed August 2, 2014)
- ^[3] <http://www.ncbi.nlm.nih.gov/pubmed/24215196> (accessed August 2, 2014)
- ^[4] Please contact your local Philips representative for details on multi-vendor coverage
- ^[5] Web Collaboration enables viewing and sharing with tablets and smartphone devices – not intended for diagnosis
- ^[6] Corridor4DM is a registered trademark of Invia, LLC.
- ^[7] Emory Cardiac Toolbox (ECTb), HeartFusion, and SyncTool are registered trademarks of Emory University
- ^[8] CAD functionality is not for sale in the US
- ^[9] Together with Enhanced Zero-click Performance option

