LVivo Cardiac Toolbox on Exa® AI-based Cardiac Ultrasound Analysis

Konica Minolta has partnered with DiA Imaging Analysis to deliver the LVivo Cardiac Toolbox for advanced, AI-based cardiac ultrasound analysis, as an integrated part of Exa's imaging reporting and viewing environment.

Quantified and reproducible cardiac analysis

Traditional cardiac ultrasound imaging analysis is subjective, error-prone and dependent on the user's experience. LVivo AI-based solutions automate the ultrasound analysis process, enabling clinicians to quickly and easily assess cardiac function, with reduced variability, increased efficiency and improved accuracy.

Objective and Automated
Versus subjective analysis

Faster Evaluation
AI enables quick results to alleviate bottlenecks

Vendor-Neutral
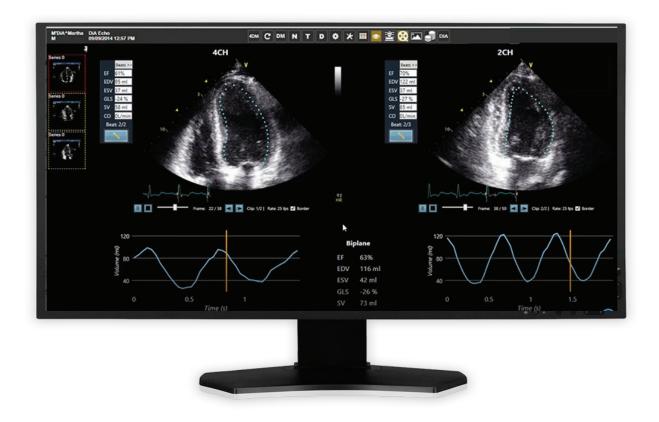Supports DICOM images from any ultrasound device

Cost-Effective
Unlimited number of LVivo users on site

LVivo EF: Quantified Ejection Fraction Analysis

Ejection fraction (EF) is a key indicator for global function of the left ventricle (LV) in patients presenting with shortness of breath, suspected heart failure or cardiogenic shock.

After selecting 4CH and/or 2CH, LVivo EF immediately delivers analysis:

- Global and Segmental Strain
- Segmental Wall Motion Scoring
- Ejection Fraction
- LV endocardial border in motion
- End-Systolic Volume
- End-Diastolic Volume
- Stroke Volume

Key features

- Beat Selection
- Manual border adjustment
- Manual initiation in case of failure

"DiA's automated software gives us the Ejection Fraction. It is reliable and it is fast. What we get from the DiA software is an accurate, fast measurement of EF"

Steven Feinstein, M.D.
Cardiology Department

LVivo Strain: Quantified Global and Segmental Strain Analysis

Strain is a key indicator for monitoring subclinical Left Ventricle (LV) dysfunction, important in cases of cardiotoxicity, chemotherapy-treated patients, follow up after coronary events and prior to aortic stenosis valve replacement surgeries.

LVivo Strain

LVivo Strain provides objective and fully automated global and segmental strain analysis to support existing clinical workflows.

After selecting each or all of the 3 apical views, LVivo Strain generates an auto-analysis of the global and segmental strain for each view to present:

- Bullseye diagram segmental strain color-coding and scoring for the 17 LV muscle segments
- Strain graph presentation for each segment
- GLS scoring index
- Endocardial border in motion divided into segments

Key features:

- Beat selection
- Manual border adjustment
- Manual initiation in case of failure

LVivo Segmental Wall Motion (SWM):
Quantified 2D SWM Analysis

Segmental Wall Motion (SWM) provides information about the contraction and strain of the various Left Ventricle (LV) segments. Identifying abnormalities is especially important during and after coronary events, and for early disease detection and monitoring in patients with coronary artery disease.

LVivo SWM: The first and only quantified 2D SWM analysis

LVivo SWM uses machine learning algorithms based on 12 features of motion and displacement of each segment to provide segmental scores.

After acquiring the 3 apical views each or all , LVivo SWM generates an auto analysis of SWM to present:

- Bullseye diagram with color-coding and scoring of the 17 LV muscle segments
- SWM graph presentation for each segment
- Segmental Score index
- Endocardial border in motion divided into segments

Key features:

- Beat Selection
- Manual border adjustment

LVivo AI solutions during COVID-19

How COVID-19 affects the heart

Recent data from COVID-19 frontlines show that heart issues were a frequent cause of death for 50% of COVID-19 patients.[1]

ASE and EACVI recommend performing limited echo exams on COVID-19 patients to monitor patients' left ventricle and detect dysfunction. [2, 3]

How LVivo AI solutions on Exa can help to :

Automated workflow enables quick analysis of cardiac function

Minimized patient contact and risk of infection

Shorter measurement time reduces patient bottlenecks

LVivo Toolbox automates the cardiac analysis process for all echo exams, with objective and reproducible results

"In the new COVID normal, sonographers and echocardiographers will face a new challenge in coping with increased procedures in the echo lab while supporting patients on the frontlines. AI-based tools like LVivo can help alleviate bottlenecks by automating workflows and shortening evaluation times to support faster decisions and minimize unnecessary risk of exposure to COVID19."

Noah Liel Cohen, M.D.
Department of Echocardiology

1. Shi S, Qin M, Shen B, et al. Association of Cardiac Injury With Mortality in Hospitalized Patients With COVID-19 in Wuhan, China. *JAMA Cardiol*. Published online March 25, 2020. doi:10.1001/jamacardio.2020.0950
2. ASE statement on COVID-19, March 2020
3. COVID-19 pandemic and cardiac imaging: EACVI recommendations on precautions, indications, prioritization, and protection for patients and healthcare personnel, *European Heart Journal - Cardiovascular Imaging, April 2020*