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PTW partners with NKI-AVL to develop advanced 3D EPID dosimetry solution for automated patient QA

The dosimetry specialist PTW Freiburg GmbH signed a collaboration agreement with The Netherlands Cancer Institute – Antoni van Leeuwenhoek Hospital (NKI-AVL, Amsterdam) to jointly develop an advanced EPID-based dosimetry solution for automated patient-specific quality assurance in radiotherapy. The new software module RT EPID, which will become part of PTW’s patient QA platform VERIQA, builds on the well-established back-projection algorithm of NKI-AVL for EPID-based 3D pre-treatment and in vivo dose verification.

As part of PTW’s VERIQA patient QA platform, VERIQA RT EPID will provide a fully automated, streamlined verification workflow – from measurement and analysis to approval and documentation.

The new VERIQA module will use the advanced back-projection method of NKI-AVL for dose reconstruction, offering significant clinical advantages. Unlike most EPID dosimetry solutions, VERIQA RT EPID will enable a true 3D dose verification from the acquired EPID images by reconstructing the dose in the patient anatomy and comparing it directly with the planned dose. EPID measurements can be performed both before (“pre-treatment”) and during patient treatment (“in vivo”), making it possible not only to detect clinically relevant errors unnoticed during pre-treatment verification, but also to quantitatively assess their dosimetric impact. “The EPID dose back-projection algorithm of VERIQA RT EPID will offer a double benefit,” states Igor Olaciregui-Ruiz, member of the EPID Dosimetry Group at NKI-AVL. “It will verify treatment delivery by using in vivo EPID measurements as well as increase efficiency in pre-treatment verification by using EPID images acquired “in air”, thus eliminating the need for phantom positioning and re-planning.”

As a true 3D EPID dosimetry solution, VERIQA RT EPID will also allow clinical users to calculate dose-volume histograms (DVH) both pre-treatment and in vivo. “The new VERIQA module RT EPID can be seen as a double-edged sword”, adds Anton Mans, medical physicist at the Radiation Oncology Department of NKI-AVL. “It will provide the radiotherapy treatment chain with an extra safety net while at the same time reducing the overall QA workload.”

PRESS RELEASE



The back-projection algorithm of VERIQA RT EPID is a clinically proven and well-established method, which has been successfully used at NKI-AVL in more than 72,000 patient treatments since 2006.

“Patient safety and workflow efficiency are key issues in any radiation oncology department today”, says Dr. Tobias Schüle, managing director of PTW.

“By joining forces with NKI-AVL, we continue to deliver intelligent patient QA solutions that address these needs. Our partnership pairs PTW’s strength in the development of high-precision dosimetry technology with NKI-AVL’s long-term scientific and clinical expertise in 3D EPID dosimetry.”

The VERIQA software platform by PTW provides medical physicists and radiation oncologists with an automated, single-source solution for patient QA – from visualization and contouring through all commonly used plan verification methods to documentation. With VERIQA RT EPID clinical users will have an additional, highly efficient dose verification tool at hand, giving them the flexibility to choose the best verification method for their patient treatment plans.

For more information about PTW's VERIQA patient QA platform, visit www.ptwveriq.com.

Clinical References:

[Transit and non-transit 3D EPID dosimetry versus detector arrays for patient specific QA](#)
I. Olaciregui-Ruiz et al, J Appl Clin Med Phys 2019; 20:6:79-90, doi: 10.1002/acm2.12610, Epub 2019 May 13

[Overview of 3-year experience with large-scale electronic portal imaging device-based 3-dimensional transit dosimetry](#)
Ben J Mijnheer et al, Pract Radiat Oncol 2015; 5(6): e679-87., doi: 10.1016/j.pro.2015.07.001. Epub 2015 Jul 9

About PTW:

PTW is a global leader in high-precision dosimetry solutions for radiation therapy, diagnostic radiology and metrology. Founded in 1922, the German company is one of the pioneers in medical radiation measurement, helping advance patient safety in modern radiation medicine. PTW technologies and services enable radiation experts in over 160 countries worldwide to precisely monitor highly complex clinical radiation equipment. The dosimetry company also owns one of the oldest and largest accredited calibration laboratories in the field of ionizing radiation and established THE DOSIMETRY SCHOOL to promote the exchange of knowledge in clinical dosimetry. PTW operates globally with ten international subsidiaries and more than 350 employees worldwide. For more information visit www.ptwdosimetry.com.

PRESS RELEASE

About NKI-AVL:

The Netherlands Cancer Institute is at the international forefront of cancer care and research for already more than a century. The unique combination of health care and scientific research within the same institute offers great benefit for cancer patients. Specialized cancer care professionals work together in multidisciplinary teams every day to set up and carry out treatment plans tailored to the needs of individual patients because no two tumors are alike. Cancer patients or people suspected of having cancer can come to our hospital, known as the Antoni van Leeuwenhoek, to make use of this personal approach and the state-of-the-art research and treatment facilities. The research institute employs more than 650 scientists investigating many aspects of cancer development, diagnosis, treatment and epidemiology. Scientists at the Netherlands Cancer Institute have access to state-of-the-art research facilities supporting their basic, translational and clinical research. This scientific research could not be carried out without the institutional support of the Dutch Cancer Society, the Ministry of Health, Welfare and Sport, the many research grants obtained by our researchers from (inter)national funding agencies, and the generous donations made by individuals that support our research program. The Netherlands Cancer Institute is the only OECD designated Comprehensive Cancer Center in the Netherlands. For more information visit www.nki.nl and www.avl.nl.



The new VERIQA RT EPID will enable an automated, true 3D EPID-based dose verification both before and during patient treatment

Photo credits: NKI-AVL, Amsterdam

(Image: NKI_Treatment Room.jpg)

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