

**Personalized confidence
in radiation oncology**



The increased complexity of high-tech radiotherapy techniques, such as stereotactic radiosurgery, proton therapy, MR-guided radiotherapy, revealed an emerging need for equally sophisticated technology in machine validation and patient treatment verification.

RTsafe as a medical technology innovator meets the challenge for integrated Machine and Patient QA solutions. By utilizing cutting-edge 3D printing technology and real 3D dosimetry, introduces truly end-to-end QA procedures and patient-centered processes.

Our team of experts specializes in the sectors of medical physics, engineering, software development, business and quality management combining both clinical and research experience. A team fully committed to quality, striving through continuous R&D for optimal and innovative products and services aiming to meet radiotherapy professionals' expectations.

Providing the opportunity for individualized care: physicians gain total control of the process, medical physicists reduce uncertainties, clinics build stronger brand name and patients get a better quality of living.

Machine QA



Remote Dosimetry Services



PseudoPatient®



Machine QA

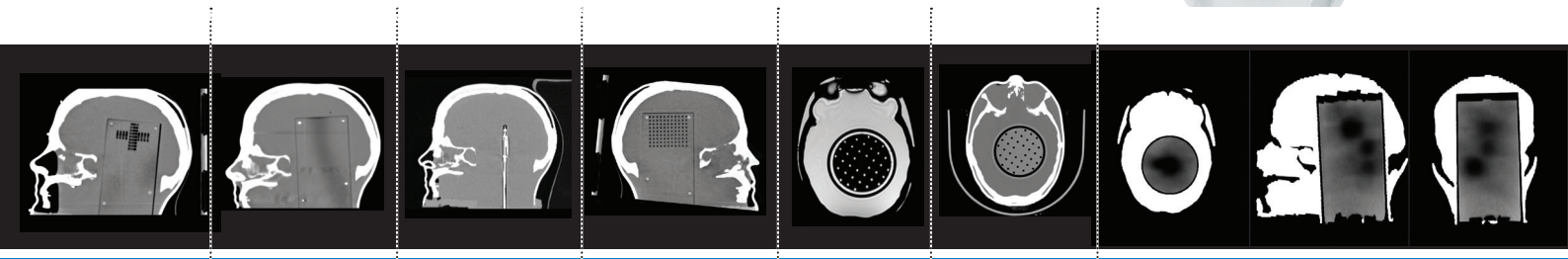
Prime

Broadening the spectrum of quality assurance

Complexity of contemporary radiotherapy demands a novel approach in quality assurance. **Prime** is a 3D-printed head phantom that broadens the spectrum of quality assurance through an integrated solution.

Comprehensive dosimetry in this true-to-life human anatomy phantom provides an End-to-End evaluation of advanced radiotherapy applications, focusing on stereotactic radiosurgery.

Prime can be combined with RTsafe's Remote Dosimetry Services.



Key Features

Confidence through 3D dosimetry

Prime phantom enables 3D gel dosimetry measurements for the evaluation of the spatial accuracy in complex treatments, in combination with the Remote 3D Dosimetry service, RTsafe provides multi-level comparison with TPS calculations incorporated in a detailed 3D dosimetry report.

True-to-life human anatomy

Based on an actual patient's CT scan, Prime utilizes bone and soft tissue-equivalent materials providing realistic contrast in MR and CT imaging.

End-to-End QA in stereotactic radiosurgery

All the links of the radiotherapy chain are evaluated in a holistic way by simulating patient's treatment processes from imaging to setup and dose delivery. Comprehensive Point/2D/3D dosimetry and imaging assessment form the ultimate QA solution in SRS.

Imaging and dosimetry inserts available

- Ion Chamber/diode/diamond detector Fixed Position Dosimetry kit
- Ion Chamber/diode/diamond detector Variable Position Dosimetry kit
- Film Dosimetry kit (2D dosimetry)
- Gel Dosimetry kit (3D dosimetry)
- MR-related geometric distortion evaluation insert
- Winston-Lutz insert with central and offset targets
- Multiple-OSL dosimetry kit
- Multiple-TLD dosimetry kit

Intended for

- End-to-End QA in SRS Applications
- Commissioning and Benchmarking
- Periodic Quality Assurance
- Confidence Building & Training
- Remote or Internal Audit Tests
- Clinical or Academic Research



Encephalon 3D

Limitless SRS QA

Current QA equipment does not meet the challenges of the commissioning of cutting-edge technology for multiple brain metastases treatments.

Encephalon 3D is a single-use head phantom constructed from bone equivalent material. The brain area is filled with 3D polymer gel dosimeter, as a tissue equivalent material, giving to the end-user the ability to gain a real-3D map of the delivered dose.

Encephalon 3D is the absolute solution for the validation of the overall hardware and software performance. Explore the limits of your SRS treatment procedures in an End-to-End manner through 3D dosimetry in a unique patient derived phantom.



Key features

3D dosimetry

Encephalon 3D head phantom enables high spatial resolution real-3D dosimetry, in a patient-derived anatomy. The 3D evaluation of the spatial accuracy reveals any minor uncertainties even in the most demanding plans, such as peripheral multiple metastases cases, making the Encephalon 3D an excellent margin-strategy decision tool.

End-to-End QA

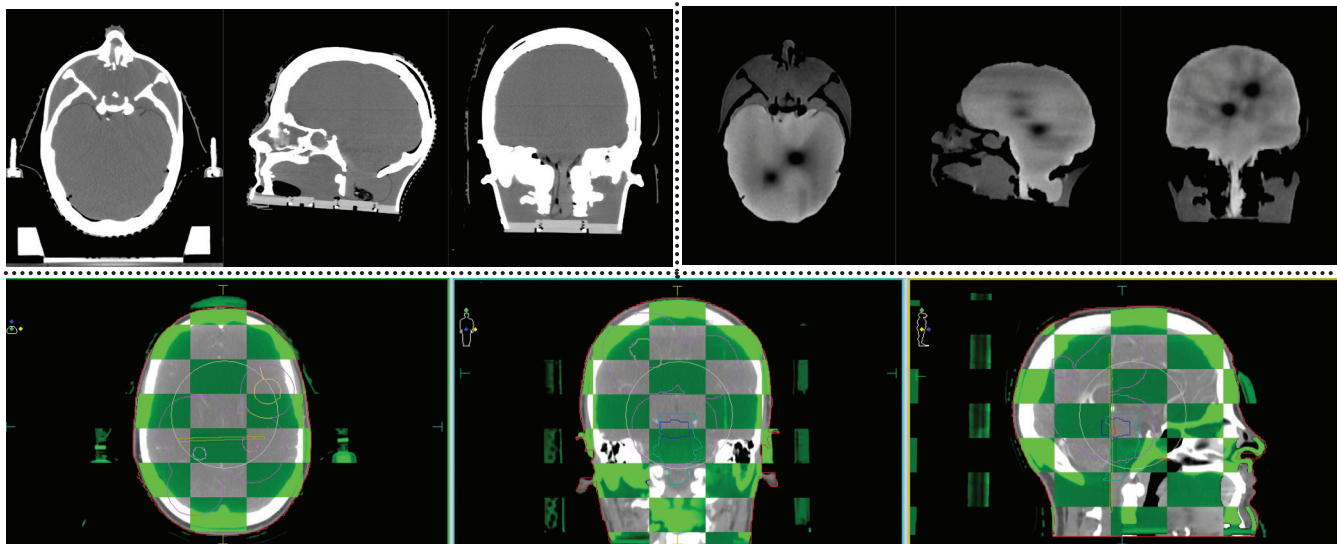
Encephalon 3D is treated as if it is the real patient, checking the whole SRS process, from imaging and planning to positioning, IGRT and treatment delivery. Commissioning and periodic QA of the SRS platform is achieved through an in-depth multi-level validation.

SRS confidence

A unique solution for boosting the SRS program at your clinic by adapting cutting-edge technology. Full exploitation of the system capabilities through data-driven decisions.

Indented for

- Advanced End-to-End QA
- Commissioning of SRS equipment and software
- Evaluation of multiple metastases SRS applications
- 3D dose measurements



Spine

More accurate spine radiosurgery

RTsafe's 3D printed **Spine** phantom is an accurate replica of a real patient's spine anatomy for SBRT quality assurance test. Spine phantom is manufactured to meet the need of a patient specific End-to-End solution in SBRT field. It is an ideal choice for building confidence and ensuring safety in treatment delivery for patients treated with hypo fractionated SBRT schemes.

Key Features

Bone equivalent material

3D printed bone anatomy with density corresponding to bone equivalent material.

Realistic anatomy-treat as the real patient

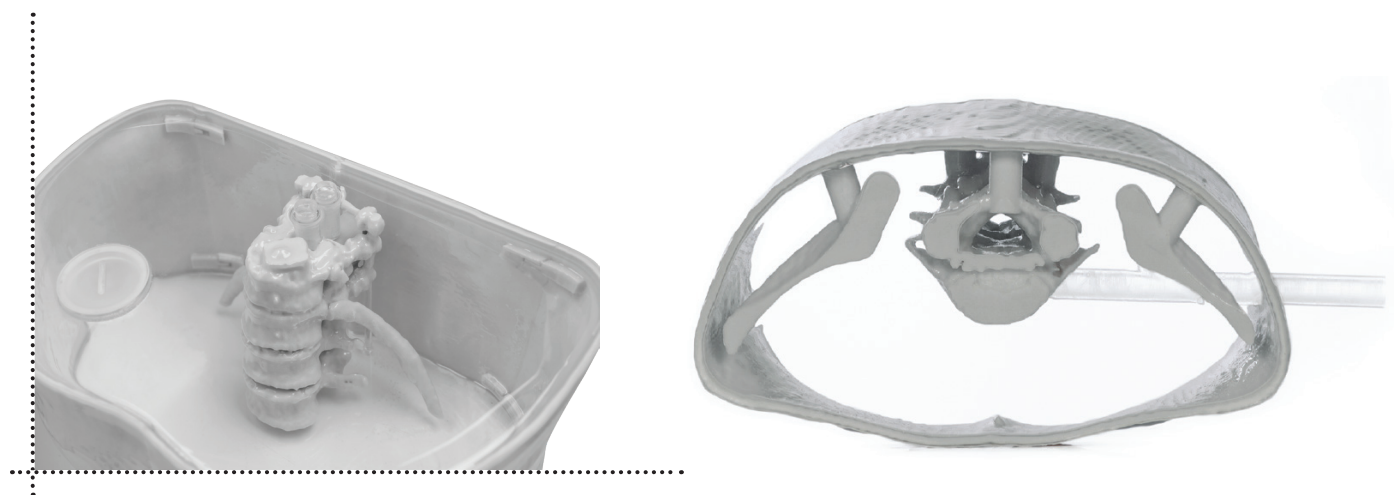
Evaluates all steps of treatment chain: planning-CT, TPS, set-up, image guidance, treatment delivery.

Flexibility to accommodate different types of point dosimeters

Properly machined to accommodate point dosimeters such as ion chambers, diodes or diamond detectors into the spinal cord and the spinal bone.

Intended for

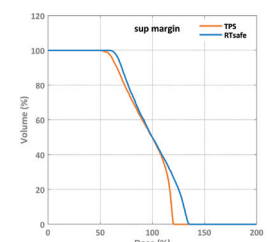
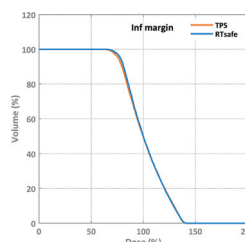
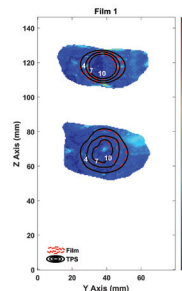
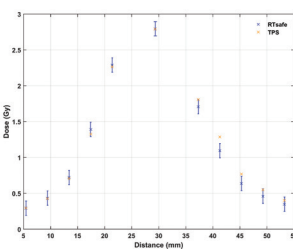
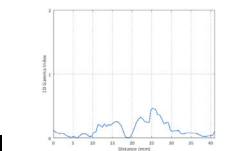
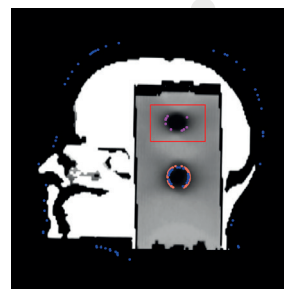
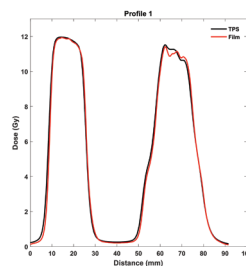
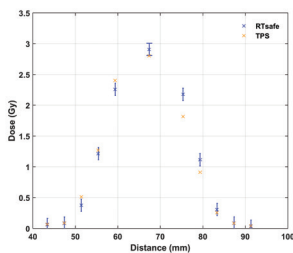
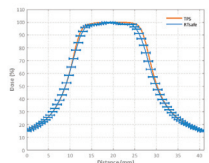
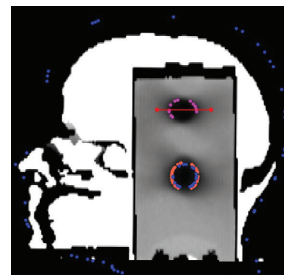
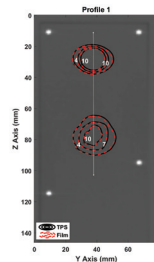
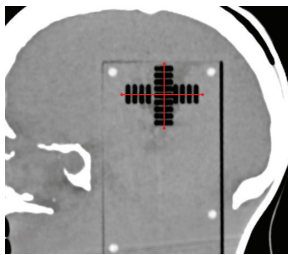
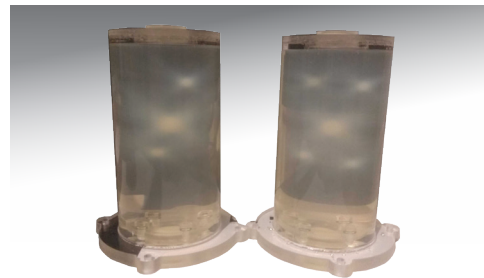
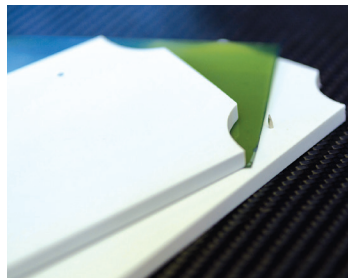
- End-to-End QA in SBRT Applications
- Commissioning and Benchmarking
- Periodic Quality Assurance
- Confidence Building & Training
- Remote or Internal Audit Tests
- Clinical or Academic Research



Remote Dosimetry Services

Advanced dosimetry. Simple implementation.

The complex nature of advanced radiotherapy treatment process demands a commitment to the highest levels of accuracy and precision. The RTsafe **Remote Dosimetry Services** package forms a powerful tool for quality improvement. Promote the best practice and assure high quality treatments, by outsourcing the routine quality control program of your radiation oncology QMS using a cost and time effective solution.





Remote Dosimetry Services

Advanced dosimetry. Simple implementation.

Key Features

High quality treatments.

Point, 2D & 3D dosimetric and geometric accuracy is verified through independent measurements, traceable to SSDL, empowering treatment's efficiency.

Effortless high-end QA.

All RTsafe remote dosimetry processes are based on existing standards and protocols from international organizations. QA solutions tailored to the department's specific needs assist radiotherapy professionals to evaluate the whole treatment chain.

Cost & time effective solution.

All dosimeters provided are ready-to-use requiring the minimum effort for machine and patient QA. An advanced solution that supports the implementation of novel and complex techniques.

Offered services

Point dosimetry

Calibrated OSL (*nanoDots™) dosimeters for absolute dosimetry.

2D dosimetry

Calibrated EBT3 and EBT-XD **GAFchromic films for relative and absolute dosimetry based on single/triple channel protocols.

3D dosimetry

Polymer gel formulation for relative dosimetry.

*NanoDot™ is a trademark of Landauer (Glenwood, IL)

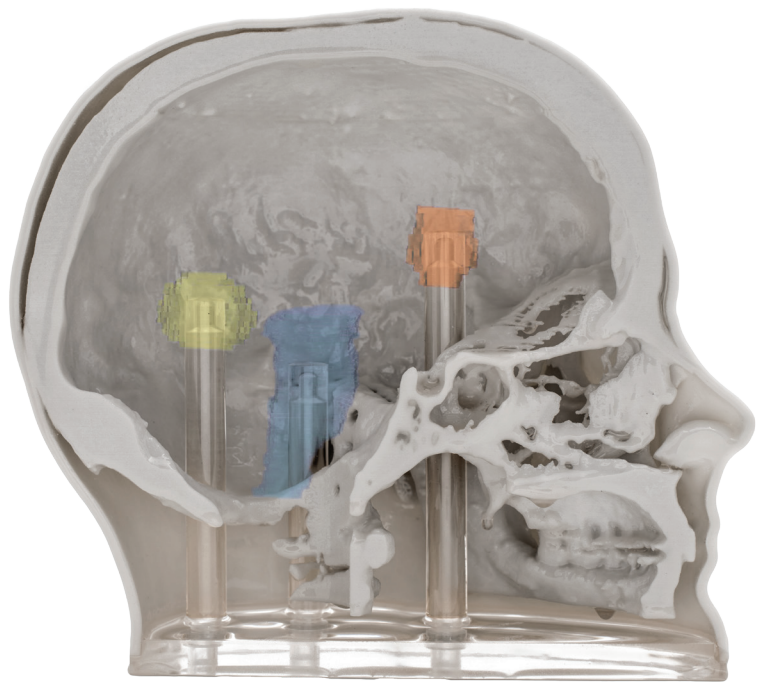
**Gafchromic™ is a trademark of Ashland Inc. (Wayne, NJ)

RTsafe performs combined with Prime phantom the dose read-out and analysis of the results providing a comprehensive dosimetric report including multi-level comparison between dose measurements and TPS calculations.

Depending on the provided service, results include:

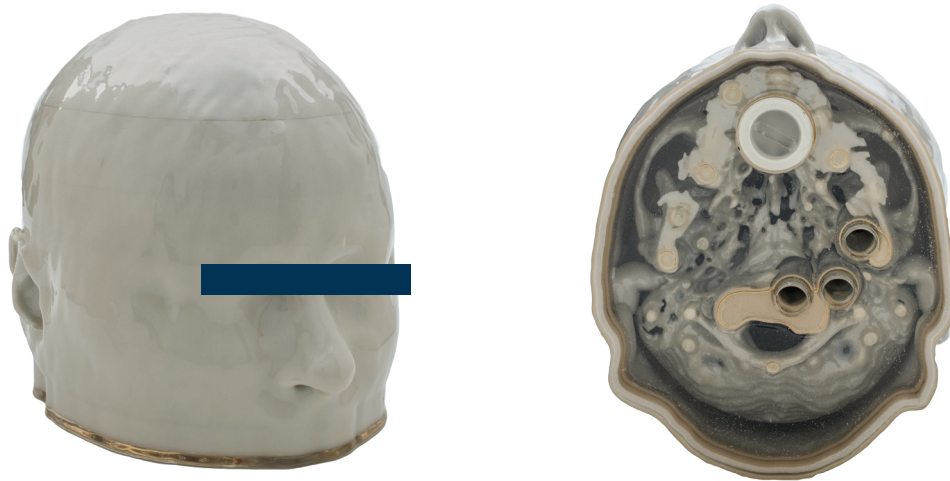
- Dose profiles
- 2D isolines
- 3D gamma evaluation
- DVHs
- Plan quality metrics
- Geometric offsets

PseudoPatient®



PseudoPatient®

Patient Treatment Verification Redefined.
Safety Personalized.

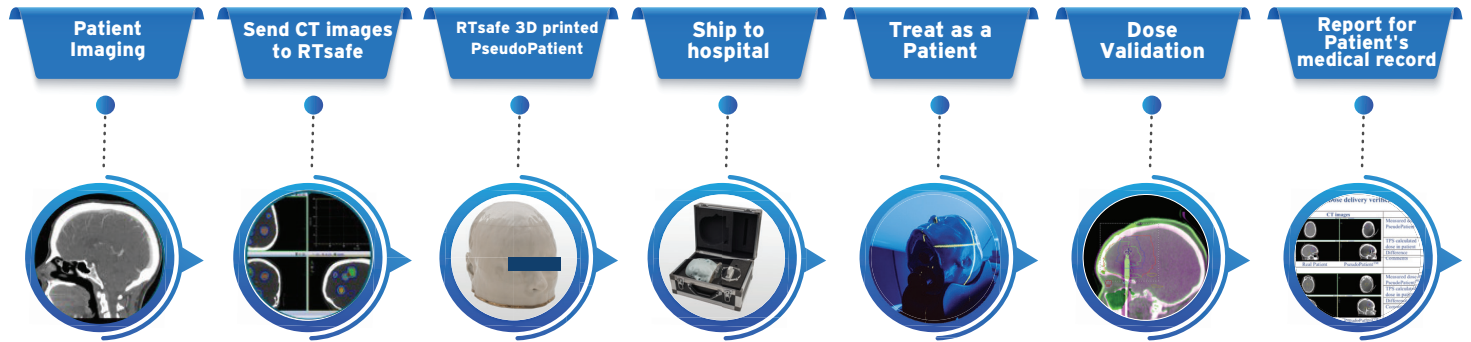


RTsafe meets the trend for truly personalized medicine offering **PseudoPatient®**, as a unique, innovative, and high-tech solution that delivers total control of the therapy process to Neurosurgeons, Radiation Oncologists, and Medical Physicists.

PseudoPatient® is an FDA cleared device constructed by the real patient's CT data using highly accurate 3D printing technology. It forms an anatomically accurate replica of patient's head, providing physicians and medical physicists with either direct dose measurements of anatomic regions of high interest (point, 2D), or a full relative 3D dose map, ideal for demanding SRS cases, such as small benign tumors.

PseudoPatient® provides medical team with the ability to make accurate data-driven decisions of whether to approve, improve, or reject any treatment prior to real implementation. As a result, patient safety is enhanced, and the risk of side effects is minimized, aiming to secure patients' quality of life.

WORKFLOW



Key Features

Evidence-based confidence

- Direct measurements on anatomic regions of high interest (PTV, OAR).
- End-to-end data-driven medical evaluation of all treatment processes.
- Unique & personalized approach optimizes treatment outcomes and minimizes the risk of side-effects.

Value-based practices

- Individualized quality monitoring. Opportunity for data-driven continuous improvement.
- Medical record evidence of true treatment results under realistic conditions.
- Building confidence process leading to enhancement of SRS usage as the optimum means of treatment.

Efficiency & Differentiation

- Increase patient throughput in advanced techniques.
- Stronger brand name through provision of exceptional patient experience.
- Safeguard against lawsuits for malpractice.



- *PseudoPatient requires patient's CT scan series and RTstructure DICOM files.
- **Number, location and orientation of detectors are fully customizable.
- ***Fully compatible with point and film dosimetry (FDA cleared)
- ****Compatible with gel-dosimetry (FDA pending)



www.rt-safe.com

info@rt-safe.com

tel: +30 210 7563691

48 Artotinis Street, 11633, Athens, Greece

