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Siemens Healthineers Introduces Somatom Confidence RT Pro CT Scanner

- Somatom Confidence RT Pro is a dedicated CT for radiation therapy
- DirectDensity algorithm delivers electron density images independent of kV settings, ensuring a smooth simple dose calculation workflow
- New version of syngo.via RT Image Suite software offers advanced treatment of moving tumors

Siemens Healthineers introduced its new Somatom Confidence RT Pro CT scanner at the 2016 annual meeting of the American Society for Radiation Oncology (ASTRO) in Boston. This is one of the first CT scanners specifically designed to fulfill the needs of two professions in radiation therapy (RT): radiation oncologists and physicists. Thanks to the new DirectDensity [1] algorithm, the CT scanner provides personalized images of the patient, for optimal tumor and organs-at-risk contouring by the clinician – and images optimized for radiation therapy treatment dose calculation performed by a physicist. Enhancing Somatom Confidence RT Pro is the new version of the software syngo.via RT Image Suite [1] , which is designed to support a smooth workflow and reduce sources of error.

The Somatom Confidence RT Pro provides all the functionalities of a CT simulator, which produces images that are used by physicians to define the target and organs at risk for treatment prescription.

In addition it provides great image quality, thanks to the new detector and iterative reconstruction methods, which is needed for contouring. “This new offering complements the dedicated Siemens Healthineers MR, CT, PET/CT and software portfolio for radiation therapy and demonstrates how it can help healthcare facilities improve their outcomes while also lowering costs,” explains Dr. Gabriel Haras, Head of Radiation Oncology at Siemens Healthineers.

During treatment preparation, radiation oncologists need the best possible CT image quality for contouring tumors and sparing healthy-organ tissue, while physicists need a CT image that shows the patient’s physical properties, the so-called electron density, for treatment planning purposes. Until now, CT images for radiation therapy were optimized primarily for physicists to acquire electron density representations that are as accurate as possible. With this goal in mind, CT acquisition parameters such as tube voltage and kV settings were typically not varied, because this would make the process of dose calculation more complicated and error prone. As a result, CT scanners’ capabilities were not utilized to their full potential. Everyone from large to pediatric patients would all be imaged all the same way. But there are many benefits to acquiring CT images with different kV settings. In the case of bariatric patients, who have higher X-ray attenuation, an X-ray tube voltage higher than 120 kV is advantageous, as it produces images with good contrast-to-noise ratio. But pediatric patients may be exposed to an unnecessarily large imaging dose at the conventional 120 kV, while lower kV could reduce the CT dose and still deliver quality images.

Somatom Confidence RT Pro with the new DirectDensity algorithm is one of the first CT scanners that directly provides electron density images. Physicians are now able to contour on personalized images acquired with individualized kV settings, while physicists get the physical property readings they need to perform dose calculations, all in a simplified, less error prone workflow. Therefore this new solution will help support personalized patient care while also standardizing practices.

The new Somatom Confidence RT Pro features iMAR [1] metal artifact reduction capabilities. The number of patients with implants is increasing, and often oncology patients have metal fixations as a result of the disease. This leads to images that contain artifacts, which physicists have then to manually correct prior to dose calculation - while physicians often guess while contouring. This leads to operational inefficiencies and can potentially reduce the quality of care. iMAR significantly reduces artifacts and helps solve this challenge. The Somatom Confidence also features Dual Energy [1] capabilities: It automatically acquires two CT scans at different kV voltages, which allows images to be manipulated in order to improve visualization and support clinicians in their tasks.

Somatom Confidence RT Pro is complemented by the new syngo.via RT Image Suite [1] , the Siemens Healthineers multimodality simulation and advanced contouring software. The solution streamlines the simulation process, which consists of marking the patient - a key step in delivering the best possible treatment. In addition, it helps determine the right treatment strategy for moving tumors, such as those found in the liver and lungs, and facilitates the adoption of new approaches like treatment in midventilation. With this new ability to visualize the quantitative 3D tumor trajectory, the decision on how to best treat moving tumors, by delivering the treatment dose to the tumor while sparing healthy tissue, is made easier. For example, treatment in midventilation - a special stage in the patient’s breathing cycle, has been shown to reduce side effects in lung cancer patients [2] . Until now, finding the mid-ventilation breathing phase was very cumbersome. The new syngo.via RT Image Suite allows this to be done semi-automatically. Mid-ventilation treatment increases the number of patients potentially eligible for stereotactic body radiation therapy (SBRT)[2] .

SBRT is an extremely precise method of treating patients with radiation in a smaller number of sessions compared with conventional approaches, and it is often used for patients in early-stage lung cancer who are inoperable [3] . By simplifying the workflow, improving efficiency, and enabling better informed decisions, syngo.via RT Image Suite will offer substantial support to radiation therapy clinics, which are constantly trying to improve their clinical, operational, and financial results.

Reference:

1. optional
2. Peulen, H., Belderbos, J., Rossi, M., et al. (2014). “Mid-ventilation Based PTV Margins in Stereotactic Body Radiotherapy (SBRT): A Clinical Evaluation.” Radiotherapy and Oncology, 110(3), 511-16.
3. Clinical Lung Cancer, Vol. 16, No. 6, 413-30 Published by Elsevier Inc. Primary Treatment Options for High-Risk/ Medically Inoperable Early Stage NSCLC Patients Guy C. Jones.

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