Data sheet

AI-Rad Companion Chest CT

Valid from February 2024

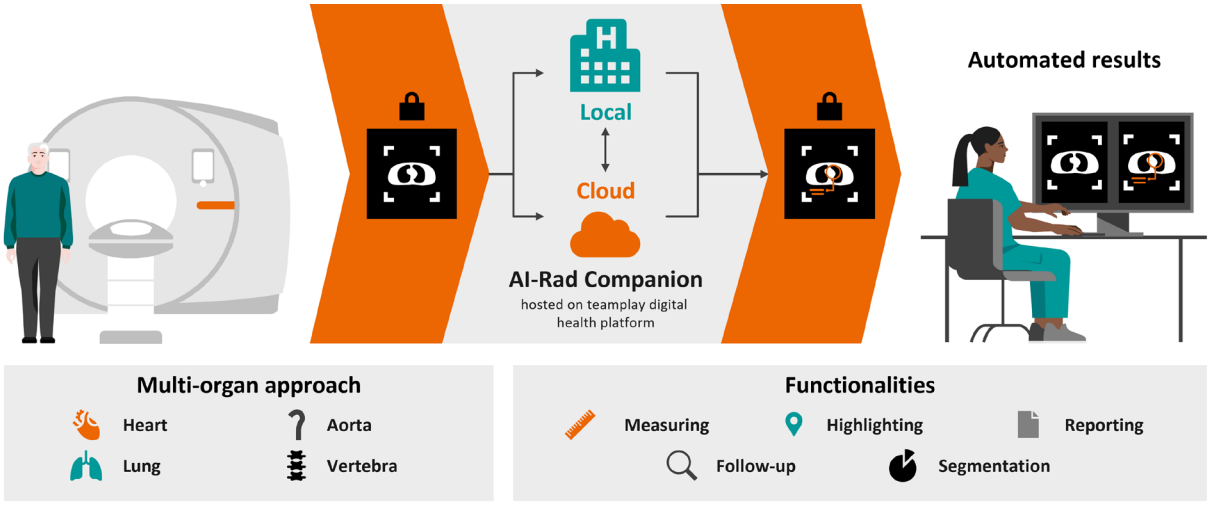
siemens-healthineers.com/ai-rad

AI-Rad Companion is a secondary reading device designed for investigating data created by imaging devices. Integrated algorithms are based on and developed with support of Artificial Intelligence (AI) (deep learning and machine learning).

As the number of CT exams increases and the number of experts does not grow proportionately, the workload per radiologist can increase dramatically. As a side effect, a reduction of reading time can have an impact on the quality of the reports.[1]

AI-Rad Companion Chest CT can support clinicians by preparing valuable clinical information to enhance the image interpretation workflow.

AI-Rad Companion Chest CT automatically performs measurements, prepares results which could be used for reports, and helps to handle the workload with more ease.



AI-Rad Companion Chest CT automatically highlights abnormalities, characterizes anatomies, and matches results with reference values as well, so that the evaluation of the cases could potentially be more confident when it comes to reporting quality.

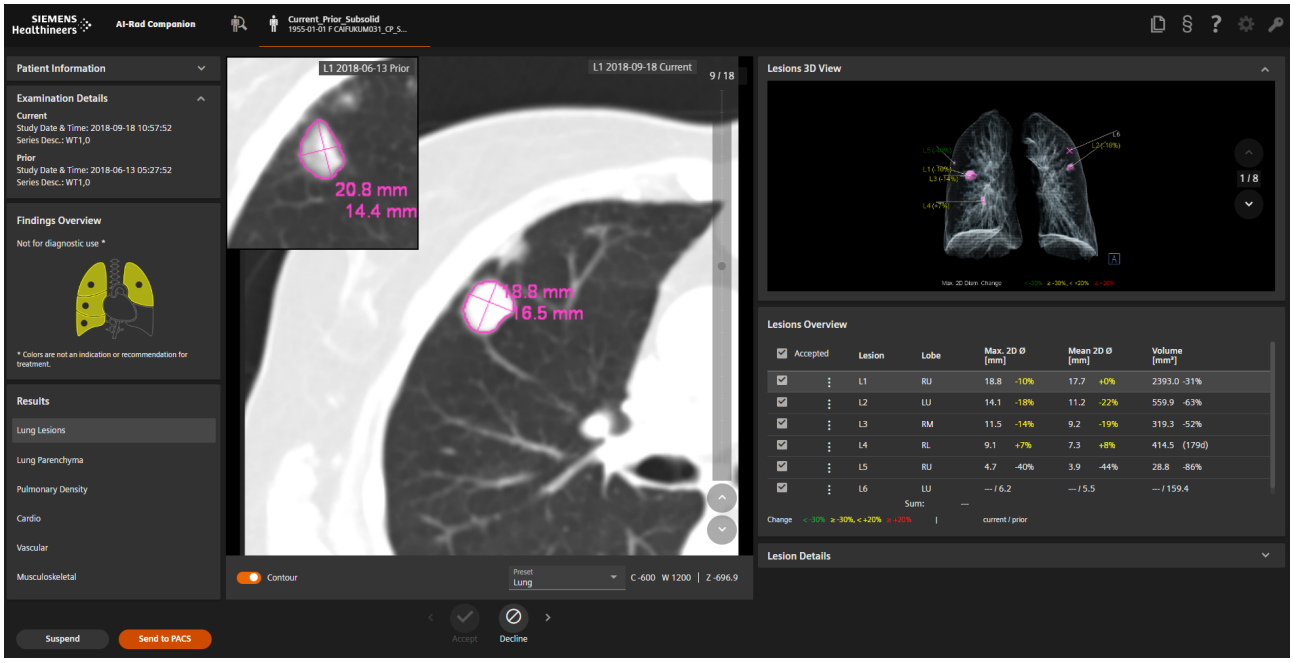
AI-Rad Companion Chest CT is intended to work as an assistant for radiologists working at their PACS workstation applying the following steps:

- Finalize the initial diagnosis on the PACS workstation (first reading)
- If clinically useful, modify the initial diagnosis by considering the results from AI-Rad Companion Chest CT (second reading)

Based on the configurable options, AI-Rad Companion Chest CT can also generate results in the form of AI results Report (DICOM Secondary Capture) and Structured Report (DICOM SR).

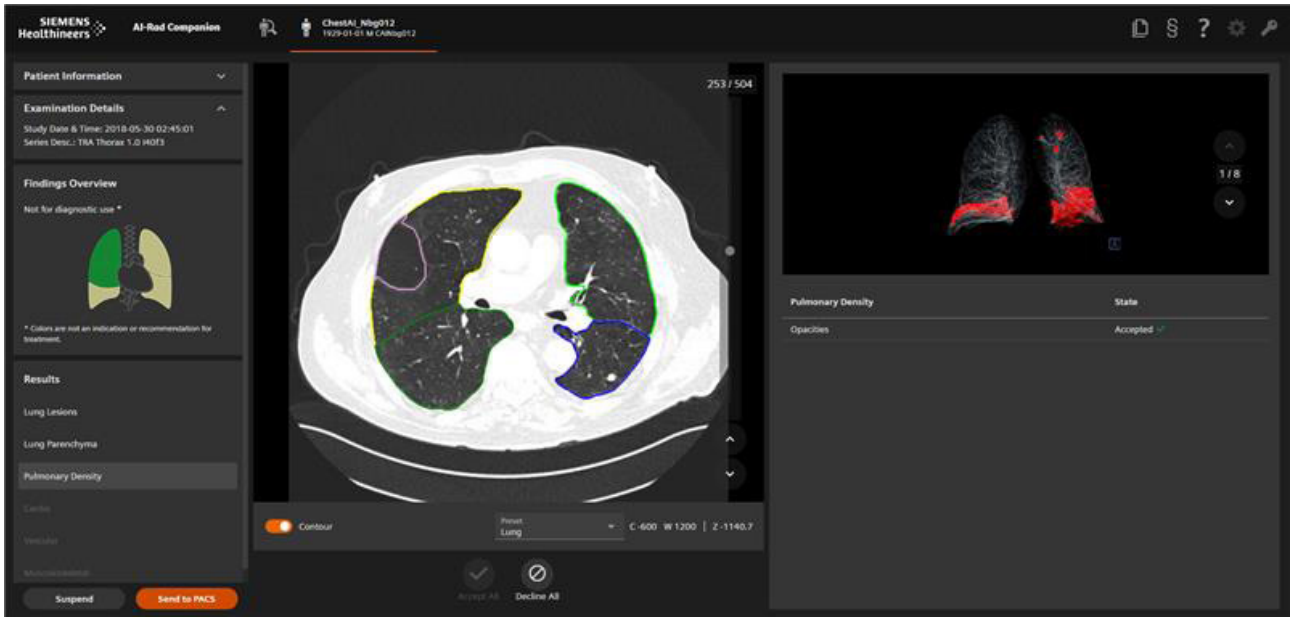
[1] *E. Skololovskaya et al., The Effect of Faster Reporting Speed for Imaging Studies on the Number of Misses and Interpretation Errors: A Pilot Study; Journal of the American College of Radiology, DOI: 10.1016/j.jacr.2015.03.040*

General features of AI-Rad Companion (Pulmonary) VA40A



Lung Lesions

Lung Parenchyma



Pulmonary Density

AI-Rad Companion (Pulmonary) is an image post-processing software that uses CT DICOM data to support clinicians in the evaluation and assessment of lung diseases.

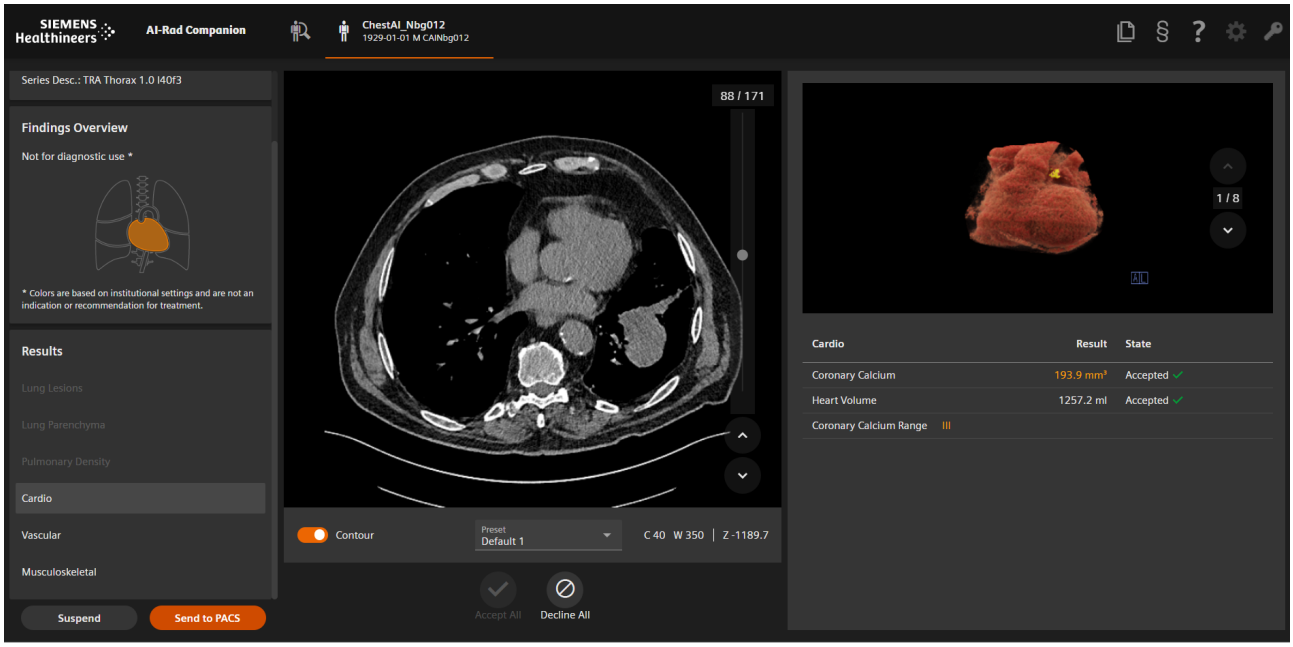
The functionality of AI-Rad Companion (Pulmonary) includes:

- Segmentation and measurements of complete lung and lung lobes.
- Identification of areas with lower Hounsfield values in comparison to a predefined threshold for complete lung and lung lobes.
- Segmentation and measurements of solid and subsolid lung nodules.
- Dedication of found lung nodules to corresponding lung lobe.
- Correlation of segmented lung nodules of current scan with known priors and quantitative assessment of changes of the correlated data
  - Prior lesions will be stored in long-term storage, growth and shrinkage of lesions will be measured, for example, volume doubling time (VDT)
  - For changes in volume, VDT is displayed per lesion in case of volume growth of a lesion between the scan time points.
  - A percentage in volume is displayed in case of shrinkage of measured lesion volume.
- Detection of lung nodules (Lung CAD).
- Identification of areas with elevated Hounsfield values, where areas with elevated versus high opacities are distinguished.
- Configurable options are available based on region growing or AI-based: All Lesions, Segmented Lesions only, All lesions (AI-based).
- Total Turnaround Time (TAT) improvement to 15 min overall by full functionality

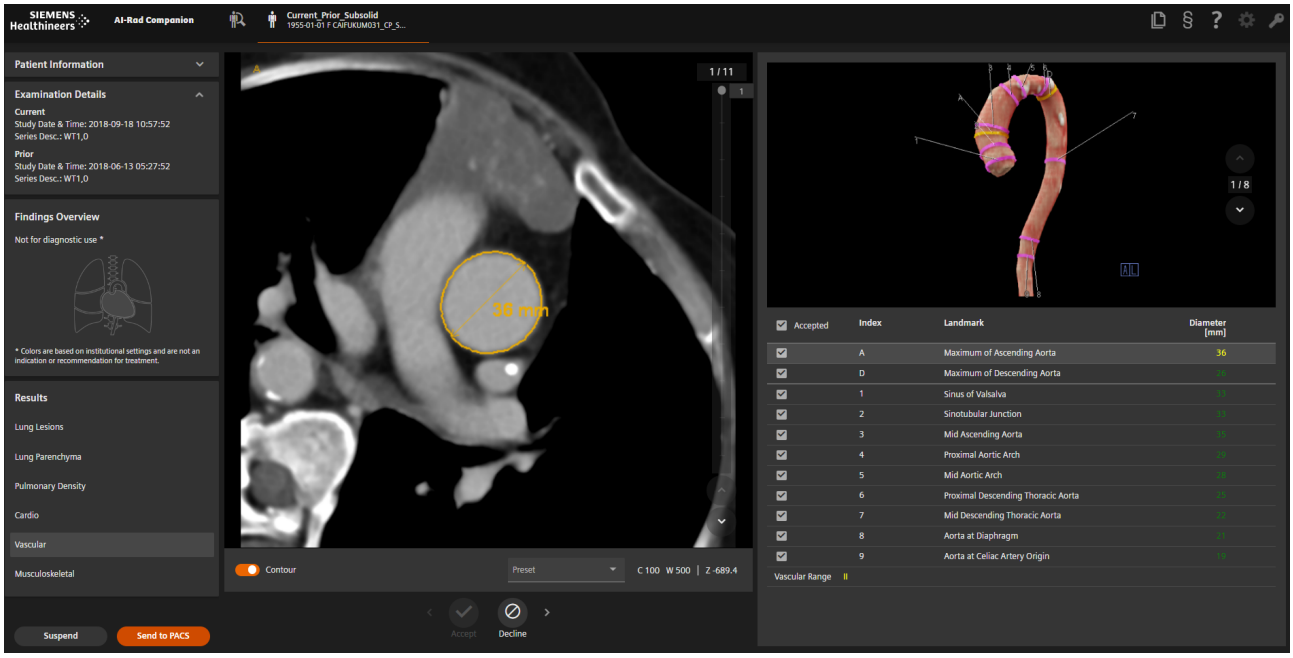
AI-Rad Companion (Pulmonary) displays the location of detected pulmonary nodules, either with a conventional CAD mark or with the contour and measurements after a successful segmentation.
The results generated by AI-Rad Companion (Pulmonary) include DICOM Structured Report with measurements results, DICOM secondary capture reports. MPRs for lung lesions can also be generated with either Overlay (DICOM 6000) or Burned-In Graphics.

Based on the configuration, the results can be verified in the Results Preview and will be included in the overview with all findings.

General features of AI-Rad Companion (Cardiovascular) VA22A



Cardio



Vascular

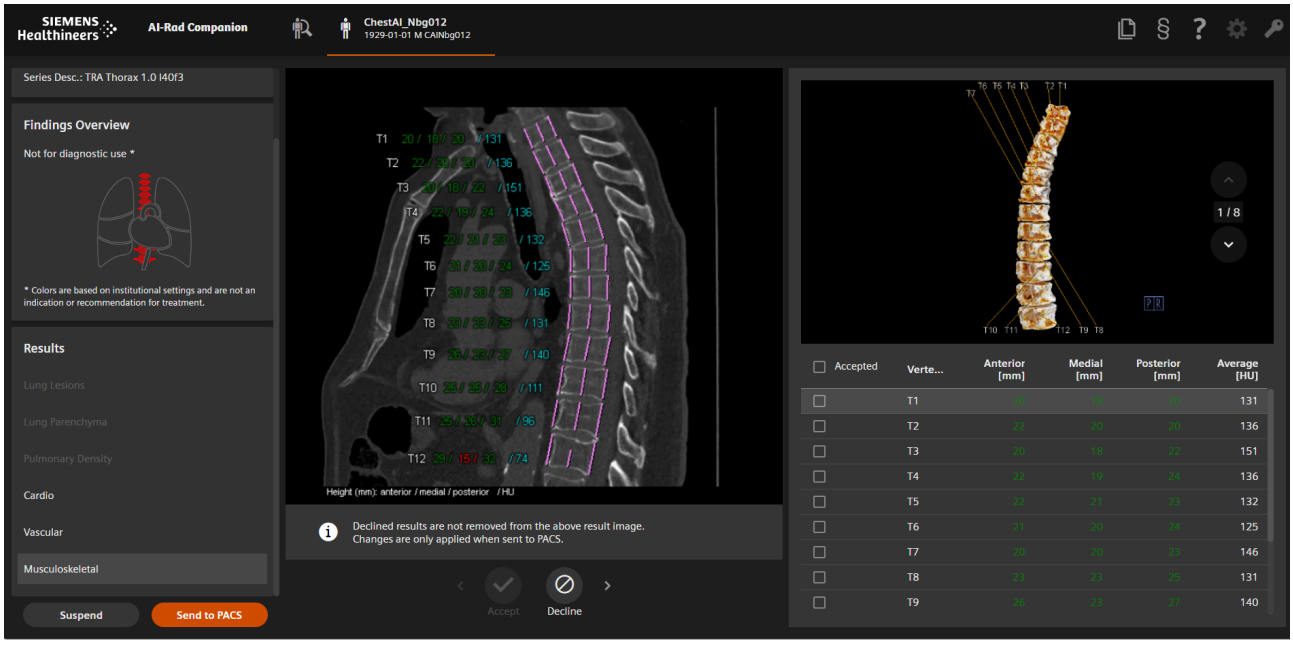
AI-Rad Companion (Cardiovascular) is an image post-processing software that provides quantitative and qualitative analysis from previously acquired CT DICOM data to support qualified clinicians in the evaluation and assessment of cardio-vascular diseases.

The functionality of AI-Rad Companion (Cardiovascular) includes:

- Segmentation and measurement of the volume of the heart
- Segmentation of the aorta
- Quantification of the total calcium volume in the coronary arteries
- Threshold-based highlighting of total calcium volume
- Support of non-contrast enhanced Chest CT exams
- Measurement of maximum diameters of the aorta at typical landmarks
  - Detection of nine anatomical landmarks
  - The maximum aortic diameter in the ascending arch is labeled as A and the maximum aortic diameter in the descending arch is labeled as D.
- Total Turnaround Time (TAT) improvement to 15 min overall by full functionality

The results will be delivered in different image formats and, depending on the configuration, can be verified in the Results Preview and will be included in the overview with all findings.
These will include DICOM Structured Report with measurements results, DICOM secondary capture reports, and Overlay (DICOM 6000).

General features of AI-Rad Companion (Musculoskeletal) VA22A



Musculoskeletal

AI-Rad Companion (Musculoskeletal) is an image processing software that provides quantitative and qualitative analysis from previously acquired CT DICOM data to support qualified clinicians in the evaluation and assessment of musculoskeletal disease.

The functionality of AI-Rad Companion (Musculoskeletal) includes:

- Labeling of vertebras
- Segmentation of vertebras
- Measurements of heights in each vertebra at three positions (anterior, medial, posterior) and indication if they are critically different
- Measurement of mean Hounsfield value in volume of interest within vertebra.
- Total Turnaround Time (TAT) improvement to 15 min overall by full functionality

The results will be delivered in different image formats and, depending on the configuration, can be verified in the Results Preview and will be included in the overview with all findings.
These will include DICOM Structured Report with measurements results and DICOM secondary capture reports.

Preconditions and requirements

Technical requirements in detail

- Input: Standardized CT data
- Format: DICOM images
- Slice thickness: ≤ 3mm at least (≤ 2 mm to enable all features)
- Orientation: Only axial images and no gantry tilt
- Coverage: No gaps between slices
- Matrix size: 512 x 512
- Reconstruction kernel: Soft to medium
- Tube voltage: ≥ 100 kVp (for calcium detection)
- Compression: Uncompressed image data is recommended
- Minimum 3 slices
- Derived and secondary series are not supported
- Bits allocated: 16
- Photometric interpretation: MONOCHROME2
- RescaleSlope: <= 5
- Samples per pixel: 1.

The following requirements additionally apply:

- Internet browser: Google Chrome, Microsoft Edge
- Patient age: ≥22 years

Workflow integration

The following section provides information on automatic workflow of AI-Rad Companion Chest CT.

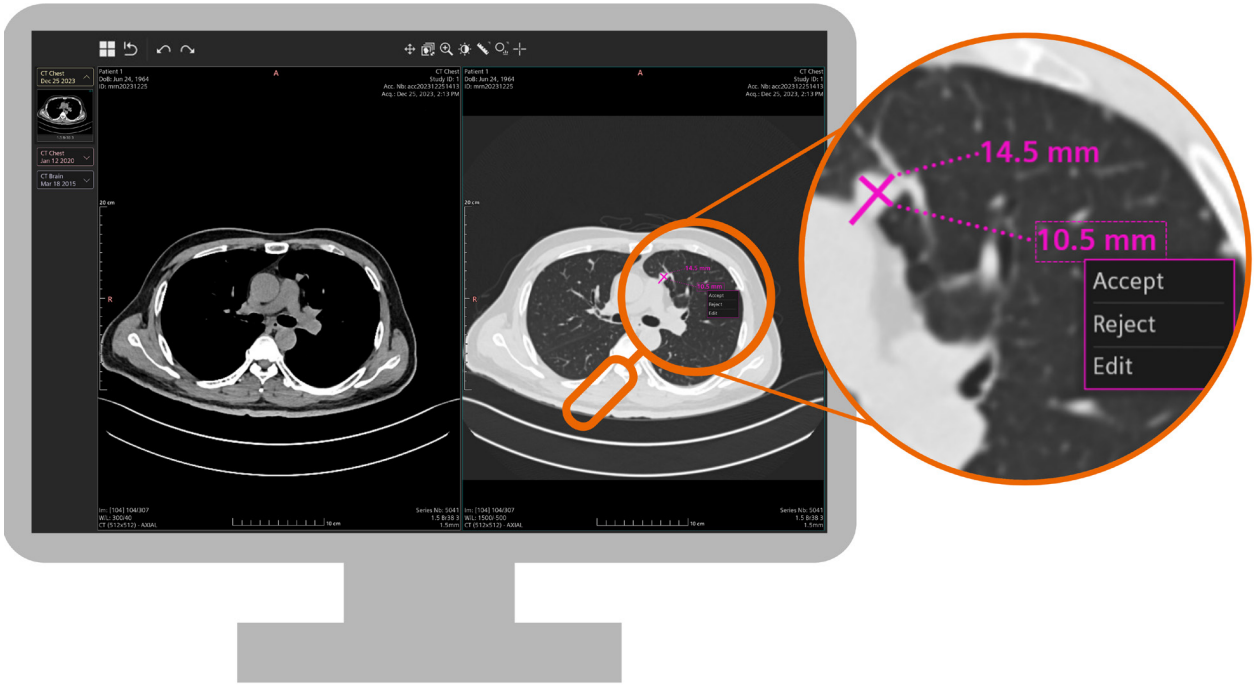
AI-Rad Companion Chest CT offers advanced ways of efficient workflow integration and customization. By design, all results are presented in the form of an annotated axial series (MPR), a 3D rendering (VRT), a concise summary table (DICOM SC: Secondary Capture), as well as Overlays (DICOM presentation state, GSPS for Lung nodules and DICOM 6000 for Lung Nodules and Aorta diameter results), enabling integration into different reading workflows. These formats typically enable the display and, for overlays, an easy toggling on/off of the results.

Best advanced integration can be achieved by the provided DICOM Structured Report (DICOM SR) format. This format, when used appropriately by a PACS, RIS or reporting system, enables:

- The display of AI annotations
- The deletion of individual AI annotations or measurements
- The editing of individual AI annotations or measurements
- The use of structured AI results in worklists
- The use of structured AI results reporting by feeding into the radiology report.

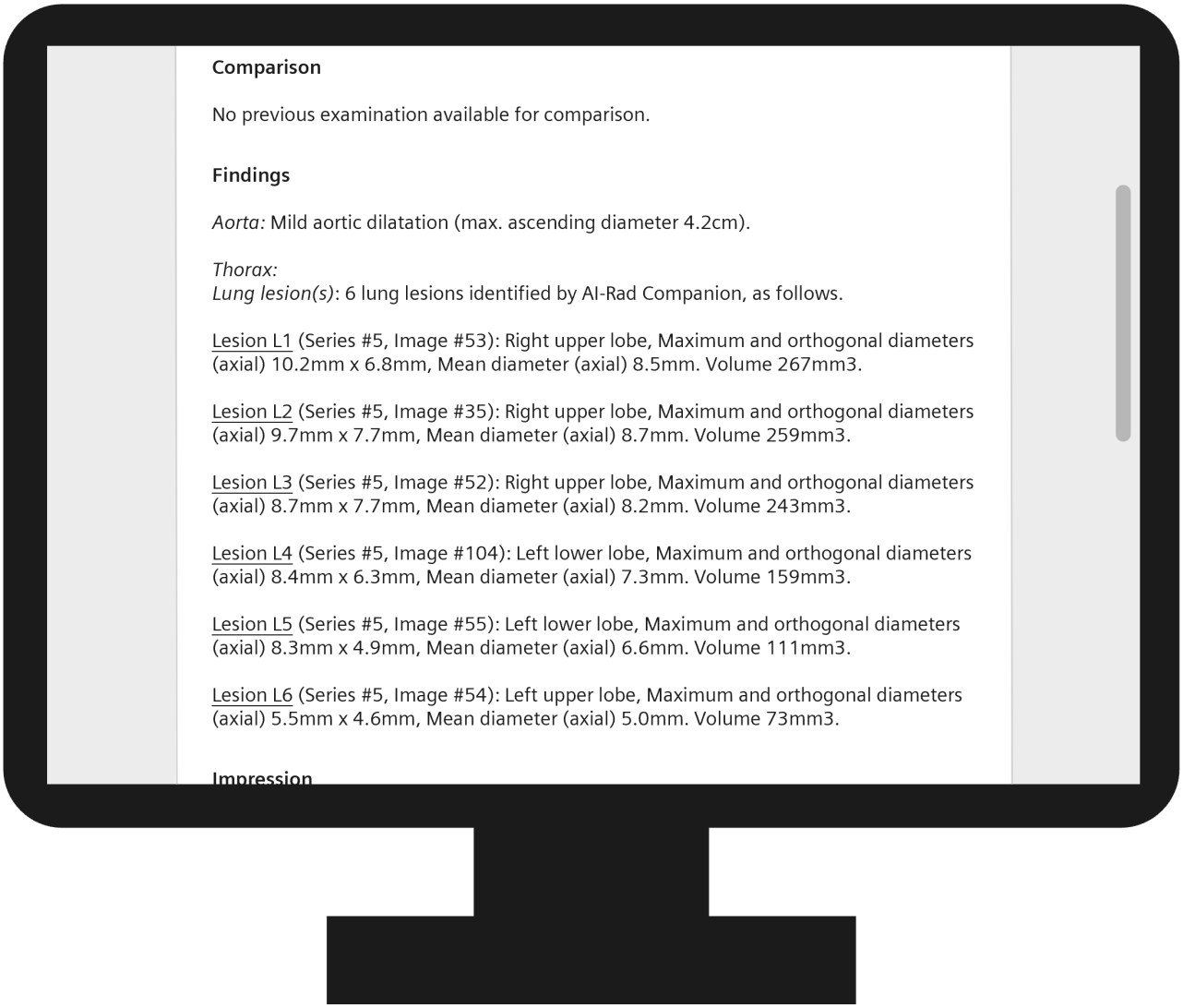
The following illustrates a common workflow integration example using AI-Rad Companion Chest CT.

Efficiency gains are best accomplished when AI-Rad Companion is used to automate the repetitive and manually tedious tasks such as measurements. Results can be deeply integrated in the respective viewing workflow by DICOM SR, supporting advanced interoperability and the individual control of results.



Reading

Workflow integration



Reporting

Workflow integration

The following section provides information on semi-automatic workflow of AI-Rad Companion Chest CT.

AI-Rad Companion Chest CT is optionally supplied with the AI-Rad Companion Notifier, which is intended to send result notifications with status-reporting information for a given patient. The AI-Rad Companion Notifier is a popup message that is displayed if AI-Rad Companion has some notifications for the given patient. The appearance and the given status-report information of result notifications may vary depending on the configuration and on the version of Microsoft Windows used.

The AI-Rad Companion Notifier indicates whether AI-Rad Companion (Pulmonary) has completed the processing, or processing is in progress, or processing has failed.
The following example displays a Results Preview page wherein you can accept or reject AI results. A result notification pops-up with status-reporting information for successful detected findings. To have a quick review of the particular case, you can open the result notification displayed on the bottom of your screen. The case is displayed in the Results Review.

A result notification pop-up

Minimum hardware requirements for on-edge deployment

Hybrid computing with edge technology combines the benefits of local computing with cloud to serve your specific needs. The Edge device is a part of the teamplay Receiver that will be physical hardware, with hardware requirements. The edge device and applications are centrally managed from the cloud to ensure up-to-date applications and algorithms and cybersecurity (SaaS).

For on-edge deployment, the following table lists the minimum hardware requirements.
These requirements correspond to a small-grade server.

As a prerequisite, install Docker Engine Enterprise (EE) on Microsoft Windows 2019 Server, version 1809.

Processor type	CPU: 1 x 8 cores Intel® Xeon® - S 4215
Memory	RAM: 96 GB
Disk	Solid State Drive (SSD) with >2 TB; at least 500 GB free disk space on Windows system drive
Operating system	Windows Server 2019 (1809)

For more information on medium-grade and large-grade server configurations,
see *AI-Rad Companion Engine Datasheet*.

Licensing

AI-Rad Companion Chest CT is available on an annual subscription defined in a volume-based tiered pricing-model. The services are provisioned per institution. The users affiliated with a given institution can access the tool, if authorized by the institution's administrator.

Additional requirements

teamplay digital health platform is a prerequisite to use AI-Rad Companion Chest CT.

Data privacy and security

As processor of your data, we are highly driven by the aim to support you in your compliance with the US standards of Health Insurance Portability and Accountability Act (HIPAA) and the privacy laws applicable throughout the world, and in particular the European General Data Protection Regulation (GDPR).

It is recommended to enable “Keep patient age” for every supported privacy level in the teamplay Receiver settings.

Data minimization is applicable for cloud-based service only.

For more information on data privacy and security, refer to the *AI-Rad Companion Data Privacy and Security White paper*.

For more information on the security of your AI-Rad Companion medical devices and to obtain the Manufacturer Disclosure Statement for Medical Device Security (MDS2), contact your Siemens Healthineers representative and ask for the document entitled Product & Solution Security Whitepaper and MDS2.

The information in this document contains general technical descriptions of specifications and options as well as standard and optional features that do not always have to be present in individual cases. Some products and services mentioned in this data sheet are not commercially available in all countries. Due to certain regional limitations of sales rights, we cannot guarantee the future availability of the products and services described in this datasheet. Please contact your local Siemens Healthineers organization for more information.

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Siemens Healthineers Headquarters
Siemens Healthineers AG
Siemensstr. 3
91301 Forchheim, Germany
Phone: +49 9191 18-0
siemens-healthineers.com

Manufacturer
Siemens Healthcare GmbH
Henkestr. 127
91052 Erlangen, Germany

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