

TECHNOLOGICAL EXPERTISE

Medical imaging software involving cardiology diagnosis and treatment are continually updated to reflect the latest developments in centralized quantitative image analysis.

UNITED STATES

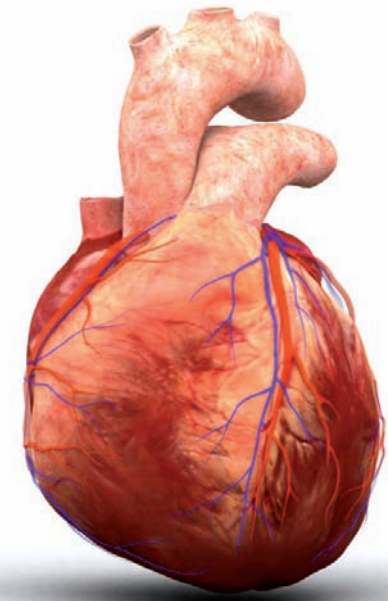
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BIOCLINICA PROVIDES QUANTITATIVE ANALYSIS IN THE FOLLOWING IMAGING MODALITIES:

BIOCLINICA™
Global clinical trial solutions. Real-world results.

CARDIOLOGY

Expertise

- ② Computed Tomography Angiography (CTA)
- ② Echocardiography
- ② Intima-Media Thickness (IMT)
- ② Intra Vascular Ultrasound (IVUS)
- ② Cardiac Magnetic Resonance Imaging (MRI)
- ② Magnetic Resonance Angiography (MRA)
- ② Quantitative Cardiovascular Angiography (QCA)
- ② Quantitative Vascular Angiography (QVA)
- ② Single Photon Emission Computed Tomography (SPECT)

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BIOCLINICA™
Global clinical trial solutions. Real-world results.

BIOCLINICA HAS EXTENSIVE EXPERIENCE IN THE FOLLOWING MODALITIES INCLUDING:

COMPUTED TOMOGRAPHY ANGIOGRAPHY (CTA) is an emerging technique for visualization of arteries. Utilizing 3-D reconstruction of the vessel, quantitative analysis is performed on the aorta, iliac and carotid arteries. Output from the analysis includes minimal lumen diameter, percent diameter stenosis and lesion length.

ECHOCARDIOGRAPHY utilizes automated contour detection software used for the quantitative analysis of image sequences. This software is used to study segmental wall motion and help detect abnormalities of the left heart chamber. In addition, left ventricular ejection fraction (LVEF), left ventricular mass and end-diastolic and end-systolic volumes can be measured.

INTIMA-MEDIA THICKNESS (IMT) is measured precisely utilizing sophisticated software analysis packages for atherosclerotic plaques. We recommend carotid images are acquired with ultrasound using the Meijers Arc, which is a device with predefined angles. This ensures image acquisition reproducibility to longitudinal assessments during clinical trials. This approach has shown to be extremely useful in multi-center studies.

INTRAVASCULAR ULTRASOUND (IVUS) is a catheter-based ultrasound probe provides tomographic images of both the arterial wall and the lumen of a coronary or vascular vessel segment. BioClinica employs state-of-the-art software specifically designed for 3-D analysis of the vessel, lumen and stent contours (if applicable).

CARDIAC MRI employs dedicated Medis MRI software allowing us to evaluate cardiac function. Global and regional left ventricular functional parameters such as ejection fraction, left ventricular mass, wall motion and thickening are examples of analysis results. In addition, results on perfusion, infarct size and myocardial viability can be obtained from time-intensity or delayed enhancement studies.

MAGNETIC RESONANCE ANGIOGRAPHY (MRA) provides quantitative analysis to assess the effects of lipid lowering drugs on the regression or progression of arteriosclerosis, the efficacy of interventional techniques and the evaluation of MRA contrast media. BioClinica provides analysis involving automatic contour detection in 3-D reconstructions of the vessel of interest.

QUANTITATIVE CARDIOVASCULAR ANGIOGRAPHY (QCA) enables the analysis involving the assessment of progression and regression of stenosis in drug trials and device studies. QCA is commonly applied in trials investigating stents in the treatment of coronary artery disease. Software developed by Medis is used for QCA and QVA analysis.

QUANTITATIVE VASCULAR ANGIOGRAPHY (QVA) employs validated software with audit trails used for quantitative vascular analysis of DICOM and plain film images for both subtracted and non-subtracted.

SINGLE PHOTON EMISSION COMPUTED TOMOGRAPHY (SPECT) is a nuclear medicine imaging technique used for the quantitative analysis of coronary artery disease and assessment of the extent and severity of myocardial perfusion abnormalities. Additional analyses can also be performed to determine global and regional function of the ventricle in addition to regional myocardial perfusion.

CARDIOLOGY EXPERTISE

BioClinica has extensive experience involving the management and analysis of images for cardiovascular clinical trials. We have completed 80 trials in a variety of indications including:

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|--------------------------|--------------------------|------------------------------|-----------------------------|----------------|
| Acute Coronary Syndromes | Congenital Heart Disease | Hypertension | Myocarditis | Stroke |
| Aneurysms | Congestive Heart Failure | Interventional Devices | Peripheral Artery Disease | Vascular Stent |
| Angina | Coronary Artery Disease | Left Ventricular Dysfunction | Peripheral Vascular Disease | |
| Brachytherapy | Drug Eluting Stents | Mitral Valve Prolapse | Stem Cell Therapy | |
| Cardiac Transplant | Hypercholesteremia | Myocardial Infarction | Stenosis | |