SIEMENS Healthineers

Press

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Siemens Healthineers introduces AI-based assistants for magnetic resonance imaging

- **The new applications in the product family AI-Rad Companion for the body regions brain and prostate can ease the burden of routine activities for radiologists and improve quality of care.**
- **AI-Rad Companion Brain MR for Morphometry Analysis provides result tables on volumetric changes in brain areas.**
- **AI-Rad Companion Prostate MR for Biopsy Support segments the prostate and can facilitate targeted biopsy under MRI and US fusion imaging.**

At the Congress of the Radiological Society of North America (RSNA 2019) in Chicago, Siemens Healthineers will introduce two software assistants based on artificial intelligence (AI) that are designed to free radiologists from the burden of performing routine activities during magnetic resonance imaging (MRI) examinations in the body regions brain and prostate. AI-Rad Companion Brain MR for Morphometry Analysis[1] automatically segments the brain in MRI images, measures brain volume, and marks volume deviations in result tables used by neurologists for diagnosis and treatment. AI-Rad Companion Prostate MR for Biopsy Support[1] automatically segments the outer contour of the prostate on MRI images and enables radiologists to mark lesions, so that it's easier for their colleagues in Urology to perform targeted prostate biopsies. Both new applications can be used on MRI scanners from different manufacturers and are available on teamplay[2], the cloud-based healthcare platform from Siemens Healthineers.

"With the new AI-based assistants, we are expanding our diagnostic offering to help our customers increase efficiency and improve the quality of care. We firmly believe that AI will help physicians deal with their workload and benefit patients by helping achieve an

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improved, patient-focused decision-making process," said Peter Koerte, Head of Digital Health at Siemens Healthineers. "We demonstrated this when we introduced the first application of the AI-Rad Companion focusing on CT for the chest body region. At RSNA 2019, we will present additional AI-Rad Companion applications for MRI examinations in the body regions, brain and prostate. Further applications for radiography and radio oncology will follow for the AI-Rad Companion family."

AI-Rad Companion Brain MR for Morphometry Analysis

The AI-Rad Companion Brain MR for Morphometry Analysis supports brain volumetry, which is performed in clinical practice for example in cases of suspected dementia. This involves measuring the volume of gray matter (nerve cells), white matter (nerve cell connections), and cerebrospinal fluid in various segments of the brain and comparing the results to normal volumes. A tendency for the brain volume to shrink may point to diseases like Parkinson's or Alzheimer's and other dementia diseases. Previously, segmentation and comparison to the norm were performed manually or only semi-automatically.

Based on AI algorithms, the AI-Rad Companion Brain MR for Morphometry Analysis can automatically identify about 50 brain segments on MRI images, measure their volumes, and compare the results to data in a normative reference database for brain morphometry made available by the Alzheimer's Disease Neuroimaging Initiative (ADNI)[3]. AI-Rad Companion Brain MR for Morphometry Analysis feeds the results into a report where deviations from the norm are automatically marked. This means that radiologists can provide the neurology department with objective, quantitative data that's relevant to differential diagnosis and therapy management. Patient care can also be improved by generating reports faster and in a more standardized and evidence-based form.

According to Alzheimer's Disease International[4], more than 50 million people around the world are living with some form of dementia. By 2030, that total could exceed 75 million and as many as 131.5 million by 2050[5] – which means that it'll be increasingly important to identify dementia diseases at an early stage in order to slow their progress with the appropriate treatments, if possible.

AI-Rad Companion Prostate MR for Biopsy Support

Prostate cancer is the second-most common malignant cancer (after lung cancer) affecting males world-wide.[6] Both the European Association of Urology (EAU) and the National Institute of Clinical Excellence (NICE), UK, provide evidence-based guidelines for diagnosing and treating prostate cancer, and in the past 12 months they've incorporated the primary diagnosis of prostate cancer using MRI and MRI/ultrasound fusion biopsy in their guidelines. Previously, urologists had to identify the suspected cancer areas using written reports and pictograms of the prostate provided by the radiologist based on the MRI examinations, and then try to take tissue samples accurately from the areas in question using ultrasound-guided biopsy. For the fusion procedure, the prostate had to be manually segmented in the MRI images, which can take up to five minutes per patient.

AI-Rad Companion Prostate MR for Biopsy Support automatically segments the outer contour of the prostate, which can cut the time needed for this routine activity down to just a few seconds. The radiologist then simply marks the suspect areas and hands the annotated MRI images to the urologist for fusion with the ultrasound images during the biopsy. Targeted, MRI-supported biopsies like this can make it easier for the urologist to detect significant prostate carcinomas and improve the quality of patient care.

The work of healthcare providers in recent years has become subject to significant time and cost pressures, and that goes for radiologists as well. In some conurbations, radiologists have to interpret a new image every three to four seconds throughout their workday. This means not only stress at the workplace, but also that it is becoming increasingly harder to keep the quality of diagnostic decision-making consistently high. Siemens Healthineers aims to take some of the load off radiologists with its AI-based assistants.

The new applications in the product family AI-Rad Companion can be used on MRI scanners from different manufacturers. They are cloud-based and use the certified, secure teamplay infrastructure, which is compliant with the HIPAA (Health Information Portability and Accountability Act, USA) and the EU GDPR (General Data Protection Regulation). The software is seamlessly integrated into the existing clinical workflow and complies with DICOM (Digital Imaging and Communications in Medicine) standards. The clinical images

and all supporting information can be made automatically available in the picture archiving and communication system (PACS) depending on the radiologists' requirements.

[1] 1 510(k) pending. This information about this product is preliminary. It is not commercially available in all countries, and its future availability cannot be ensured.

[2] teamplay is not yet commercially available in all countries. For regulatory reasons, its future availability cannot be guaranteed. Please contact your local Siemens Healthineers organization for more details.

[3] For the Alzheimer's Disease Neuroimaging Initiative (ADNI), see http://adni.loni.usc.edu/

[4] For Alzheimer's Disease International (ADI), see https://www.alz.co.uk/

[5] Source: https://www.alz.co.uk/research/statistics

[6] Source: Rawla, P. "Epidemiology of Prostate Cancer." *World J Oncol*, 2019 Apr; 10(2): 63–89, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6497009/

This press release and a press photo is available at
www.siemens-healthineers.com/press-room/press-releases/pr-ai-rad-companions-mri.html

For further information on RSNA, please see
www.siemens-healthineers.com/press-room/press-features/pf-rsna2019.html

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Siemens Healthineers AG (listed in Frankfurt, Germany: SHL) is shaping the future of Healthcare. As a leading medical technology company headquartered in Erlangen, Germany, Siemens Healthineers enables healthcare providers worldwide through its regional companies to increase value by empowering them on their journey towards expanding precision medicine, transforming care delivery, improving the patient experience, and digitalizing healthcare. Siemens Healthineers is continuously developing its product and service portfolio, with AI-supported applications and digital offerings that play an increasingly important role in the next generation of medical technology. These new applications will enhance the company's foundation in in-vitro diagnostic, image-guided therapy, and in-vivo diagnostics. Siemens Healthineers also provides a range of services and solutions to enhance healthcare providers ability to provide high-quality, efficient care to patients. In fiscal 2019, which ended on September 30, 2019, Siemens Healthineers, which has approximately 52,000 employees worldwide, generated revenue of €14.5 billion and adjusted profit of €2.5 billion. Further information is available at www.siemens-healthineers.com.