January 22, 2026

Siemens Healthcare GmbH
Kira Morales
Regulatory Affairs Manager
Henkestrasse 127
Erlangen, 91052
Germany

Re: K253057
Trade/Device Name: AI-Rad Companion Brain MR
Regulation Number: 21 CFR 892.2050
Regulation Name: Medical Image Management And Processing System
Regulatory Class: Class II
Product Code: QIH
Dated: December 5, 2025
Received: December 5, 2025

Dear Kira Morales:

We have reviewed your section 510(k) premarket notification of intent to market the device referenced above and have determined the device is substantially equivalent (for the indications for use stated in the enclosure) to legally marketed predicate devices marketed in interstate commerce prior to May 28, 1976, the enactment date of the Medical Device Amendments, or to devices that have been reclassified in accordance with the provisions of the Federal Food, Drug, and Cosmetic Act (the Act) that do not require approval of a premarket approval application (PMA). You may, therefore, market the device, subject to the general controls provisions of the Act. Although this letter refers to your product as a device, please be aware that some cleared products may instead be combination products. The 510(k) Premarket Notification Database available at https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfpmn/pmn.cfm identifies combination product submissions. The general controls provisions of the Act include requirements for annual registration, listing of devices, good manufacturing practice, labeling, and prohibitions against misbranding and adulteration. Please note: CDRH does not evaluate information related to contract liability warranties. We remind you, however, that device labeling must be truthful and not misleading.

If your device is classified (see above) into either class II (Special Controls) or class III (PMA), it may be subject to additional controls. Existing major regulations affecting your device can be found in the Code of Federal Regulations, Title 21, Parts 800 to 898. In addition, FDA may publish further announcements concerning your device in the Federal Register.

Additional information about changes that may require a new premarket notification are provided in the FDA guidance documents entitled "Deciding When to Submit a 510(k) for a Change to an Existing Device" (https://www.fda.gov/media/99812/download) and "Deciding When to Submit a 510(k) for a Software Change to an Existing Device" (https://www.fda.gov/media/99785/download).

Your device is also subject to, among other requirements, the Quality System (QS) regulation (21 CFR Part 820), which includes, but is not limited to, 21 CFR 820.30, Design controls; 21 CFR 820.90, Nonconforming product; and 21 CFR 820.100, Corrective and preventive action. Please note that regardless of whether a change requires premarket review, the QS regulation requires device manufacturers to review and approve changes to device design and production (21 CFR 820.30 and 21 CFR 820.70) and document changes and approvals in the device master record (21 CFR 820.181).

Please be advised that FDA's issuance of a substantial equivalence determination does not mean that FDA has made a determination that your device complies with other requirements of the Act or any Federal statutes and regulations administered by other Federal agencies. You must comply with all the Act's requirements, including, but not limited to: registration and listing (21 CFR Part 807); labeling (21 CFR Part 801); medical device reporting (reporting of medical device-related adverse events) (21 CFR Part 803) for devices or postmarketing safety reporting (21 CFR Part 4, Subpart B) for combination products (see https://www.fda.gov/combination-products/guidance-regulatory-information/postmarketing-safety-reporting-combination-products); good manufacturing practice requirements as set forth in the quality systems (QS) regulation (21 CFR Part 820) for devices or current good manufacturing practices (21 CFR Part 4, Subpart A) for combination products; and, if applicable, the electronic product radiation control provisions (Sections 531-542 of the Act); 21 CFR Parts 1000-1050.

All medical devices, including Class I and unclassified devices and combination product device constituent parts are required to be in compliance with the final Unique Device Identification System rule ("UDI Rule"). The UDI Rule requires, among other things, that a device bear a unique device identifier (UDI) on its label and package (21 CFR 801.20(a)) unless an exception or alternative applies (21 CFR 801.20(b)) and that the dates on the device label be formatted in accordance with 21 CFR 801.18. The UDI Rule (21 CFR 830.300(a) and 830.320(b)) also requires that certain information be submitted to the Global Unique Device Identification Database (GUDID) (21 CFR Part 830 Subpart E). For additional information on these requirements, please see the UDI System webpage at https://www.fda.gov/medical-devices/device-advice-comprehensive-regulatory-assistance/unique-device-identification-system-udi-system.

Also, please note the regulation entitled, "Misbranding by reference to premarket notification" (21 CFR 807.97). For questions regarding the reporting of adverse events under the MDR regulation (21 CFR Part 803), please go to https://www.fda.gov/medical-devices/medical-device-safety/medical-device-reporting-mdr-how-report-medical-device-problems.

For comprehensive regulatory information about medical devices and radiation-emitting products, including information about labeling regulations, please see Device Advice (https://www.fda.gov/medical-devices/device-advice-comprehensive-regulatory-assistance) and CDRH Learn (https://www.fda.gov/training-and-continuing-education/cdrh-learn). Additionally, you may contact the

Division of Industry and Consumer Education (DICE) to ask a question about a specific regulatory topic. See the DICE website (https://www.fda.gov/medical-devices/device-advice-comprehensive-regulatory-assistance/contact-us-division-industry-and-consumer-education-dice) for more information or contact DICE by email (DICE@fda.hhs.gov) or phone (1-800-638-2041 or 301-796-7100).

Sincerely,

Daniel M. Krainak, Ph.D.
Assistant Director
DHT8C: Division of Radiological
Imaging and Radiation Therapy Devices
OHT8: Office of Radiological Health
Office of Product Evaluation and Quality
Center for Devices and Radiological Health

Enclosure

# Indications for Use

| | |
|---|---|
| Please type in the marketing application/submission number, if it is known. This textbox will be left blank for original applications/submissions. | K253057 |

Please provide the device trade name(s).

AI-Rad Companion Brain MR

Please provide your Indications for Use below.

AI-Rad Companion Brain MR is a post-processing image analysis software that assists clinicians in viewing, analyzing, and evaluating MR brain images.

AI-Rad Companion Brain MR provides the following functionalities.
• Automated segmentation and quantitative analysis of individual brain structures and white matter hyperintensities
• Quantitative comparison of each brain structure with normative data from a healthy population
• Presentation of results for reporting that includes all numerical values as well as visualization of these results

Please select the types of uses (select one or both, as applicable).

- ☒ Prescription Use (Part 21 CFR 801 Subpart D)
- ☐ Over-The-Counter Use (21 CFR 801 Subpart C)

# 510(k) SUMMARY
# FOR
# AI-Rad Companion Brain MR

Submitted by:
Siemens Medical Solutions USA, Inc.
40 Liberty Boulevard
Malvern, PA 19355
Date Prepared: December 5, 2025

This summary of 510(k) safety and effectiveness information is being submitted in accordance with the requirements of Safe Medical Devices Act of 1990 and 21 CFR §807.92.

## 1. Submitter

**Importer/Distributor**

Siemens Medical Solutions USA, Inc.
40 Liberty Boulevard
Malvern, PA 193552
Registration Number: 2240869

**Manufacturing Site**

Siemens Healthcare GmbH
Henkestrasse 127
Erlangen, Germany 91052
Registration Number: 3002808157

## 2. Contact Person

Kira Morales
Regulatory Affairs Manager
Siemens Medical Solutions USA, Inc.
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Malvern, PA 19335
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Email: kira.morales@siemens-healthineers.com

## 3. Device Name and Classification

| | |
|---|---|
| **Product Name:** | AI-Rad Companion Brain MR |
| **Trade Name:** | AI-Rad Companion Brain MR |
| **Classification Name:** | Medical Image Management and Processing System |
| **Classification Panel:** | Radiology |
| **CFR Section:** | 21 CFR §892.2050 |

**Device Class:** Class II
**Product Code:** QIH

## 4. Predicate Device

| | |
|---|---|
| Product Name: | AI-Rad Companion Brain MR |
| Propriety Trade Name: | AI-Rad Companion Brain MR |
| 510(k) Number: | K232305 |
| Clearance Date: | October 23, 2023 |
| Classification Name: | Medical Image Management and Processing System |
| Classification Panel: | Radiology |
| CFR Section: | 21 CFR §892.2050 |
| Device Class: | Class II |
| Primary Product Code: | QIH |
| Recall Information: | N/A |

## 5. Reference Device

| | |
|---|---|
| Product Name: | icobrain |
| 510(k) Number: | K192130 |
| Clearance Date: | December 13, 2019 |
| Classification Name: | Medical Image Management and Processing System |
| Classification Panel: | Radiology |
| CFR Section: | 21 CFR §892.2050 |
| Device Class: | Class II |
| Primary Product Code: | LLZ |
| Recall Information: | N/A |

## 6. Indications for Use

AI-Rad Companion Brain MR is a post-processing image analysis software that assists clinicians in viewing, analyzing, and evaluating MR brain images.

AI-Rad Companion Brain MR provides the following functionalities.

- Automated segmentation and quantitative analysis of individual brain structures and white matter hyperintensities
- Quantitative comparison of each brain structure with normative data from a healthy population
- Presentation of results for reporting that includes all numerical values as well as visualization of these results

## 7. Device Description

AI-Rad Companion Brain MR runs two distinct and independent algorithms for Brain Morphometry analysis and White Matter Hyperintensities (WMH) segmentation, respectively. In overall, comprises four main algorithmic features:

- Brain Morphometry
- Brain Morphometry follow-up
- White Matter Hyperintensities (WMH)
- White Matter Hyperintensities (WMH) follow-up

The feature for Brain Morphometry is available since the first version of the device (VA2x), while segmentation of White Matter Hyperintensities was added since VA4x and the follow-up analysis for both is available since VA5x. The brain morphometry and brain morphometry follow-up feature have not been modified and remain identical to previous VA5x mainline version.

AI-Rad Companion Brain MR VA60 is an enhancement to the predicate, AI-Rad Companion Brain MR VA50 (K232305). Just as in the predicate, the brain morphometry feature of AI-Rad Companion Brain MR addresses the automatic quantification and visual assessment of the volumetric properties of various brain structures based on T1 MPRAGE datasets. From a predefined list of brain structures (e.g. Hippocampus, Caudate, Left Frontal Gray Matter, etc.) volumetric properties are calculated as absolute and normalized volumes with respect to the total intracranial volume. The normalized values are compared against age-matched mean and standard deviations obtained from a population of healthy reference subjects. The deviation from this reference population can be visualized as 3D overlay map or out-of-range flag next to the quantitative values.

Additionally, identical to the predicate, the white matter hyperintensities feature addresses the automatic quantification and visual assessment of white matter hyperintensities on the basis of T1 MPRAGE and T2 weighted FLAIR datasets. The detected WMH can be visualized as a 3D overlay map and the quantification in count and volume as per 4 brain regions in the report.

# 8. Substantially Equivalent (SE) and Technological Characteristics

The intended use of the predicate device and the subject device are equivalent. The main difference is that AI-Rad Companion Brain MR VA60 adds improvements to the White matter hyperintensities and White Matter Hyperintensities Follow-up as compared to the predicate, AI-Rad Companion Brain MR VA50.

The subject device, AI-Rad Companion Brain MR VA60 is substantially equivalent with regard to the intended use and technical characteristics compared to the predicate device, AI-Rad Companion Brain MR VA50 (K232305) with respect to the software features, functionalities, and core algorithms. The additional enhancements and improvements provided in AI-Rad Companion Brain MR VA60 increase the usability and reduce the complexity of the imaging workflow for the clinical user.

Icobrain serves as a reference device within this submission and a dedicated comparison of technological characteristics is provided. Siemens Healthineers has determined that AI-Rad Companion Brain MR VA60 is comparable to icobrain (K192130) as it has similar technological and performance characteristics with respect to the white matter hyperintensities & follow-up feature improvements (algorithms cleared in K232305). AI-Rad Companion Brain MR VA60 used equivalent validation methodology to analyze the performance of the white matter hyperintensities follow-up feature compared to icobrain (K192130).

The risk analysis and non-clinical data support that both devices perform equivalently and do not raise different questions of the safety and effectiveness.

| Feature | Subject Device: AI-Rad Companion Brain MR VA60 | Predicate Device: AI-Rad Companion Brain MR VA50 (K232305) | Reference Device: icobrain (K192130) | Comparison Results |
|---|---|---|---|---|
| *Brain Morphometry Segmentation* | Pre-processing functionality for automatic segmentation and volumetry of MPRAGE data. | Pre-processing functionality for automatic segmentation and volumetry of MPRAGE data. | Image processing for automatic segmentation and volumetry of MPRAGE data. | **Same as predicate** |
| *Brain Morphometry Quantification* | Calculation of label maps (display of brain segmentation) and partially combined label maps (fused with the processed MPRAGE data). | Calculation of label maps (display of brain segmentation) and partially combined label maps (fused with the processed MPRAGE data). | Normalized and unnormalized volume and volume changes of different brain structures. | **Same as predicate** |
| *Brain Morphometry: Deviation Map* | Calculation of deviation map (representation of brain status in relation to reference data) and partially combined deviation maps (fused with the processed MPRAGE data) User customizable color labels for the overlay map. | Calculation of deviation map (representation of brain status in relation to reference data) and partially combined deviation maps (fused with the processed MPRAGE data) User customizable color labels for the overlay map. | Not available | **Same as predicate** |
| *Brain Morphometry Follow-Up* | Automatic calculation of the atrophy range in | Automatic calculation of the atrophy range in | Not available | **Same as predicate** |

| | | | | |
|---|---|---|---|---|
| | percentage for each segmented brain structure | percentage for each segmented brain structure | | |
| *Brain Morphometry Follow-Up Time Between Studies* | Configurable between 14-180 days | Configurable time interval between the current and the prior scan should be ⩾ 180 days and < the retention period. | Not available | **Enhanced from the predicate** |
| *Brain White Matter Hyperintensities Segmentation* | Pre-processing functionality for automatic segmentation and volumetry of MPRAGE and FLAIR data. | Pre-processing functionality for automatic segmentation and volumetry of MPRAGE and FLAIR data. | Image processing for automatic segmentation and volumetry of FLAIR data. | **Same as predicate** |
| *Brain White Matter Hyperintensities Quantification* | Calculation of white matter hyperintensities count and volume as per 4 brain regions. | Calculation of white matter hyperintensities count and volume as per 4 brain regions. | Unnormalized volume and volume changes of FLAIR white matter hyperintensities as per 4 brain regions | **Same as predicate** |
| *Brain White Matter Hyperintensities Map* | Calculation of white matter hyperintensities map fused with the processed FLAIR data User customizable color labels for the overlay map. | Calculation of white matter hyperintensities map fused with the processed FLAIR data User customizable color labels for the overlay map. | Calculation of white matter hyperintensities map overlaid with the FLAIR data | **Same as predicate** |
| *Brain White Matter Hyperintensities Input Data* | T2-weighted 3D FLAIR image series. | T1-weighted MPRAGE and T2-weighted 3D FLAIR image series | T1-weighted MPRAGE and T2-weighted 3D FLAIR image series | **Streamlined from the predicate** |

| | | | | |
|---|---|---|---|---|
| *White Matter Hyperintensities Follow-Up* | MR images from two time points to identify new or enlarged areas. The results of follow-up scan are then refined by using morphological operations to generate WMH changed areas between baseline and follow-up scan | MR images from two time points to identify new or enlarged areas. The results of follow-up scan are then refined by using morphological operations to generate WMH changed areas between baseline and follow-up scan | Assessment of New/Enlarging Lesion count | **Same as predicate** |
| *White Matter Hyperintensities Follow Up Input Data* | WMH follow-up supports 1.5T and 3T input data in both prior and current study | WMH follow-up is only supported for 3T input data in both prior and current study. | Both 1.5T and 3T is supported | **Enhanced from the predicate** |
| *White Matter Hyperintensities Follow-Up Data Criteria* | Not mandatory to have the same Slice Thickness, Pixel Spacing, and Magnetic Field Strength consistent between prior and current studies. *In case if the prior and current Magnetic Field Strength (0018, 0087) are not same, the system will process the input data with an information message. | Mandatory to have the same Slice Thickness, Pixel Spacing, and Magnetic Field Strength consistent between prior and current studies. | Not available | **Enhanced from the predicate** |
| *White Matter Hyperintensities & Follow-Up Multi-Vendor Support* | Validated with data from Siemens Healthineers, GE and Philips | Only supports data acquired on 3 Tesla Siemens Healthineers MR scanners | Multi-vendor support | **Enhanced from the predicate** |
| *Distribution & Archiving* | Creation of an image series for a morphometry report. Automatic transfer of | Creation of an image series for a morphometry report. Automatic transfer of | Automatic transfer of generated image | **Same as predicate** |

| | | | | |
|---|---|---|---|---|
| | generated maps and morphometry report to a PACS system. | generated maps and morphometry report to a PACS system. | series and report to a PACS system. | |
| *User Interface Confirmation* | Confirmation UI with basic visualization functionality | Confirmation UI with basic visualization functionality | Not available. | **Same as predicate** |
| *User Interface Configuration* | Configuration UI | Configuration UI | Not available | **Same as predicate** |
| *Layouts* | Simplified layout dedicated for confirmation of results | Simplified layout dedicated for confirmation of results | Not available | **Same as predicate** |
| *Architecture* | Cloud solution and Edge components deployed on customer premise. | Cloud solution and Edge components deployed on customer premise. | Cloud only solution with no components deployed on customer premise. | **Same as predicate** |
| *DICOM SR* | DICOM structured report representation of a natural language report | DICOM structured report representation of a natural language report | DICOM structured report | **Same as predicate** |

*Table 1: Comparison table for AI-Rad Companion Brain MR VA60, predicate device AI-Rad Companion Brain MR VA50 (K232305) and reference device icobrain (K192130)*

The conclusions from all verification and validation data suggest that these enhancements are equivalent with respect to safety and effectiveness of the predicate device. These modifications do not change the intended use of the product. Siemens is of the opinion that AI-Rad Companion Brain MR VA60 is substantially equivalent to the currently marketed device, AI-Rad Companion Brain MR VA50.

# 9. Nonclinical Tests

Non-clinical tests were conducted to test the functionality of AI-Rad Companion Brain MR. Software validation and bench testing have been conducted to assess the performance claims as well as the claim of substantial equivalence to the predicate device.

AI-Rad Companion has been tested to meet the requirements of conformity to multiple industry standards. Non-clinical performance testing demonstrates that AI-Rad Companion Organs RT complies with the FDA guidance document, "Guidance for the Content of Premarket Submissions for Device Software Functions" (June 2023) as well as with the following voluntary FDA recognized Consensus Standards listed in **Table 2.**

| Recognition Number | Product Area | Title of Standard | Reference Number and Date | Standards Development Organization |
|---|---|---|---|---|
| 5-129 | General | Medical Devices – Application of usability engineering to medical devices [including Corrigendum 1 (2016)] | IEC 62366-1 Edition 1.1 2020-06 CONSOLIDATED VERSION | IEC |
| 5-125 | General | Medical Devices – application of risk management to medical devices | ISO 14971 Third Edition 2019-12 | ISO |
| 13-79 | Software/ Informatics | Medical device software – software life cycle processes [Including Amendment 1 (2016)] | IEC 62304 Edition 1.1 2015-06 CONSOLIDATED VERSION | AAMI ANSI IEC |
| 12-349 | Radiology | Digital Imaging and Communications in Medicine (DICOM) Set | PS 3.1 – 3.20 2021e | NEMA |
| 5-134 | General | Medical devices – symbols to be used with information to be supplied by the manufacturer – Part 1: General Requirements | 15223-1 Fourth edition 2021-07 | ISO IEC |
| 13-97 | Software/ Informatics | Health software – Part 1: General requirements for product safety | 82304-1 Edition 1.0 2016-10 | IEC |

*Table 2: List of recognized standards*

## Verification and Validation

Software documentation level, per FDA's Guidance Document "Guidance for the Content of Premarket Submissions for Software Contained in Medical Devices" issued on June 14, 2023, is also included as part of this submission. The performance data demonstrates continued

conformance with special controls for medical devices containing software. Non-clinical tests were conducted on the subject device during product development.

Software bench testing in the form of Unit, System and Integration tests were performed to evaluate the performance and functionality of the new features and software updates. All testable requirements in the Requirement Specifications and the Risk Analysis have been successfully verified and traced in accordance with the Siemens Healthineers DH product development process. Human factor usability validation is addressed in system testing and usability validation test records. Software verification and regression testing have been performed successfully to meet their previously determined acceptance criteria as stated in the test plans.

Siemens Healthineers adheres to the cybersecurity recommendations as defined the FDA Guidance "Cybersecurity in Medical Devices: Quality System Considerations and Content of Premarket Submissions" (September 2023) by implementing a process of preventing unauthorized access, modifications, misuse or denial of use, or the unauthorized use of information that is stored, accessed, or transferred from a medical device to an external recipient.

# 10. Performance Software Validation

AI-Rad Companion Brain MR VA60A brain morphometry and brain morphometry follow-up features are identical to the predicate device AI-Rad Companion Brain MR VA50A.

## White Matter Hyperintensities Features

Performance testing for AI-Rad Companion Brain MR WMH was performed on test data from 100 subjects, which included Multiple Sclerosis patients (MS), Alzheimer's patients (AD), cognitive impaired (CI) and healthy controls (HC) from Siemens, GE, and Philips scanners. Testing data has balanced distribution with respect to gender and age of the patient according to target patient population and field strength (1.5T and 3T) of the MR scanner used.

Accuracy was validated by comparing the results of the device to manual annotated ground truth from three radiologists. Acceptance criteria for above experiments were defined based on a literature review. In all validation experiments, AI-Rad Companion Brain MR WMH feature passed the acceptance criteria, the Pearson correlation coefficient between the WMH volumes estimated by our software and ground truth annotation was 0.96. The interclass correlation coefficient between between the WMH volumes estimated by our software and ground truth annotation was 0.94. The segmentation accuracy of the WMH reaches a Dice score of 0.60. The F1-score of WMH detection is 0.67.

| | | Subject Device | | | | | Icobrain (K192130) |
|---|---|---|---|---|---|---|---|
| | | All | Gender | | Field Strength | | |
| | | | M | F | 1.5 T | 3.0 T | |
| # Data | | 100 | 39 | 61 | 38 | 62 | 51 |
| Dice | Mean | 0.60 | 0.60 | 0.59 | 0.62 | 0.58 | 0.58 |
| | Med | 0.62 | 0.60 | 0.63 | 0.64 | 0.60 | N.A. |
| | STD | 0.14 | 0.12 | 0.17 | 0.15 | 0.16 | N.A. |
| | 95% CI | [0.57, 0.63] | [0.56, 0.64] | [0.54, 0.63] | [0.57, 0.66] | [0.54, 0.62] | N.A. |
| ASSD | Mean | 0.05 | 0.04 | 0.05 | 0.08 | 0.03 | N.A. |
| | Med | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | N.A. |
| | STD | 0.15 | 0.11 | 0.17 | 0.21 | 0.08 | N.A. |
| | 95% CI | [0.02, 0.08] | [0.01, 0.08] | [0.02, 0.10] | [0.03, 0.16] | [0.01, 0.05] | N.A. |

| | | Subject Device | | |
|---|---|---|---|---|
| | | Siemens | GE | Philips |
| # Data | | 40 | 30 | 30 |
| Dice | Mean | 0.64 | 0.56 | 0.55 |
| | Med | 0.67 | 0.60 | 0.59 |
| | STD | 0.15 | 0.14 | 0.16 |
| | 95% CI | [0.60, 0.69] | [0.51, 0.61] | [0.50, 0.61] |
| ASSD | Mean | 0.02 | 0.09 | 0.04 |
| | Med | 0.00 | 0.01 | 0.00 |
| | STD | 0.06 | 0.23 | 0.11 |
| | 95% CI | [0.00, 0.04] | [0.03, 0.19] | [0.00, 0.08] |

**DICE and ASSD Results for the AI-Rad Companion Brain MR White Matter Hyperintensities Algorithm**

## White Matter Hyperintensities Follow-up Features

Performance testing for AI-Rad Companion Brain MR WMH follow-up feature was performed on 1.5T and 3T test datasets from 165 subjects, which included Multiple Sclerosis patients (MS) and Alzheimer's patients (AD) scanned using Siemens, GE and Philips scanners. Testing data has balanced distribution with respect to gender and age of the patient according to target patient population.

Accuracy was validated by comparing the results of the subject device to manual annotated ground truth from three radiologists. Acceptance criteria for above experiments were defined based on a literature review. In all validation experiments, AI-Rad Companion Brain MR WMH follow-up feature passed the acceptance criteria, the Pearson correlation coefficient between the new or enlarged WMH volumes estimated by our software and ground truth annotation was 0.76. The segmentation accuracy of the new or enlarged WMH reaches an average Dice score of 0.59. The average F1-score of new or enlarged WMH detection is 0.71.

For each dataset, three sets of ground truth of white matter hyperintensity changes between two time points are annotated manually. Each set is annotated by a disjoin group of annotator, reviewer and clinical expert, with the expert randomly assigned per case. For each test dataset, the three initial annotations are annotated by three different in-house annotators, then each initial annotation is reviewed by the in-house reviewer. Afterwards, each initial annotation is reviewed by the referred clinical expert.

**Standard Annotation Process:**

For each dataset, three sets of ground truth of white matter hyperintensity changes between two time points are annotated manually. Each set is annotated by a disjoint group of annotator, reviewer, and clinical expert, with the expert randomly assigned per case to minimize annotation bias. For each test dataset, the three initial annotations are annotated by three different in-house annotators. Then, each initial annotation is reviewed by the in-house reviewer. Afterwards, each initial annotation is reviewed by the referred clinical expert. The clinical expert reviews and corrects the initial annotation of the changed WMH areas according to the annotation protocol. If the corrections are significant and time-consuming, the corrections are communicated to the annotator for correction and then re-reviewed.

**Testing & Training Data Independence:**

WMH follow-up algorithm does not include any machine learning/ deep learning component. The training data used for the fine tuning the hyper parameters of WMH follow-up algorithm is independent of the data used to test the white matter hyperintensity algorithm follow up algorithm.

# 11. Summary of Nonclinical Tests

Based on the nonclinical performance documented within the Scientific Evaluation, AI-Rad Companion Brain MR VA60 was found to have a safety and effectiveness profile that is similar to the predicate. Since the predicate device was cleared based on the results of the prior conducted scientific evaluation, the same methodology was required to support the substantial equivalence. The nonclinical data and verification and validation results supports the safety and effectiveness of the subject device in that it should performs comparable to the predicate device that is currently marketed.

# 12. Summary of Clinical Tests

The predicate (K232305) was not validated using clinical tests and therefore no clinical tests were conducted to test the performance and functionality of the modifications introduced within AI-Rad Companion Brain MR. Verification and validation of the enhancements and improvements have been performed and these modifications have been validated for their intended use. No animal testing has been performed on the subject device.

# 13. Safety and Effectiveness

The device labeling contains instructions for use and any necessary cautions and warnings to ensure safe and effective use of the device.

Risk management is ensured via ISO 14971:2019 compliance to identify and provide mitigation of potential hazards in a risk analysis early in the design phase and continuously throughout the

development of the product. These risks are controlled via measures realized during software development, testing and product labeling.

Furthermore, the device is intended for healthcare professionals familiar with the post processing of magnetic resonance images.

# 14. Conclusion

Based on the discussion and validation testing and performance data above, the proposed device is determined to be as safe and effective as its predicate device, AI-Rad Companion Brain MR VA50 (K232305).