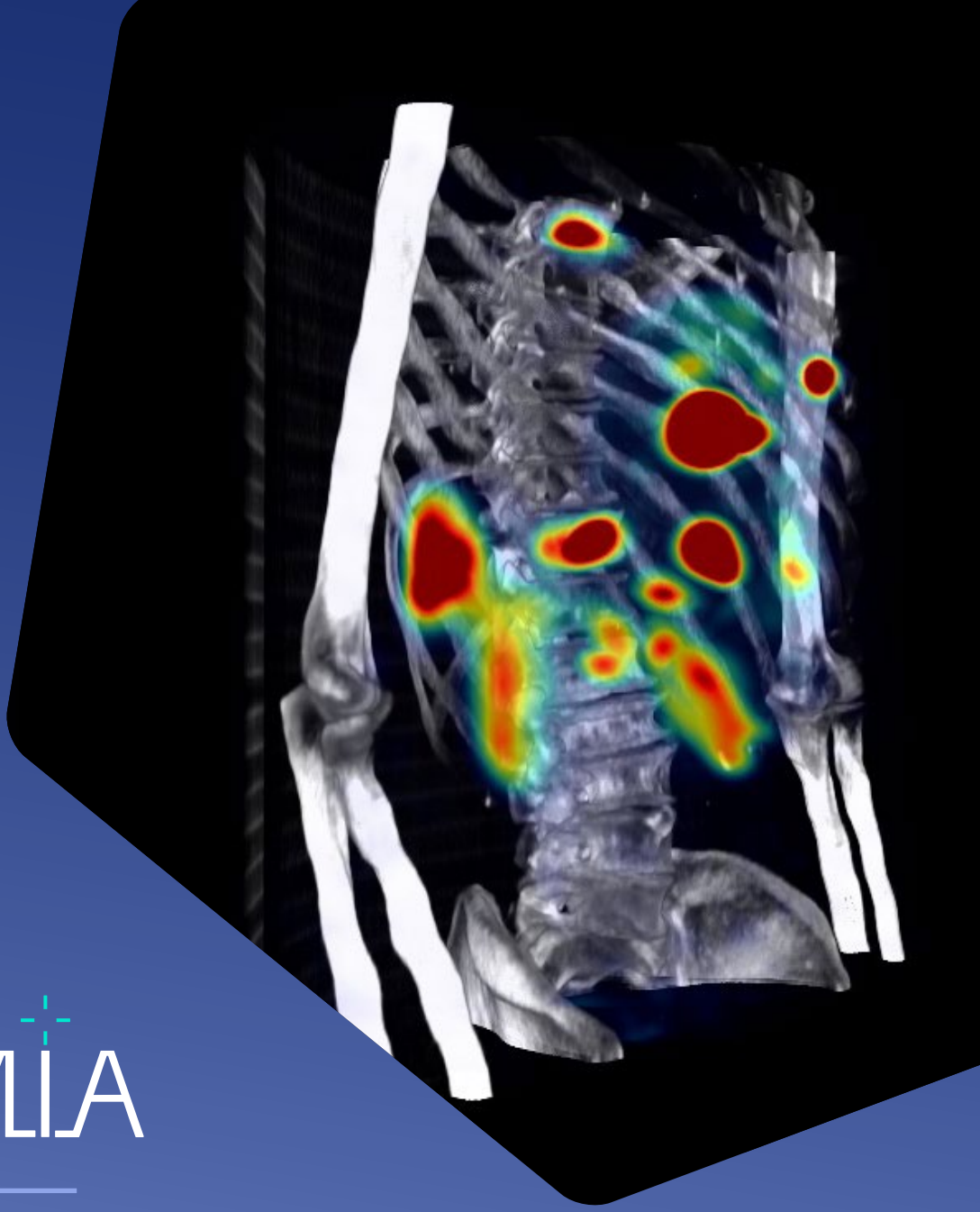
Theranostics & therapy



HERMIA

Software Innovation for Personalized Theranostics & Therapies

HERMES MEDICAL SOLUTIONS

“With the theranostics approach in cancer, one can judiciously choose the most suitable treatment for each individual patient, both at the level of molecules and doses, and also apply innovative treatments.”

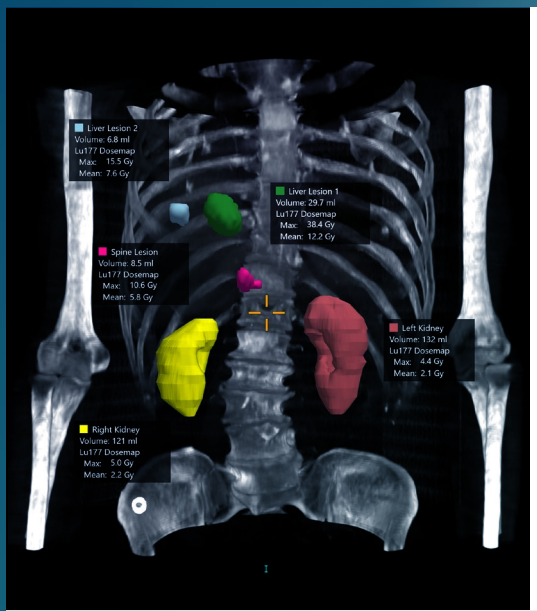
– Dr. François Lamoureux, Associate Professor of Nuclear Medicine at the Faculty of Medicine, University of Montreal, President of CANM

ADVANCING PERSONALIZED THERANOSTICS AND THERAPIES

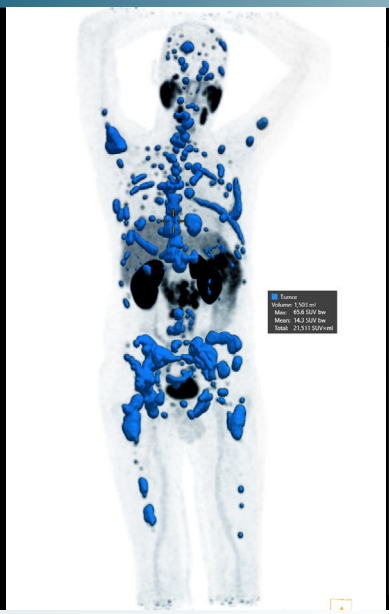
The future of personalized therapy for treating complex liver, prostate, and neuroendocrine cancers is here. Hermes Medical Solutions is committed to the advancement and future of theranostics. Optimizing patient outcomes and delivering cost-effective, cutting-edge treatment relies on providing individualized dosimetry for each patient. Enter HERMIA, our all-in-one vendor-neutral solution for your theranostics and therapy program.

Our complete suite of advanced tools, including Voxel Dosimetry, quantitative SPECT reconstruction, Organ Dosimetry and SIRT treatment planning and verification, enables your department to continue advancing cancer treatment. Hermia has been designed to give you all the tools you need for efficient oncology, diagnostics, and therapy, including personalized dosimetry in ONE platform.

Together we can develop personalized, precise treatment and therapy options and continue to push the forefront of medicine.



I Regions of interest for the kidneys and tumors with dose statistics for Lu-177 DOTATATE PRRT



I Ga-68 PSMA total burden quantitation

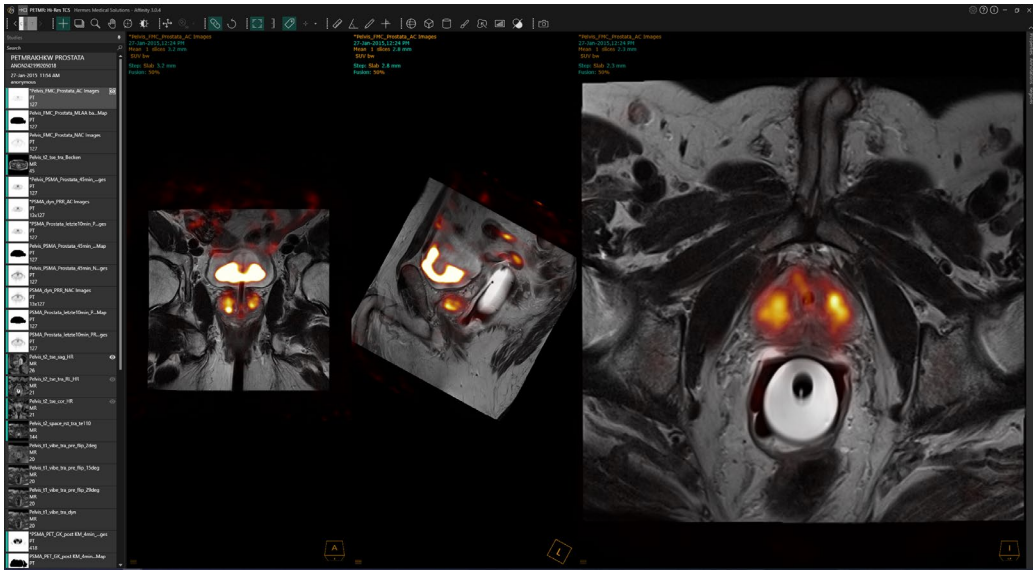
I SIRT Dose planning

ONCOLOGY DIAGNOSTICS AND THERAPY IN ONE INTUITIVE PLATFORM

With Hermia, Molecular Imaging Departments can handle all oncology-related work, from diagnostic imaging and reporting to therapy, for all modalities and scanners. This high inter-operability considerably helps to streamline the workflow of the department and facilitate multi-disciplinary collaboration most notably with the radiation oncology department.

New insights with advanced multimodality visualization

Featuring the unique Deep Fusion Technology™, Hermia delivers unprecedented clarity for multimodality imaging. Designed to handle multiple time points, bed positions and modalities with ease, it allows any number of fused image layers to support expert reading, bringing new insights for confident diagnosis. Any 3D data from any modality, in any combination, including volumes of interest (VOIs), can be visualized and analyzed in real-time.



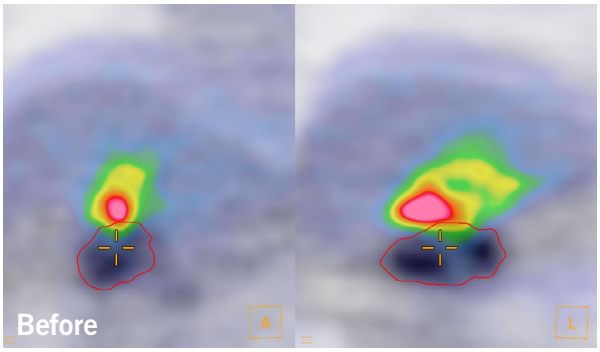
Prostate cancer case featuring unique unlimited layer Deep Fusion Technology

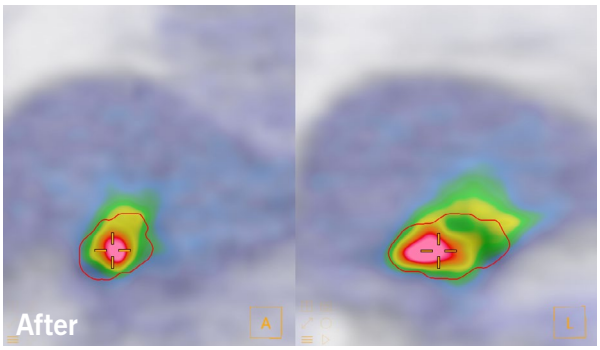
One-click Lesion Segmentation

With the assistance of AI algorithms*, users can automatically segment any tumor with high precision as well as separate adjacent tumors into their most natural parts or differentiate physiological uptake from clinically-relevant uptake in the lesions. This facilitates the calculation of the total tumor burden and helps to provide a more accurate overview for diagnosis and staging.

Automatic Local/Focused Registration

With the local registration, you can obtain a refined automatic registration of multiple time points focusing on a specific area of interest.



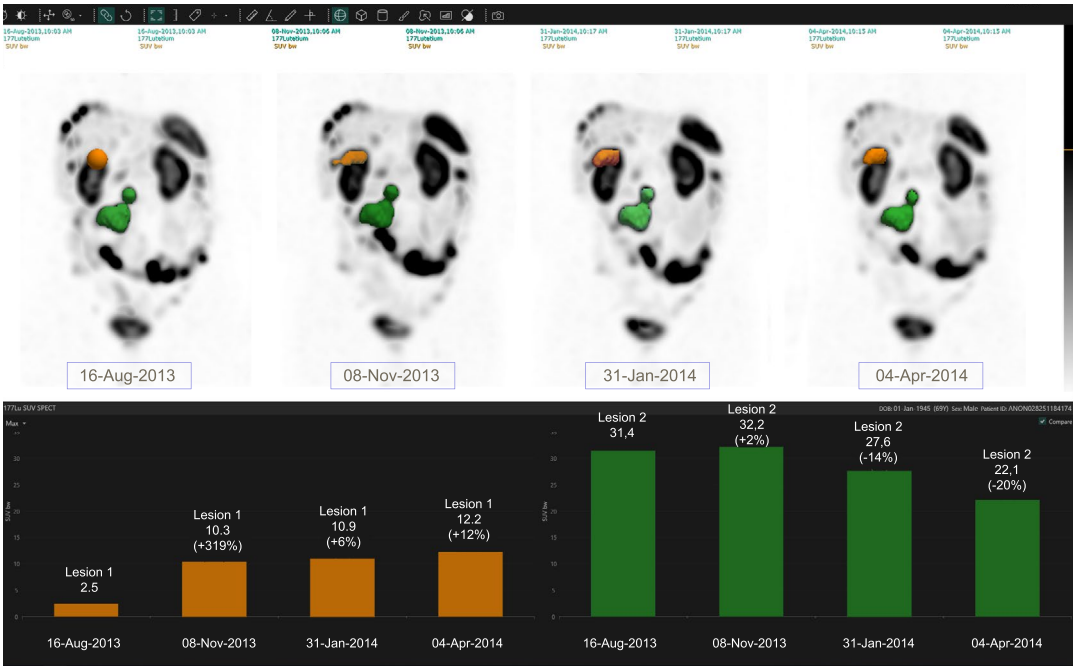


| 3D visualization of MIP with volumes of interest

*All algorithms are deterministic and have been verified before release.

AI-driven* Lesion Tracking and Therapy Response Metrics

The software automatically tracks, and compares lesions across multiple time points providing the user with accurate measurements on how the lesion evolves, such as Metabolic TumorVolume, Total Tumor Burden, Metabolic Peak, SUVMax and SUVPeak.



I Four cycles of 177Lu DOTATATE PRRT for neuro endocrine tumor post therapy with SUV SPECT lesion tracking

Statistics dashboard to compare and share your findings

A flexible dedicated statistics dashboard allows visualization of all imaging data in one place, facilitating efficient assessment and comparison for a confident diagnosis. With advanced analysis tools, including column charts for serial imaging and Dose Volume Histograms for personalized dosimetry assessment, investigation findings can be easily exported to share valuable insights with clinical colleagues.

Radiotherapy planning with PET and SPECT

Segment and threshold molecular images, automatically align with the planning CT, and easily export RT structure sets to be used with your radiotherapy treatment planning system.

 *All algorithms are deterministic and have been verified before release.

University Hospitals Birmingham NHS shows personalized dosimetry is essential for neuroendocrine tumors (NETs)

Lydia Ram, Erin Ross, and a multi-disciplinary team at University Hospitals Birmingham NHS FT in the UK, with the support of Hermes Medical Solutions, conducted a project to evaluate the dose delivered to patients receiving the fixed treatment regime of 4 cycles of 7.4GBq Lu-177 DOTATATE.

The aim was to build a tumor dose-response relationship and determine dose limits for organs at risk (OARs), facilitating a personalized activity prescription on an individual patient basis rather than a standardized ‘one size fits all’ regime. Here we report initial results from 19 patients.

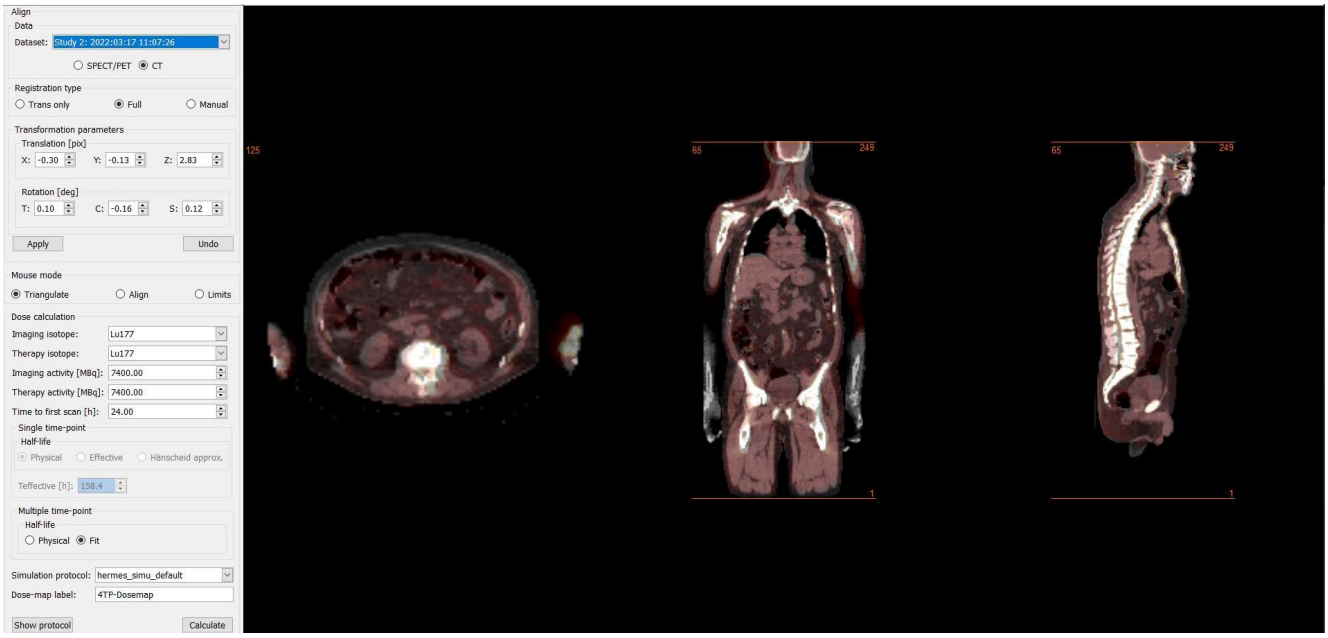
Using the Hermia Voxel Dosimetry and vendor-neutral quantitative SPECT reconstruction software, post therapy SPECT images acquired on day 0, day 1, day 4, and day 7 were combined into a 3D voxel dose distribution facilitating detailed dosimetric analysis. Voxel Dosimetry employs full Monte Carlo simulation for the photon component of the radionuclide, which is essential when evaluating OAR dose when a high uptake tumor is close by.

Indeed, 18 out of 19 patients in the cohort received less than the 23 Gy assumed mean kidney dose limit summed over the four treatment cycles; for the one patient exceeding this limit a kidney adjacent high uptake tumor was the cause. Wide variation was found in the mean absorbed dose to the 37 analysed NETs: mean dose 14.4 Gy with a standard deviation of 10.2 Gy. Analysed NETs included those in the mesenteric nodes, abdominal nodes, liver, and bones. NET and OAR doses vary significantly between patients, highlighting the need for individualized dosimetry.

See how you can perform personalized dosimetry for your patients

A NEW PERSONALIZED APPROACH TO DOSIMETRY WITH VOXEL DOSIMETRY™

HERMIA Voxel dosimetry™ is regulatory cleared in Europe, Canada and the US** for a wide range of therapy and imaging isotopes - helping make personalized therapy a reality for your clinical practice.



I In Hermia Voxel Dosimetry, Hänscheid method, effective half-life, and physical half-life assumptions are available to facilitate dosimetry from a single image time point improving patient experience and simplifying departmental logistics.

Quantitative SPECT Reconstruction for all your existing cameras

Hermia SUV SPECT Reconstruction is optimized for speed and a wide range of procedures, radiopharmaceuticals and collimators, making it possible to improve image quality while reducing dose and acquisition time with virtually any camera manufacturer.

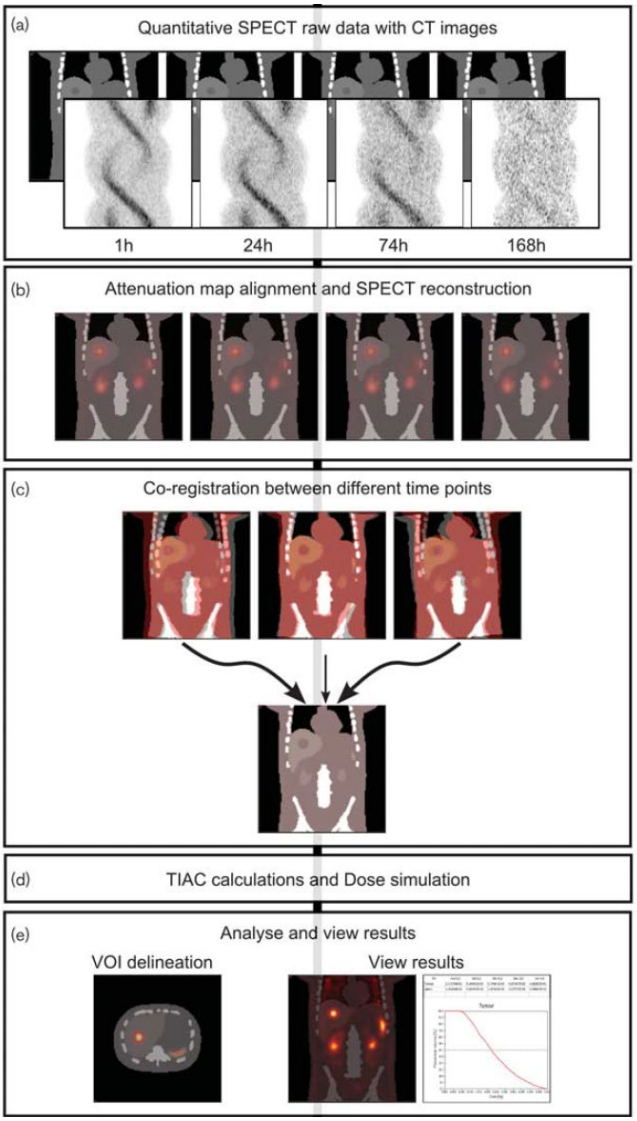
It is available for all supported radionuclides with resultant datasets, in voxel values in Bq/ml or SUV. State-of-the-art resolution recovery collimator correction achieves excellent image quality, even for the most challenging radionuclides including ^{131}I, ^{123}I, ^{90}Y, and ^{166}Ho. Septal penetration, compton scattering, and photoelectric absorption in the collimator septa are modelled to produce the highest accuracy activity distribution for confident therapy dosimetry and follow up[1].

**Only intended for calculating dose for FDA approved radiopharmaceuticals for any clinical purpose, and calculation of unapproved drugs can only be used for research purpose.

One workflow to handle multiple timepoints from PET or Quant SPECT

Process DICOM images from all camera manufacturers using the same workflow with automatic alignment of multiple quantitative SPECT/CT or PET/CT time points followed by their automatic co-registration and dosemap simulation. Cumulated activity in each voxel is thereafter calculated and a Monte Carlo algorithm simulates photon absorption and scatter through the patient's CT to calculate dose distribution over the entire field of view.

After the dose simulation, the user can delineate VOIs using versatile manual drawing tools or automated methods. As a final step, the user can visualize the calculated total absorbed dose distribution, dose volume histograms and a table of VOI statistics.



| Overview of the voxel-level dose calculation software in Hermia[2]

VALIDATED MONTE CARLO DOSIMETRY ALGORITHM

Accurate and fast, personalized to the patient anatomy. Extensive clinical validation of the accuracy of the dose results in patients and phantoms is published in peer reviewed journals[2-6].

SINGLE TIME POINT DOSIMETRY

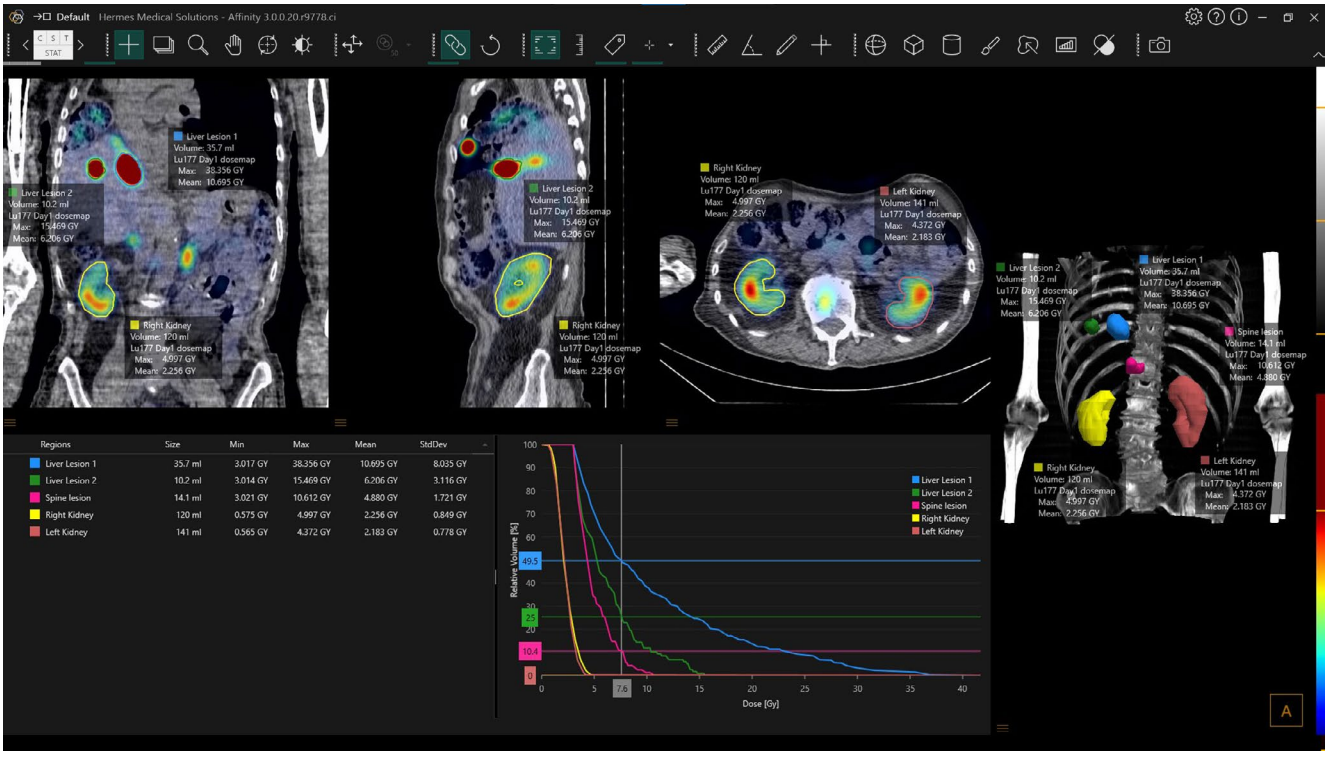
The novel Hänscheid method calculates doses for Lu-177 PRRT and needs only one imaging time point four days post therapy. Hänscheid and colleagues have validated their method vs multiple time point imaging to within 90% accuracy[7]. Hänscheid method, effective half-life, and physical half-life assumptions are available to facilitate dosimetry from a single image time point improving patient experience and simplifying departmental logistics.

PURE THERANOSTIC APPROACH

Plan and verify dose distribution with full flexibility in imaging and therapy radionuclides**. Support for a wide range of therapy and imaging isotopes: ^{68}Ga; ^{166}Ho; ^{111}In; ^{123}I; ^{131}I; ^{177}Lu; ^{223}Ra; ^{99m}Tc; ^{90}Y; ^{89}Zr. Mapping from imaging to therapy isotopes enables a true theranostics approach for dose prediction to target volumes and organs at risk for best practice legislative compliance. We constantly innovate to provide support for new isotopes via regular releases.

DOSIMETRY RESULTS REVIEW AND SHARING

Dose volume histogram analysis and 3D dose map are available to provide a detailed understanding of dose distribution in volumes of interest and facilitate the communication with the referring physicians and patients. Dosemaps can be stored as DICOM for further and future analysis.



I Review of the results for each VOI with dose volume histogram analysis and 3D dose map.

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6. Hippelainen E Tenhunen M Sahlberg A. Fast voxel-level dosimetry for ^{177}Lu labelled peptide treatments. Physics in Medicine and Biology 2015, vol: 60 (17) pp: 6685-6700

7. Hänscheid H, Lapa C, Buck AK, Lassmann M, Werner RA. Dose Mapping After Endoradiotherapy with ^{177}Lu-DOTATATE/DOTATOC by a Single Measurement After 4 Days. J Nucl Med. 2018 Jan;59(1)

About the company
Hermes Medical Solutions

Since its establishment in 1976, in Stockholm, Sweden, Hermes Medical Solutions continuously innovates to enable faster and more personalized diagnosis and therapies in molecular imaging.

The company was first to develop SPECT reconstruction software and dual-head whole-body scanning and first to introduce medical image fusion software for combined viewing of images from different scanners. With Hermia, we empower healthcare professionals with state-of-the-art software for all clinical scenarios into ONE vendor-neutral software suite.

Combining leadership in innovation for NM/MI software with customer-driven service is our mission and our success lies in our close and longstanding collaboration with our customers to meet their software, support and service needs.

The result is improved quality in patient management and decision support for thousands of healthcare providers and their patients worldwide.

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