Siemens’ New Biograph mCT PET-CT System Enables Greater Diagnostic Certainty

The new PET-CT scanner offers accurate, reproducible quantification in molecular imaging, for results that redefine clinical decision-making.

At the 97th Scientific Assembly and Annual Meeting of the Radiological Society of North America (RSNA), November 27 to December 2 in Chicago, USA, Siemens Healthcare introduced the next-generation Biograph mCT, its positron emission tomography-computed tomography (PET-CT) scanner that enables precise measurement of metabolic processes and data quantification, including the assessment of neurological disease and cancerous tissue, as well as cardiac blood flow (perfusion). Technological innovations and intelligent software solutions within the new PET-CT result in quantitative assessments that are accurate and consistent. Siemens presents with the new Biograph mCT another paradigm in PET-CT to further strengthen the company’s innovative power and competitiveness within the recently introduced global initiative “Agenda 2013”.

“By bringing accuracy and reproducibility to quantification in PET, we can more precisely characterize cancer lesions, allowing for better staging and monitoring of the change in activity over time for more accurate assessment of treatment response”, said Jerry Froelich, MD, FACR, Loken Professor of Radiological Sciences and head of molecular imaging and nuclear medicine at the University of Minnesota, Minneapolis. “In cardiology, being able to measure absolute myocardial blood flow allows for accurate assessment of multi-vessel disease. In neurology, the potential is huge. The ability to noninvasively assess the brain can improve the diagnosis and therefore management of patients presenting signs of Alzheimer’s disease.”

Siemens incorporated this clinical requirement in the new Biograph mCT to support physicians in treating many oncological, cardiological and neurological diseases – not only through earlier, more exact diagnosis, but also in therapy planning and precise monitoring of disease progression. The
additional information provided will help enable physicians to make decisions with high certainty and initiate more patient-tailored therapies.

The level of measurement and quantification to be offered by the new Biograph mCT has special significance for the diagnosis of neurodegenerative diseases, such as dementia.

With the latest Biograph mCT and potential new PET biomarkers\(^1\), reliable imaging of beta-amyloid plaque in the brain may be possible, providing additional information to aid in the diagnosis of dementia, potentially slowing disease progression through earlier care. The most frequently diagnosed form of dementia is Alzheimer’s disease, which currently affects an estimated 35.6 million people worldwide, with predictions of as many as 115.4 million patients having the disease by 2050.\(^2\)

**Technical Innovations**

With conventional technology, clinicians face the issue of variability in quantitative results due to software and hardware challenges. Intelligently engineered to overcome these technical and procedural obstacles, the new Biograph mCT is designed to offer accurate and reproducible quantification in PET•CT imaging by ensuring that each element of the imaging chain is optimized – with an emphasis on the finest volumetric image resolution on the market\(^3\), daily system calibration, accuracy of attenuation correction using automated co-registration algorithms and more automated, user-independent and reproducible SUV calculation methods for daily clinical practice.

The new Biograph mCT incorporates the Siemens unique OptisoHD (High-Definition) Detector System, which will feature a fine volumetric resolution\(^4\) of only 87 mm\(^3\). Other innovative technologies include Time of Flight (TOF) and HD (High-Definition) PET, ensuring fast, precise images with minimum radiation dose.

With Siemens Quanti•QC, daily system normalization can be performed overnight, calibrating and tuning the system to precisely the right specifications, facilitating consistent and optimal performance, day after day.

\(^1\) Products are still under development and not commercially available yet. Future availability cannot be ensured.


\(^3\) Based on competitive literature available at time of publication. Data on file.

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SMART (Siemens Molecular & Anatomical Registration Technologies) address the traditional problem of inherent scanner drift and inaccurate attenuation correction through misregistration of anatomical and functional images. To facilitate accurate attenuation correction and reliable quantitative measurements, the new Biograph mCT will feature a unique patient handling system designed to virtually eliminates differential deflection, as well as Auto Cardiac Registration that automatically aligns CT and PET heart images and reduces variability between users. SMART also offers a new form of attenuation correction for neurological images that no longer requires CT data.5

Advanced syngo clinical applications provide essential tools to obtain quantifiable measurements in neurology, cardiology and oncology imaging. SUVpeak, new in the syngo.via oncology engine, provides consistent and reproducible quantitative assessments of hot spots. Myocardial Blood Flow (MBF) can be used as an absolute quantification method to assess balanced disease in all areas of the heart. And an exciting quantitative tool in neurology, the syngo.PET Neuro6 applications, automatically registers brain data to a normals database to assist in the assessment of neurological disorders.

The new Biograph mCT is currently under review by the FDA.

Preparing for a Changing Healthcare Market
Agenda 2013 is a global initiative to further strengthen Healthcare Sector’s innovative power and competitiveness. Four fields of action have been defined: Innovation, Competitiveness, Regional Footprint, and People Development, with specific measures to be implemented over the next two years.

Please find press images for the new Siemens Biograph mCT at:
http://www.siemens.com/healthcare-pictures/Biograph-mCT2011

The here mentioned product/features are not commercially available. Due to regulatory reasons, its future availability in any country cannot be guaranteed. Please contact your local Siemens organization for further details.

The outcomes achieved by the Siemens customers described herein were achieved in the customer’s unique setting. Since there is no “typical” hospital and many variables exist, e.g., hospital size, case mix, level of IT adoption, there can be no guarantee that others will achieve the same results.

The Siemens Healthcare Sector is one of the world’s largest suppliers to the healthcare industry and a trendsetter in medical imaging, laboratory diagnostics, medical information technology and hearing aids. Siemens offers its customers products and solutions for the entire range of patient care from a single source – from prevention and early detection to

5 / 6 SMART Neuro AC and syngo.PET Neuro are pending 510(k) clearance.
diagnosis, and on to treatment and aftercare. By optimizing clinical workflows for the most common diseases, Siemens also makes healthcare faster, better and more cost-effective. Siemens Healthcare employs some 51,000 employees worldwide and operates around the world. In fiscal year 2011 (to September 30), the Sector posted revenue of 12.5 billion euros and profit of around 1.3 billion euros. For further information please visit: [www.siemens.com/healthcare](http://www.siemens.com/healthcare).