

Release Notes

TOMTEC-ARENA TTA2.50.00

What you should know about the new release

Congratulations to the purchase of your new TOMTEC Software Product TOMTEC-ARENA TTA2 and thank you for choosing us as your partner. In addition to the manual and training of our application specialists, we would like to inform you about some product details in this release note.

Clinical application packages part of TTA2:

- IMAGE-COM
- 4D LV-ANALYSIS
- 4D RV-FUNCTION
- 4D CARDIO-VIEW
- 4D MV-ASSESSMENT
- 4D SONO-SCAN
- 2D CPA
- FETAL 2D CPA
- AutoStrain LV / SAX / RV / LA
- REPORTING
- TOMTEC DATACENTER (incl. STUDYLIST, DATA MAINTANANCE, WEB REVIEW)

Changes to previous release

Module	Function	Description
All	Refresh Hint	TOMTEC-ARENA hints the user to refresh the page, when either patient demographics, visit or study information has been updated in the background, or DICOM objects have been received or deleted. For the advanced clinical application packages as well as the worksheet the refresh hint is displayed in IMAGE-COM once they are closed.
All	Appendix	Useful tools and preconfiguration are now available within the software deployment as appendix.
All	Measurement Value rounding	Due to alignment with Image-Com results the rounding method has changed to "round half to even" for all application packages. This might result in slightly different values due to this rounding change.
All	Synchronization of txt / csv Export of measurements	CSV / txt Export now have the following default name for all caps and Image-Com. Abbreviated CAPName_Patient ID_Export Date_Export Time For all 4D Applications with export functionality - - the first 4

		<p>letters are used (e.g. 4DMV, 4DRV, ...). For 2D applications the complete name.</p> <p>Exported files contain a common header: Export Date CAP name and version Patient Name Patient Date of Birth Gender Dicom PatientID Dicom StudyID Dicom StudyUID Study date</p>
4D RV-FUNCTION	Automated contour detection	<p>The workflow starts in view adjustment for all data except Philips heart model RV acquisition.</p> <p>Landmarks in view adjustment state are detected for TTE data but can be edited.</p>
4D Cardio-View	Landmarks can be linked for circumference value	<p>Similar to 4D MV-Assessment, landmarks can now be linked for a circumference value.</p> <p>Ordering logic: according to their polar angles, using a coordinate system computed from all selected points. (similar in 4D MV-Assessment).</p>
AutoStrain SAX	New CAP	<p>Application to measure global strain and strain rate using 1-3 short axis views.</p> <p>Calculated measurements results are:</p> <ul style="list-style-type: none"> • GCS Endo Peak Basal • GCS Endo Peak Mid • GCS Endo Peak Apical
AutoStrain LV	EF measurement	<p>EF measurement and volume curves are available as part of AutoStrain LV in additional workflow steps as mono- or biplane (BP) Simpson measurement.</p>
AutoStrain LV	Mid layer Strain	<p>Myocardium is visualized by Endo-, Mid and Epicardial layer.</p>
AutoStrain LV	New measurements	<p>New measurements:</p> <ul style="list-style-type: none"> • GLS Mid Peak A4C • GLS Mid Peak A2C • GLS Mid Peak A3C • GLS Mid Peak Avg • EF (BP) • EDV (BP) • EDVI (BP) • ESV (BP) • ESVI (BP) • SV (BP) • EF (A4C) • EDV (A4C) • EDVI (A4C) • ESV (A4C) • ESVI (A4C) • SV (A4C) • EF (A2C) • EDV (A2C) • EDVI (A2C)

		<ul style="list-style-type: none"> • ESV (A2C) • ESVI (A2C) • SV (A2C)
AutoStrain RV	Renamed measurements	Renamed measurements: <ul style="list-style-type: none"> • RVFWSL Endo: was RVFWSL before • RV4CSL Endo: was RV4CSL before
AutoStrain LV/ SAX/ RV/ LA	Native data loading	Philips 2D clips are loaded based on native data information if it was saved in DICOM file.
General	Data format	Additional support of GE SW V204 & 3D Philips Affiniti.
General	Probe support	Support of 3D GE6Vc-D probe.
IMAGE-COM	Semi-automated standard measurements	For the following measurements a semi-automated measurement is available for the selected frame. Please be aware that ECG information is highly recommended for this workflow. <ul style="list-style-type: none"> • Ao Asc diam • Ao Ann diam • Ao STJ diam • Ao SV diam • IVSd • LA diam systole • LVIDd • LVIDs • LVOT diam • LVPWd • RVDd base (RVD1) • RVDd mid (RVD2) • RVLd • RVOT diam lax • RVOT diam prox • TV Ann diam ant-post* • IVSd-LVIDd-LVPWd (same line) • MV Dec. Slope • MV A Vel • MV E Vel • AV VTI • LVOT VTI • PV VTI • TR Vmax • LV A'(l) • LV A'(s) • LV E'(l) • LV E'(s) • RV A'(l) • RV E'(l) • RV S'(l) <p>*TV Ann diam ant-post distance is optimized for end-systolic phase. Measuring in a different phase can be inaccurate. In this case, please use the manual measurement.</p>
IMAGE-COM	Semi-automated standard measurements	The semi-automated measurements expect some assumptions: An enddiastolic measurement is expected within the first half of a complete heart cycle. If it is not, then there must also exist

		<p>at least another half cycle next to the current cycle.</p> <p>An endsystolic measurement should be within a complete heart cycle, but it must not be the first frame of the cycle.</p>
IMAGE-COM	Tiling specific measurement overlay smart region is no longer available	In previous versions there was a specific smart region for switching on and off the local result display. This smart region is removed due to confusing handling. It is still possible to show / hide the overlay with the checkmarks for all tilings.
IMAGE-COM	STRESS ECHO	Additional smart region added for same look and feel as review tab.
IMAGE-COM	STRESS ECHO	The WMSI is now displayed in the stress echo tab in Image-Com below the bull's eye display.
IMAGE-COM	Shutter	The feature "shutter" has been moved from review tab to "tools".
IMAGE-COM	Measurement Caliper	X and Y axis disappear after the velocity caliper is set on spectral Doppler trace - a single point remains on the spectral trace.
IMAGE-COM	Annotations	Annotation color can be changed in the user settings.
IMAGE-COM Zero	Export avis / secondary captures	It is now possible to export also clips as avi or save secondary captures. Due to compression this can last a little longer than in the desktop variant.
MEASUREMENTS	TTE Guideline Preset	A TTE Guideline measurement preset is available per factory default for the Adult Echo exam type.
MEASUREMENTS	Adult Echo Measurements	<p>Following packages have been enhanced according to the latest ASE Guidelines:</p> <p>Group: Mitral Valve</p> <ul style="list-style-type: none"> • MR • PISA (MR) • PISA (MS) <p>Group: Aortic Valve</p> <ul style="list-style-type: none"> • LVOT • AR • PISA (AR) • PISA (AS) <p>Group: Tricuspid Valve</p> <ul style="list-style-type: none"> • TR • PISA (TR) <p>Group: Pulmonary Valve</p> <ul style="list-style-type: none"> • PR • PISA (PR) <p>Group_ Pulmonary Vein</p> <ul style="list-style-type: none"> • PVein <p>Group: Venous Return</p> <ul style="list-style-type: none"> • Hepatic Vein
MEASUREMENTS	Pediatric Measurements	<p>Following packages are new or have been enhanced:</p> <p>Group: Mitral Valve/LAVV</p> <ul style="list-style-type: none"> • Enhanced: MV/LAVV • New: MMode <p>Group: Aortic Valve/Aorta</p> <ul style="list-style-type: none"> • Enhanced: Aorta • New: AVA (VTI)

		<ul style="list-style-type: none"> • New: AVA (Vmax) • New: MMode <p>Group: Pulmonic Valve /PA</p> <ul style="list-style-type: none"> • New: PVA (VTI) • New: PVA (Vmax) <p>Group: RVOT</p> <ul style="list-style-type: none"> • RVOT <p>Group: RV-LV</p> <ul style="list-style-type: none"> • Enhanced: 2D • Enhanced: MMode <p>Group: LV Volume Function</p> <ul style="list-style-type: none"> • New: Bullet <p>Group: RA-LA</p> <ul style="list-style-type: none"> • New: RA Dimension • Enhanced: RA Vol (A-L) • Enhanced: LA Vol (A-L) • New: MMode
MEASUREMENTS	Adult Echo and Pediatric Measurements	<p>Following factory measurement packages have the automatic prompt functionality (besides column based packages):</p> <p>Adult Echo:</p> <ul style="list-style-type: none"> • LV <ul style="list-style-type: none"> ○ 2D ○ MMode ○ Area Length ○ Bullet ○ LV Mass T-E ○ LV Mass A-L • LA <ul style="list-style-type: none"> ○ LA Vol (A-L) • RA <ul style="list-style-type: none"> ○ RA Vol (A-L) <p>Pediatric:</p> <ul style="list-style-type: none"> • RV-LV <ul style="list-style-type: none"> ○ 2D ○ MMode • LV Volume Function <ul style="list-style-type: none"> ○ Area Length ○ Bullet ○ LV Mass A-L • RA-LA <ul style="list-style-type: none"> ○ RA Vol (A-L) ○ LA Vol (A-L)
MEASUREMENTS	Pediatric Measurements	<p>Ao Root diam is now available for systole and diastole. Unspecific Ao Root diam measurement keys will be mapped to Ao Root diam diastole as per factory default. It can be adapted via a Measurement Mapping Request.</p>
MEASUREMENTS	Vascular Measurements	<p>Resistance Index (RI) is now available for packages in exam type Vascular Graft.</p>
MEASUREMENTS	POC Measurements	<p>New exam type Point-of-Care is available with following groups:</p> <ul style="list-style-type: none"> • Abdomen • GYN

		<ul style="list-style-type: none"> • Small Parts • Cardiac <p>A new export format "TID – Point-of-Care Report" is available for measurement export.</p>
MEASUREMENTS	CAP Measurements	Measurement labels for AutoStrain RV and 4D MV-ASSESSMENT have been improved in the worksheet to stay consistent.
MEASUREMENTS	Precision	<p>The precision of weight is changed from 1 to 2 for all Small Units & Precisions sets.</p> <p>The precision of Aliasing velocity is changed from 1 to 2 for all adult PISA packages.</p>
MEASUREMENTS	Measurement Label Language	Measurement labels and description can be translated according to the regional language settings for all modules. The measurement list export (PDF print) reflects the measurement language, all other export formats stay in English.
REPORTING	Lopez Z-Scores	<p>Measurements have been completed according to Lopez Z-Score guideline and all Z-Scores are available in pediatric reporting workspace.</p> <p>Publication name has been updated and on configuration it is called: Pediatric Heart Network.</p>
REPORTING	TEE Pre/Post OP	<p>Following labels of Post OP measurements have been improved in the TEE Pre/Post OP reporting workspace to be consistent with Pre OP measurements:</p> <p>Left Ventricle:</p> <ul style="list-style-type: none"> • EDV > EDV (BP) • ESV > ESV (BP) • SV > SV (BP) • EF (Simpson BP) > EF (BP) • SI > SI (BP) <p>Left Atrium:</p> <ul style="list-style-type: none"> • LAA (A4C) > LAAs (A4C) • LAA (A2C) > LAAs (A2C) <p>Right Atrium:</p> <ul style="list-style-type: none"> • RA Vol (Simpson) > RA Vol (A4C) <p>Aortic Valve:</p> <ul style="list-style-type: none"> • AVA (trace) > AVA (Trace) • LV PEP > LVPEP <p>Mitral Valve:</p> <ul style="list-style-type: none"> • MR PISA Flow Rate > PISA Flow Rate • Ann diam comm > MV Ann diam comm • Ann diam ant-post > MV Ann diam ant-post <p>Tricuspid Valve:</p> <ul style="list-style-type: none"> • Ann diam ant-post > TV Ann diam ant-post <p>Pulmonary Valve:</p> <ul style="list-style-type: none"> • RV PEP > RVPEP <p>Aorta:</p> <ul style="list-style-type: none"> • Ao diam systole > Ao Root diam systole • Ao diam diastole > Ao Root diam diastole • Ao Ring diam > Ao Ann diam
REPORTING	Stress	<p>Following measurements have been added only for the stress reporting workspace under stress interpretation > stage measurements:</p> <p>2D and MMode</p>

		<ul style="list-style-type: none"> • EDVI (BP) • ESVI (BP) • MR PISA Radius • MR VC diam • TAPSE Doppler <ul style="list-style-type: none"> • LVOT SI • MR PISA ERO Area • MR PISA Reg. Volume
REPORTING	Translation	Quantity fields are translatable in reporting context and no longer affected by the measurement label language.
REPORTING	Fields IDs	Following fields have a new ID, this may lead to the need to update QuickFills that could fill these fields: Recommendation, Recommendation_PostOP, VentricularAssistDevice, VentricularAssistDevice_PostOP
REPORTING	Vascular summary	Vascular Summary Report Block is now consistent and also shows dashed border as all other report blocks.
REPORTING	WMS	WMS title and image are no longer split in 2 different pages. Label and tooltip of the WMS score = 2 is now Hypokinesis only. WMS stage names length is now limited to 25 chars. New report blocks are also available to be able to print the same content using less space for adult echo reports: <ul style="list-style-type: none"> • WallMotionScoringStress Bullseye only • WallMotionScoringStrees Small • WallMotionScoringRest Bullseye only • WallMotionScoringRest Small
REPORTING	Properties in rule 8,9 and 10	Generic Report: Referring Physician and further staff can now be included in the name of generated PDF.
REPORTING	Order of name elements	Configuration in administration for names will now be consistent in print report.
REPORTING	Header and Footer	Please note that small changes on header and footer can happen after upgrade since content has been aligned and space has been optimized. Also, hyperlinks will no longer be activated. Images can look differently in PDF than in configuration And only images till the size of 3MB can be used.
REPORTING	Autocomplete and spellchecker	Autocomplete and spellchecker (in web) has been disabled for reporting input fields.
REPORTING	Shrink to fit	New functionality to reduce text size to fit on less space. This does not affect images, measurement tables and drawings.
REPORTING	Measurement blocks	Label from copied measurement block will also be copied to new measurement block.
REPORTING	Exception page	Exception handling message will be shown
REPORTING	New fields	<ul style="list-style-type: none"> • Model site and Manufacturer has been improved in fields in Aortic Valve/Prosthesis, Mitral Valve/Prosthesis, Tricuspid Valve/Prosthesis, Pulmonary Valve/Prosthesis for TTE, TEE and TEE Pre/Post OP

		<ul style="list-style-type: none"> New field Window of highest velocity has been added to the aortic valve section in TTE / TEE / TEE Pre/Post OP New field LA pressure in Left Atrium report block New field FAC in Right Ventricle report block for TTE/TEE/TEE Pre/Post OP New field TDI S' in Right Ventricle report block for TTE/TEE/TEE Pre/Post OP New field Trabeculations in Right Ventricle report block for TTE/TEE/TEE Pre/Post OP New group for Coronary Arteries in Aorta
REPORTING	Customization upgrade	Older version customization file can be imported into a current software version.
REPORTING	Customization Choice Lists & Summary dialog	Dialog has a fixed size and content adapts to window size.
REPORTING	HL7 inbound support	Visit number field in reporting is now read-only If patient, study or visit information is update in the background user will be informed by clicking on refresh button and dialog will be shown with relevant information.
REPORTING	ENG-GB	Improvements have been added into ENG-GB translation for partner.
REPORTING	PDF fonts and characters support	<ul style="list-style-type: none"> PDF report supports: Latin characters, chinese characters, japanese characters, korean characters, cyrillic characters, greek characters, and characters with diacritics PDF report supports the following fonts: Noto Sans and Noto Sans CJK JP, SC, TC & KR
TOMTEC DATACENTER	HL7 Connectivity	<p>HL7 Connectivity according to the HL7 Standard V2 is now available.</p> <p>The HL7 Connectivity includes:</p> <ul style="list-style-type: none"> HL7 Activation and setup Customizations on the HL7 interface A test mode to allow testing HL7 in a productive environment A retention period configuration for unused patients, visits or orders from the system Receiving Inbound ADT messages to register, update and merge patient records Receiving Inbound ORM to list upcoming examinations Sending Outbound ORU messages to transmit results such as measurements, sections of the report text or the full report text Sending outbound MDM messages to transmit the report as PDF. <p>Further details can be found in the HL7 Conformance Statement document.</p>
TOMTEC DATACENTER	DICOM Connectivity	TOMTEC DATACENTER now persists historical patient demographics for a study and is able to add an incoming study to a patient even if the patient demographics are outdated.

TOMTEC DATACENTER	Audit Events	Additional event types and event sub types are traced within the Audit Log. Patient Level <ul style="list-style-type: none"> • Patient create • Patient search • Patient update • Patient merge • Patient delete Order Level <ul style="list-style-type: none"> • Order create • Order update • Order delete
TOMTEC DATACENTER	Audit Log Search	New search configurations have been added to the Audit Log: <ul style="list-style-type: none"> • Filter for affected Patient ID, Visit Number or Placer Order Number or Study Instance UID • Filter based on outcome (Success/Failed) • Full Content search for the audit details content. Column Customization is now available for Audit Log page.
TOMTEC DATACENTER	Units & Precisions	Units&Precision sets for Small Animals have been renamed to Small.
TOMTEC DATACENTER	BSA Calculation	Following BSA calculation methods are now available (global setting): <ul style="list-style-type: none"> • Mosteller (Default) • DuBois • Boyd (weight only) • Haycock
TOMTEC DATACENTER	Rule Templates	A factory preset of rule templates is now available in Rule Management page.
TOMTEC DATACENTER	Re-archiving capabilities	Archiving to the long-term archive has further improved to automatically and reliably retrigger archiving after changes on data such as measurements or images.
TOMTEC DATACENTER/ MEA	Measurement Mapping	Measurement import mapping is skipped on study status viewed or analyzed. If needed a backward compatibility configuration is available to still allow mapping when study status is viewed. Further incoming SRs will no longer be mapped. Measurements performed in Image Com will no longer be overwritten/lost.
TOMTEC DATACENTER	DATA MAINTENANCE Restore Measurements	TTD allows to restore the measurements of a study to the original measurements of the last SR version from modality which will be available in the Worksheet afterwards. Those measurements performed in IMAGE-COM will then be removed by the system.
TOMTEC DATACENTER	DATA MAINTENANCE Split and Merge Patients	It is now possible to merge duplicate patients, to add new patient records and to re-assign DICOM studies and HL7 visits from one patient to another patient.
TOMTEC DATACENTER	Dual Monitor callup	The TTD Integration Interface has been extended by a feature to callup the desktop client in dual monitor configuration.
TOMTEC DATACENTER	Desktop Client Monitor Setup	The client.properties file of the Desktop Client can now be utilized to predefine the Monitor Configuration ahead of client distribution .

TOMTEC DATACENTER	STUDY LIST Filters	The following dropdown filters of STUDY LIST has been changed to support multiselect: <ul style="list-style-type: none"> • Study Status • Archive Status • Availability The factory default filter has been changed to exclude the study status no images and with this ordered examinations.
TOMTEC DATACENTER	STUDY LIST Results display	For the results display in STUDY LIST, a vertical scrollbar is now available for navigation instead of paging.
WORKSHEET	Filter functions	Measurement filter buttons and functionalities have been improved: The 'show all measured values' and 'show missing QualitySeal measurements' buttons are now located at the top toolbar and hide empty rows for a better overview.
WORKSHEET	Measurement List	The order of lateral vascular measurements has been improved in the measurement list: First all right measurements and then all left measurements for a vessel are listed.

Resolved Complaints

Module	Error ID	Description
AutoStrain LV	INV-1387	Specific Philips datasets could not be loaded due to calibration issues.
GENERAL	INV-1467 INV-1267	Image quality fix for 3D Canon datasets.
GENERAL	INV-1288 INV-1437	Fix for GE 3D loader issues.
GENERAL	INV-1513	Philips Elite 3D datasets can be opened multiple times.
IMAGE-COM	INV-1469	Playback status is not reset to play when a study was closed.
IMAGE-COM	INV-1456	Switching between secondary and primary studies may result into a black screen.
IMAGE-COM	INV-1455	ECG for 2D CX50 data is not shown in TTA.
IMAGE-COM	INT-655	IMAGE-COM opens in defined Default Window settings value again.
IMAGE-COM	INV-1445	ECG curve uses Hz as units for both axes results in not displayed images.
IMAGE-COM	INV-1403 INV-1454	Dragged images after layout change & 1:1 does not page to next expected image.
IMAGE-COM	INV-1221	IC closes and gets back to study list when a secondary capture was done in IC with a auto strain add-in measurement.
IMAGE-COM (Partner integrations)	INV-1346	IMAGE-COM is opening on the correct configured monitor.
IMAGE-COM (Partner integrations)	INV-1399	Decreased starting performance due to high amount of setting requests.
IMAGE-COM / Study List	INV-1416	Images of supported JPEG-LS Transfer Syntaxes are not shown in Preview and Review.

IMAGE-COM / Cath-QCA	IC-1919	The semi-automated stenosis quantification add-in button is visible again. The missing Cath-QCA module number is added.
MEASUREMENTS	INV-1479	ESV (BP) is mapped wrong - pediatric unit.
MEASUREMENTS	INV-1321	Corrected Code Meaning of Topographical modifier LDISTATTACH.
MEASUREMENTS	INV-1396	LVOT area is not always calculated.
MEASUREMENTS	INV-1412	DICOM header tags of exported SRs not updated with the latest patient height and weight.
MEASUREMENTS	INV-1483	DE: Rounding up fetal/newborn body weight values.
REPORTING / IMAGE-COM	INV-1408	Order of stress stages in Reporting is now consistent with order in IMAGECOM.
REPORTING	INV-1386	Order of stress stages in workspace is now consistent with order in print preview.
REPORTING	INV-1419	Fixed memory leak caused by report server rendering.
REPORTING	INV-1434	Open Report in partner integration with choice list default customization will not throw exception.
REPORTING	RPT-6944	Improved Dutch translations.
REPORTING	RPT-6997	Customization in Jasper render updated in case of multiple partner integration rendering instances.
REPORTING	INV-1486	Images in report issue has been fixed to avoid images getting lost or swapped on print report.
REPORTING	INV-1477 INV-1360	Reports no longer stuck during status transitions.
REPORTING	INV-1308	FHIR conversion service error was corrected.
REPORTING	INV-1273	Invalid characters will be removed before saving data.
REPORTING	INV-1361	Reporting DICOM PDF should support further transfer syntaxes.
WORKSHEET	INV-1141	Worksheet remains empty.
WORKSHEET	INV-1052	The measurement fields are not available in exam type "Carotid" unless its manually enlarge.
TOMTEC DATACENTER	INV-1358	Measurements sometimes are unavailable in the Worksheet with log stating a ClosedByInterrupt Exception.
TOMTEC DATACENTER	INV-1407	Java.lang.NullPointerException error message after auto log off.
TOMTEC DATACENTER	INV-1200	'Not all objects are available for review' dialog still displayed after a successful reload.
TOMTEC DATACENTER	INV-1227	Thumbnail bar displays Philips Ultrasound 3D Multiframe Images of model EPIQ with a 2D label instead of 3D label.
TOMTEC DATACENTER	INV-1245	Modality column in STUDY LIST is not updating correctly when new DICOM objects have been created or existing DICOM objects have deleted.
TOMTEC DATACENTER	INV-1404	Query retrieve using date/time information such as Date of Birth are delivering more results than expected (filtered date until current date).
TOMTEC DATACENTER	INV-1373	Audit Trail is unavailable after update from a TTA2.3 to a TTA2.4 version due to FHIR update failure. This is fixed for the update to TTA2.50.00 version.

TOMTEC DATACENTER	INV-1198	Copying the folder <TTA Root>\Runtime\Log is not possible in runtime because sub folder tasks is blocked by the system.
TOMTEC DATACENTER	INV-1426	Disabled Transfer Syntaxes are still arriving in import folder.
TOMTEC DATACENTER	INV-1457	System crash on manual study archive for a user without DICOM Editor permission.
TOMTEC DATACENTER	INV-1372	C-Find based storage validation failed with status 'NONE'.
TOMTEC DATACENTER	INV-1349	Studies in WorkingArchive and LTA simultaneously when forwarded to the long-term archive and then reloaded to TTA.
TOMTEC DATACENTER	INV-815	Field validation was missing when the user enters illegal characters such as spaces for the DICOM Device name.
TOMTEC DATACENTER	INV-1097	Large temp files were removed from <TTARoot>\Runtime\Temp (usually located on the C: drive) with a delay only. In addition temp folder does not fallback to the default directory when un- or misconfigured in the tomtec.properties file.
TOMTEC DATACENTER	INV-1316	Upper/lower case mismatch when the client.properties host configuration contains capital letters.
TOMTEC DATACENTER	INV-1470 INV-1546	Failed FHIR tasks for the Audit Trail when properties such as the patient ID is empty.
TOMTEC DATACENTER	INV-1389	Retrieving a study from the remote repository fails error 'study is not available anymore. press OK to refresh the study list' fails in a special condition.
TOMTEC DATACENTER	INV-1511	When entering a filter in STUDY LIST, the text cursor jumps to end of text after changing character in mid of text.
TOMTEC DATACENTER	INV-1375	Error on login 'This product is incompatible with the license'.
TOMTEC DATACENTER	INV-1512	The 'Lock created at' column on Locked Studies page displays a wrong month in the date/time stamp.
TOMTEC DATACENTER	INV-1499	Issues to configure the system to open all displays at first window when there is a screen resolution difference between the monitors.
TOMTEC DATACENTER	INV-1334	TTD opens only after two times password entered which happens only when incorrect license file is used (network license not available for server client installation).
TOMTEC DATACENTER	INV-1361	For DICOM Communication, TTD uses the first transfer syntax provided in the presentation context instead a preferred transfer syntax.
TOMTEC DATACENTER	INV-773	Some studies remain partially archived when creating new reports, images or measurements after archiving happened.
TOMTEC DATACENTER	INV-1368	Instruction on how to burn data to CD/DVD using TOMTEC-ARENA is not available in user manual.
TOMTEC DATACENTER	INV-920	Thumbnails are unavailable for some time after a service restart.
TOMTEC DATACENTER	INV-1266	'Review application failed to start' message appears a few seconds after login even if IMAGE-COM has not been started yet.
TOMTEC DATACENTER	INV-1316	Insufficient access rights to the <TTA Root>\Runtime directory has been logged with the unspecific error message 'Cannot write into index directory'.
TOMTEC DATACENTER	INV-1397	Desktop Client does not start due an incompatibility with OS proxy configuration.
TOMTEC DATACENTER	INV-1057	Retrying failed tasks in the task log fails with nullpointer exception.

Resolved Vulnerabilities

Module	CVE	Description
D.39.0263-01 Notes TOMTEC-ARENA TTA2		TTA2.50.00

TOMTEC DATACENTER	CVE-2020-17510	3 rd party library vulnerability, where sending a manipulated http request from within the network to the TOMTEC-ARENA could lead to the acquisition of unauthorized access to TOMTEC-ARENA.
IMAGE-COM	CVE-2020-8112	3 rd party library vulnerability, where sending a manipulated JPEG contained in a DICOM file to TOMTEC-ARENA from within the network could lead into a buffer overflow which may result in leakage of sensitive information.

Language Support

The following languages are supported (* for Instructions for use only, Software language: English):

- English
- Bulgarian*
- Chinese simplified
- Chinese traditional
- Croatian*
- Czech*
- Danish
- Dutch
- Estonian*
- Finnish
- French
- German
- Greek*
- Hungarian*
- Indonesian*
- Italian
- Japanese
- Kazakh*
- Korean*
- Latvian*
- Lithuanian*
- Macedonian*
- Norwegian
- Polish*
- Portuguese
- Romanian*
- Russian
- Serbian*
- Slovak*
- Slovenian*
- Spanish
- Swedish
- Turkish*
- Vietnamese*

Hints

Module	Function	Description
2D CPA / FETAL 2D CPA	Export	AVI export and Secondary capture is always the B-Mode clip with contour overlay.
2D CPA / FETAL 2D CPA / AutoStrain LV/ SAX/ RV/ LA	Color & Doppler data	DICOM clips containing color/Doppler data are not suitable for analysis with this module but can be loaded.
4D LV-ANALYSIS	Automated workflow	Automated workflow does not work for TEE data.
4D MV-ASSESSMENT	Automated initialization	Automated initialization is not available for TTE data. Automated initialization works only for TEE data from Philips and GE.
4D MODULES /Stress Echo	4k screens	There might be display issues with 4k monitors in combination with windows zoom factors. The text size is now limited but not all elements are scalable.
4D MODULES	User Documents / Manual	In case of single monitor the user documentation and manual might open in the background of the advanced package, if you try to open it via the "Help" or "Documentation" button in the About Box. Please close or minimize the advanced application to read / select the document.
4D MODULES	Measurement Export	The measurement export (txt, csv) is not translated. Exported result names and units are English only.
4D MODULES/ 2D CPA	Units	Settings of IMAGE-COM regarding units are not transferred to the modules.
4D MODULES/ 2D CPA /Q-Apps	Log-off	Logoff while 4D module / 2D CPA / Q-App is open closes the module without saving results.
All	SQL Server 2014 Support	Support of SQL Server 2014 and lower is discontinued and TOMTEC-ARENA will not run anymore. A database upgrade of the used SQL Server to at least Version 2016 is mandatory BEFORE performing the update installation to this version. Please contact your service representative if further information is needed.
ALL	Log info for GE compressed data	GE Vivid 4D format "raw compressed" is not supported – a WRN in the log file is added for an easier troubleshooting.
ALL	Modality Setting Transfer Syntaxes	The following transfer syntax (using JPG2000) shall not be used due to performance issues: <ul style="list-style-type: none"> - 1.2.840.10008.1.2.4.90 JPEG 2000 Image Compression (Lossless Only) - 1.2.840.10008.1.2.4.91 JPEG 2000 Image Compression
ALL	Modality Configuration	All modalities shall be configured to send images only on study closed to avoid that not all images

		and results are displayed when IMAGE-COM is opened.
ALL	About Box - Help	In order to open the manual within the zero footprint solution ("Help" Button in the About Box), a pop-up is forced to open the manual. This is blocked by default by most of the browsers. If the user adds an exception for TTA Zero the manual will pop-up.
ALL	ECG display	ECG information is only displayed, if information is offered by US device. Please contact your device manufacturer for settings information.
ALL	Monitor Resolution	Changing the OS monitor resolution or scaling requires a restart of the client.
ALL	OS Hardening	TOMTEC-ARENA will not function on a Windows operating system that has been hardened or configured to prevent unsigned executables or libraries to be executed. The current workaround is to remove the hardening/configuration on PC's that will be running TOMTEC-ARENA which will lower the overall security level and may increase the risk of security breaches.
AutoStrain LV / RV / LA	Automated workflow	Automated workflow does not work for TEE data.
AutoStrain LV	EF	EF measurement is not available for TEE data. Workflow steps remain grayed out.
AutoStrain LV / RV / LA	Bookmarks	Bookmarks of former versions are not supported anymore.
AutoStrain LV	Supported data	AutoStrain supports BMode clips with a single calibrated region only. Triplane or x-plane acquisitions are not loaded.
IMAGE-COM	Semi-automated standard measurements	In comparison to the already known Add-ins (AutoLV, AutoStrain, AutoLA) the frame, where the measurement shall be performed, needs to be preselected in B-Mode Clips.
IMAGE-COM	Measurement menu presets	The measurement menu might have display issues for measurement menu presets including column based measurement packages. As a workaround select first the factory preset and switch to the user preset directly.
IMAGE-COM	Measurement menu presets	After upgrade to TTA2.50.00 measurement menu presets might result in IMAGE-COM freeze due to changes in the measurement menu configuration. Please forward the files to Service & Support or re-create the user preset with the TTA2.50.00 measurement menu editor.
IMAGE-COM	Measurement menu presets	Measurement menu presets only affect the measurement menu itself, neither the Worksheet nor the Measurement List and its derived PDF print. The synchronization between IMAGE-COM and Worksheet menu is no longer available in case a preset contains user defined groups and packages.

IMAGE-COM	Measurement menu presets	In case of creating own presets for the measurement menu the user has to be aware of quality seal settings. Switching measurements off is under responsibility of the user.
IMAGE-COM	Measurement menu presets	Some measurement packages cannot be changed or duplicated because of a direct link of measurement in the code. A lock symbol is displayed to mark these packages. Left Ventricle Simpson Strain (3P) Left Atrium LA Vol (Simpson) Right Atrium RA Vol (Simpson)
IMAGE-COM	Measurement menu presets	Default groups can only be changed limitedly: You can change the order of the included packages and measurements or de-select/select the packages and measurements. It is not possible to add packages and measurements from another default group. Therefore, a new group must be created to combine desired packages and measurements.
IMAGE-COM	Measurement menu presets	Renaming of default packages is not allowed. Only own created packages can be re-named.
IMAGE-COM	Measurement menu presets	It is not possible to configure laterality measurements into different packages, i.e. splitting up left and right or segmental vascular measurements into different measurement groups and/or packages.
IMAGE-COM	Zero Semi-automated measurements	In Zero, semi-automated measurements (AutoStrain, AutoLV, Standard Semi-automated Measurements) last a little longer for each first time start of Image-Com because dlls need to be loaded.
IMAGE-COM	Thumbnail display 3D data	Image-Com displays the reference clip / image saved with the 3D dataset as thumbnail. Not all ultrasound carts export this reference clip/image and therefore a black 3D thumbnail might be displayed. The advanced tools can still be operated from it.
IMAGE-COM	Reload study	A reload of primary studies is not supported in IMAGE-COM. Primary studies need to be reloaded via the study list before launching IMAGE-COM
IMAGE-COM	AutoSTRAIN	If the user deletes the contour of one view the contours of the other views are also deleted.
IMAGE-COM	Secondary Study Review	Limitation <ul style="list-style-type: none"> • Due to performance issues, the number of secondary studies displayed in the patient history is limited to three. • Measurements of secondary studies can be displayed.

		<ul style="list-style-type: none"> • New measurements can only be performed for primary studies. Only Generic measurements, which are not saved back to platform. • Additional DICOM data as secondary captures cannot be saved on secondary studies • 4D CAPS cannot be launched by a secondary study. • Worksheet is available only for the Primary Study <p>Not all settings are set independent for secondary and primary studies. The following settings apply to all studies</p> <ul style="list-style-type: none"> - Brightness / Contrast - Synchronization - Speed - 1:1 display
IMAGE-COM (Partner integrations)	Unsupported modality type	IMAGE-COM opens with a blank screen if the modality type is not supported. (INT-669)
IMAGE-COM, Cath-QCA	Recommended minimal length of caliper line	The start and end points of the measurement must be placed in a healthy part of the vessel. The start and end points must be at least one lesion length away from the lesion. Start and end point can still be moved after setting.
IMAGE-COM Zero	Feature gap	The following features are currently not available in the TOMTEC-ARENA ZERO solution of IMAGE-COM: Analysis (All CAPs).
IMAGE-COM / REPORTING	Secondary study review	In case of reporting and review of secondary studies, the images and the reporting may not be in synch.
INSTALLER TOOL	SQL Installation port configuration	In case you perform a Single-Seat or Server installation with an SQL Instance, please make sure that the standard used port is either opened within the windows firewall or the firewall is turned off. Otherwise, the SQL installation might fail.
INSTALLER TOOL	Folder permissions	Due to preconfigured policies it might happen that the "TOMTEC-ARENA AppServer (TTA2)" is not allowed to access / write to folders. (E.g. the runtime/temp folder). One of the symptoms is a failing export of studies. A manual creation of the required folders usually solves the issue.
INSTALLER TOOL	SQL Server compatibility	SQL Server versions older than SQL Server 2016 are not supported by TTA. A manual upgrade or reinstallation of the existing SQL Server to version 2016 or higher prior installation of TTA is required prior the Update.
MEASUREMENTS	Units & Precision	This customization option does not affect results that are shown within CAPs. Units & Precision of generic measurements may have differing factory default dimensions. Therefore it might happen that a labeled distance (e.g. RVAWd) is shown in

		cm whereas its corresponding generic distance measurement is in mm. If the simultaneous display of these results is not wanted, the show local checkbox of the Measurement Display tab can be switched to off in IMAGE-COM.
Q-Apps	Log-off	If a Q-App is open during log-off, it takes 1 minute to reopen it after login.
Q-Apps	SR export	If user triggers multiple SR exports during one session only the last one will be imported by Image-Com.
Q-Apps	Q-Apps do not launch out of IMAGE-COM	Q-Apps require the Microsoft Visual C++ 2010 Redistributable Package, which is not automatically installed with the integrated version of Q-Lab. In case the affected PC has no Microsoft Visual C++ 2010 Redistributable Package this needs to be installed.
Quality Seal light	Changes of recommended fields	Changes of recommended fields require a new start of the software.
REPORTING	Finalized Reports	Please be aware the DICOM header of a finalized DICOM PDF Report holds the information "VERIFIED" in tag 0040,A493 (Verification Flag). This tag will not be changed when a report gets un-finalized later on. The reason is, that it is not possible to guarantee unlimited access to the object (e.g. in case the object is already archived to a long-term archive). An additional object with UNVERIFIED" in tag 0040, A493 (Verification Flag) will be created. Correct processing of the objects by 3 rd parties is within their responsibility.
REPORTING	Update	All reports must be finalized prior to an update to TTA 2.50.
REPORTING	Update	Reports from TTA 2.20 or older are not supported within the update. To keep the reports, the user has to make sure that all relevant reports are either printed and archived or stored as PDF externally and archived prior to the update.
REPORTING	State Preliminary	When Report content is edited in any way during the status Preliminary, the status does not change automatically back to "Started". This has to be done manually and is important in case a trigger is set to send the preliminary report. Because the already sent preliminary report is not updated automatically.
REPORTING	Drag & drop images from reporting thumbnails	When inserting a multi-frame image from the thumbnail bar to the dynamic preview only the first frame is added to the print report.
REPORTING	Deprecated Fields	The warning for content of a report belonging to deprecated fields is not visible in report state "Finalized". It will appear only in the following states: <ul style="list-style-type: none"> • Report status "Started" or "Preliminary" • After changing the workspace for a study

		<ul style="list-style-type: none"> After a finalized report is re-opened.
REPORTING	REPORTING customization	<p>It is recommended that only one user is working in reporting customization at a time.</p> <p>It is also recommended to only perform customizations when no user is reporting.</p>
REPORTING	Audit Log	Audit Log data from TTA 2.31 or older may not be readable properly within higher versions. In case this data is needed, please forward the files to Service & Support.
REPORTING	Dual monitor setup	<p>It is recommended to use a dual monitor setup with equal monitor resolution and size. Using different resolution and size might cause a mouse cursor shift for some dropdown lists in REPORTING and REPORTING customization, which will impede navigation slightly.</p> <p>Hint: Even if the items cannot be reached by the cursor, they can be accessed with the arrows on the keyboard and applied with "Enter" button.</p>
REPORTING	Header and Footer customization	When adding an image please ensure that the image is completely visible. If not, just click on the image and the window will automatically adjust. Please note also that for huge headers or footers including tables and/or with setting "Display header only on first page", they could overlap report content.
REPORTING	Drop downs customization	If an item is selected to be default for a single selection drop down and user wants to remove the customization, just select the drop down and delete it and add it again without being default
REPORTING	Screen Resolution and scaling	For dropdowns with long contents, it might happen that the dynamic preview overlaps depending on the screen resolution and scaling. Reducing the scaling or increasing the resolution is needed to read those dropdowns properly.
REPORTING	Printing from PDF preview	When printing directly from PDF preview it can happen that the margins get small cut-off. If the report is saved and then printed it would look perfect.
REPORTING	Drawing in Jasper	Please note that the preview from a drawing could include difference on the Jasper report when edges are sharp.
TOMTEC DATACENTER	Database password encryption	The password for the TOMTEC-ARENA database user will get encrypted with the update TTA2.50.00. Checking the plain text password to ensure it is known is advised before the update.
TOMTEC DATACENTER	HTML inline frame	TTD Integration Interface is configured to be embedded in an HTML inline frame, the current supported chrome and edge browser versions do only allow the callup using an https proxy configuration.

TOMTEC DATACENTER	HL7 and patient matching configuration	When activating the HL7 interface, the patient matching automatically considers patient ID only for the HL7 interface. Further details can be found in the Server Administration guide.
TOMTEC DATACENTER	Data check for HL7 Interface	Where productive patient data are already in the TOMTEC-ARENA, before activating HL7 interface, the quality must be assessed. Further details can be found in the Server Administration guide.
TOMTEC DATACENTER	Audit Trail for HL7 messages	HL7 Audit events will be listed when TTA receives HL7 update messages which are unrelated to the data persisted in TOMTEC-ARENA. When searching by patient ID and comparing to prior state, it is possible to check if changes were applied or not.
TOMTEC DATACENTER	Auto archive configuration	When using the auto archive configuration from tomec.properties, ensure the gap between threshold and max size in working archive is at least twice the size of studies received per day.
TOMTEC DATACENTER	Query/Retrieve SCP	Requesting all studies of TOMTEC-ARENA multiple times within a short timeframe impacts the performance of the system and should be avoided.
TOMTEC DATACENTER	Access permissions	When installing or updating TOMTEC-ARENA, make sure the Windows user/TTA service user permissions are sufficient for the installed directory, import and export folders used as well as file archives and file exchange folders used. Further details on required access permissions are available in the Server Administration Guide.
TOMTEC DATACENTER	Local archives	The local archives including Import Folder, Working Archive, Online Cache and Thumbnail Folder must be locally on the server or accessible with a low latency and high bandwidth comparable to local access.
WORKSHEET	Scaling Factor	Following maximum scaling factors for the worksheet are recommended: HD monitors: 150% 4k monitors: 400%
WORKSHEET	Dual monitor setup	It is recommended to use a dual monitor setup with equal monitor resolution and size. Using different resolution and size might cause a zoomed measurement list PDF.

Known Bugs

Module	Description
4D MODULES	Waiting widget runs into endless loop. If working archive is full and read only. The waiting widget is running into an endless loop if you save a bookmark in a CAP and close the cap.
4D RV-FUNCTION	TTA is also released for pediatric data. Our tracking works and did not change due to the heart model (publications are still valid). Nevertheless, the first initialization can fail for very small hearts, if landmarks and initial orientation is done by heart model. Re-enter the view adjustment is required to trigger a re-tracking so the tracking is working fine again.
4D SONO-SCAN	When loading a bookmark, the application may not be in the exact same state as when the bookmark was saved. E.g. when loading a bookmark which was saved in the curved slice mode, the application does not show the corresponding menu in the tool space, so that the user has to select it again if he wants to edit the curved slices. (PLGVIEW-1240)
4D SONO-SCAN	In Disc-Summation mode the reset button is without effect. The result can still be deleted by a button in the corresponding tool space section. (PLGVIEW-1097)
4D SONO-SCAN	Annotation is not possible in reference view of Multi-Slice D'Art mode. (PLGVIEW-1102)
4D SONO-SCAN	The state of the slice- and rotation animation is not stored in bookmarks. (PLGVIEW-1104)
4D SONO-SCAN	An annotation can be deleted by a double left mouse click or a right mouse click while hovering the cursor over them. (PLGVIEW-1201)
IMAGE-COM	Printing an SR out of the pdf viewer does not work. Please print via worksheet or reporting.
IMAGE-COM	The MMT Adult license is requested with IC start not with selection of the measurement tab. It is released as expected when a different tab or another exam type is selected.
IMAGE-COM	New created objects like secondary captures are sometimes sorted to the beginning of a study instead of staying at the end when closing Image-Com.
IMAGE-COM (Partner integrations)	No Measurements are exported if the export format is configured in Image-Com config.xml and report export parameter is handed over through a command-line parameter at the same time. (INT-699)
IMAGE-COM ZERO	Exporting secondary captures and avis out of IMAGE-COM ZERO can take long time for data containing many frames.
INSTALLER TOOL	When installer is pausing with a message hinting to blocked TCP/IP ports and then is cancelled by the user, then continuing the installation fails. After Re-Installation the connection to the database has to be configured manually.
INSTALLER TOOL	In case the installer detects an existing database during the installation, the message with that information window is opened behind the installation progress bar. The installation window shall be moved and to reach the message, otherwise the installer will not continue.
INSTALLER TOOL	When using an SQL Instance name which exceeds 16 characters or a special character, the TTA installation will fail.
REPORTING	When printing a report using Edge browser version 44.17763.831.0, the PDF displays a blank page between the report pages. Edge shall not be used for printing reports directly from the browser, the PDF shall be downloaded and printed.
TOMTEC DATACENTER	Sporadically performance issues on servers with two active network connections. (PA-4226)
TOMTEC DATACENTER	For file archives located on a DFS (Distributed File Shared), the drive size and file size is calculated incorrectly. (PA-4248)
TOMTEC DATACENTER	Issues on starting IMAGE-COM when the path to the review executable in client.properties contains commas (e.g. C:\executable,review\IC). (PA-4300)

TOMTEC DATACENTER	Pending tasks in SERVER ADMINISTRATION are not executed after uncontrolled shutdown of TTA server or the database. Therefore, after an uncontrolled shutdown, the task log must be checked thoroughly. (PA-4307)
TOMTEC DATACENTER	If IMAGE-COM fails to start it can happen that the study stays locked and the license is still kept. In such a case an administrative user can solve the situation by unlocking the study from the SERVER ADMINISTRATION area. (PA-4356)
TOMTEC DATACENTER	DICOM tags Study Description or Series Description with more than 255 characters are truncated at import. (PA-4373)
TOMTEC DATACENTER	When changing the archive configuration of existing archives, the archive is not immediately validated. In case of a misconfiguration, this may lead to a read only state displayed by messages after a delay of several minutes instead of instant feedback. (PA-4566)
TOMTEC DATACENTER	It is not possible to perform a database migration from TTA2.2x to TTA2.3x and higher using the database migration tool. (PA-4803)
TOMTEC DATACENTER	When changing the monitor display the Desktop Client may not immediately react to the circumstances such as a different resolution of the display. A client restart solves this problem. (PA-5581)
TOMTEC DATACENTER	When searching in STUDY LIST, wild card characters such as underscore '_' (e.g. 'TTE_test') are getting ignored. (PA-5702)
TOMTEC DATACENTER	In a setup one screen is configured to be displayed duplicated on another screen via the OS display settings, the Desktop Client does not appear on the intended position according to configuration. (PA-5959)
TOMTEC DATACENTER	When multiselecting from the thumbnail preview in DATA MAINTENANCE for object deletion on the very right of the bar, the thumbnail bar may scroll to the very left directly with the selection. (PA-6151).
TOMTEC DATACENTER	When changing the OS resolution or scaling, the Desktop Client may not immediately react to the circumstances such as a different resolution of the display. A client restart solves this problem. (PA-6193)
TOMTEC DATACENTER	When a new DICOM structured report arrives to the system, while working in IMAGE-COM or REPORTING, it can sometimes happen that the measurements performed in IMAGE-COM are getting overwritten by the arrived data after several minutes of work. (PA-6203)
TOMTEC DATACENTER	In the erroneous condition where at least one long-term archive is offline, it may happen that in IMAGE-COM patient history in addition to the offline data of the patient, online prior studies are not loaded in addition. IMAGE-COM displays a warning that priors are incomplete. (PA-6218)
TOMTEC DATACENTER	When adding a DICOM Device or an HL7 Device, there may pop up an 'unsaved changes' message when saving. When confirming the message with 'OK', the device has been added to the list and it is possible to continue right away. (PA-6230)
WORKSHEET	The default filename for .txt and .pdf measurement export from the worksheet TTA Zero does not contain the study UID, but only the export date. (RPT-6930)

Update information to TTA2.50.00

From installed version	IMAGE-ARENA 4.7	IMAGE-ARENA 4.7 with TTA IMAGE-COM (Hybrid)	TTA 2.4x
To TTA2.50.00			
Review DICOM files originating from modality	✓	✓	✓
Review measurement values (in WS) created in IC	as EncPDF (IA) in IC	✓	✓
Review/Edit overlays of measurements in IC	✗	✓	✓
Reopen AutoStrain (from SR)	n.a.	✓	✓
Open CPA Bookmarks	✗	✓	✓
Open AutoStrain LV / RV / LA Bookmarks	n.a.	n.a.	✗
Open 4D CAP Bookmarks	✓ Exceptions: GE created with TTA version < TTA2.4x ✗ Exception: 4D RV-FUNCTION 2 Bookmarks will not be supported with 4D RV-FUNCTION 3	✓ Exceptions: GE ✗ version < TTA2.4x ✗ Exception	✓ Exceptions: GE ✗ version < TTA2.4x ✗ Exception
Access finalized Reports	✓ as EncPDF (IA) in IC	✓ as EncPDF (IA) in IC	✓
Access Report content (restore entered findings)	☐	✗	✓
Take over report status	✗	✗	✓
Reuse Reporting Customization	✗	✗	✓
Reuse configuration of DICOM endpoints	✗	✗	✓
Reuse configuration of Users/Groups/Permissions	✗	✗	✓
Reuse LicenseFile.xml	✗	✗	✓

ANNEX I

New Measurements

The following measurements have been added for TTA2.50.

Exam Type	Measurement Group	Package	Label	Measurement Description
Adult Echo				
	Left Ventricle			
		AutoStrain LV AP		
			GLS Mid Peak A4C	Left Ventricle - Global Peak Longitudinal Strain - myocardial - Apical four chamber
			GLS Mid Peak A2C	Left Ventricle - Global Peak Longitudinal Strain - myocardial - Apical two chamber
			GLS Mid Peak A3C	Left Ventricle - Global Peak Longitudinal Strain - myocardial - Apical three chamber
			GLS Mid Peak Avg	Left Ventricle - Global Peak Longitudinal Strain - myocardial - Average
			EDV (BP)	Left Ventricle - End Diastolic Volume - Biplane
			ESV (BP)	Left Ventricle - End Systolic Volume - Biplane
			EDVI (BP)	Left Ventricle - End Diastolic Volume - Biplane - Body Surface Area
			ESVI (BP)	Left Ventricle - End Systolic Volume - Biplane - Body Surface Area
			SV (BP)	Left Ventricle - Stroke Volume - Biplane
			EF (BP)	Left Ventricle - Ejection Fraction - Biplane
			EDV (A4C)	Left Ventricle - End Diastolic Volume - Apical four chamber
			ESV (A4C)	Left Ventricle - End Systolic Volume - Apical four chamber
			EDVI (A4C)	Left Ventricle - End Diastolic Volume - Apical four chamber - Body Surface Area
			ESVI (A4C)	Left Ventricle - End Systolic Volume - Apical four chamber - Body Surface Area
			SV (A4C)	Left Ventricle - Stroke Volume - Apical four chamber

		EF (A4C)	Left Ventricle - Ejection Fraction - Apical four chamber
		EDV (A2C)	Left Ventricle - End Diastolic Volume - Apical two chamber
		ESV (A2C)	Left Ventricle - End Systolic Volume - Apical two chamber
		EDVI (A2C)	Left Ventricle - End Diastolic Volume - Apical two chamber - Body Surface Area
		ESVI (A2C)	Left Ventricle - End Systolic Volume - Apical two chamber - Body Surface Area
		SV (A2C)	Left Ventricle - Stroke Volume - Apical two chamber
		EF (A2C)	Left Ventricle - Ejection Fraction - Apical two chamber
	AutoStrain LV SAX		
		GCS Endo Peak Basal	Left Ventricle - Global Peak Circumferential Strain - endocardial - Parasternal short axis basal
		GCS Endo Peak Mid	Left Ventricle - Global Peak Circumferential Strain - endocardial - Parasternal short axis middle
		GCS Endo Peak Apical	Left Ventricle - Global Peak Circumferential Strain - endocardial - Parasternal short axis apical
		GCS Endo Peak Avg	Left Ventricle - Global Peak Circumferential Strain - endocardial - Average
	Mitral Valve		
	MV		
		Anterior Leaflet Height	Mitral Valve - Anterior Leaflet Height
		Posterior Leaflet Height	Mitral Valve - Posterior Leaflet Height
		ALH/PLH	Mitral Valve - Anterior to Posterior Leaflet Height Ratio
		C-sept Distance	Mitral Annulus - Coaptation-Septal Distance
		Ao-MV Angle	Mitral Valve - Angle between Mitral Valve and Aortic Valve
	MR		
		MR VC Area	Mitral Valve - Vena Contracta Area
		MRSI	Mitral Valve - Mitral Regurgitation Severity Index
	Aortic Valve		

		LVOT	
		LVOT Vmax Valsalva	Left Ventricle Outflow Tract - Peak Velocity - Antegrade Flow - Valsalva Maneuver
		AR	
		AR VC Area	Aortic Valve - Vena Contracta Area
Tricuspid Valve			
		TR	
		TR VC Area	Tricuspid Valve - Vena Contracta Area
Pulmonary Valve			
		PR	
		PR VC Area	Pulmonary Valve - Vena Contracta Area
Pulmonary Vein			
		PVein	
		RUPV VTI	Pulmonary Veins - Velocity Time Integral - Right Upper Segment
		RUPV Vmax	Pulmonary Veins - Peak Velocity - Right Upper Segment
		RUPV PGmax	Pulmonary Veins - Peak Gradient - Right Upper Segment
		RUPV PGmean	Pulmonary Veins - Mean Gradient - Right Upper Segment
		RLPV VTI	Pulmonary Veins - Velocity Time Integral - Right Lower Segment
		RLPV Vmax	Pulmonary Veins - Peak Velocity - Right Lower Segment
		RLPV PGmax	Pulmonary Veins - Peak Gradient - Right Lower Segment
		RLPV PGmean	Pulmonary Veins - Mean Gradient - Right Lower Segment
		LUPV VTI	Pulmonary Veins - Velocity Time Integral - Left Upper Segment
		LUPV Vmax	Pulmonary Veins - Peak Velocity - Left Upper Segment
		LUPV PGmax	Pulmonary Veins - Peak Gradient - Left Upper Segment
		LUPV PGmean	Pulmonary Veins - Mean Gradient - Left Upper Segment
		LLPV VTI	Pulmonary Veins - Velocity Time Integral - Left Lower Segment
		LLPV Vmax	Pulmonary Veins - Peak Velocity - Left Lower Segment
		LLPV PGmax	Pulmonary Veins - Peak Gradient - Left Lower Segment
		LLPV PGmean	Pulmonary Veins - Mean Gradient - Left Lower Segment

Venous Return			
	Hepatic Vein		
	S Vel	Hepatic Vein - Systolic Peak Velocity - Antegrade Flow	
	D Vel	Hepatic Vein - Diastolic Peak Velocity - Antegrade Flow	
	A Vel	Hepatic Vein - Atrial Contraction Reversal Peak Velocity - Diastole	
	V Vel	Hepatic Vein - Atrial Overfilling Peak Velocity	
Congenital			
	PDA		
	PDA diam	Patent Ductus Arteriosus - Diameter	
	PDA diam color	Patent Ductus Arteriosus - Diameter - Doppler Color Flow	
	PDA length	Patent Ductus Arteriosus - Length	
	PDA L-R VTI	Patent Ductus Arteriosus - Velocity Time Integral - Left to right cardiovascular shunt	
	PDA L-R Vmax	Patent Ductus Arteriosus - Peak Velocity - Left to right cardiovascular shunt	
	PDA L-R Vmean	Patent Ductus Arteriosus - Mean Velocity - Left to right cardiovascular shunt	
	PDA L-R PGmax	Patent Ductus Arteriosus - Peak Gradient - Left to right cardiovascular shunt	
	PDA L-R PGmean	Patent Ductus Arteriosus - Mean Gradient - Left to right cardiovascular shunt	
	PDA R-L VTI	Patent Ductus Arteriosus - Velocity Time Integral - Right to left cardiovascular shunt	
	PDA R-L Vmax	Patent Ductus Arteriosus - Peak Velocity - Right to left cardiovascular shunt	
	PDA R-L Vmean	Patent Ductus Arteriosus - Mean Velocity - Right to left cardiovascular shunt	
	PDA R-L PGmax	Patent Ductus Arteriosus - Peak Gradient - Right to left cardiovascular shunt	
	PDA R-L PGmean	Patent Ductus Arteriosus - Mean Gradient - Right to left cardiovascular shunt	

Exam Type	Measurement Group	Package	Label	Measurement Description	
Pediatric Echo					
	MV - LAVV				
		MV/LAVV			
			MV PHT	Mitral Valve - Pressure Half-Time	
			MVA (PHT)	Mitral Valve - Cardiovascular Orifice Area - Area by Pressure Half-Time	
			MV diam	Mitral Valve - Cardiovascular Orifice Diameter	
			MV SV	Mitral Valve - Stroke Volume	
		MMode			
			E wave amp	Mitral Valve - Amplitude E-Wave	
			A wave amp	Mitral Valve - Amplitude A-Wave	
			DE slope (Vp)	Mitral Valve - D-E Slope (Flow Propagation Velocity)	
			DE excursion	Mitral Valve - D-E Excursion	
			EPSS	Mitral Valve - EPSS, E-Wave	
			EF slope	Mitral Valve - E-F Slope	
			AC interval	Mitral Valve - A-C Interval	
			A wave amp/E wave amp	Mitral Valve - A-Wave Amplitude to E-Wave Amplitude	
			E wave amp/A wave amp	Mitral Valve - E-Wave Amplitude to A-Wave Amplitude	
			MAPSE	Left Ventricle - Mitral Annular Plane Systolic Excursion	
		TV - RAVV			
			Annulus		
				TV Annulus diam ant-post	Tricuspid Annulus - Diameter - Diastole - Anterior-Posterior
	AV - Ao				
		AVA (VTI)			
			AV VTI	Aortic Valve - Velocity Time Integral - Antegrade Flow	
		LVOT VTI	Left Ventricle Outflow Tract - Velocity Time Integral		
	LVOT diam	Left Ventricle Outflow Tract - Cardiovascular Orifice Diameter			

		AVA (VTI)	Aortic Valve - Cardiovascular Orifice Area - Continuity Equation by Velocity Time Integral
		AVAI (VTI)	Aortic Valve - Cardiovascular Orifice Area - Continuity Equation by Velocity Time Integral - Body Surface Area
AVA (Vmax)			
		AV Vmax	Aortic Valve - Peak Velocity - Antegrade Flow
		LVOT Vmax	Left Ventricle Outflow Tract - Peak Velocity
		LVOT diam	Left Ventricle Outflow Tract - Cardiovascular Orifice Diameter
		AVA (Vmax)	Aortic Valve - Cardiovascular Orifice Area - Continuity Equation by Peak Velocity
		AVAI (Vmax)	Aortic Valve - Cardiovascular Orifice Area - Continuity Equation by Peak Velocity - Body Surface Area
Aorta			
		Ao Root diam systole	Aortic Root - Diameter - Systole
		LA diam diastole	Left Atrium - Diameter - Diastole
		LA _s /AO _d	Left Atrium Systole to Aortic Root Diastole Diameter Ratio
		Ao Asc VTI	Ascending Aorta - Velocity Time Integral
		Ao Asc Vmean	Ascending Aorta - Time averaged mean velocity
		Ao Asc PGmean	Ascending Aorta - Mean Gradient
		Ao Thor VTI	Thoracic Aorta - Velocity Time Integral
		Ao Thor Vmean	Thoracic Aorta - Time averaged mean velocity
		Ao Thor PGmean	Thoracic Aorta - Mean Gradient
MMode			
		Ao Root diam systole	Aortic Root - Diameter - Systole
		Ao Root diam diastole	Aortic Root - Diameter - Diastole
		LA diam systole	Left Atrium - Diameter - Systole - Antero-posterior
		LA diam diastole	Left Atrium - Diameter - Diastole
		AO/LA systole	Left Atrium - Aortic Root Diameter to Left Atrium Diameter Ratio

		LA/AO systole	Left Atrium - Left Atrium Diameter to Aortic Root Diameter Ratio
		LAs/AOd	Left Atrium Systole to Aortic Root Diastole Diameter Ratio
		LA diam systole Index	Left Atrium - Diameter - Systole - Body Surface Area
		ACS	Aortic Valve - Cusp Separation
PV - PA			
	PV		
		PV Annulus diam ant-post	Pulmonary Annulus - Diameter - Anterior-Posterior
		PV Annulus diam trans	Pulmonary Annulus - Diameter - Transverse
	PVA (VTI)		
		PV VTI	Pulmonary Valve - Velocity Time Integral - Antegrade Flow
		RVOT VTI (RV)	Right Ventricle Outflow Tract - Velocity Time Integral - Antegrade Flow
		RVOT diam	Right Ventricle Outflow Tract - Cardiovascular Orifice Diameter
		PVA (VTI)	Pulmonary Valve - Cardiovascular Orifice Area - Continuity Equation by Velocity Time Integral
		PVAI (VTI)	Pulmonary Valve - Cardiovascular Orifice Area - Continuity Equation by Velocity Time Integral - Body Surface Area
	PVA (Vmax)		
		PV Vmax	Pulmonary Valve - Peak Velocity - Antegrade Flow
		RVOT Vmax	Right Ventricle Outflow Tract - Peak Velocity - Antegrade Flow
		RVOT diam	Right Ventricle Outflow Tract - Cardiovascular Orifice Diameter
		PVA (Vmax)	Pulmonary Valve - Cardiovascular Orifice Area - Continuity Equation by Peak Velocity
		PVAI (Vmax)	Pulmonary Valve - Cardiovascular Orifice Area - Continuity Equation by Peak Velocity - Body Surface Area
RVOT			
	RVOT		
		HR	Pulmonary Valve - Heart Rate
RV - LV			

		2D	
		LVPWd/LVIDd	Left Ventricle - Thickness to Internal Dimension Ratio
		LVIDd sax PM ant-post	Left Ventricle - ROI Internal Dimension by US - End Diastole - Anterior-Posterior - Parasternal short axis at the Papillary Muscle level
		LVIDd sax PM sep-lat	Left Ventricle - ROI Internal Dimension by US - End Diastole - Septal-Lateral - Parasternal short axis at the Papillary Muscle level
		LVEId	Left Ventricle - LV Eccentricity Index - End Diastole
		LVIDs sax PM ant-post	Left Ventricle - ROI Internal Dimension by US - End Systole - Anterior-Posterior - Parasternal short axis at the Papillary Muscle level
		LVIDs sax PM sep-lat	Left Ventricle - ROI Internal Dimension by US - End Systole - Septal-Lateral - Parasternal short axis at the Papillary Muscle level
		LVEIs	Left Ventricle - LV Eccentricity Index - End Systole
LV Volume - Function			
		Bullet	
		LVIDd	Left Ventricle - ROI Internal Dimension by US - End Diastole
		LVLd	Left Ventricle - Major Axis - End Diastole
		LVLd Epi	Left Ventricle - Epicardial Major Axis - End Diastole
		LVLs	Left Ventricle - Major Axis - End Systole
		LVAd sax	Left Ventricle - Area - End Diastole - Parasternal short axis
		LVAd sax Epi	Left Ventricle - Epicardial Area - End Diastole - Parasternal short axis
		LVAs sax	Left Ventricle - Area - End Systole - Parasternal short axis
		EDV	Left Ventricle - End Diastolic Volume - Bullet
		EDV Epi	Left Ventricle - Epicardial End Diastolic Volume - Bullet
		ESV	Left Ventricle - End Systolic Volume - Bullet
		LV Mass	Left Ventricle - Mass - End Diastole - Bullet
		LV Mass/EDV	Left Ventricle - LV Mass to Volume Ratio - End Diastole - Bullet
		SV	Left Ventricle - Stroke Volume - Bullet
		CO	Left Ventricle - Cardiac Output - Bullet
		EF	Left Ventricle - Cardiac ejection fraction - Bullet
		SI	Left Ventricle - Stroke Index - Bullet
		CI	Left Ventricle - Cardiac Index - Bullet

		LV Sphericity Index	Left Ventricle - End Diastolic Sphericity Index
		HR	Left Ventricle - Heart Rate
		AutoStrain LV AP	
		GLS Mid Peak A4C	Left Ventricle - Global Peak Longitudinal Strain - myocardial - Apical four chamber
		GLS Mid Peak A2C	Left Ventricle - Global Peak Longitudinal Strain - myocardial - Apical two chamber
		GLS Mid Peak A3C	Left Ventricle - Global Peak Longitudinal Strain - myocardial - Apical three chamber
		GLS Mid Peak Avg	Left Ventricle - Global Peak Longitudinal Strain - myocardial - Average
		EDV (BP)	Left Ventricle - Volume - End Diastole - Biplane
		ESV (BP)	Left Ventricle - Volume - End Systole - Biplane
		EDVI (BP)	Left Ventricle - Volume - End Diastole - Biplane - Body Surface Area
		ESVI (BP)	Left Ventricle - Volume - End Systole - Biplane - Body Surface Area
		SV (BP)	Left Ventricle - Stroke Volume - Biplane
		EF (BP)	Left Ventricle - Ejection Fraction - Biplane
		EDV (A4C)	Left Ventricle - Volume - End Diastole - Apical four chamber
		ESV (A4C)	Left Ventricle - Volume - End Systole - Apical four chamber
		EDVI (A4C)	Left Ventricle - Volume - End Diastole - Apical four chamber - Body Surface Area
		ESVI (A4C)	Left Ventricle - Volume - End Systole - Apical four chamber - Body Surface Area
		SV (A4C)	Left Ventricle - Stroke Volume - Apical four chamber
		EF (A4C)	Left Ventricle - Ejection Fraction - Apical four chamber
		EDV (A2C)	Left Ventricle - Volume - End Diastole - Apical two chamber
		ESV (A2C)	Left Ventricle - Volume - End Systole - Apical two chamber
		EDVI (A2C)	Left Ventricle - Volume - End Diastole - Apical two chamber - Body Surface Area
		ESVI (A2C)	Left Ventricle - Volume - End Systole - Apical two chamber - Body Surface Area
		SV (A2C)	Left Ventricle - Stroke Volume - Apical two chamber

		EF (A2C)	Left Ventricle - Ejection Fraction - Apical two chamber
	AutoStrain LV SAX		
		GCS Endo Peak Basal	Left Ventricle - Global Peak Circumferential Strain - endocardial - Parasternal short axis basal
		GCS Endo Peak Mid	Left Ventricle - Global Peak Circumferential Strain - endocardial - Parasternal short axis middle
		GCS Endo Peak Apical	Left Ventricle - Global Peak Circumferential Strain - endocardial - Parasternal short axis apical
		GCS Endo Peak Avg	Left Ventricle - Global Peak Circumferential Strain - endocardial - Average
	RA - LA		
	RA Dimension		
		RA diam lax	Right Atrium major dimension
		RA diam sax	Right Atrium minor dimension
		RA Area ES	Right Atrium - Area - End Systole
	LA Vol (A-L)		
		LA Vol (A-L) (A4C)	Left Atrium - Volume - End Systole - Area-Length, Single Plane - Apical four chamber
		LA Vol I (A-L) (A4C)	Left Atrium - Volume - End Systole - Area-Length, Single Plane - Apical four chamber - Body Surface Area
	MMode		
		Ao Root diam systole	Aortic Root - Diameter - Systole
		Ao Root diam diastole	Aortic Root - Diameter - Diastole
		LA diam systole	Left Atrium - Diameter - Systole - Antero-posterior
		LA diam diastole	Left Atrium - Diameter - Diastole
		AO/LA systole	Left Atrium - Aortic Root Diameter to Left Atrium Diameter Ratio
		LA/AO systole	Left Atrium - Left Atrium Diameter to Aortic Root Diameter Ratio
		LAs/AOd	Left Atrium Systole to Aortic Root Diastole Diameter Ratio
		LA diam systole Index	Left Atrium - Diameter - Systole - Body Surface Area

Exam Type	Measurement Group	Package	ACS Label	Aortic Valve - Cusp Separation Measurement Description
Vascular Graft				
Graft 1				
		Inflow A		
			RI	Resistivity Index
		Prox Anastomosis		
			RI	Resistivity Index
		Prox Graft		
			RI	Resistivity Index
		Prox - Mid Graft		
			RI	Resistivity Index
		Mid Graft		
			RI	Resistivity Index
		Mid - Dist Graft		
			RI	Resistivity Index
		Dist Graft		
			RI	Resistivity Index
		Dist Anastomosis		
			RI	Resistivity Index
		Prox Outflow A		
			RI	Resistivity Index
		Mid Outflow A		
			RI	Resistivity Index
		Dist Outflow A		
			RI	Resistivity Index
Graft 2				
		Inflow A		

		RI	Resistivity Index
	Prox Anastomosis		
		RI	Resistivity Index
	Prox Graft		
		RI	Resistivity Index
	Prox - Mid Graft		
		RI	Resistivity Index
	Mid Graft		
		RI	Resistivity Index
	Mid - Dist Graft		
		RI	Resistivity Index
	Dist Graft		
		RI	Resistivity Index
	Dist Anastomosis		
		RI	Resistivity Index
	Prox Outflow A		
		RI	Resistivity Index
	Mid Outflow A		
		RI	Resistivity Index
	Dist Outflow A		
		RI	Resistivity Index
	Graft 3		
	Inflow A		
		RI	Resistivity Index
	Prox Anastomosis		
		RI	Resistivity Index
	Prox Graft		
		RI	Resistivity Index

Release Notes
TTA2.50.00



	Prox - Mid Graft		
		RI	Resistivity Index
	Mid Graft		
		RI	Resistivity Index
	Mid - Dist Graft		
		RI	Resistivity Index
	Dist Graft		
		RI	Resistivity Index
	Dist Anastomosis		
		RI	Resistivity Index
	Prox Outflow A		
		RI	Resistivity Index
	Mid Outflow A		
		RI	Resistivity Index
	Dist Outflow A		
		RI	Resistivity Index

Modified Measurements

The following measurement labels/descriptions have been modified for TTA2.50 (changed labels/descriptions are marked in blue).

Exam Type	Measurement Group	Package	Label	Measurement Description
Adult Echo				
	Left Ventricle			
		2D		
			LV Mass I	Left Ventricle - Mass - Body Surface Area
			LV Mass I(ht)	Left Ventricle - Mass - Patient Height
		MMode		

		LV Mass I	Left Ventricle - Mass - Body Surface Area
	Simpson		
	EDV (BP)	Left Ventricle - End Diastolic Volume - Method of Disks, Biplane	
	ESV (BP)	Left Ventricle - End Systolic Volume - Method of Disks, Biplane	
	EDVI (BP)	Left Ventricle - End Diastolic Volume - Method of Disks, Biplane - Body Surface Area	
	ESVI (BP)	Left Ventricle - End Systolic Volume - Method of Disks, Biplane - Body Surface Area	
	EDVI(ht) (BP)	Left Ventricle - End Diastolic Volume - Method of Disks, Biplane - Patient Height	
	ESVI(ht) (BP)	Left Ventricle - End Systolic Volume - Method of Disks, Biplane - Patient Height	
	SV (BP)	Left Ventricle - Stroke Volume - Method of Disks, Biplane	
	CO (BP)	Left Ventricle - Cardiac Output - Method of Disks, Biplane	
	EF (BP)	Left Ventricle - Ejection Fraction - Method of Disks, Biplane	
	SI (BP)	Left Ventricle - Stroke Index - Method of Disks, Biplane	
	CI (BP)	Left Ventricle - Cardiac Index - Method of Disks, Biplane	
	LV Mass T-E		
	LV Mass I	Left Ventricle - Mass - Left Ventricle Mass by Truncated Ellipse - Body Surface Area	
	LV Mass A-L		
	LV Mass I	Left Ventricle - Mass - Left Ventricle Mass by Area Length - Body Surface Area	
	2D CPA		
	EDDmid (A4C)	Left Ventricle – End Diastolic Mid Diameter – Apical four chamber	
	Ao-LA		
	2D		
	Ao Root diam systole	Aortic Root - Diameter - Systole	

		Ao Root diam diastole	Aortic Root - Diameter - Diastole
	MMode		
		Ao Root diam systole	Aortic Root - Diameter - Systole
		Ao Root diam diastole	Aortic Root - Diameter - Diastole
Mitral Valve			
	MV		
		MV C-O dur	Mitral Valve - Closure to Opening Time - Antegrade Flow
	LV MPI		
		MV C-O dur	Mitral Valve - Closure to Opening Time - Antegrade Flow
	MMode		
		DE excursion	Mitral Valve - D-E Excursion
	MVA (VTI)		
		MVAI (VTI)	Mitral Valve - Cardiovascular Orifice Area - Antegrade Flow - Continuity Equation by Velocity Time Integral - Body Surface Area
	MVA (Vmax)		
		MVAI (Vmax)	Mitral Valve - Cardiovascular Orifice Area - Antegrade Flow - Continuity Equation by Peak Velocity - Body Surface Area
	4D MV Assessment		
		AP Diam	Mitral Valve - Anterior-Posterior Annulus Diameter [3D]
		AL-PM Diam	Mitral Valve - Anteriorlateral-Posteriormedial Annulus Diameter [3D]
		Sphericity Index (AP / AL-PM)	Mitral Valve - Sphericity Index (AP / AL-PM) [3D]
		Commissural Diam	Mitral Valve - Commissural Diameter [3D]
		Saddle Shaped Annulus Area (3D)	Mitral Valve - Saddle Shaped Annulus Area [3D]

		Saddle Shaped Annulus Perimeter (3D)	Mitral Valve - Saddle Shaped Annulus Perimeter [3D]
		D-Shaped Annulus Area (2D)	Mitral Valve - D-Shaped Annulus Area [2D]
		D-Shaped Annulus Perimeter	Mitral Valve - D-Shaped Annulus Perimeter [3D]
		Coaptation Depth	Mitral Valve - Coaptation Depth [3D]
		Max Prolapse Height	Mitral Valve - Maximum Prolapse Height [2D]
		Max Open Coaptation Gap	Mitral Valve - Maximal Open Coaptation Gap [2D]
		Max Open Coaptation Width	Mitral Valve - Maximal Open Coaptation Width [3D]
		Total Open Coaptation Area (3D)	Mitral Valve - Total Open Coaptation Area [3D]
		Anterior Leaflet Area	Mitral Valve - Anterior Leaflet Area [3D]
		Posterior Leaflet Area	Mitral Valve - Posterior Leaflet Area [3D]
		Annulus Area (2D)	Mitral Valve - Annulus Area [2D]
		Anterior Closure Line Length (2D)	Mitral Valve - Anterior Closure Line Length [2D]
		Anterior Closure Line Length (3D)	Mitral Valve - Anterior Closure Line Length [3D]
		Posterior Closure Line Length (2D)	Mitral Valve - Posterior Closure Line Length [2D]
		Posterior Closure Line Length (3D)	Mitral Valve - Posterior Closure Line Length [3D]

		C-Shaped Annulus	Mitral Valve - C-Shaped Annulus [3D]
		Max Annular Displacement	Mitral Valve - Maximum Annular Displacement [3D]
		Max Annular Displacement Vel	Mitral Valve - Maximum Annular Displacement Velocity [3D]
		Annulus Area Fraction (2D)	Mitral Valve - Annulus Area Fraction [2D]
Aortic Valve			
	AVA (VTI)		
		AVAI (VTI)	Aortic Valve - Cardiovascular Orifice Area - Antegrade Flow - Doppler Mode - Continuity Equation by Velocity Time Integral - Body Surface Area
	AVA (Vmax)		
		AVAI (Vmax)	Aortic Valve - Cardiovascular Orifice Area - Antegrade Flow - Doppler Mode - Continuity Equation by Peak Velocity - Body Surface Area
Tricuspid Valve			
	TVA (VTI)		
		TVAI (VTI)	Tricuspid Valve - Cardiovascular Orifice Area - Antegrade Flow - Continuity Equation by Velocity Time Integral - Body Surface Area
	TVA (Vmax)		
		TVAI (Vmax)	Tricuspid Valve - Cardiovascular Orifice Area - Antegrade Flow - Continuity Equation by Peak Velocity - Body Surface Area
Pulmonary Valve			
	PV		
		Q to PVclose	Pulmonary Valve - Time from Q wave to Pulmonic Valve Closes - Antegrade Flow
	PVA (VTI)		
		PVAI (VTI)	Pulmonary Valve - Cardiovascular Orifice Area - Antegrade Flow - Continuity Equation by Velocity Time Integral - Body Surface Area

		PVA (Vmax)	
		PVAI (Vmax)	Pulmonary Valve - Cardiovascular Orifice Area - Antegrade Flow - Continuity Equation by Peak Velocity - Body Surface Area
Right Ventricle			
		2D	
		RVAd I	Right Ventricle - Area - End Diastole - Body Surface Area
		RVAs I	Right Ventricle - Area - End Systole - Body Surface Area
		AutoStrain RV	
		RVFWSL Endo	Right Ventricle - RV Free Wall Longitudinal Strain
		RV4CSL Endo	Right Ventricle - RV Global 4 Chamber Longitudinal Strain
Left Atrium			
		LA Vol (A-L)	
		LA Vol I (A-L)	Left Atrium - End Systolic Volume - 2D mode - Area-Length, Biplane - Body Surface Area
		LA Vol (Simpson)	
		LA Vol I (A4C)	Left Atrium - End Systolic Volume - Method of Disks, Single Plane - Apical four chamber - Body Surface Area
		LA Vol I (A2C)	Left Atrium - End Systolic Volume - Method of Disks, Single Plane - Apical two chamber - Body Surface Area
		LA Vol I (BP)	Left Atrium - End Systolic Volume - Method of Disks, Biplane - Body Surface Area
		Appendage	
		LA Vmax App.	Left Atrium - Peak Velocity - Appendage
		AutoStrain LA	
		LASr ED	Left Atrium - LA reservoir strain with reference at end diastole
		LAScd ED	Left Atrium - LA conduit strain with reference at end diastole
		LASct ED	Left Atrium - LA contraction strain with reference at end diastole

Exam Type	Measurement Group	Package	Label	Measurement Description
	Right Atrium			
		RA Vol (A-L)		
			RA Vol I (A-L)	Right Atrium - End Systolic Volume - Area-Length, Single Plane - Body Surface Area
		RA Vol (Simpson)		
			RA Vol I (A4C)	Right Atrium - End Systolic Volume - 2D mode - Method of Disks, Single Plane - Apical four chamber - Body Surface Area
	Pediatric Echo			
	MV - LAVV			
		MV/LAVV		
			MV C-O dur	Mitral Valve - Closure to Opening Time
		LV MPI		
			MV C-O dur	Mitral Valve - Closure to Opening Time
	TV - RAVV			
		TV/RAVV		
			TV C-O dur	Tricuspid Valve - Closure to Opening Time - Antegrade Flow
	AV - Ao			
		Aorta		
			Ao Root diam diastole	Aortic Root - Diameter - Diastole
			LA diam systole	Left Atrium - Diameter - Systole - Antero-posterior
			AO/LA systole	Left Atrium - Aortic Root Diameter to Left Atrium Diameter Ratio
			LA/AO systole	Left Atrium - Left Atrium Diameter to Aortic Root Diameter Ratio
	PV - PA			
		PV		
			PV Acc Time	Pulmonary Valve - Acceleration Time - Antegrade Flow

			PV Acc T/ET	Pulmonary Valve - Ratio of Pulmonic Valve Acceleration Time to Ejection Time - Antegrade Flow
			PV Annulus	Pulmonary Annulus - Diameter
	RV - LV			
	2D			
			LV Mass I	Left Ventricle - Mass - Body Surface Area
	MMode			
			LV Mass I	Left Ventricle - Mass - Body Surface Area
			LA diam systole	Left Atrium - Diameter - Systole - Antero-posterior
	LV Volume - Function			
	Simpson			
			EDV (BP)	Left Ventricle - Volume - End Diastole - Method of Disks, Biplane
			ESV (BP)	Left Ventricle - Volume - End Systole - Method of Disks, Biplane
			EDVI (BP)	Left Ventricle - Volume - End Diastole - Method of Disks, Biplane - Body Surface Area
			ESVI (BP)	Left Ventricle - Volume - End Systole - Method of Disks, Biplane - Body Surface Area
			SV (BP)	Left Ventricle - Stroke Volume - Method of Disks, Biplane
			CO (BP)	Left Ventricle - Cardiac Output - Method of Disks, Biplane
			EF (BP)	Left Ventricle - Cardiac ejection fraction - Method of Disks, Biplane
			SI (BP)	Left Ventricle - Stroke Index - Method of Disks, Biplane
			CI (BP)	Left Ventricle - Cardiac Index - Method of Disks, Biplane
	LV Mass A-L			
			LV Mass I	Left Ventricle - Mass - Left Ventricle Mass by Area Length - Body Surface Area
	RV Volume - Funtion			
	RV			
			RVAd I	Right Ventricle - Area - End Diastole - Body Surface Area
			RVAs I	Right Ventricle - Area - End Systole - Body Surface Area
	AutoStrain RV			

			RVFWSL Endo	Right Ventricle - RV Free Wall Longitudinal Strain
			RV4CSL Endo	Right Ventricle - RV Global 4 Chamber Longitudinal Strain
	RA - LA			
	RA Vol (A-L)			
			RA Vol (A-L) (A4C)	Right Atrium - Volume - End Systole - Area-Length, Single Plane - Apical four chamber
			RA Vol I (A-L) (A4C)	Right Atrium - Volume - End Systole - Area-Length, Single Plane - Apical four chamber - Body Surface Area
	RA Vol (Simpson)			
			RA Vol I (A4C)	Right Atrium - Volume - End Systole - Method of Disks, Single Plane - Apical four chamber - Body Surface Area
	LA Vol (A-L)			
			LA Vol I (A-L)	Left Atrium - Volume - End Systole - Area-Length, Biplane - Body Surface Area
	LA Vol (Simpson)			
			LA Vol I (A4C)	Left Atrium - Volume - End Systole - Method of Disks, Single Plane - Apical four chamber - Body Surface Area
			LA Vol I (A2C)	Left Atrium - Volume - End Systole - Method of Disks, Single Plane - Apical two chamber - Body Surface Area
			LA Vol I (BP)	Left Atrium - Volume - End Systole - Method of Disks, Biplane - Body Surface Area
	AutoStrain LA			
			LASr ED	Left Atrium - LA reservoir strain with reference at end diastole
			LAScd ED	Left Atrium - LA conduit strain with reference at end diastole
			LASct ED	Left Atrium - LA contraction strain with reference at end diastole