TOSHIBA
Leading Innovation ≫≫≫

MSSW-CFA/S1
Cardiac PACKAGE

APPLICATIONS

The Cardiac package is an optional package for the Toshiba magnetic resonance imaging (MRI) system. This package provides new functions that are useful for cardiac function analysis in order to expand the range of clinical applications.

FEATURES

- This software is used to measure the ventricular volumes based on end-diastolic and end-systolic images in order to calculate the cardiac output (CO), ejection fraction (EF), and other cardiac function parameters. This software also calculates the ventricular volume for each phase of the cardiac cycle based on ventricular contour lines drawn in advance on images acquired in various phases and displays a ventricular volume change curve (volume curve).
- The ratio of the ventricular wall thickness at end diastole to that at end systole (% wall thickness) is obtained and displayed graphically.
- Cardiac and thoracic images with reduced flow artifacts can be obtained by employing the FASE BB (Black Blood) imaging technique.
- This package provides new sequences that support cine imaging during breath-holding, late-enhancement myocardial imaging and other cardiac function examinations.
- Cine images covering almost the entire cardiac cycle can be acquired in retrospective gating mode. This minimizes degradation of image quality due to fluctuations in the R-R interval.

COMPOSITION

Software (License) .... 1 set

This package does not include an operation manual. Refer to the operation manual supplied with the MRI system.

APPLICABLE COMBINATIONS

This package is applicable to the following systems.
- Vantage Titan™ 3T

* The optional interactive cardiac gating unit (model MKSU-ECG04/S1) must also be installed in the MRI system.

PERFORMANCE SPECIFICATIONS

This package provides the following functions.

Cardiac function analysis
- Left ventricular contour creation function
  – ECG-gated images for up to 24 cardiac phases can be processed using the biplane Simpson's method.
  – Manual creation and editing of the left ventricular inner wall contour is possible.
  – Automatic detection of the left ventricular inner wall contour is possible based on 4-chamber cross-sectional images including the left ventricular long-axis plane.
- Cardiac parameter calculations
  – Left ventricular volumes are measured using the left ventricular contour lines at end diastole and end systole, and the stroke volume (SV), cardiac output (CO), ejection fraction (EF), and other cardiac function parameters are calculated based on the contour data. Each cardiac parameter is calculated in less than 1 second.
  – The following two methods are provided to calculate left ventricular volumes.
    · Biplane Simpson's method
    · Single-plane Simpson's method
- Volume curve display
  – The left ventricular volume in each phase of the cardiac cycle is calculated based on ventricular contour lines drawn in advance on images acquired in various phases and the volume curve (line graph) is displayed.
  – Cardiac parameters are displayed together with the volume curve.
- % wall thickness calculation
  – The ratio of the ventricular wall thickness at end diastole to that at end systole is obtained by performing the calculation below for a number of points set along the cardiac wall, and the calculation result is displayed as a graph.

$$\frac{\left(\begin{array}{c}\text{Segment length}\\\text{at end systole}\end{array}\right) - \left(\begin{array}{c}\text{Segment length}\\\text{at end diastole}\end{array}\right)}{(\text{Segment length at end diastole})} \times 100 \ (\%)$$

  – Cardiac parameters are displayed together with the graph.

Cine imaging

Cine imaging is supported in the FE 2D and FFE 2D techniques.

Sequential multislice multiphase acquisition can be performed with this package.

Two cardiac gating modes, prospective are provided.

ViewShare reconstruction is also supported in order to improve temporal resolution.

FASE BB (Black Blood) imaging function

Cardiac and thoracic images can be obtained by suppressing the signals from blood flowing into the slice plane by applying a Black Blood prepulse.

The user can specify the number of slices to be acquired during a single breath-hold in sequential multislice imaging.

Late-enhancement myocardial imaging

T1-weighted images are acquired using the inversion recovery technique. This technique is applicable to FFE 2D and FFE 3D sequences.

TI prep

In order to adjust appropriate TI degree in delay scanning, images including automatically changed TI degree are scanned in FFE2D.

This technique is used with ECG or PPG, and scans the same slice while changing TI, such as ECG-Prep and flow Prep.

POWER AND ENVIRONMENTAL REQUIREMENTS

The power and environmental conditions are the same as for the MRI system.

COMPLIANCE WITH STANDARDS

This package complies with the same standards as the MRI system.

MASS

Unit	Mass (kg)
Cardiac package	Approx. 0.5

TOSHIBA MEDICAL SYSTEMS CORPORATION

http://www.toshibamedicalsystems.com

Made for Life™

Produced in Japan