

LANDAUER®

Get the Reassurance of a Second Opinion on Patient Radiation Dose



Why Measure Patient Dose?

You can't improve what you don't measure

microSTAR[®] ii medical dosimetry system



nanodot

Patient safety in radiation oncology is the focus of public attention and regulatory scrutiny. Greater complexity of treatments and evolving standards are further raising the bar for radiation safety, and increasing risk to healthcare organizations.

There are many reasons to independently verify planned dose during or prior to the first fraction of radiation treatment as part of a patient quality assurance program, including compliance with professional practice guidelines, risk reduction, and improved safety and quality of care.

Patient-specific dose measurements offer your organization an important tool for early identification and correction of potential errors or deficiencies in the delivery of prescribed dose. LANDAUER's OSL technology, featuring nanoDot[™] medical dosimeters and the microSTAR[®] ii medical dosimetry system offer a simple, flexible, wireless alternative to diodes or mosfets for in vivo¹ dosimetry, and can also be used with a QA phantom to verify machine output.

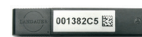
LANDAUER's OSL-Based Dosimeters



The most trusted technology for measuring occupational radiation dose, now customized for medical dosimetry applications.



nanoDot[™]
Medical
Dosimeter



Mammography QA
Dosimeter



Computed
Tomography
(CT) QA Dosimeter

¹ In vivo refers to superficial dose.

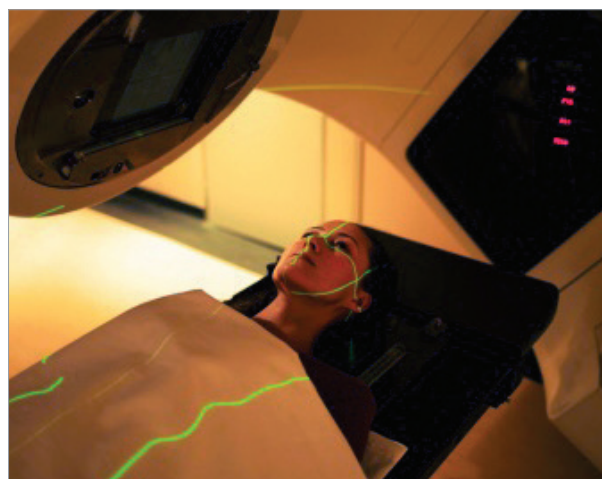
Radiation Oncology

Verify planned dose

Join leading radiation oncology authorities by choosing LANDAUER's® state-of-the-art OSL technology for dose verification.

Radiological Physics Center

For more than 30 years, the Radiological Physics Center (RPC) in partnership with the National Cancer Institute (NCI) has used TLDs for remote audits of photon and electron beam output, and energy verifications for electron beams, monitoring more than 1,700 radiation therapy facilities worldwide and measuring more than 13,000 beams annually. In 2010, after conducting a multi-year clinical evaluation of the technology, the RPC converted to use of OSL dosimeters in over 90% of its remote audit program.



Paul A. Jursinic, Ph.D., is renowned among medical physicists for his rigorous focus on QA. Dr. Jursinic investigated a wide range of technologies for efficiency and precision in comparing measured dose with calculated dose output, and concluded that OSLDs are a superior substitute for TLDs and diodes for *in vivo* dosimetric measurements, particularly for surface dose measurements.

“If I could only buy one dose verification system, I would buy OSLD, because OSLD can do every measurement that TLD and diodes can do, plus measurements they cannot accurately capture.”¹ - Paul A. Jursinic

TLD

- Labor Intensive
- Time Consuming



Diodes & Mosfets

- Procedure-specific (multiple diodes needed for multiple energies)
- Wires may be obtrusive during use
- Not durable



OSLD

- Simple
- Flexible
- Wireless
- Energy independent in therapy range
- Ideal for point dose measurements
- Proven superior accuracy and precision



nanoDot™ OSLD

Individually bar-coded nanoDot™ dosimeters enable complete chain of custody

nanoDOT™ Medical Dosimeters - a simple, flexible solution for measuring patient radiation dose

Regulatory authorities and experts agree that reducing potential for error or deficiencies in the delivery of prescribed dose in radiation oncology is a priority. LANDAUER's OSL technology featuring nanoDot™ medical dosimeters and the microSTAR® ii medical dosimetry system is a simple, flexible, wireless dose verification solution.

For over 13 years, OSL technology has been trusted to measure occupational radiation dose for millions of healthcare professionals across the globe. OSL dosimeters are used for occupational dose monitoring in over 80% of hospitals in the United States and are the focus of more than 30 published peer-reviewed scientific publications.

LANDAUER's nanoDot™ OSL-based medical dosimeter is the most effective tool to independently verify the quantity of dose delivered during radiation treatments and provides an inexpensive insurance policy to mitigate risk for your facility.

nanoDot™ Medical Dosimeter



The nanoDot™ is a compact, robust medical dosimeter ideal for a variety of dosimetry applications, such as, secondary dose verification in radiation oncology and other point dose measurements.

nanoDOT™ Medical Dosimeters

- Wide operating energy range (5keV to 20 MeV) makes nanoDot™ medical dosimeters an ideal solution for dose verification in radiation oncology and other point dose measurement applications
 - Linear dose response with dose up to 3 Gy, software-supported non-linear calibration up to 15 Gy
- Reanalysis capabilities (non-destructive readout)
- Dosimeter preparation eliminated with single-use dosimeters
- Minimal angular or energy dependence in Megavoltage energy range
- Accurate within $\pm 5\%$ for photons and electrons from 5MeV - 20MeV*
- Dosimeter can be placed anywhere on the body, is wireless, and radiolucent
- Ideal for measuring dose at a point of interest, even in challenging clinical conditions
- Can be used for in- and out-of-field measurements, including pacemaker dose
- Dosimeter can be used without buildup to make surface dose measurements or with buildup to make measurement at depth.**

* When reader is calibrated per recommended protocols and microStar QA program is implemented.

** The reader calibration must be consistent with the clinical use mode in terms of build-up characteristics.

With microSTAR® ii Medical Dosimetry System, using nanoDots is simple and efficient

microSTAR® ii Medical Dosimetry System

- Immediate, independent verification of planned dose using nanoDot™ medical dosimeters
- Improved readout precision and durability with state-of-the-art pulsed OSL technology
- Fast, efficient single dosimeter readout
- Compact, lightweight and portable
- Operates with a client-provided PC running Windows 7 (optional laptop sold separately)

microSTAR ii medical dosimetry system

Reading Calibration Dosimeter Assignment Data Hardware Test Backup/Restore Sensitivity Assessment Administration Configuration About

Operational Data

User ID: admin

Linear Low Dose: HDLIN_6MV

Linear High Dose: LDLIN_6MV

Non-linear High Dose: NL_6MV

Calibration Use Type: Therapy

Daily QC Status: PASSED

Screened: YES

Sensitivity: 0.84

Process ID: TX-M0001

Dosimeter #: DN084160011

Patient Info

First Name: Susan

M.I.: P

Last Name: Jones

MRN / ID: 87654321

Date of Birth: 5/9/1980

Sex: Female

More / Edit

Exposure Info

Dosimetry Category: Patient

Dosimetry Use Type: Therapy

Measurement Condition: On Patient

Dosimeter Position: Left Hip

Radiation Quality: 6MV

More / Edit

Result

Used	Read ID	Beam Used	Test Counts	Raw Counts	Dose (cGy)
<input checked="" type="checkbox"/>	920	Weak	0	107508	209.93
<input checked="" type="checkbox"/>	921	Weak	0	107313	209.55
<input checked="" type="checkbox"/>	922	Weak	0	107244	209.42
<input checked="" type="checkbox"/>	923	Weak	0	106911	209.93
<input checked="" type="checkbox"/>	924	Weak	0	106782	208.52

Avg. Raw Counts: 107151.6

Std Dev: 298.37

CV: 0.0028

Avg. Element Counts: 107151.6

Control Dose (cGy): 0.02

Avg. Dose (cGy): 209.22

Accept

Calibration Factor: 609.648

Sensitivity: 0.84

SAF: 1.00

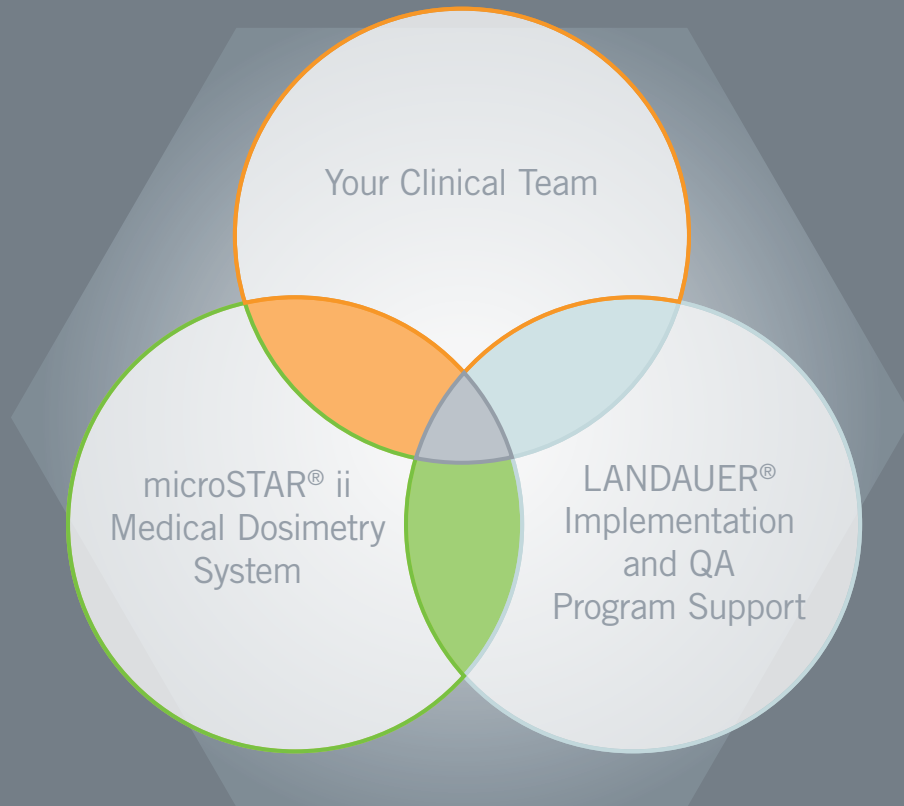
Notes

Connected Dosimeter type: Dot DEFAULT 5/9/2013 5:14 PM

Software customized to medical dosimetry applications for streamlined analysis, reporting and reimbursement

- Built-in and automated QC functionality for efficient implementation of the LANDAUER microSTAR® reader Quality Assurance Program
- Patient-centric workflow, with additional fields for patient and exposure information
- Automated re-reading capability for improved accuracy and efficiency
- Built-in dose reports to streamline reimbursement

Radiation Safety is a Team Effort



Your Clinical Team

- Provide quality patient care and outcomes
- Execute Quality Assurance program that reinforces patient safety initiatives
- Build trust in your community

microSTAR® ii Medical Dosimetry System

- Establish a continuous patient and instrumentation quality assurance program for radiological procedures
- Independently verify planned dose
- Simple, flexible, wireless solution for patient-specific dose measurements
- Tested and adopted by leading credentialing authorities for radiation dose measurement

LANDAUER® Implementation and QA Program Support

- In-house experts available for consultation to assist medical physicists implementing a new OSL-based medical dosimetry system
- For facilities without in-house medical physics expertise, LANDAUER(R)'s team of Qualified Medical Physicists can provide guidance on implementation of a medical dosimetry QA program that fits the unique requirements of your facility



LANDAUER®

The global leader in radiation safety

For over 55 years, LANDAUER's® innovations in radiation science and services have been instrumental in shaping the industry. With our expansive team of health and medical physicists and our dedication to advancing knowledge through investment in education, scholarships, R&D, and collaborative research partnerships, LANDAUER® is the only private organization committed to the comprehensive study of dosimetry.

LANDAUER® works closely with both customers and government entities to develop best practices in risk mitigation and guide the development of occupational and public health and safety regulations. Our historical practice of dosimeter archiving has resulted in the only existing national registry of exposure data. With Landauer Medical Physics, we have expanded our capabilities to provide clients with end-to-end radiation safety solutions to measure radiation exposure, manage data and improve patient outcomes through the safe and effective use of radiation in medicine. No organization is better equipped to support the safe use of medical radiation.

LANDAUER®. The global leader in radiation safety.

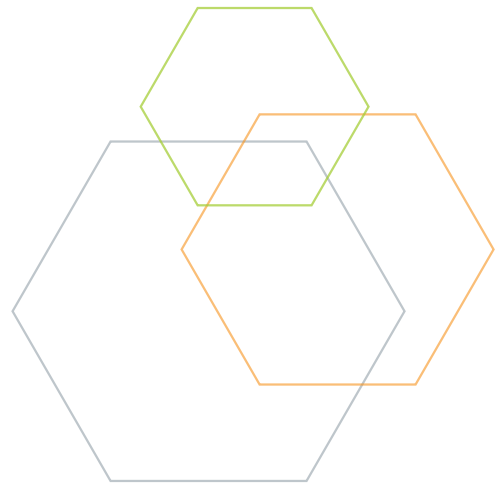
Contact Landauer to learn more
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To minimize our environmental impact, this brochure was printed using renewable energy on papers containing fibers from environmentally appropriate, socially beneficial and economically viable forest resources.



A2LA accreditation covers calibration dosimeters used with the microStar® dosimetry reader

***The microStar® dosimetry reader and nanoDot™ dosimeter is classified as a Radiologic Quality Assurance Instrument, and should not be used to adjust the radiation dose delivered to a patient

1. Paul A. Jursinic, Ph.D., West Michigan Cancer Center, Kalamazoo, MI 49007. pjursinic@wmcc.org