

Meet Today's Challenges in Cardiovascular Patient Management and Healthcare with EchoInsight®: A Business Case

Improve Patient Continuum of Care, Standardize Functional Analytics and Better Monitor Patients

With an aging population, increased obesity and other growing clinical indications, health systems have seen an increased occurrence of cardiovascular disease. A high percentage of these cases are patients ultimately diagnosed with heart failure, degenerative valve disease and atrial fibrillation. Today's challenges, along with changes in healthcare economics and standards, require efficient and effective diagnostic solutions. These solutions must deliver health systems with tools to provide better patient care through improving quality, risk stratification and workflow while reducing patient readmissions, adding longevity to existing equipment, and standardizing across equipment vendor types and lowering costs.

The Value of Speckle Tracking (Strain Imaging)

Tremendous research has shown that speckle tracking strain imaging can improve diagnostic assessment, standardize interpretation and assist in improving the monitoring of patients over time to optimize care. Additionally, strain imaging is a much more sensitive and less variable measurement than gold standard measurements like EF, making it increasingly important. (EF can demonstrate >15% in variabilityⁱ, where a variety of studies are demonstrating strain imaging can be less than 7% in variability.)

Recent Developments Supporting Strain Imaging for Clinical Use:

- [ASE chamber quantification guidelines](#) now recommend strain imaging when assessing function.
- [ASE recommendations for assessment and monitoring with echo of cardio oncology patients](#) indicate strain imaging should be monitored in this patient population.
- [ACVI/ASE/Industry Task Force standards for 2D speckle tracking](#)
- Increasingly, studies show that assessing and monitoring strain imaging may improve quality of patient care and reduce costs with patient readmissions.ⁱⁱ
- A New category III CPT code for myocardial strain imaging (0399T) is now available. (January 1, 2016)

Although strain imaging has proven to be valuable in the assessment and management of patients with echo, until now, diagnostic software solutions with strain imaging have been research-oriented, laborious and workflow inefficient in clinical practice.

The Power of EchoInsight

By delivering valuable echocardiographic analysis tools designed to transform patient management, EchoInsight with strain imaging is improving diagnostic confidence, standardization and efficiency. Designed for the clinical environment, EchoInsight visualization and analysis meets today's clinical needs and healthcare system challenges. EchoInsight offers fast, intuitive, and reliable clinical applications for improved echo analysis, interpretation and patient trending in a vendor neutral platform. At its core is Epsilon Imaging's proprietary speckle tracking technology, TissueTrack[®], providing robust strain imaging with automation of cardiac measurements. EchoInsight seamlessly integrates into healthcare IT infrastructure as a DICOM compliant system with structured reporting.

Designed for the clinical environment, EchoInsight visualization and analysis provides:

- Clinical strain imaging for improved confidence in assessment and monitoring of wall mechanics for the entire heart
- Semi-automated linear, volumetric and area measurements for improved efficiency and standardization based on ASE guidelines



- *The EchoInsight RV application has demonstrated to save 3.5 minute per study when providing analysis of FAC, TAPSE and basal and mid-cavity diameters and length compared to conventional methodsⁱⁱⁱ*
- *The EchoInsight LV application has demonstrated to save 1 minute per study when providing analysis of volumes and EF with strain when compared to conventional methods.^{iv}*
- Easy to use features and clinical applications for fast analysis
- Rapid study comparison capabilities for comprehensive assessment and monitoring of patient studies
 - *A study indicated that compared to another commercial vendor, EchoInsight can save ~12 minutes per study when conducting serial comparison with strain imaging^v*
- Available as a stand-alone workstation or client-server architecture
- DICOM structured reporting for streamlined patient management with HIT
- Vendor neutral platform
- Premier consultative customer support



EchoInsight and its Clinical Value-Add: Snapshot

EchoInsight and Heart Failure (Cardio Oncology)

An NIH reported that in 2013 of the 25 million echo studies conducted in the United States, over half of those studies were to assess and monitor heart failure. Throughout the last decade or more, the medical community has seen an increased occurrence of cardiotoxicity in patients undergoing cancer treatments (i.e. chemotherapy, radiation). There is a need to identify cardiotoxicity early and to protect the heart with medications. Strain imaging has been shown in research to give clinicians information of change in heart function sometimes up to three months sooner than EF. ^{vi}

In the September issue of the Journal of the American Society of Echocardiography, Juan Carlos Plana, et al. published “Expert Consensus for Multimodality Imaging Evaluation of Adult Patients during and after Cancer Therapy: A Report from the American Society of Echocardiography and the European Association of Cardiovascular Imaging.” ^{vii} These recommendations include echocardiographic assessment and monitoring of the heart using strain imaging for improved detection and management of oncology patients at risk for cardiotoxicity. These new recommendations include 2D echo assessment and monitoring of LV using EF and

strain imaging echo, along with RV using TAPSE, S' and FAC for improved management of oncology patients at risk for cardiotoxicity.

The Cardio-Oncology Patient Challenges

- Need for standardized, fast approach for echo analysis and trending
- Reliable analysis of heart mechanics
 - LV longitudinal strain, EF
 - RV TAPSE, S', FAC
- Customized metrics and trending for patient population to assist in improved patient management as the echo studies are performed routinely

Echolnsight Improves Patient Management With Cardio-Oncology Patients

- Quality
 - Clinical strain imaging (GLS and regional) with bull's eye visualization and data
- Standardization
 - Automated LV EF, linear and volumetric and RV linear and area, along with TAPSE, S', FAC measurements
 - Vendor neutral platform
- Workflow and Patient Management
 - Fast and intuitive
 - Rapid serial study comparison
 - DICOM structured reporting

A study published in Computing in Cardiology in 2013 from a team at University of Chicago Medicine demonstrated improved quality, standardization with time savings when using Echolnsight for monitoring of patients.^{viii}

Increasing research supports Echolnsight for use with detection and monitoring of heart failure in patients for improved analysis and interpretation.^{ix}

Echolnsight and Degenerative Valve Disease

Degenerative valve disease affects 4-5 percent of the general population. Over time, the attachments of the valve thin out or rupture and the leaflets become floppy and redundant and this can lead to leakage through the valve. If untreated, regurgitation occurs. Additionally, stenosis may occur increasing the risk of blood clots and causes the heart to work harder.

The Degenerative Valve Disease Patient Challenges

- Need for standardized, fast approach to echo analysis and trending
- Reliable analysis of heart mechanics
 - LV EF, and mass, linear and volume measurements
 - RV TAPSE, S', FAC, and linear and area measurements
 - LA and RA volume and linear measurements
- Customized metrics and trending for patient population to assist in improved patient management
 - Echo performed pre and post TAVR, and per ASE protocol

Echolnsight Improves Patient Management With Valve Disease Patients

- Quality
 - Clinical strain imaging
- Standardization
 - Automated LV EF and linear, mass and volumetric, RV TAPSE, S', FAC and linear and area measurements. LA and RA volume and linear measurements are also available.
 - Vendor neutral platform
- Workflow



- Fast and intuitive
- Rapid serial study comparison
- DICOM structured reporting

EchoInsight and Atrial Fibrillation

Atrial Fibrillation occurs when rapid, disorganized electrical signals cause the atria to contract fast and irregularly. Blood can pool in the atria and may not be pumped completely into the ventricles. Atrial Fibrillation may be asymptomatic, and stroke and heart failure risk increase with condition.

The Atrial Fibrillation Patient Challenges

- Need for standardized, fast approach to analysis and trending
- Reliable analysis of heart mechanics
 - LV EF, and mass, linear and volume measurements
 - RV TAPSE, S', FAC, and linear and area measurements
 - LA and RA volume and linear measurements
- Customized metrics and trending for patient population to assist in improved patient management
 - Echo performed routinely based on protocol

EchoInsight Improves Atrial Fibrillation Patient Management

- Quality
 - Clinical strain imaging
- Standardization
 - Automated LV EF and linear, mass and volumetric, RV TAPSE, S', FAC and linear and area measurements. LA and RA volume and linear measurements are also available.
 - Vendor neutral platform
- Workflow
 - Fast and intuitive
 - Rapid serial study comparison
 - DICOM structured reporting

In 2015, a study was presented at ACC 2015 by a University of Michigan team showing EchoInsight left atrial strain to be predictive of atrial fibrillation recurrence in patients with paroxysmal atrial fibrillation and preserved ejection fraction.^x

Epsilon Imaging is committed to partnering with customers to meet today's clinical challenges in cardiovascular patient management. EchoInsight is an innovative software platform that is uniquely dedicated to optimizing strain in clinical practice with easy to use applications based on guidelines, semi-automation of measurement, ability to analyze the whole heart and has serial comparison capabilities for improved patient management. Let's partner and improve patient care, standardize functional analytics with strain imaging and better monitor patients with EchoInsight. Learn more at www.epsilon-imaging.com.

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