HITACHI
Inspire the Next

ARIETTA 70

NEXT GENERATION ULTRASOUND SYSTEM
For Cardiovascular

Hitachi Aloka Medical America, Inc.

Ultrasound Solutions Clearly Defined™

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ARIETTA 70 Overview

Hitachi Aloka pioneered ultrasound for use by cardiologists and we continue to lead the way with major innovations. Recognized for our superior image quality & Doppler performance, outstanding system reliability and advanced transducer technology, Hitachi Aloka remains the standard in the field of ultrasound.

Hitachi Aloka's commitment and dedication to cardiology allows us to offer a wide range of consoles and specifically designed transducers to meet the needs of every cardiologist.

The Most Advanced Hemodynamic Capabilities:

- Dual Gate Doppler enables observation of Doppler waveforms at 2 points from the same cardiac cycle
  - PW/TDI- for AF patients
  - PW/PW- IRT measurement in a real time
  - TDI/TDI- watch synchronization imperfection in a real time aspect of a TDI wave pattern
- Vector Flow Mapping can visualize blood flow in the heart and vessels as velocity vectors
- eTracking provides multiple parameters necessary for early-stage detection of atherosclerosis
- Wave Intensity is a new hemodynamic index that provides information about the dynamic behavior of the heart and the vascular system and their interaction

Hitachi Aloka's premium level cardiology systems provide:

- Extraordinary high-resolution digital imaging with single crystal transducers
- Speckle reduction and edge enhancement technologies providing clearly defined images
- Eyeball EF calculates a Biplane EF from automatic traces of endocardium on both apical 2 and 4 chamber images
- Broadband harmonics offering significantly enhanced sensitivity and axial resolution
- Natural Ergonomics design for reduction of muscle loading while scanning
- User defined and customizable study protocols guaranteeing exam consistency
- Real-time Virtual Sonography blends and overlays CT/MR images with ultrasound images

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IMAGE TECHNOLOGY & ERGONOMICS

Compound Pulse Wave Generator (CPWG+)

The most advanced broadband beam-forming technology combined with high speed image processing that allows for higher definition ultrasound imaging than ever before.

Symphonic Technology

Provides high quality imaging using an expanded range of harmonic signals. This technology results in excellent image resolution and sensitivity and improved penetration.

HI REZ

Clearly displays differences in tissues, reducing speckle noise while maintaining the frame rate. It can also display outlines more clearly by selectively emphasizing boundaries.

Compound Imaging

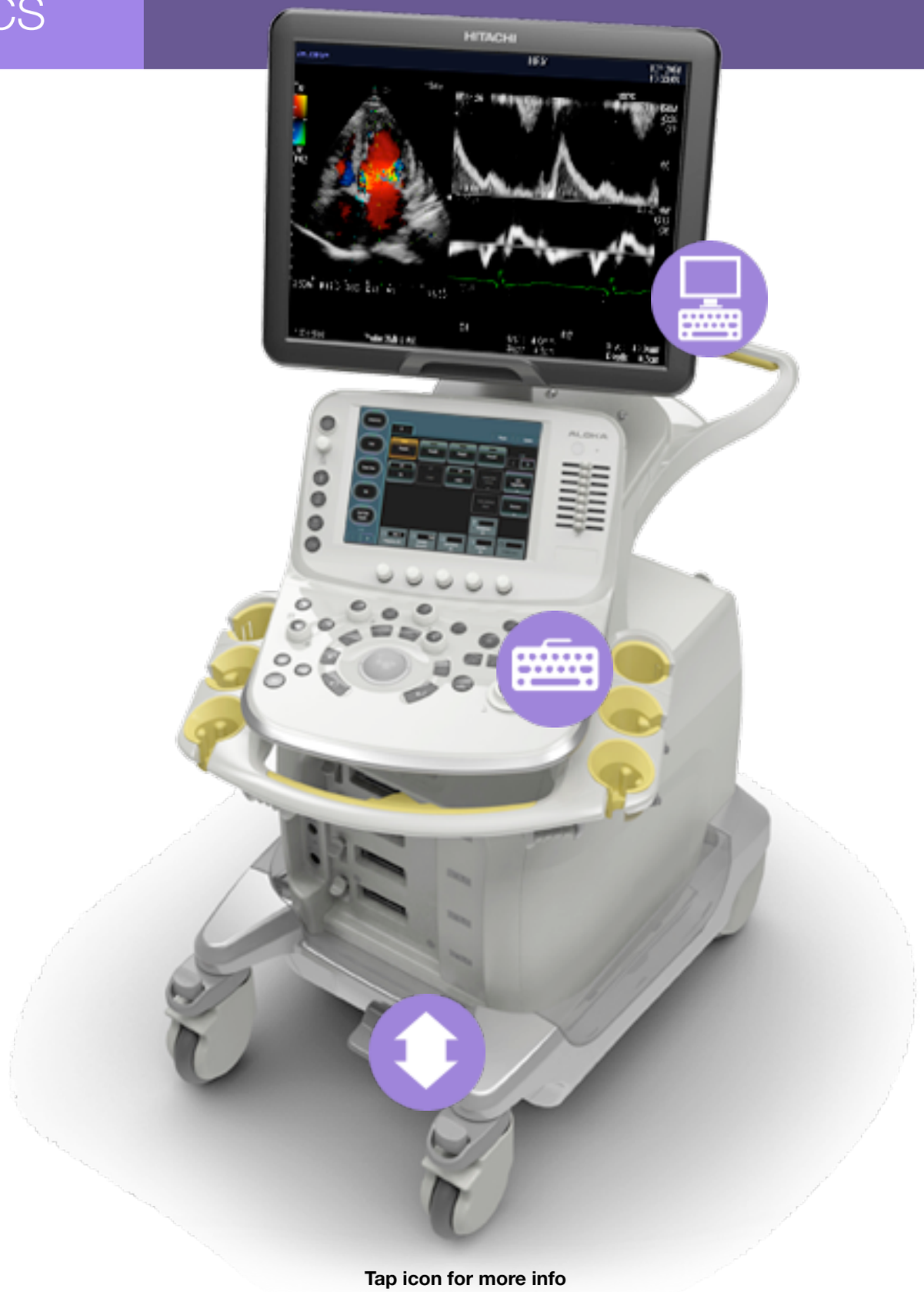
The ultrasound beam is transmitted and received in real time and in the multiple directions resulting in a reduction of speckle noise, suppression of artifacts, and improvement of contrast resolution allowing lesions to be clearly observed.

Image Optimizer

At the touch of a button the B-mode image is instantly optimized to the user's preference. This technology continually monitors the user's typical settings to optimally adjust the image when pressed resulting in less manual adjustments and more efficient examinations.

Single Crystal Probes

A single crystal is used to provide the piezoelectric elements of the probe. Single crystal technology achieves higher sensitivity and wider bandwidths over standard piezoceramics.



Tap icon for more info

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ARIETTA 70 Features

Dual Gate Doppler

The Dual Gate Doppler generates a full FFT analysis and display from two separate sample gates allowing measurements from two different locations, during the same cardiac cycle. For example:

PW/PW: LV inflow and PV flow - for pseudonormalisation assessment

PW/TDI: E-wave, A-wave and e'- E/e', as a way of evaluating diastolic dysfunction

TDI/TDI: septal wall TDI and lateral TDI - evaluation of cardiac resynchronisation therapy

2D Tissue Tracking (2DTT) utilizing speckle technology

It is very simple to set the contours of the myocardium with the 2DTT in order to fit the endo and epicardium and easily assess the parametric data and images. The 2DTT provides precise quantitative measurements and information such as:

Global Longitudinal Strain/Strain Rate and Radial Strain/Strain Rate Twist angle, displacement, wall thickening and various other parameters to visualize, quantify and analyze the myocardial mechanics.

Free Angular M-mode (FAM)

Three M-mode lines can be set at any position and angle simultaneously, thus eliminating the complications involved with usual ultrasound systems in getting accurate measurements when the conventional view cannot be acquired. Additionally, wall motion at different positions can be compared simultaneously, making it possible to accurately measure an eventual delay.

Strain/Strain Rate

Conventional cardiac function analysis is focused on diagnosis of global heart movement. By opposition, Strain quantifications aim is to analyse cardiac function more locally and sensitively by focusing attention on myocardium areas themselves.

Strain analysis is used to examine the cardiac function by measuring the elongation and shrinkage of the regional myocardium between two designated points. Strain analysis is attracting attention because it is less affected by translation and tethering for correct evaluation of myocardial motion.

You can carry on analysis while making sure that ROI position and Strain length are adequately set (therefore tracking of the “objective part”) and working by checking the ROI that automatically follows by velocity tracking and the SR marks.

Hitachi Aloka’s Velocity Tracking Algorithm to calculate STRAIN, based on the state of the art technology, makes it possible to automatically and easily track regional myocardium motion (Strain) while taking in consideration “twist” & “tethering” effects of the global heart movement.

Using line data (RAW), the TDI analysis software enables high frame rate for accurate analysis results.

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ARIETTA 70 Features (Cont.)

Directional *e*FLOW (D-eFLOW)

*e*FLOW is a high-definition blood flow imaging mode with drastically improved spatial and temporal resolution. In eFLOW it is possible to display blood flow information with higher sensitivity and resolution than with conventional methods.

This enables detailed observation of fine blood vessels such as those inside a tumor, which were difficult to display separately in conventional methods. *e*FLOW has a resolving power that can separately display the hepatic artery running alongside the portal vein.

In conventional Colour Flow and Power Flow, spatial resolution is low and sometimes blood vessels are displayed thicker than the actual size due to blooming and it was difficult to differentiate two thin blood vessels running in parallel.

In eFLOW, thanks to widened bandwidth of the ultrasound transmitter/receiver and reviewing processing method, a new blood flow imaging mode having high spatial resolution and high temporal resolution was realized. In addition *e*FLOW suppresses attenuation of the blood flow signal in each data processing, and enhances the processing to discriminate blood flow from tissue, enabling fine blood vessels including flow direction to be displayed, which is clinically useful.

Directional display, which is useful for identifying blood vessels, overcomes the problem of trade-off between high detectability of low velocity flows and aliasing. The directional *e*FLOW (D-eFLOW) offers blood flow information with high resolution by optimizing the transmission/reception sequence and the settings of color coding and others according to the purpose of the examination.

Stress Echo

The large capacity Cine Memory enhances the efficiency of the examination. You can capture moving images for approximately five continuous minutes in the standard display format. You can perform complex Stress Echo examinations smoothly by pressing a single switch to acquire series of images.

Dynamic images stored during stress echo examination can be analysed. It is possible to shuffle images and reproduce multiple images simultaneously. The user can also score and make a report while comparing images taken before and after stressing.

Auto IMT

The relationship between the presence of Carotid atherosclerosis with increased CIMT and coronary arteries disease is now well established. Our Automated IMT Measurement is an easy and simple non invasive tool to quickly assess the evaluation of the cardiovascular risk, at an early stage.

It is possible to automatically extract max IMT and mean IMT by simply setting the ROI (region of interest) on a long-axis view of the vessel. Equipped with an exclusive report function, multiple measurement values for each part and time phase, can be listed making comparison easier. The displayed items include: max, min, average, SD, points (How many points are used for the result), Width of ROI and Histogram.

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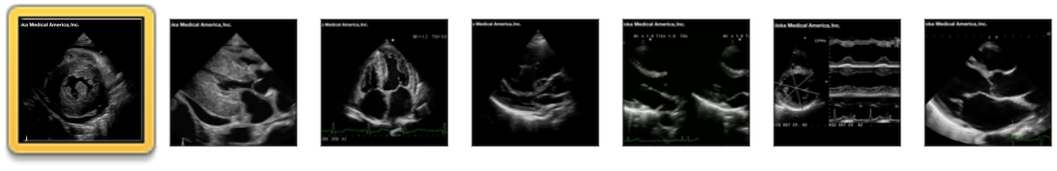
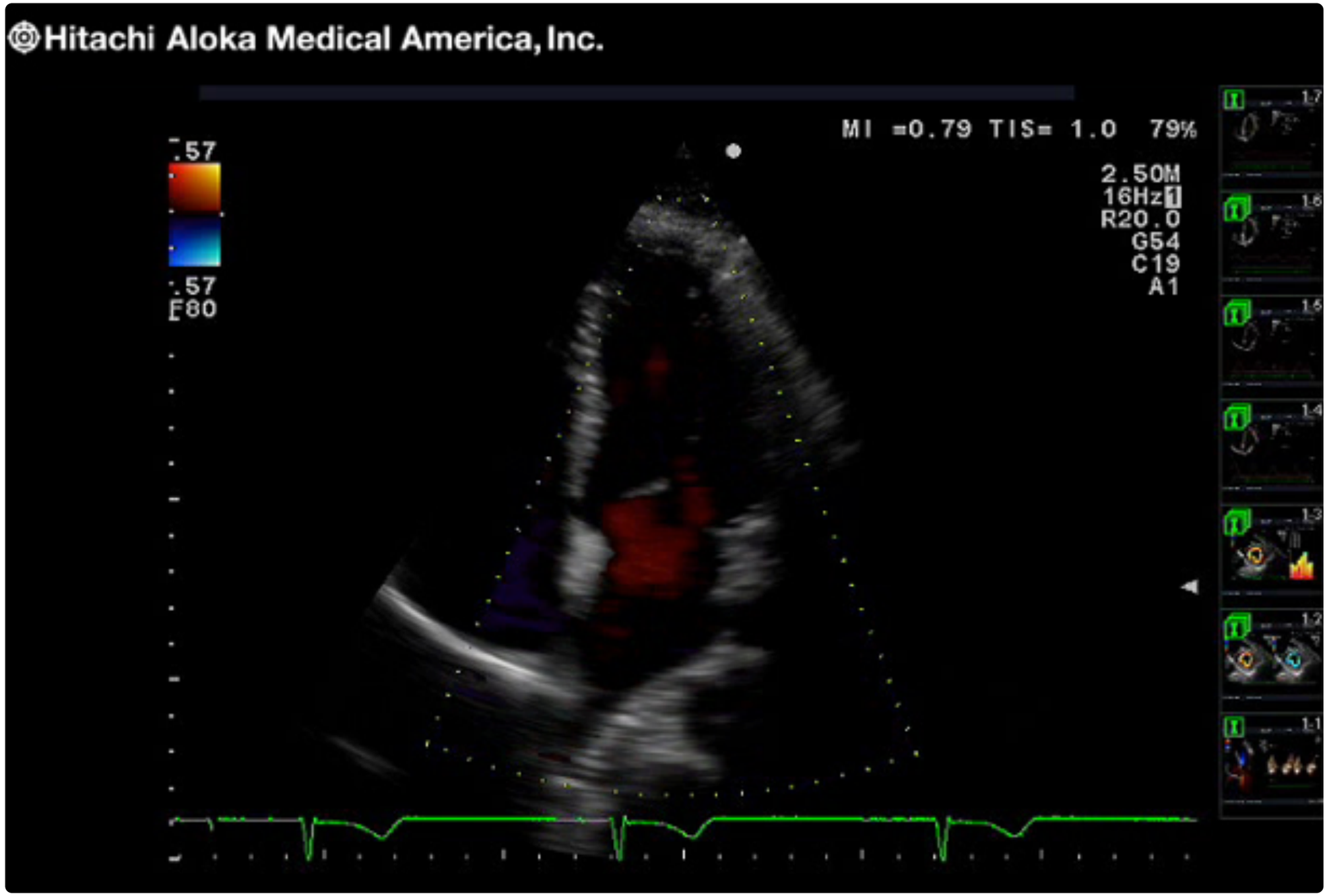
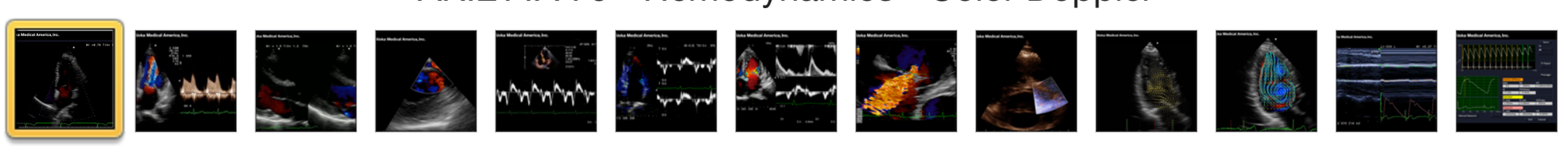
ARIETTA 70 - Anatomy - Hypertrophic cardiomyopathy

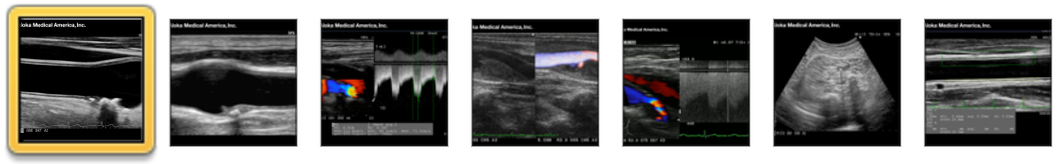


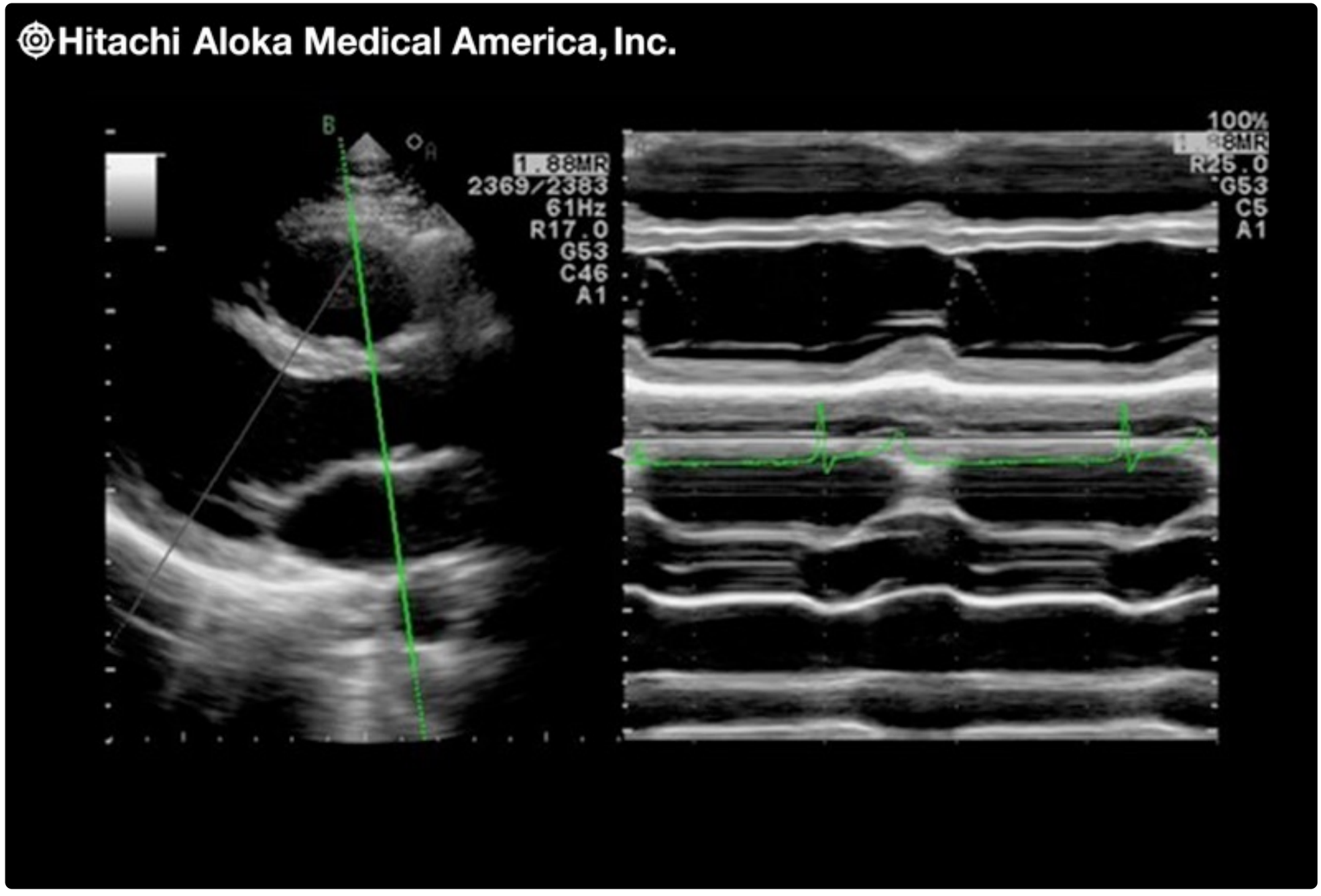


ARIETTA 70 - Hemodynamics - Color Doppler

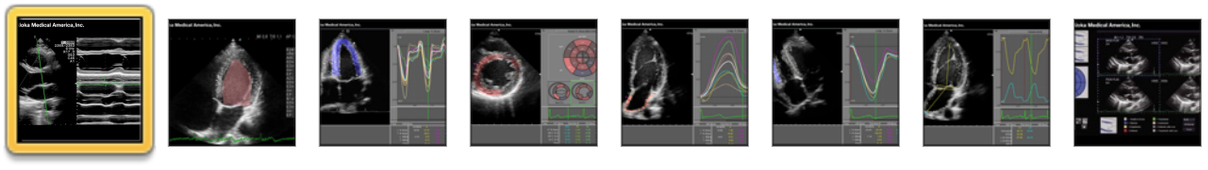


Arietta 70 - Vascular - Carotid





ARIETTA 70 - Wall Motion and Viability - Free Angular M Mode 2 Lines



ARIETTA 70 Advanced Features

Vector Flow Mapping (VFM)

Vector Flow Mapping (VFM) is a novel application that allows users to assess cardiovascular blood flow distribution in an observation plane. This unique, non-invasive technique is derived from the Color Doppler velocity data and generates the velocity fields on the 2D image.

Until now only data received in the direction of the beam were extracted from the Doppler information. By using new mathematical methods we are able to estimate the radial (perpendicular) component and display the flow distribution without angle dependency.

Wave Intensity

The new Index of Cardiovascular Circulation Dynamics

The heart and the arterial system constantly interact with each other through forward travelling waves and reflected waves. Wave Intensity (WI) is calculated as the product of the derivatives of the simultaneously recorded blood-pressure changes and blood-flow-velocity changes. Wave Intensity can be obtained at an arbitrary point in the circulatory system.

Blood pressure change waveform is conventionally measured invasively. Hitachi Aloka has developed a system to calculate blood pressure change noninvasively and with a high level of accuracy. Based on the similarity of the cyclic blood pressure change and its simultaneous vessel diameter change, a blood pressure waveform is derived non-invasively. This non-invasive pressure waveform can then be analyzed further.

WI is a new hemodynamic index which is potentially useful for analyzing interaction of the cardiovascular system, including contraction and dilatation characteristics, influence of reflected waves from peripherals, interaction of elastic and resistance vessels and an index related to time.

WI is a new indicator of blood flow dynamics, which is expected to help pave the way for analysis of the interference between the heart and the arterial system.

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ARIETTA 70 Advanced Features (Cont.)

*e*TRACKING

Comprehensive analysis package supporting the assessment of Atherosclerosis

The severity of Cardiovascular disease is likely to be reduced if atherosclerosis is detected early and before morphologic changes such as plaque and wall thickening are visible in the arterial walls. Prevention and treatment of lifestyle-related diseases are increasingly important today, and so the role of the ultrasound diagnostic system is not only to observe the morphologic changes but also to perform functional assessment.

Hitachi Aloka realized functional assessment of arteries by developing our unique *e*TRACKING technology.

*e*TRACKING achieves highly precise measurements of the vessel distension in real time, using radio frequency (RF) signals. Conventionally, vessel diameters are measured visually on B-mode and M-mode images, this can lead to variations in the measurement because it is difficult to know time-dependent changes in the vessel diameter on B-Mode. Furthermore it is difficult to identify exact timing for the measurement of the maximum and minimum diameter. To overcome these problems in measuring vessel diameter, eTRACKING has been developed and implemented in a diagnostic Ultrasound system.

*e*TRACKING Features

• Movement of the vessel wall is tracked automatically by simply setting the tracking gate on the B-mode image.

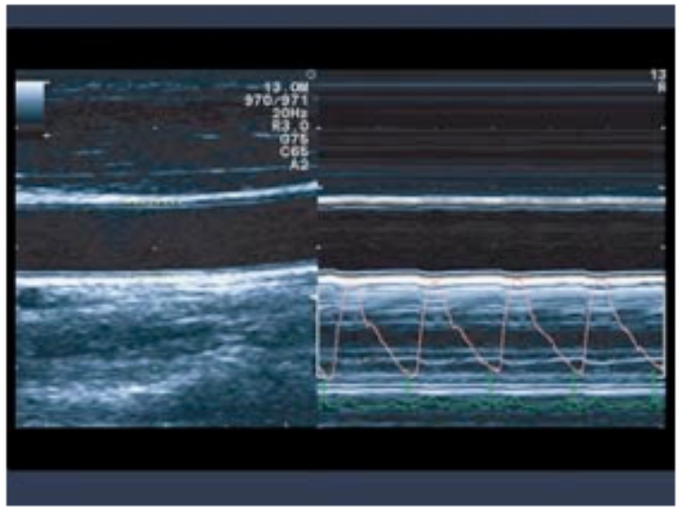
• Calculates vessel diameter very accurately by using the RF signal. The 10 MHz probe achieves 0.01 mm accuracy.

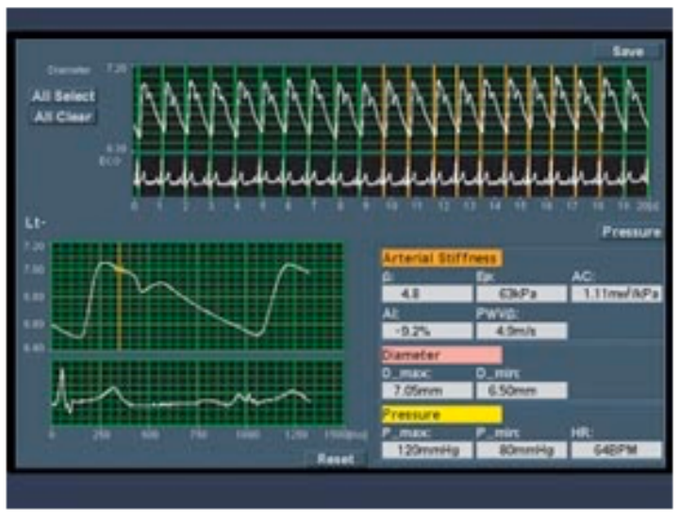
• Displays waveforms of changes in vessel diameter (distension wave) in real time.

• Automatically calculates various parameters describing vessel stiffness, and displays the results.

• Easier to operate than conventional methods, applicable to routine examination and shortens examination time.

• Non-invasive examinations allow easier and faster repetition.





eTRACKING

Comprehensive analysis package supporting the assessment of Atherosclerosis

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L441

L64

S12

1 2 3 4 5

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UST-52126

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