Application Note

Vevo® 3100   Vevo® LAB

An overview of features and data analysis tools for Cardiovascular Research with the **Vevo 3100** Imaging System and **Vevo LAB** analysis software

MKT02626 Application Note: An overview of features and data analysis tools for Cardiovascular Research with the Vevo 3100 Imaging System and Vevo LAB Analysis Software Rev 1.0

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FUJIFILM VisualSonics Value Proposition for Cardiovascular Research

With the Vevo Imaging Systems, researchers have access to an advanced solution to visualize small animals in real time and *in vivo*. It has been demonstrated by Loveless *et al.* that micro-ultrasound produces images eclipsing MRI resolution, and that the two imaging systems can be combined to validate each other's results.[10] Furthermore, micro-ultrasound has the highest temporal resolution among all available *in vivo* modalities, and with frame rates of over 400 frames per second in B-Mode and over 1000 frames per second in EKV (ECG-Gated Kilohertz Visualization), enables visualization and tracking of fast moving cardiac tissue, wall motion analysis, blood flow and tissue velocity analysis, strain and strain rate quantification which are key methodologies in any comprehensive cardiovascular study.

This is a summary of the unique value proposition FUJIFILM VisualSonics has for Cardiovascular researchers with the **Vevo 3100** micro ultrasound system and the **Vevo LAB** analysis software:

Ergonomic Design:
o   Smaller and easier to store and move system

o   Smaller and lighter transducers

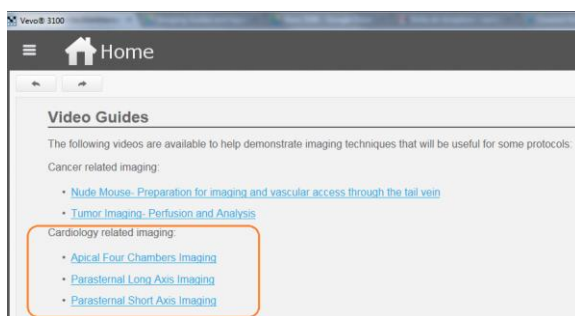o   Adjustable sound controls and brightness for the Control Panel in various imaging environments

High-throughput imaging:
o   Touch screen Control Panel: easy to customize interface according to user's preferences;

o   Application and Presets configuration can be user defined and modeled according to predefined imaging protocols;
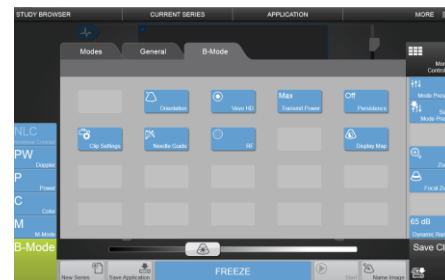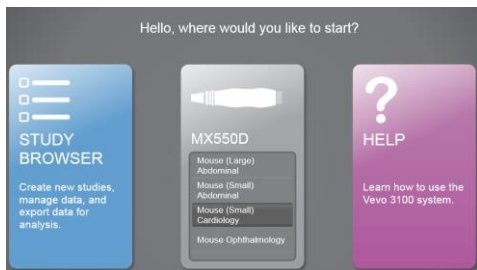
On board Vevo 3100 education material:
o   Imaging Guides and videos available from the Education section

Dedicated animal physiology monitor:
o   ECG trace, HR, Temp, and Respiration

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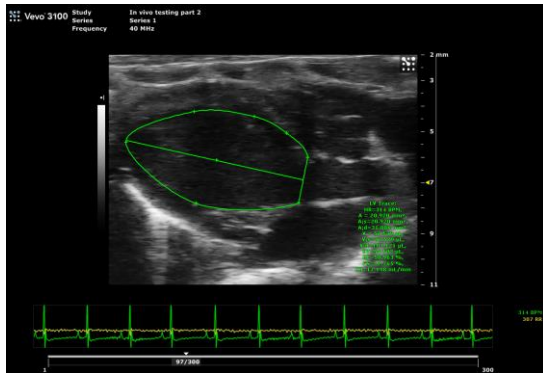
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FUJIFILM VisualSonics Value Proposition for Cardiovascular Research

Cardiac Performance – Drug Development, Myocardial Overload Models: View of the Left and Right ventricles in B-Mode, M-Mode and PW Doppler Mode and evaluation of size and performance. Measurements and Calculations: **LV Area, Volume, Fractional Shortening, Ejection Fraction, Stroke Volume and Cardiac Output, Right Ventricular Output, Pulmonary Valve Diameter.**

LV Function

Parasternal Long Axis View: automatic trace measurements

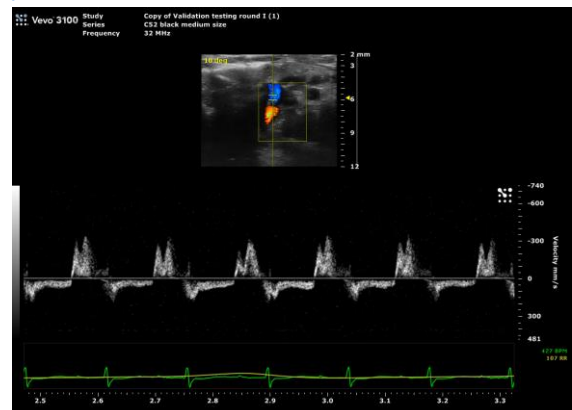Parasternal Short Axis View: automatic trace measurements
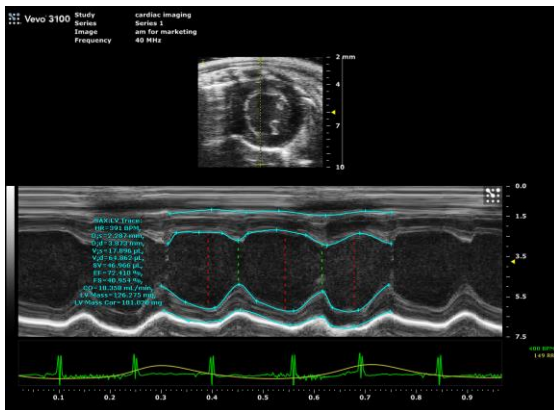
Suprasternal View, Ascending Aorta: VTI measurements

RV Function

View of the Right Atrium and Ventricle from a modified PLSAX

Tricuspid Valve flow
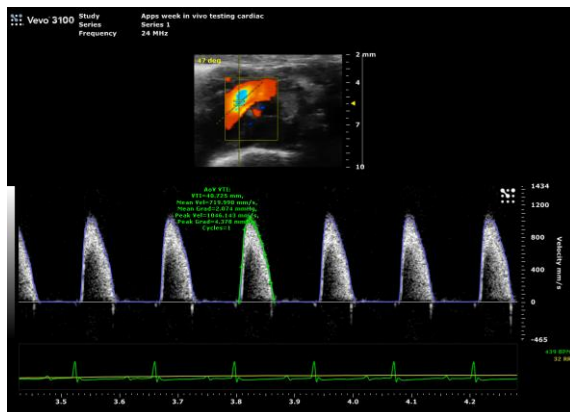
Pulmonary Artery flow and VTI measurements

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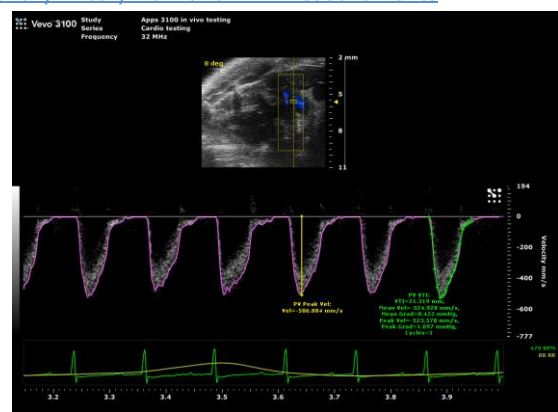
Arterial Occlusive Models: Anatomical and functional biomarkers can be visualized and quantified for interventional investigation.

Aortic Arch
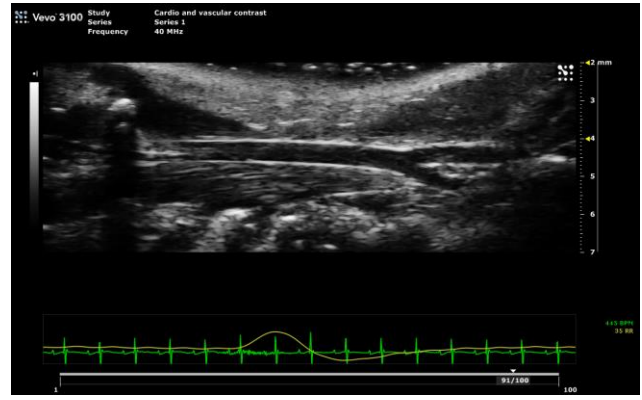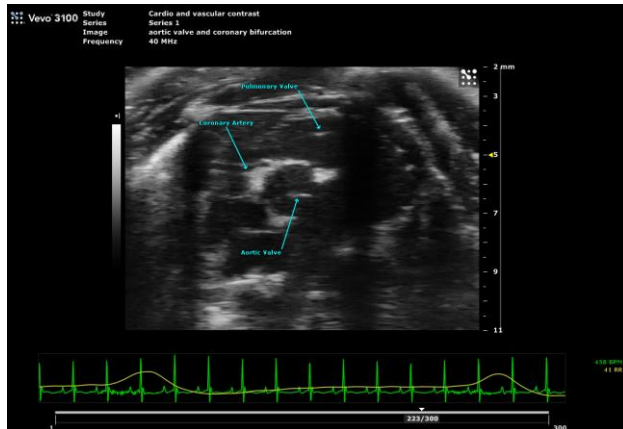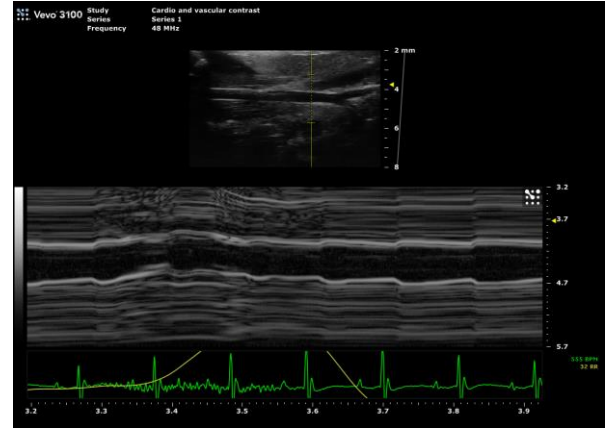
B-Mode visualization – sagittal plane

B-Mode visualization, aortic root – transverse plane

Vascular Strain analysis of the Aortic Arch with Vevo Vasc*

Carotid Artery

B-Mode LCCA – longitudinal plane and the bifurcation

M-Mode LCCA – motion analysis in the longitudinal plane
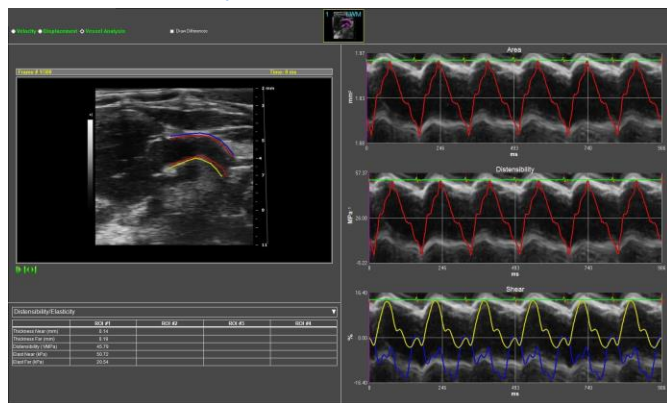
ILCA flow – PW Doppler Mode with VTI measurement

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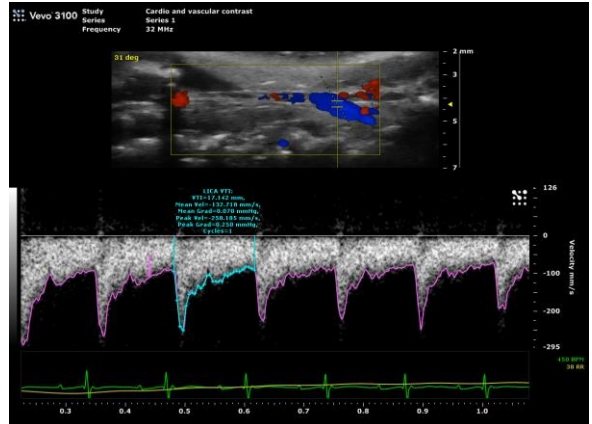
Pressure Overload Models (LAD/TAC): Coronary artery visualization and analysis, and Strain and Strain Rate analysis. The Vevo Strain* and Vevo Vasc* Software Analysis applications are very easy to use and very sensitive to changes in the cardiovascular system, providing a valuable tool to researchers assessing cardiovascular risk in diabetes, CKD and muscular dystrophy.

Coronary Artery

B-Mode visualization – sagittal plane
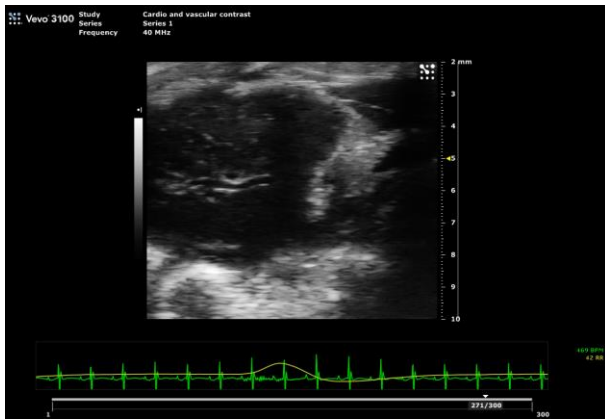
PW Doppler Mode flow – sagittal plane
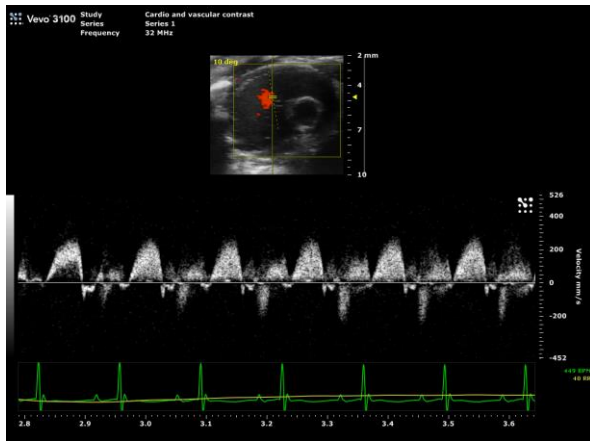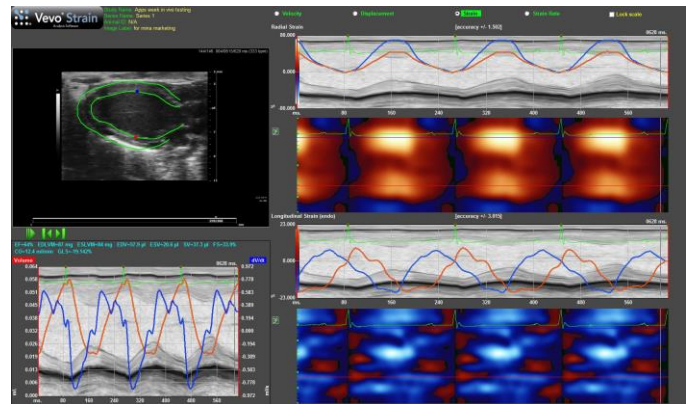

Vevo Vasc* Vessel Analysis on the Coronary Artery

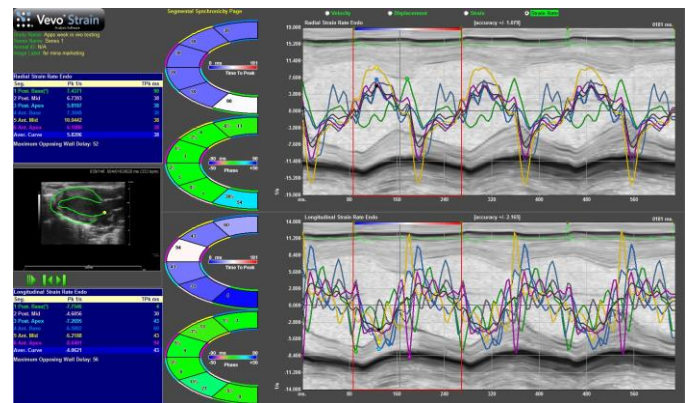## Strain and Strain Rate analysis

Strain analysis for the Parasternal Long Axis View

Calculated values in the Longitudinal and Radial directions for:

o   Velocity
o   Displacement
o   Strain
o   Strain Rate
o   Left Ventricular Volume and Volume derivative
o   EF, FS, SV, CO

o   Segmental Syncronicity

Vevo Vasc and Vevo Strain are available in Vevo LAB

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FUJIFILM VisualSonics, Inc.
T.1.416.484.5000
Toll Free (North America) 1.866.416.4636
Toll Free (Europe)   +800.0751.2020
E. info@visualsonics.com
www.visualsonics.com