EFOMP

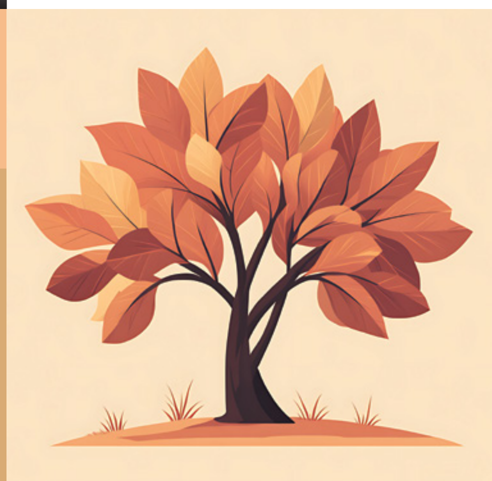
EUROPEAN FEDERATION OF ORGANISATIONS FOR MEDICAL PHYSICS

EMP NEWS

ISSUE 03

AUTUMN 2025

www.efomp.org



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Autumn is here!

Dear EMP News readers,
It's a pleasure to welcome you to this autumn edition of *European Medical Physics News!* With summer now behind us and autumn unfolding, it feels like the perfect moment to reflect on the many highlights of recent months and to look forward to what promises to be an exciting conclusion to 2025.

Figure. Welcome autumn.

Reflecting on a Vibrant Summer

This summer was rich in activity and achievements across the medical physics community. One of the true highlights was the 12th Alpe Adria Medical Physics Meeting in Trieste, hosted at the Abdus Salam International Centre for Theoretical Physics (ICTP). Organised by the Italian Association of Medical Physicists alongside regional partner societies, the meeting was a vibrant gathering of colleagues, featuring research from hospitals and universities across the Alpe Adria region. The accompanying EFOMP School on *New Technologies in Radiotherapy* added a strong educational component, while the event also served as the venue for the EFOMP Officer's Meeting. A particularly memorable moment was the awarding of the EFOMP Medal to Prof. Slavik Tabakov for his outstanding international contribution to the advancement of medical physics.

This summer also brought the results of the EFOMP elections, where delegates selected the new officers who will begin their terms in January 2026. We extend congratulations to the incoming board members and heartfelt thanks to all candidates for their commitment and enthusiasm—your dedication continues to shape EFOMP's dynamic future.

Looking Ahead: Schools and Council Meeting in Zagreb

As we step into autumn, attention now turns to Zagreb, where two key EFOMP activities are about to take place. Later this month, from 18–20 September, the EFOMP School on Interventional Radiology Practices will welcome participants from across Europe. This timely course reflects the growing importance of medical physics in supporting the safe and effective use of interventional techniques.

Just days later, Zagreb will also host the EFOMP Council Meeting, gathering national delegates to review achievements of the past year and set strategic priorities for the years ahead. This promises to be an important occasion for shaping EFOMP's collective vision as we move into 2026.

Looking Ahead: Global and Regional Connections

The calendar for the remainder of 2025 is no less exciting. In just a few weeks' time, colleagues will convene in Athens for the SMRD2 Symposium (November 2025), which will focus on molecular radiotherapy dosimetry. This symposium is expected to bring together leading voices in research, clinical practice, and education, and will be of particular interest to both senior and early career professionals working in this rapidly advancing area.

Meanwhile, anticipation continues to grow for the IUPESM 2025 World Congress in Adelaide, Australia, which will bring together medical physicists and biomedical engineers worldwide later this year. This global forum is set to be a landmark event for our profession, sparking new collaborations and shaping discussions for the decade ahead.

Closer to home, preparations are already underway for ECMP 2026 in Valencia—and while it may still feel a little distant, the momentum is building fast for what promises to be another unforgettable congress.

Celebrating Emerging Talent

We are delighted to continue our tradition of recognising the next generation of professionals through the **Early Career Article Award**. The most recent award (Summer 2025) went to **Michaela Walsh of University College Dublin** for her article, *"Proof-of-Concept Study on Host-Gut Microbiome Functional Resilience to Radiation."* Her work combines scientific excellence with innovative thinking, and we extend our warmest congratulations to her.

We warmly encourage our early career colleagues (within 10 years of MPE registration or a higher academic degree) to submit their contributions for upcoming issues. Winners of the 2025 awards will receive free registration to one of the ESMPE Schools, while the 2026 awardees will enjoy free registration to ECMP 2026 in Valencia—a unique chance to showcase their work to the wider European medical physics community.

Embracing the Spirit of the Season

As autumn progresses, it serves as a reminder that our profession, too, thrives on cycles of renewal and growth. We hope this edition of EMP News brings you inspiration—whether through reports from recent meetings, insights into upcoming events, or stories celebrating the people and achievements that shape our community.

And don't forget: **7 November marks the International Day of Medical Physics**. This year's theme, *"Medical Physics and Emerging Technologies: Shaping the Next Decade,"* feels particularly timely as we reflect on how our expertise can help guide healthcare into the future. We look forward to hearing about your celebrations in our winter edition.

Warm regards,
Sasha Ivashchenko
Chair, EFOMP Communications
and Publications Committee

Sasha Ivashchenko, MPE at the Department of Nuclear Medicine and Molecular Imaging of the University Medical Center Groningen, chair of the CP committee 2024-2025.

EFOMP President's Report

The IAEA and the EFOMP are strengthening cooperation to support global challenges in healthcare

Figure 1. Mauro Carrara, Head of Dosimetry and Medical Radiation Physics, Efi Koutsouveli, Najat Mokhtar, May Abdel-Wahab, Director of the IAEA Division of Human Health (© IAEA).

On 5 June 2025, together with IAEA Deputy Director General and Head of the Department of Nuclear Sciences and Applications, Najat Mokhtar, we signed a new collaboration agreement at the IAEA headquarters in Vienna, Austria (Figure 1 and 2). The signing ceremony took place during the 4th International Conference on Advances in Radiation Oncology (ICARO-4) — often described as the "Olympics of Radiation Oncology" — with a view to addressing the challenges of appropriate cancer management and examining the pivotal role of emerging radiotherapy techniques in tackling the health challenges common to many IAEA Member States.

The International Atomic Energy Agency (IAEA) and EFOMP have been cooperating since the Federation's inception, working to strengthen educational and training accreditation schemes and to develop a qualified expert workforce in line with the European Basic Safety Standards (BSS). Directive 1984/466/EURATOM, issued in 1984 and laying down basic measures for the radiation protection of persons undergoing medical examinations or treatment, stated for the first time that a qualified expert in radiophysics must be available in sophisticated departments of radiotherapy and nuclear medicine. The

2013/59/EURATOM introduced the role of Medical Physics Expert, outlining key areas of responsibility that include leading the physics aspects of clinical practice—such as equipment selection and management, quality assurance, imaging, planning, and dosimetry—along with the training of personnel, and contributions to research and innovation.

Figure 2. IAEA Headquarters.

In pursuing the objective of high standards of training and performance of medical physicists in the countries of all EFOMP member organisations, competency-level materials have been systematically developed and published over the years in close partnership with EFOMP member organisations, the IAEA, and national authorities across various member states. Under our new agreement, the IAEA and EFOMP will continue our scientific collaboration in medical physics, focusing on the development of guidance documents, including those for clinical training and assessment. In addition, we will jointly develop educational and training materials to further strengthen capacity building over the coming years, promoting the safe and effective use of ionising radiation in medicine for the diagnosis and treatment of communicable and non-communicable diseases.

Within this collaborative framework, the IAEA and EFOMP have organised joint training courses with the Abdus Salam International Centre for Theoretical Physics (ICTP) in Trieste, Italy, since 2008. EFOMP has also provided experts to support the IAEA's Human Health programme and promoted the use of the IAEA's Quality Assurance Team in Radiation Oncology (QUATRO) audit methodology as a tool for quality improvement.

On cancer care in particular, EFOMP will work closely with the IAEA to support Rays of Hope Anchor Centres. Anchor Centres have been established to build professional networks and deliver specialised training across regions to address inequality in global cancer care. Rays of Hope and Anchor Centres play an important role at both global and regional levels in expanding oncological health services and management, and in promoting long-term well-being across populations. Our shared goal is to integrate oncological health services into sustainable health strategies, ensuring the efficient use of resources, the responsible adoption of innovations, and the cultivation of expertise that benefits both present and future generations.

During my visit to Vienna, I had the privilege of being hosted at the offices of the IAEA's Dosimetry and Medical Radiation Physics Section, where we discussed ongoing collaborations and future sustainable initiatives aimed at improving training, retraining, and radiation safety to provide the best possible care for patients and make it accessible to everyone. Together, our goals are to support the development of postgraduate academic programmes, continually enhance our skills, and strengthen the healthcare workforce across the continent. Our conversations focused in particular on the Rays of Hope initiative and the development of Anchor Centres in Europe and beyond, to expand access to diagnostic imaging, nuclear medicine, radiation oncology, and medical physics where it is needed most (Figure 3).

Figure 3. Mauro Carrara, Virginia Tsapaki, Efi Koutsouveli, Graciela R. Vélez, Jamema Swamidas, Godfrey Azangwe, Dosimetry and Medical Radiation Physics section at IAEA Division of Human Health.

I was also delighted to participate in ICARO-4, organised by our colleagues at the IAEA Division of Human Health. It was an honour to meet experts and participants from across the globe, exchange ideas, identify significant knowledge gaps, and explore ways in which EFOMP can contribute to advancements in Medical Physics, Radiobiology, and Radiation Oncology (Figure 4).

Figure 4. With Leila Ounalli, Centre National des Sciences et Technologies Nucléaires, Tunis.

In this spirit, EFOMP will support participants from United Nations-designated low- and middle-income countries to attend EFOMP Schools, either online or on-site. This initiative aims to broaden access to high-quality education and professional development, ensuring that medical physics expertise is more widely available worldwide.

For more information on the EFOMP educational activities, or to request a reduced fee, interested participants are encouraged to contact EFOMP directly.

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References

[1] EFOMP-IAEA agreement, IAEA website

[2] Rays of Hope Anchor Centres, IAEA website

[3] Human Health Programme, IAEA website

[4] EFOMP School, EFOMP website

Efi Koutsouveli a Medical Physics and Radiation Protection Expert, has worked at Hygeia Hospital in Athens since 1993, specialising in radiation oncology and Hospital Quality Management Systems. Currently serving as EFOMP's President, she has a strong interest in Oncology Information Systems. In 2019, she received the IOMP-IDMP award for her efforts in promoting medical physics to a broader audience

EFOMP Secretary General Report

In this article you will find an update on the institutional matters of our organisation during the last three months.

On the 23rd of May, our EFOMP Officers Meeting was held during the 12th Alpe Adria Medical Physics Meeting at the Abdus Salam International Centre for Theoretical Physics (ICTP). The meeting was organised by the Italian Association of Medical Physicists (AIFM) in cooperation with the Medical Physics Societies of Austria, Croatia, Hungary, North Macedonia, Serbia and Slovenia. An EFOMP School on New Technologies in Radiotherapy was convened as a pre-meeting event at the commencement of the conference. Many medical physicists, from those early in their careers to those with more experience, attended the event. It was inspiring to see the large range of medical physics research and advancements being conducted in hospitals and universities throughout the Alpe Adria region. It was an honour for me to finally meet Prof. Slavik Tabakov and see him awarded the EFOMP Medal for his outstanding and internationally acknowledged contribution to the advancement of medical physics.

Figure 1. Prof. Slavik Tabakov receiving his EFOMP Medal alongside his wife Dr Vassilka Tabakova and some of the meeting organisers and EFOMP officers.

EFOMP Governing Committee Updates

During the summer months, our elections for new EFOMP Board Members took place. There were multiple candidates for some positions, so it was a tough decision for our delegates to make. In summary, please find the newly elected EFOMP member who will commence their vice/assistant positions in January 2026. Best wishes to all the new candidates!

Position	Name	NMO/Country
President	Dimos Baltas	DGMP, Germany
Secretary General	Jurgita Laurikaitienė	LSMP, Lithuania
Treasurer	Dimitris Visvikis	IPEM, UK
Science Committee	John Dickson	IPEM, UK
Education & Training Committee	Christina Zacharatou	IAPM, Ireland

We would like to acknowledge the dedication of those who put their names forward for positions. It is precisely this spirit and ethos of voluntary contribution that constitutes the core dynamic of EFOMP as a federation. Through the collective engagement of its members, EFOMP advances the mission of medical physics in service of patients, staff, public and healthcare professionals. Additional positions will emerge in the future, and all members of our National Member Organisations are encouraged to take part in this ongoing endeavour.

EFOMP SIGs Updates

Physica Medica – the European Journal of Medical Physics recently announced that the paper "Time-Activity Data Fitting in Molecular Radiotherapy: Methodology and Pitfalls" by Oleksandra V. Ivashchenko, Jim O'Doherty, Deni Hardiansyah, Marta Cremonesi, Johannes Tran-Gia, Eero Hippeläinen, Caroline Stokke, Elisa Grassi, Mattias Sandström, and Gerhard Glatting has been elected as the best paper published in the journal in 2024. This paper stems from work conducted by one of the former focus groups of our SIG dedicated to Radionuclide Internal Dosimetry. The Galileo Galilei Award in Medical Physics is given every year to the best paper published in this journal in the previous year.

Congratulations to our Dental SIG Steering Committee who recently had some of their work published in Physica Medica. Their article on "Diagnostic reference levels for dental cone-beam computed tomography: current state and way forward" was published in the September issue of Physica Medica.

Figure 2. Eeva Boman, Joao Seco and Lidia Strigari who were lecturers from the Advanced Radiotherapy Technology one day EFOMP school in ICTP, Trieste.

EFOMP School Updates

Following on from two successful schools held in Prague in February and July of this year and our 1 day school held at ICTP, Triest, our fourth and final school of this year will be held in Zagreb, Croatia from 18th to 20th of September. The topic "Interventional Radiology Practices" has proved popular with a high number of participants registering.

In 2026, we look forward to visiting three new locations for our EFOMP schools. The first school of 2026 will be held on the topic of Radiation Biology in Porto, Portugal from 19th to 21st of February 2026. This will be followed by a school on Advancing Breast Imaging with AI: Innovations, Applications, and Future Directions in Tallinn, Estonia from 23rd to 25th of April 2026. As usual we will host a number of Pre Congress ESMPE schools at ECMP 2026 in Valencia so keep an eye on our social media and website for more information. All courses planned are listed here.

2025 IOMP Awards Announcement

The International Organization for Medical Physics recently announced the recipients of the 2025 IOMP Awards, recognising excellence in medical physics across education, research, innovation, and leadership. EFOMP NMO members have won two of these prizes — congratulations to them for this remarkable recognition! The Harold Johns Medal was awarded to Golam Abu Zakaria, DGMP (Germany) and the IUPAP Early Career Scientist Prize was awarded to Jesús García Ovejero, SEFM (Spain). Jesús is a member of our Early Career SIG Steering Committee.

Figure 3. Andrija Štampar School of Public Health, Zagreb, Croatia where the EFOMP Council Meeting 2025 will be held.

International Day of Medical Physics 7th of November 2025

The theme for IDMP 2025 is "Medical Physics and Emerging Technologies: Shaping the Next Decade". This reflects the rapidly evolving landscape of healthcare and the critical role of medical physicists in advancing, integrating, and safeguarding the application of new technologies in medicine. If you are planning any events please let us know. We welcome submissions form all our NMOs about your events for our winter edition of EMP news.

Thank you for reading my updates and please get in contact secretary@efomp.org for any queries. I hope everyone had a great summer and I look forward to meeting our NMO delegates at our Annual Council Meeting in Zagreb, Croatia on the 20th of September.

Brenda Byrne is a Principal Physicist working in the Mater Misericordiae University Hospital, Dublin, Ireland. Her primary areas of interest are diagnostic radiology, nuclear medicine and radiation protection. She has been a registered radiation protection adviser (RPA) since April 2000 and is a recognised medical physics expert (MPE). Brenda is the current Secretary General of EFOMP and Past Chair of the EFOMP Professional Matters Committee.

Physica Medica: Editor's Choice

For this autumn issue of EMP News I selected the following 4 articles, recently published in Physica Medica (EJMP) which particularly attracted my attention.

C. Velten, *et al*. DCE-MRI functional NTCP modeling in SBRT for hepatocellular carcinoma.

Phys. Med. 2025; 133: 104958, doi.org/10.1016/j.ejmp.2025.104958.

This study explores the use of DCE-MRI functional Normal Tissue Complication Probability (NTCP) modelling in stereotactic body radiotherapy (SBRT) for hepatocellular carcinoma (HCC) in patients with impaired liver function. Building up on the RTOG-1112 randomized phase III study of sorafenib versus stereotactic body radiation therapy followed by sorafenib in hepatocellular carcinoma (HCC), the authors model how SBRT combined with sorafenib improves survival outcomes without increasing significant adverse events. The proposed DCE-MRI-based NTCP model represents a promising tool for personalized risk assessment, aiming to optimize treatment planning and enhance safety in delivering high-precision radiation therapy for vulnerable patient populations.

W. Li, *et al*. Advancing carbon ion therapy with dual-energy CT: Enhanced elemental decomposition for precise range and secondary dose estimation.

Phys. Med. 2025; 133: 104960, doi.org/10.1016/j.ejmp.2025.104960.

This article highlights a significant step forward in carbon ion radiotherapy by integrating dual-energy CT (DECT) imaging into treatment planning. DECT enables precise characterization of the elemental composition of tissues, providing more accurate information on stopping power ratios, critical for determining the penetration depth of carbon ion beams. By reducing uncertainties in dose calculation, this approach can improve tumour targeting accuracy while sparing surrounding healthy tissue. The authors demonstrate how DECT's enhanced imaging capability can refine range predictions, potentially leading to safer, more effective treatments and opening the door to wider clinical adoption of carbon ion therapy. This represents an important bridge between advanced imaging science and next-generation radiotherapy, with the potential to raise precision and patient outcomes to new levels.

J-A. Fragoso-Negrín, *et al*. Methodology for comparing absorbed dose rate calculation algorithms in molecular radiotherapy dosimetry.

Phys. Med. 2025; 133: 104965, doi.org/10.1016/j.ejmp.2025.104965.

This study presents a detailed comparative analysis of absorbed dose rate calculation algorithms applied in molecular radiotherapy, with particular emphasis on their performance in scenarios involving short-range beta radiation and secondary gamma contributions. The authors benchmark multiple computational approaches, evaluating accuracy in stopping power estimation, electron transport modelling, and cross-irradiation effects across clinically relevant geometries. Results highlight notable differences in predicted dose distributions, particularly in heterogeneous media, underscoring the importance of algorithm selection in both treatment planning and post-therapy dosimetry. By providing a systematic framework for inter-algorithm comparison, the work supports harmonisation of absorbed dose rate calculations across centres, facilitating reproducibility, improving quantitative accuracy, and ultimately enabling more robust biologically guided treatment planning. This paper will be of particular interest to physicists engaged in internal dosimetry, radionuclide therapy optimisation, and protocol standardisation initiatives.

A. Ali, *et al*. A systematic review of the dosimetric consequences of the interplay effect.

Phys. Med. 2025; 134: 105004, doi.org/10.1016/j.ejmp.2025.105004.

This systematic review provides a comprehensive synthesis of evidence on the dosimetric consequences of intra-fraction organ motion in thoracic external-beam radiotherapy. Focusing on respiration-induced displacement of targets and surrounding organs at risk, the analysis quantifies deviations in delivered dose relative to planned distributions, with particular emphasis on lung, heart, and oesophagus. The review evaluates the performance of current motion-management strategies and planning margins, highlighting their limitations in mitigating underdosage to the target and unintended dose escalation to critical structures. For medical physicists, this work underscores the necessity of integrating advanced imaging, adaptive replanning, and motion-compensation techniques into the clinical workflow to preserve dose conformity and treatment robustness in thoracic RT.

Iuliana Toma-Dasu, Editor-in-Chief of Physics Medica – European Journal of Medical Physics.

Report on EFOMP Representative's Participation at the European Nuclear Young Generation Forum 2025

Figure 1. ENYGF opening ceremony.

The **European Nuclear Young Generation Forum (ENYGF) 2025**, held from 2–6 June in Zagreb, Croatia, brought together young professionals, researchers, students, and industry stakeholders from across Europe to discuss advancements in nuclear science and technology. Hosted by the Croatian Nuclear Society and the European Nuclear Society, the biennial forum convened over 300 early-career professionals, with a particular focus on Central and South-eastern Europe. The event aimed to foster knowledge transfer, networking, and collaboration under the theme "The Future of Nuclear", emphasising developments in nuclear technology, including medical applications, small modular reactors, and sustainable nuclear operations.

The conference featured a diverse programme, including keynote speeches, panel discussions, educational workshops, and technical sessions

Figure 2. Medical Physics meets AI: Enhancing Nuclear Medicine PET and SPECT Imaging.

where delegates presented papers and posters. Among the contributions was my presentation as an invited representative of the European Federation of Organisations for Medical Physics (EFOMP). I delivered a talk on my research published in the European Journal of Medical Physics, which focused on reducing Single Photon Emission Computed Tomography (SPECT) acquisition times using deep learning techniques—an area of growing interest in medical physics and nuclear medicine.

The presentation took place during the workshop *"AI in Action: Powering Innovation Across Nuclear Fields"*. My group's work demonstrated how deep learning algorithms can optimise SPECT imaging procedures, significantly reducing acquisition times while maintaining or improving image quality. This advancement has the potential to increase patient throughput, reduce radiation exposure, and enhance diagnostic efficiency. The talk highlighted the integration of artificial intelligence with nuclear medicine imaging, aligning with ENYGF's broader theme of emerging technologies shaping the nuclear industry.

The session attracted considerable attention from early-career researchers and industry professionals, prompting a lively discussion. Questions addressed practical implementation of deep learning models in clinical workflows, the generalisability across different imaging systems, and potential integration with other modalities. The discussion emphasised the importance of interdisciplinary collaboration between medical physicists, nuclear medicine specialists, and data scientists to advance such technologies.

Figure 3. Moderators of the educational workshop AI in action: (from left to right) Fabian Palacher (Fusenet), Ivan Pribanić (EFOMP), Gabriel Pavel (ENEN) and Mattia Baldoni (ENS).

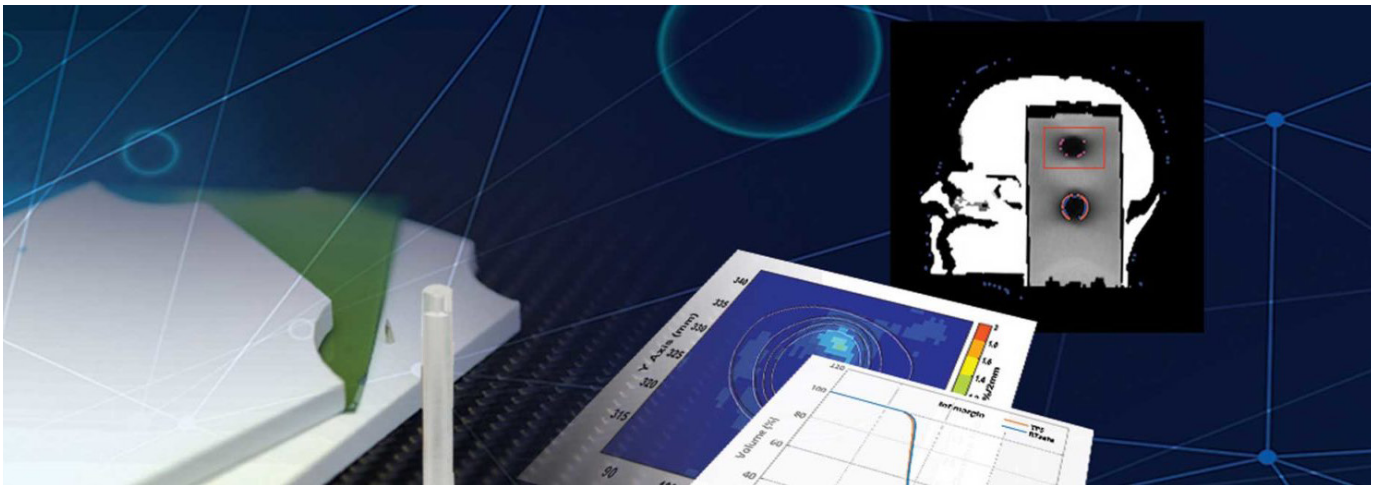
This was the first occasion that EFOMP was invited to participate in ENYGF, reflecting its mission to facilitate knowledge transfer and interdisciplinary collaboration. The event, marking the **25th anniversary of ENYGF and the 30th anniversary of the European Nuclear Society's Young Generation Network**, provided an important platform to showcase advancements in nuclear medicine and the contribution of physics to clinical practice.

For further details, visit enygf.org

Ivan Pribanić is a medical physicist specialising in the application of physics in nuclear medicine at the Department of Medical Physics and Radiation Protection, University Hospital Rijeka, Croatia. He is a research and teaching assistant at the Department of Medical Physics and Biophysics, Medical Faculty, University of Rijeka, and a PhD student in the Doctoral Programme in Physics at the Faculty of Physics, University of Rijeka.

RTsafe Remote Dosimetry Services

Advanced dosimetry. Simple implementation.



Radiation medicine is advancing and technology innovations pave the way to more efficient and safer treatments. Stereotactic radiosurgery (SRS) and Stereotactic Body Radiation Therapy (SBRT) are on the forefront of this technological leap and contemporary SRS/SBRT applications continuously gain ground against conventional methodologies. These advanced techniques allow for highly accurate and precise treatments, resulting in better clinical outcomes and improved quality of life for patients. However, applying SRS and SBRT effectively requires higher technological standards compared to conventional radiotherapy. Systems and procedures that are routinely considered as sufficient for standard radiotherapy techniques cannot be applied for SRS/SBRT. The complex nature of the SRS/SBRT treatment process demands a commitment to the highest levels of accuracy and precision.

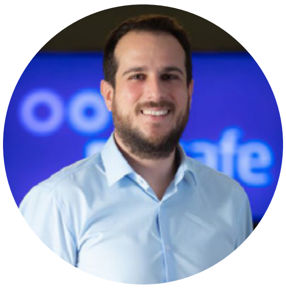
Whilst more complex treatments usually translate to more targeted treatments, at the same time they require more complex QA. This fact has highlighted the necessity of independent dosimetry audits, as an effective way to verify whether the quality of dosimetry practices at a radiotherapy center are adequate to achieve treatment objectives and minimize the possibility of unintended exposures. Audits can also provide support and confidence for the introduction of new and complex techniques. Although international recommendations regarding the benefits of the external verification of the accuracy and reliability of a radiotherapy practice exist, the current access of several countries' radiotherapy centers across the world to audit opportunities is not sufficient.

RTsafe, which envisages more efficient radiotherapy worldwide, has developed a novel approach in End-to-End QA testing, focused not only on SRS, but also on SBRT applications. A set of remote dosimetry services is introduced, to support radiotherapy centers, promote the best practice and assure high quality SRS/SBRT treatments, by outsourcing the routine quality control program of their radiation oncology QMS using a cost and time effective solution.

Prime and SBRT phantoms combined with point, 2D & 3D remote dosimetry services provide confidence and reliability for challenging SRS/SBRT applications.

RTsafe's remote dosimetry services provide point (OSL), 2D (EBT4 films) & 3D (polymer gel) dosimetric and geometric accuracy through independent dose measurements, assuring traceability to a secondary standard dosimetry laboratory. It is setup to evaluate the whole treatment chain, including clinical and technical aspects by reviewing at the same time procedures and protocols of the radiotherapy center. At the end, the user receives a comprehensive dosimetric report including comparisons between measurements and Treatment Planning System (TPS) calculations in terms of: 1D dose profiles and 1D gamma index, 2D isolines and 2D gamma index maps, 3D gamma index passing rates, Dose Volume Histograms (DVHs), DVHs metrics, dosimetric indices and spatial offsets, for each target and/or Organ-at-Risk (OAR), defined by the end-user at the planning stage.

For more information on RTsafe remote dosimetry services, please visit rt-safe.com.



Emmanouil Zoros is responsible for product management, data analysis, and film dosimetry at RTsafe. He has a Diploma in Applied Mathematics & Physics from the National Technical University of Athens and a Master of Science in Medical Physics from the National and Kapodistrian University of Athens. His research interests focus on radiation therapy with emphasis on quality assurance in stereotactic radiosurgery, experimental and computational dosimetry using Monte Carlo simulation techniques.

Vasiliki Margaroni is a medical physicist responsible for the data analysis and the scientific support and guidance of the end user. She has a Diploma in Physics and a Master of Science in Medical Physics from National and Kapodistrian University of Athens. She is a PhD Candidate at Medical Physics Laboratory of Medical School, National and Kapodistrian University of Athens and her research interests focus on radiation therapy with emphasis on quality assurance, experimental and computational dosimetry in contemporary radiotherapy and radiosurgery systems.

RAD formation

Radformation Announces Scripting Support for EZFluence, ClearCheck, and ClearCalc in Monaco and RayStation

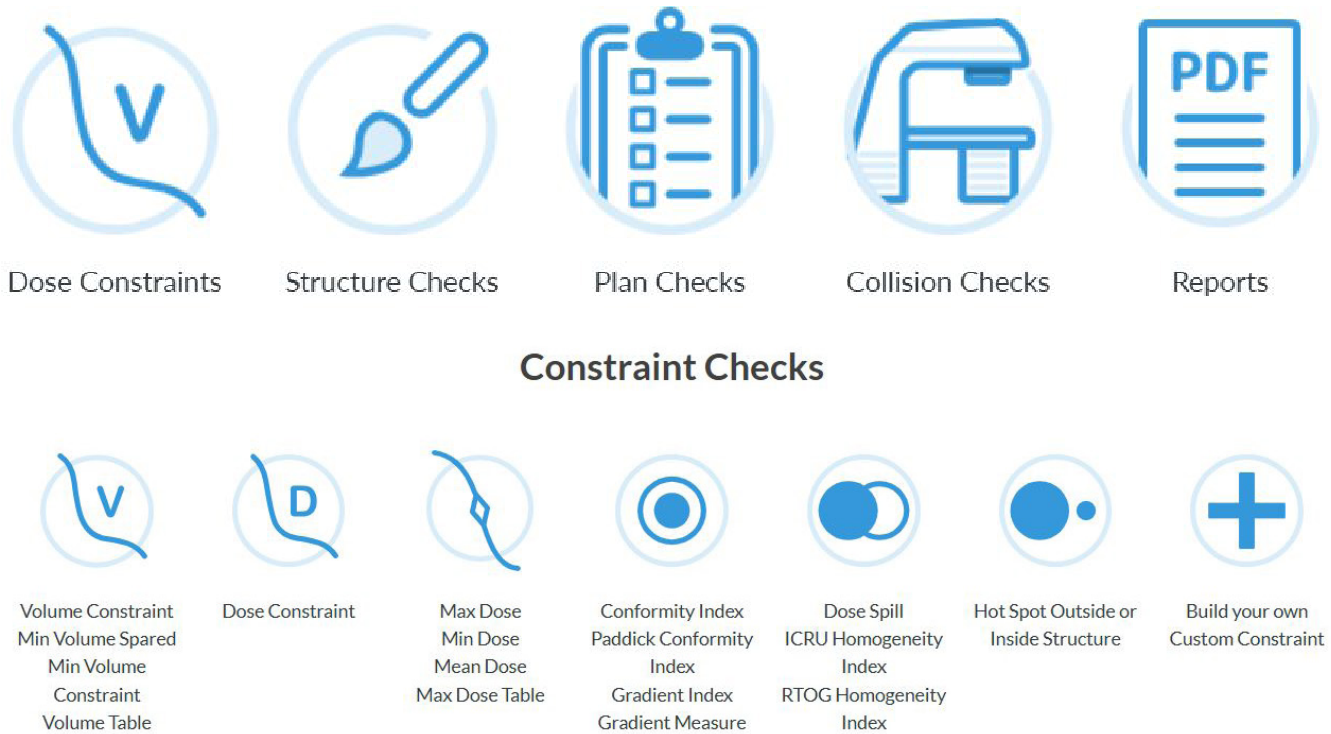


Figure 1. ClearCheck provides dozens of useful comparison checks and metrics to assist with high quality plan evaluations.

Radformation's intelligent automation is now more accessible than ever. The latest software updates introduce scripting integrations for Monaco® and RayStation® treatment planning systems (TPSs) across three of Radformation's automation solutions—EZFluence, ClearCheck, and ClearCalc (with optional RadMonteCarlo integration). This expansion opens up automated planning to more treatment planning systems, and further automates key quality assurance solutions.

Automated 3D Planning with EZFluence

The highlight of the latest version update is scripting-enabled integration of EZFluence, Radformation's 3D planning solution. Already popular for its intelligent approach to 3D planning for other treatment planning systems, EZFluence can now be used within both Monaco and RayStation environments, without any manual plan imports or exports. This development allows for automated generation of high-quality field-in-field plans using virtually any beam arrangement for any treatment site—all while racking up considerable time savings.

EZFluence offers powerful features for better field-in-field planning:

Figure 2. ClearCalc (with optional RadMonteCarlo Integration) provides robust, accurate secondary plan calculations for protons, electrons, protons, brachytherapy, and more.

- **User-friendly interface** with real-time dose updates during fluence and segment editing, enabling immediate visual feedback and fine-tuning.

- **Subfield merging**, which saves a step in planning and speeds up treatment delivery.

- **Enhanced target coverage tools** to boost dosimetric confidence across complex anatomies and planning intents, including mixed-energy plans.

By leveraging scripting, departments can now launch EZFluence workflows programmatically from within their TPS, increasing efficiency and convenience without compromising plan quality.

Stony Brook University Hospital carefully evaluated field-in-field planning with EZFluence and found automatically generated plans compared favorably with manual outputs, but with a time savings of 85%.

Powerful Plan Evaluation with ClearCheck

Alongside EZFluence, ClearCheck brings automation to the plan evaluation and reporting stage. Known for its fast and comprehensive plan review, ClearCheck allows clinics to:

- Quickly assess plan quality with key dose constraints, including custom dose constraint types, validating important plan metrics against internal standards or consensus guidelines.

- Perform BED/EQD2 conversions and apply discount factors as needed, accommodating challenging retreatment or multi-modality treatment cases.

- Run automated plan checks and generate PDF reports instantly.

- Conduct collision checks with virtual dry run simulations to ensure safe treatment delivery.

With the latest version (v2.6), we've added scripting to make plan evaluation for Monaco and RayStation faster and easier. ClearCheck can now be initiated directly from the TPS—ideal for ensuring consistency and reducing turnaround times without additional manual steps.

Reliable Dose Verification with ClearCalc

ClearCalc supports busy radiotherapy departments with fast, accurate secondary dose calculations. The new release extends scripting functionality to both Monaco and RayStation, enabling automated plan exports and dose verification within a wide range of treatment types:

- Supports 3D, IMRT, VMAT, SBRT/SRS, and HDR/LDR brachytherapy.

- Accepts inputs for photons, electrons, protons, and more—providing modality flexibility.

- Allows for phantom-free QA, allowing patient-specific checks with greater speed and efficiency.

- Provides access to gold-standard accuracy for apples-to-apples comparison with MonteCarlo-based algorithms with optional RadMonteCarlo integration.

Like the other applications, ClearCalc scripting enables tighter integration with existing systems, reduces redundant tasks, and supports high quality plan validation through automation.

A Win for Workflow Efficiency and Interoperability

Together, these scripting-enabled enhancements represent a significant step toward seamless automation across diverse planning systems. By extending support to Monaco and RayStation users, Radformation continues its mission to deliver accessible, customizable, and scalable automation tools to benefit clinics everywhere seeking smarter ways to manage growing workloads and complex planning needs.

For clinics using Monaco or RayStation, these new capabilities unlock workflow efficiencies without requiring changes to their core TPS infrastructure. The result: more time for clinical teams to focus on patient care, research, or innovation—without sacrificing safety, or quality.

To get more information about EZFluence, ClearCheck, or ClearCalc, or if you're interested in better understanding the new scripting access, schedule a demo to learn more.

Tyler Blackwell, MS, DABR, FAAPM is a medical physicist at Radformation focused on clinical collaborations and community engagement. Before joining Radformation, he spent a decade working as a clinical physicist. He is active on several committees for the American Association of Physicists in Medicine and volunteers for the American Board of Radiology.

2019 / EZFLUENCE CASE STUDY

Stony Brook University Hospital Analyzes Usefulness of EZFluence for Breast Planning

Todd Yoder, M.S., An Ting Hsia, M.S., Zhigang Xu, Ph.D., Alexander Stessin, M.D., Ph.D., Samuel Ryu, M.D.
Department of Radiation Oncology, Stony Brook University Hospital, Stony Brook, NY

Introduction

Patients with early stage breast cancer are commonly treated with tangential radiation therapy beams. Currently, there is no general consensus regarding the optimal method for planning breast tangents in the clinic. Ideal dose distributions have been established for the lung, heart, and skin to minimize radiation induced pneumonitis, ischemic heart disease, and skin toxicity, respectively. (1,2)

In addition, desired dose homogeneity with specific objectives to limit the breast planning target volume (PTV) receiving 105% of the prescribed dose (V105) to < 15%, 110% of the prescribed dose (V110) to < 2%, and 115% of the prescribed dose (V115) to < 0.1% constraints are documented to achieve favorable breast cosmesis. (3)

Large breasts are generally more difficult to plan and often require using mixed energy photon beams in order to reduce the hotspot. Technology has steadily advanced from using physical wedges, enhanced dynamic wedges, to manual Field-in-Field (FiF) technique and electronic compensators. EZFluence (Radformation, New York, NY) is an Eclipse (Varian Medical Systems VMS, Palo Alto, CA) treatment planning system script developed by Radformation and is used to generate optimal fluence for tangent breast plans. EZFluence collects plan information through the Varian Eclipse application program interface and generates fluence intensity maps based on the patient's anatomy and plan parameters.

It begins by identifying points in the center of the target structure, or near the surface of an organ at risk (OAR; e.g., lung), where the goal is to achieve 100% of the prescription dose. Fluence intensity maps are iteratively modulated to ensure that hot spots are balanced on both sides of the breast. EZFluence then ensures that the maximum dose is reduced to a specific maximum dose goal.

EZFluence identifies regions within the field that do not intersect the patient (i.e., "flash") and automatically extrapolates fluence intensities so as to minimize the negative effects of small setup errors.

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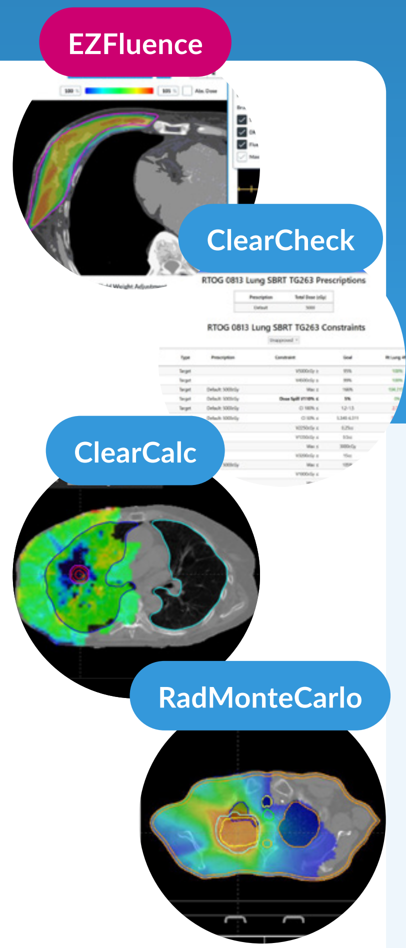
Radformation's latest updates bring scripting support for Monaco® and RayStation® to **EZFluence**, **ClearCheck**, and **ClearCalc** (with optional **RadMonteCarlo**), expanding access to automated planning and streamlining key QA workflows across more treatment planning systems.



Read the Blog to Learn More

PTW and SCMPCR: United for Excellence in Medical Physics in South Asia and Beyond

In 2025, the South Asia Centre for Medical Physics and Cancer Research (SCMPCR) further advanced its role in medical physics education and training. Its annual e-learning programmes and hands-on workshops, now also attended by radiation oncologists, reflect the centre's growing interdisciplinary approach. From 2026, radiologists will also be included. As a long-standing supporter, PTW reports on SCMPCR's latest developments.

A key pillar of SCMPCR's educational work is the annual e-learning programme, held each November. Attendance remains high, with around 100 attendees from South Asia, Africa, and Europe – including Germany for the first time. The 2024 programme focused on brachytherapy procedures for medical physicists and radiation oncologists and was accredited with 16 CPD points by the International Organisation for Medical Physics (IOMP).

In November 2025, the programme will celebrate its tenth edition, with the lecture series focusing on "Soft Skills for Medical Physicists and Scientists in Cancer Research".

Practical Training: Hands-on Workshop in Nepal

From 13 to 16 March 2025, the eighth SCMPCR hands-on workshop took place in collaboration with the B.P. Koirala Memorial Cancer Hospital (BPKMCH) in Chitwan, Nepal. Under the title "Clinical Implementation of SRS, SRT and SBRT for Medical Physicists and Radiation Oncologists", the workshop focused on the practical application of modern radiotherapy techniques.

For the first time, the event was aimed not only at medical physicists but also at radiation oncologists. Professor Golam Abu Zakaria, founder and director of SCMPCR, commented: "This premiere went very well. We had two physicians as speakers for the radiation oncologists. The medical physicists were also enthusiastic, as both groups benefited from the joint participation and exchange."

A total of 42 medical physicists and radiation oncologists from Nepal, India and Bangladesh took part. The four-day workshop offered a balanced mix of theory and practice – presented by renowned experts from six countries: Germany, Belgium, the Netherlands, Switzerland, Bangladesh and India. Representing PTW, Dr K. Kanakavel was on site and provided insights into patient-specific quality assurance, presenting various measurement and testing systems used in this context. The workshop was accredited with 38 CPD points from the European Board for Accreditation in Medical Physics (EBAMP).

Figure 1. From 13 to 16 March 2025, the eighth SCMPCR hands-on workshop took place in Chitwan, Nepal.

In addition to professional development, the event also provided space for international exchange and personal networking. The location, Chitwan – known for its natural beauty – highlighted the holistic nature of the programme.

The next hands-on workshop is scheduled for March 2026 in Sri Lanka. For the first time, radiologists will also be actively involved in the programme – another step towards interdisciplinary exchange and practical training.

Awareness and Prevention Campaigns on a New Level

SCMPCR has successfully established a partnership with public hospitals in Bangladesh. This collaboration enables the targeted use of hospital infrastructure for future prevention programmes. "Although we have to bring equipment and medical staff, having access to the facilities enhances the impact of our campaigns," explains Professor Zakaria.

Figure 2. Thanks to a partnership with public hospitals in Bangladesh, SCMPCR can now use hospital infrastructure for its awareness and prevention campaigns.

A Mobile Clinic as a Vision for the Future

One idea for the future is the creation of a mobile clinic – a specially equipped bus with a mammography device and other diagnostic tools, delivering preventive care to remote areas.

Promoting Future Leaders: Golam-Abu-Zakaria Best Young Leadership Award

A key highlight was the presentation of the Golam-Abu-Zakaria Best Young Leadership Award, granted by the Asia-Oceania Federation of Organisations for Medical Physics (AFOMP). First awarded in 2022, the prize honours outstanding young professionals under the age of 40 who demonstrate leadership, commitment and sustainable contributions to the advancement of medical physics in the region. In 2024, the award was presented to Dr Men Kuo, a medical physicist from China. The annual award ceremony takes place during the Asia-Oceania Conference on Medical Physics (AOCMP).

PTW remains a reliable partner of SCMPCR in 2025 – united by shared values and the goal of advancing medical physics in the region through excellent education and knowledge transfer in modern cancer therapies.

Further details about SCMPCR's e-learning programmes and hands-on workshops can be found at the e-leraning's program and workshop's website. To support SCMPCR's initiatives, visit here.

Tino Ebneth is a medical physics expert. He initiated the PTW Dosimetry School in 2014. As a head of the school, he oversees the planning, development, and delivery of its training programme.

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INDEPENDENT X-RAY QUALITY ASSURANCE

Streamlining CT Quality Assurance: RTI Group's Innovative Solutions for Accurate Dosimetry

Figure 1. RTI Mako testing Computed Tomography X-ray.

In the rapidly evolving landscape of medical imaging, Computed Tomography (CT) has become an indispensable diagnostic tool. As CT technology advances, ensuring precise calibration and quality assurance (QA) is paramount to maintaining image accuracy and patient safety. RTI Group, a leader in X-ray QA solutions with over 40 years' experience, addresses these challenges with its state-of-the-art CT calibration probes and measurement tools, designed to meet the rigorous demands of modern imaging environments and streamline testing.

Figure 2. RTI Mako CT solution with accessories.

RTI Mako

With the launch of the latest X-ray meter, Mako, RTI Group has further strengthened CT dosimetry and X-ray testing capabilities, offering the most advanced CT testing tools available. The RTI Mako system measures all parameters required for routine testing, including kV measurements (on the couch or on the gantry) with the industry-leading accuracy of the Mako R/F Probe, typical CT Dose Index with the RTI CT Ion Chamber, and streamlined tests of CTDI, DLP and FWHM with the patented RTI CT Dose Profiler, either free-in-air or in phantom. RTI also provides regulation-size CTDI phantoms and the leading Ocean Next software for an all-in-one premium solution.

RTI CT Ion Chamber

A range of parameters influence the uncertainty of CTDI measurement in axial scans. Two particular factors pertaining to the Ion Chamber are: 1) energy dependence, and 2) effective length, with different manufacturers showing variation in effective length from 97 mm to 117 mm – with an estimated uncertainty of ±1 mm.

For this reason, the RTI CT Ion Chamber has been built with outstanding energy linearity, within 0.5% in the range 70–150 kV for the IEC 61267 radiation qualities RQR 5 to 10, RQA 5 to 10, and RQT 8 to 10, as well as ISO N-150. This applies to soft radiation (low HVL) as well as highly attenuated radiation (high HVL). With an effective length that is very precise (100 ±0.5 mm), a chamber that is traceable to primary standards, and integrated with the advanced electrometer in the Mako system, users can be assured of a premium solution for CT dosimetry.

To further enhance the efficiency of CTDI testing, the RTI Ocean Next software includes built-in measurement protocol templates which automate and streamline typical CTDI measurements. For example, the procedure of one axial scan in the isocentre of the PMMA CTDI phantom, and four scans in the periphery, can be fully automated in Ocean Next with fully traceable reporting. The weighted CTDI is calculated automatically upon completion of the five scans. Templates can be customised to any routine and setup.

Overcome wide-beam CT challenges with the RTI CT Dose Profiler

Over the past decade, there has been more discussion about the testing of wider beams in CT, and how the CTDI100 formalism applies. As technology has advanced, wider beams in CT combined with helical scanning have placed greater demands on CT dosimetry testing, to ensure that the CT Dose

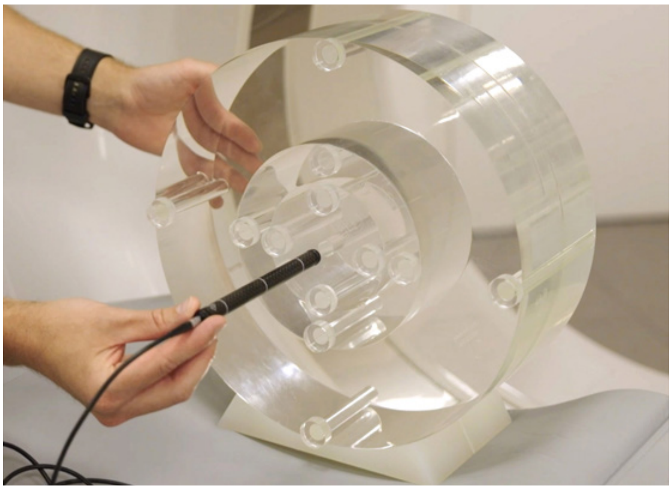

Figure 3. RTI CT Ion Chamber.

Index measurement provides a solid foundation for calculating patient or effective dose.

The patented RTI CT Dose Profiler (CTDP) was developed to overcome such challenges and streamline routine testing. The CT Dose Profiler has the same form factor as an Ion Chamber (fitting into standard CTDI phantoms) but uses solid-state technology with a point-dose detector. It can be moved through the beam, such as in a helical scan, to obtain dose data throughout the entire scan profile, overcoming the traditional drawback of an Ion Chamber and avoiding multiple scans.

Figure 4. RTI CT Dose Profiler.

The CT Dose Profiler provides a clear view of the dose profile. When scanned in the isocentre of the CTDI phantom, one helical scan provides the weighted CTDI measurement (typically requiring five axial scans with an Ion Chamber), which can streamline routine testing. When scanning free-in-air, the CT Dose Profiler also provides information on geometric efficiency, beam width (full width at half maximum; FWHM), and the CTDI100 in mGy, providing a unique tool in CT scanner testing and dosimetry.

Bringing It All Together

RTI Group's advanced tools—Mako, CT Ion Chamber, CT Dose Profiler, and Ocean Next software—offer a complete solution for accurate, efficient CT quality assurance. Together, they simplify testing, support compliance, and enhance patient safety.

Michael Olding, PhD, is Head of Product Management at RTI Group. Michael works on the interface between product development at RTI and global end users of RTI's products & solutions (physicists, engineers and medical professionals), and is passionate about ensuring user needs are at the forefront of new product development at RTI Group.

Tackling the Real Problem: The Dosimetric Unknowns in Patient Setup

Treatment planning is performed on a static CT dataset, capturing a single snapshot. The resulting plan is then delivered to the patient over multiple weeks, relying on efforts to recreate that initial anatomy and setup for every fraction.

Surface Guided Radiation Therapy (SGRT) technologies have become invaluable in helping position patients consistently, using surface metrics to guide alignment. Yet, typical SGRT tolerances — often set generically at 3–5 mm and 3 degrees — are rarely customised to individual patients or specific anatomical sites. These thresholds do not reflect the actual dosimetric consequences of deviations for a given patient. Patients with limited mobility introduce additional challenges in reproducibility. Even with careful setup, small positional inconsistencies can result in subtle, unintended dose shifts. In some cases, evidence of excessive or misplaced dose to normal tissues is only discovered after treatment has been delivered, when the opportunity to intervene has passed.

Patients, after all, are not phantoms, and Patient Specific Quality Assurance (PSQA) activities lose clinical meaning when a surrogate phantom stands in for the patient for independent secondary calculations and the IMRT QA process. After all the checks and approvals are done and a patient is prepared for the start of treatment, their anatomy has already changed, and it continues to change throughout the course of treatment. Breast tissue can swell or develop seromas. Abdominal organs fluctuate with varying gas or solid content. The pelvis undergoes daily shifts with bladder or rectal filling. Even with Image Guided Radiation Therapy (IGRT) to align to internal anatomy and minimise gross setup errors, insight into how day-to-day anatomical changes impact the actual dose delivered is still lacking. So the question remains:

- How do we adapt and personalise our SGRT and IGRT setup tolerances based on the true dosimetric situation for each patient?
- How does moving to more individualised tolerances help clinicians decide when it is safe to treat versus when to adapt or replan?

The Challenge Is Recognised — But Not Universally Solved

Unseen dosimetric uncertainty is now acknowledged across the field. Sophisticated platforms like the Elekta Unity MR-linac offer online adaptive radiotherapy workflows such as Adapt to Position (ATP), which aligns the day's image to the reference via rigid registration and updates the plan accordingly. However, these solutions require significant infrastructure. Many clinics lack such technology, yet still face the same challenges of anatomy-driven dose variability.

Where RadCalc Is Heading

At LAP, we are addressing this gap by building on our core strengths: precise alignment and independent dose verification. LAP lasers and LUNA 3D offer continuous, non-invasive surface tracking from simulation through delivery. Paired with

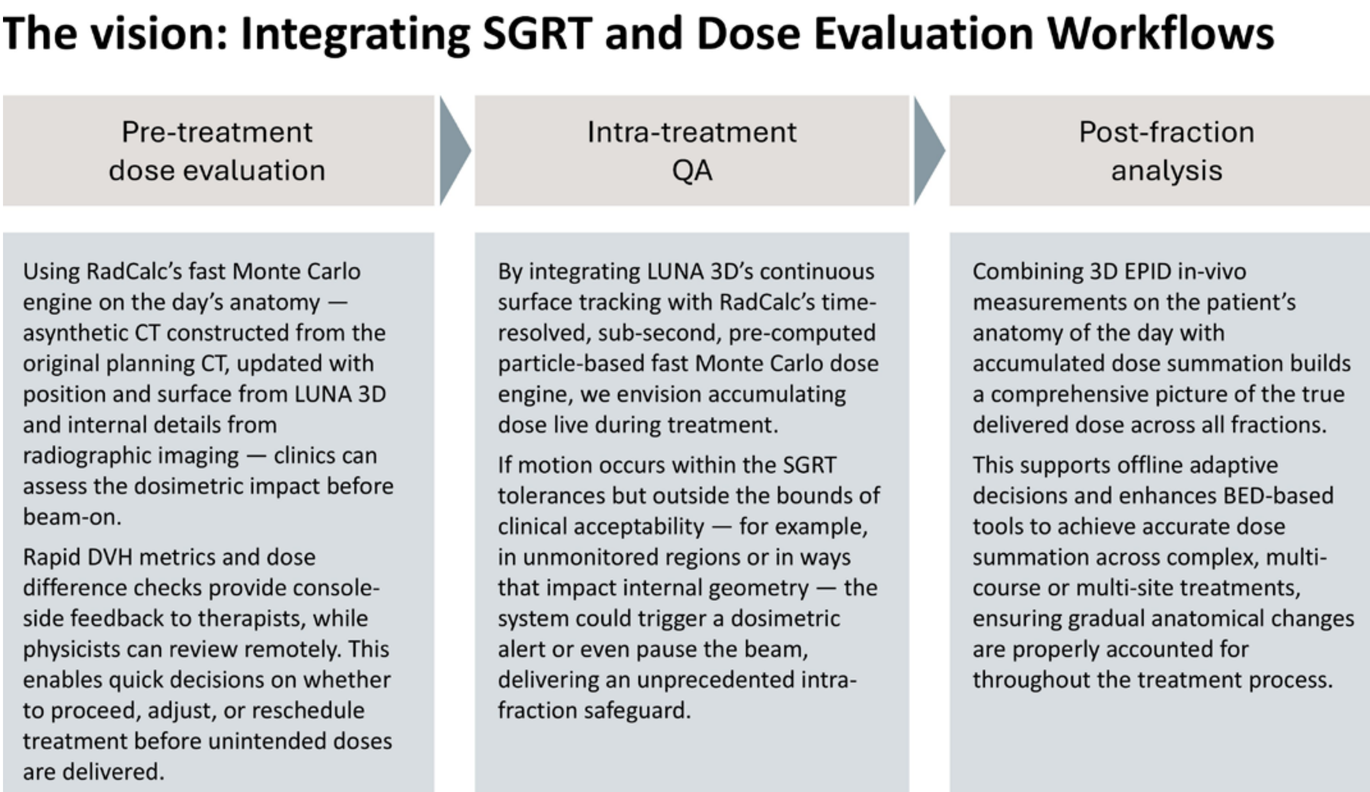

Figure 1. Integration of the SGRT and Dose Evaluation Workflows.

RadCalc's 3D QA suite, we are creating an integrated workflow to make dosimetric insight patient-specific and actionable. RadCalc's EPID dosimetry already allows clinics to assess the dose delivered retrospectively. However, proactive insight is needed before or during treatment, not just afterwards.

Redefining QA: Integrated SGRT and Dose Evaluation Workflows

RadCalc's future centres on combining SGRT and adaptive QA through three key workflows, as shown in the vision presented in Figure 1.

A Smarter, Patient-Centric QA Standard
Together, these tools help clinics move from fixed tolerances to a personalised, dosimetrically grounded approach — no MR-linac required. With RadCalc, QA becomes dynamic, data-driven, and built around the patient, not the plan.

Let's connect and explore how this evolution in QA can support your clinic's vision!

Note: German Patent Application No. 10 2023 115 102.9, PCT Patent Application No. EP2024/065566, US Patent Application No. 19/144,366

Carlos Bohorquez, MS, D.A.B.R, is the Product Manager for RadCalc at LifeLine Software, Inc., a part of the LAP Group. An experienced board-certified Clinical Physicist with a proven history of working in the clinic and medical device industry, Carlos' passion for clinical quality assurance is demonstrated in the research and development of RadCalc into the future.

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Closing the Gap: Standard Imaging Introduces TruPose™ Head Adjuster for Precise Rotational Corrections in Radiation Therapy

Middleton, WI--Standard Imaging, a leader in radiation therapy QA solutions, is proud to announce the debut of TruPose™ Head Adjuster, a bore-linear accelerator (linac) specific head adjuster system designed to enhance patient positioning by enabling precise six degrees of freedom (6DoF) corrections using visual feedback from surface-guided radiation therapy (SGRT) system.

Ensuring sub-millimetric accuracy in patient positioning is critical for the success of radiation therapy. Many bore-linacs feature treatment couches with only translational movements, making manual rotational error correction a challenge. Even c-arm linacs equipped with 6DoF couches can benefit from utilizing the TruPose™ Head Adjuster for finite adjustments down to +/-0.1 degree.

TruPose addresses this need by offering three degrees of freedom (3 DoF) for pitch, roll and yaw rotational positioning corrections with range of adjustments of up to ±4.0 degrees. The system allows for fine-tuned correction via three intuitive, color-coded adjustment knobs, improving clinical workflow and patient confidence. The user simply needs to look at the SGRT display monitor, verify the delta, and rotate the corresponding knob to zero the rotational error.

“We saw a gap in the industry—clinicians needed a precise, intuitive solution for rotational corrections in patient positioning,” said Eric DeWerd, President and CEO of Standard Imaging. “TruPose meets that need, delivering sub-millimetric accuracy while seamlessly integrating into existing workflows.”

The TruPose system features a rotatable carbon fiber head support plate fixed by a ball joint near the neck, secured to a base frame beneath the patient. Designed to work seamlessly with third-party thermoplastic masks, the head support plate immobilizes the patient’s head while allowing crucial adjustments. Careful attention has been given to the device’s compact operating housing to ensure it does not interfere with most non-coplanar treatment beams.

“The TruPose is the ideal device for precise, intuitive and quick patient set up for surface-guided head and neck and intracranial radiotherapy especially for bore-type linacs like the Varian Halcyon, Ethos and Accuray Radixact” said Umar Baharom, Product Manager and OEM Strategic Accounts.

Learn more about how this innovative system can enhance your radiation therapy workflow with our team.

About Standard Imaging

Standard Imaging remains at the forefront of the industry with cutting-edge QA solutions that guarantee precise, reliable, and safe patient care. By continuously advancing technology and setting new standards of excellence, they reinforce their commitment to equipping clinics worldwide with the essential tools for achieving optimal treatment outcomes. For more information, contact the Standard Imaging team.

Ashley Reis is the Marketing Operations Lead at Standard Imaging and has been with the company since 2020.

Patient Cases Highlight Online Adaptation & Advanced Imaging

Nearly 40 case reports of patients treated with online adaptive radiotherapy (oART) were submitted to Cureus.com, as part of a publishing competition in collaboration with Varian Medical Affairs to increase available clinical information.
The call for papers solicited case reports of patients treated with oART guided by pre-session CT or CBCT scans. The vast majority of cases were submitted by users of Varian's Ethos therapy system, and several featured advanced imaging with the HyperSight imaging solution, including metal artifact reduction.

"This collection of online adaptive cases demonstrates a wide range of creative approaches to personalized, precision radiotherapy," said Sushil Beriwal, Vice President, Medical Affairs, Digital Oncology, for Varian. "In many cases, safe radiotherapy would not have been possible without adapting plans at the time of treatment. This open access collection will be a valuable resource for Ethos users as they establish and develop their oART programs."

Cases were submitted from 28 institutions and covered more than a dozen distinct adaptive treatments. In almost every case, Ethos oART led to a reduction in normal tissue doses and/or a maintenance of treatment target coverage, and in some cases allowed reduction of margins below what is conventional.

The case report [1] from researchers at Chinese PLA General Hospital was recognized with a first place award, and highlights the use of on-demand, online adaptive planning in a patient with advanced head and neck cancer to account for regression in tumor volume or changes in external body contour.

With large tumor volume reductions across the 33-session treatment, adapting plans five times during the entire course led to the maintenance coverage of the target volume and lowered the dose to normal tissues. The patient did well with treatment, with only grade 1 radiodermatitis and grade 2 oral mucositis.

The paper shows a unique solution to account for the change in external body contour for online adaptation. It also highlights the benefit of online and on-demand adaptation for head and neck cancers to account for anatomical changes.

The second place case report [2] came from Cliniques Universitaires Saint-Luc, and examined the potential benefits of oART for patients with gastric mucosa-associated lymphoid tissue (MALT) lymphoma - a rare type of slow-growing cancer that develops in the stomach's inner lining.

In this paper, researchers were able to reduce PTV margins from a standard 12mm used in non-adaptive therapy, down to just 4mm by using a breath-hold oART methodology. This resulted in significantly reduced doses to organs-at-risk and the normal tissue surrounding the target, an important goal in improving outcomes for radiotherapy patients.

The third place case report [3], submitted by Amsterdam UMC, explored the potential of daily oART for bladder cancer to limit high-dose exposure of healthy tissue, compared to conventional non-adaptive radiotherapy. The paper examines a bladder cancer patient treated after cystoscopic tumor resection to 40 Gy in 20 sessions, with a simultaneous boost of 15 Gy to the tumor bed. By utilizing daily online adaptation of the treatment plan, the team was able to achieve smaller planning target volume margins. This reduced the dose to normal healthy tissues in the bladder and bowel, while maintaining 100% coverage of the target region.

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For media inquiries, please contact:
Kristin Corey
PublicRelations@varian.com

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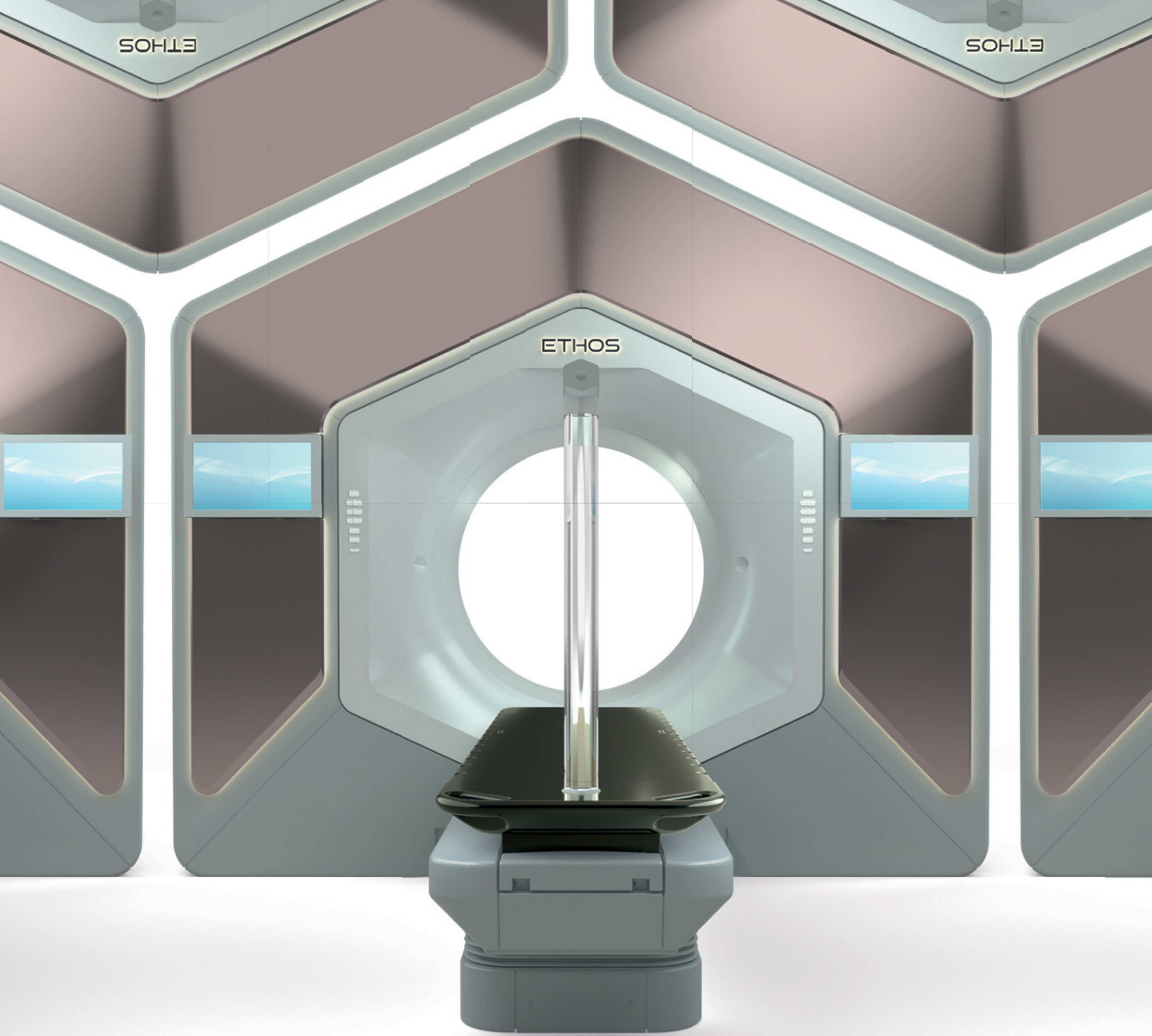

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ETHOS

Proactive Quality Assurance for Adaptive Radiotherapy: Real-Time MLC Verification with myQA SRS

Introduction

This study emphasizes the need to reevaluate the sufficiency of traditional periodic MLC QA methods for adaptive radiotherapy (ART). While foundational, these methods often fail to address the precision demands of ART, where even minor deviations in MLC performance can compromise treatment accuracy. myQA SRS bridges this gap by providing high-resolution MLC assessments, ensuring machine-specific capabilities align with the precision required for ART and guidelines for plan complexity are definable. By enhancing machine QA, myQA SRS supports ART delivery without reliance on patient-specific QA, positioning itself as an essential tool in modern radiotherapy [1].

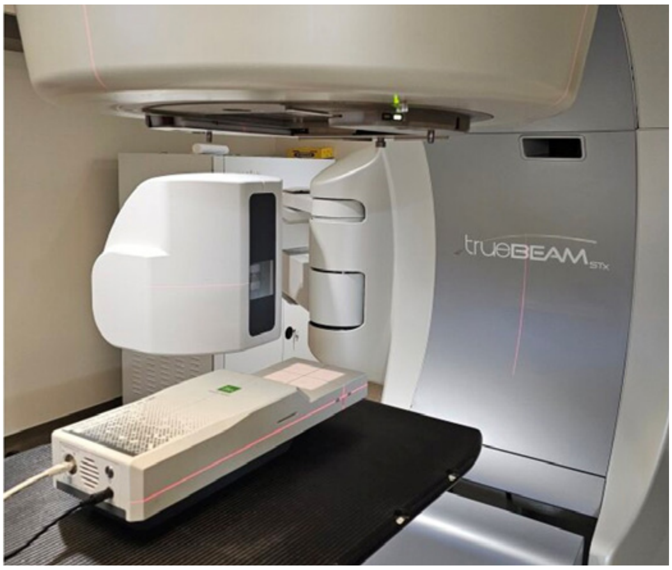

Figure 1. myQA SRS setup, using 6 MV beam with AP delivery for MLC analysis.

Adaptive radiotherapy (ART) demands an unprecedented level of performance from multileaf collimators (MLCs) to accommodate dynamically updated treatment plans. Current protocols for MLC quality assurance (QA) rely heavily on historic tests which only detect large scale deviations that are visually discernible in traditional 3D planning [2]. While these protocols are sufficient for traditional radiotherapy approaches, the heightened precision required for ART raises an important question: are our current QA practices enough to ensure the accuracy necessary for delivering ART?

Methods

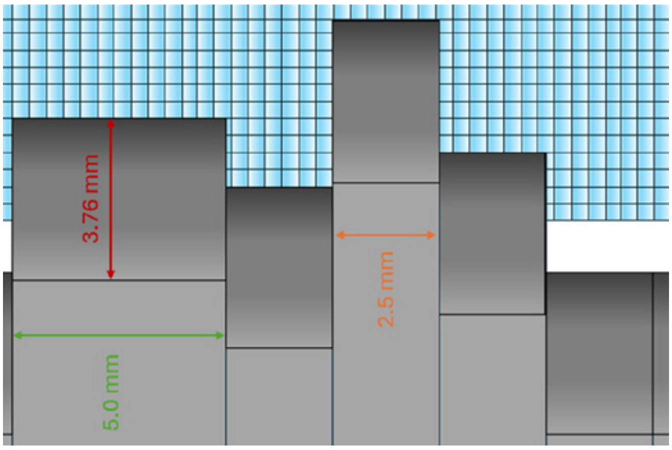

Figure 2. myQA SRS detector elements superimposed with MLC leaves to demonstrate resolution of detection for both 5.0 and 2.5 mm leaves, and with clear delineation of the leaf edge as defined by the rounded leading edge of each leaf.

myQA SRS was utilized with its 0.4 mm × 0.4 mm detector resolution to assess key MLC performance parameters (Figure 2): positional accuracy, edge detection, delivery repeatability, and dosimetric consistency. Tests included (1) MLC edge detection and leaf positioning analysis for HDMLC leaves, (2) MLC positioning, gap stability and variance detection, and (3) transmission analysis. MLC accuracy and functionality were evaluated through a series of specifically designed delivery patterns (Figure 3) as well as the commonly used 'chair test' which encompasses several MLC parameters within one test.

Results

Through the exceptional resolution of the myQA SRS, least count edge detection enables accurate leaf edge detection of 0.6 ± 0.2 mm, as well as indicates individual MLC's position accurately under various dosimetric conditions. However, with derivative gradient analysis, that detection can be refined to a sub-detector element effective resolution. MLC positioning, gap stability and transmission measurements showed deviations consistent with TPS expected variance. Variance detection indicated a very high level of dosimetric quantification of MLC movement down to sub-millimeter shifts, confirming myQA SRS's suitability for dynamic ART QA.

Discussion

myQA SRS introduces a new paradigm by offering high-resolution periodic QA capabilities that proactively verify MLC behavior and machine integrity. Detector resolution of 0.4 mm × 0.4 mm allows for precise characterization of MLC parameters, edge detection of at most 0.6 ± 0.2 mm and sub-detector element effective resolution with simple derivative dose gradient analysis (Figure 4). Tests such as the commonly used 'chair test' and specially designed delivery patterns reveal insights into MLC behavior that extend beyond traditional periodic QA, identifying subtleties in leaf positional accuracy, speed, gap stability, and dosimetric consistency that could affect patient treatment and speak to plan robustness [3] (Figure 5). This level of granularity provides clinicians with assurance that their LINAC is operating at ART-specific precision standards for adaptive patients.

Conclusion

This study highlights the value of myQA SRS in providing precise verification of MLC behavior and performance through high-resolution dosimetry and provides possible evaluation metrics for online-ART. myQA SRS provides an effective solution to verify MLC behavior, preventing errors rather than identifying them post-treatment, thus enhancing the safety and accuracy of ART.

Future work includes further exploration of MLC transmission and dosimetric leaf gap (DLG) analysis using this high-resolution platform.

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Michael Merrick is a Senior Medical Physics Resident with the University of Kentucky, in affiliation with One Physics. His research interests commit to improving patient outcomes through the precise and safe use of radiation, shaped by his experience assessing cell migration following radiation exposure and exploring theranostic applications in molecular radiotherapy. He is set to begin his post-residency clinical career with One Physics in St. Louis in 2026.

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Special Interest Group on Dental Imaging

The EFOMP Special Interest Group (SIG) in Dental Imaging focuses on the evolving role of medical physicists in dental radiology, particularly with the increasing adoption of Cone Beam CT (CBCT). Established under the EFOMP Scientific Committee, the SIG aims to clarify responsibilities, harmonise practices, and provide guidance on emerging technologies such as AI-driven diagnostic tools.

Objectives

The group seeks to:

- Define the medical physicist's role in dental practices.
- Evaluate and standardise Quality Assurance (QA), Quality Control (QC), Diagnostic Reference Levels (DRLs), and radiation shielding.
- Support medical physics education in undergraduate and postgraduate dental curricula.

Steering Committee

Elected in January 2024 for a three-year term, the committee includes:

- Ruben Pauwels (Denmark) – Convener
- Hugo Trindade (Portugal) – Vice Convener
- Eirini Tsaggari (Denmark) – Secretary
- Mona Lisa Camilleri (Malta)
- Chibuzor Eneh (Finland)
- Paddy Gilligan (Ireland)
- Brendan Tuohy (Ireland)

Priorities

Key focus areas include:

- Standardisation and optimisation of dental imaging practices to enhance patient safety.
- Education and training to raise awareness of medical physics in dentistry.
- Integration of emerging technologies, including AI, with emphasis on validation and clinical utility.

Focus Groups

The SIG organises its work into four Focus Groups (FG):

- **FG1**: Image Quality Metrics, DRLs, Exposure Optimisation – Leader: Hugo Trindade
- **FG2**: Medical Physics Training, Radiation Protection, Shielding, and Pregnancy Considerations – Leader: Mona Lisa Camilleri
- **FG3**: QC and QA Protocols – Leader: Eirini Tsaggari
- **FG4**: Dosimetry Methodology and Protocols – Leader: Chibuzor Eneh

Other initiatives include coordination on AI tools in dental imaging with EFOMP's AI SIG and WHO, while discussions on dental MRI are ongoing.

Webinars and Educational Activities

The SIG delivers regular webinars and workshops on:

- Radiation safety and patient protection
- Imaging protocol optimisation
- Innovations in dental imaging technology
- Best practices in QA/QC and dosimetry

Schedules and content will be announced through EFOMP communications.

Membership

Open to EFOMP National Member Organization members, individual Associate Members (including international professionals), EFOMP Company members, and nominations from affiliated organisations. Applications can be submitted via the EFOMP SIG Dental Imaging online form.

For more information, visit the EFOMP website or contact SIG Secretary Eirini Tsaggari.

Eirini Tsaggari is a Medical Physicist and Radiation Protection Advisor with extensive experience in Radiotherapy and Radiosurgery. Her recent work focuses on Cone Beam CT scanners, particularly dosimetry, Quality Assurance (QA), and radiation protection. She currently serves as Secretary of the EFOMP Dental Imaging SIG and leads its focus groups on developing QA and QC protocols.

Supporting the Next Generation: EFOMP at the ENEN Summer School 2025

From 30 June to 4 July 2025, Budapest hosted the 2nd ENEN BSc and MSc Nuclear Competition & Summer School, bringing together 40 outstanding students and recent graduates. Participants were nominated by ENEN members or universities and selected based on the quality of their thesis abstracts. As Vice Convenor of the EFOMP Early Career Special Interest Group (SIG), I had the honour of representing EFOMP at this event.

On the opening day, a **Cross-YGN Workshop** titled *"Nuclear Paths – Education, Networks and Career Opportunities"* featured four young professionals from different organisations and societies, each sharing their career journeys and highlighting opportunities for early-career participants. I was invited by Mattia Baldoni of the European Nuclear Society (ENS) to speak at the workshop, which was divided into two sessions: "Education and career paths" and "Networking in the nuclear field."

Sharing My Path in Medical Physics

In the first session, I discussed my journey into medical physics, the challenges I faced, the decisions I made, and how unexpected opportunities shaped my career. The audience was highly engaged, with many participants still exploring their specialisation. We discussed variations in medical physics education and training across Europe, sparking debate about the need for greater harmonisation to support mobility and standardised qualifications.

It was particularly rewarding to speak with students during the break, who shared their thesis topics and career plans. One student mentioned that my presentation inspired him to specialise in radiation protection—a highlight of the event for me.

Promoting EFOMP's Early Career Community

In the second half of the workshop, I formally introduced the EFOMP Early Career SIG, outlining our mission and activities, including webinars, the ECMP Early Career section, cross-border collaboration projects, mentoring programmes, and opportunities to contribute to European level initiatives. There was strong interest from participants, including those from outside Europe, demonstrating the growing global reach of EFOMP's early career network.

I was proud to present alongside other young professional groups, including ENS-YGN, IRPA YGN, and the FuseNet Student Council. This was my first opportunity to meet representatives from these societies in person, providing valuable insights into how other disciplines support their early-career communities.

Serving on the Jury

On the second day, the student competition took place. Participants presented their thesis work in four categories: Medical Physics, Radiation Protection, Nuclear Physics and Engineering, and Nuclear Waste Management. I had the privilege of serving on the ENEN2plus jury panel as an EFOMP representative, evaluating presentations from both Bachelor's and Master's students in the Medical Physics and Waste Management categories.

The quality of the student work was impressive, demonstrating scientific rigour and creativity. In Medical Physics, projects included: developing open-source tools for automating quality control; designing in-house phantoms for MRI and DaTscan QA; novel PET/CT radiomic feature stability techniques; and an internal dosimetry programme for the Filipino population. In Nuclear Waste Management, topics included characterising hard-to-measure radionuclides, developing phosphate-based geopolymers for waste disposal, and testing corrosion-resistant materials for high-temperature reactor applications.

Figure 1. Active student engagement during the Cross-YGN workshop.

Selecting winners was challenging, as each participant brought unique insights and enthusiasm for research.

Networking and Celebration

To celebrate the students' achievements, a boat trip on the Danube provided a memorable opportunity for networking while enjoying Budapest's landmarks.

I sincerely thank EFOMP for allowing me to represent the organisation and support young professionals. Participating in this event allowed me to contribute, learn, connect, and be inspired. To all the students and early-career professionals I met: congratulations on your outstanding work,

Figure 2. Showcasing EFOMP Early Career SIG's work during the Cross-YGN workshop

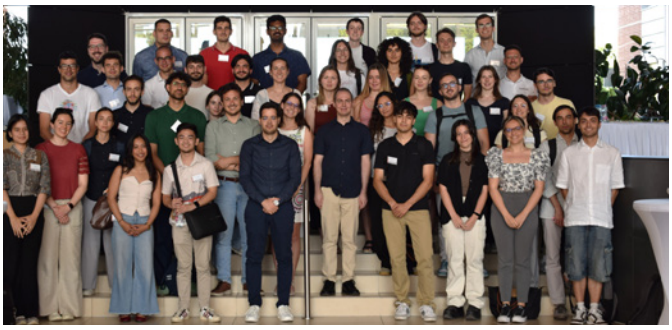

Figure 4. On the boat with Mattia Baldoni (ENS), Victoria Herzner (IRPA YGN), and Zsofia Szallasi (Hungarian YGN) – left to right.

Figure 3. Group photo of the participants in ENEN Summer School 2025

Antonio Jreije is a Medical Physicist at Vilnius University Hospital Santaros Klinikos, Lithuania. He is Vice Convenor of the EFOMP Early Career SIG and a member of the EURAMED Communications Committee.

Special Interest Group for Radionuclide Internal Dosimetry (SIG_FRID)

The SIG_FRID aims to create a network of medical physicists working in radionuclide dosimetry, addressing the need for networking, education, research, and professional exchange. Current membership stands at 266, and new applications are always welcome (see below for details).

Steering Committee

The composition of the Steering Committee as of March 2024 is:

- Manuel Bardiès (Chair)
- Julia Brosch-Lenz
- Carlo Chiesa
- Gerhard Glatting
- Silvano Gnesin
- Pablo Mínguez Gabiña (Vice-Chair)
- Steffie Peters
- Katarina Sjögreen Gleisner (Secretary)
- Lidia Strigari

Priorities

The SIG_FRID Steering Committee focuses on:

1. Scientific meetings
2. Focus group management and follow-up
3. Teaching, education, and dissemination
4. Communication
5. Professional, regulatory, and economic matters

Priority 1: Scientific Meetings & Case Reports

All scientific meetings and case reports are accessible via EFOMP's e-learning platform, e-LEMENT: Webinar Repository. Recent meetings included:

- June 17: "Dosimetry Software"
- August 12: "Dosimetry in [177Lu]Lu-PSMA Therapy"

Upcoming 2025 meetings:

- Scientific: Tuesday, 21 October, 15:00–17:00 CEST
- Case Reports: Tuesday, 2 December, 12:00–13:00 CET
  Topics and speakers will be announced later; registration is open via the EFOMP website.

Priority 2: Focus Group Management

Current Focus Groups and leaders:

- FG2 Treatment Planning Systems – Lidia Strigari
- FG3 Absorbed Dose-Effect Relationship – Lidia Strigari
- FG4 Voxel S-Values – Julia Brosch-Lenz
- FG5 DICOM Standard – Manuel Bardiès
- FG6 Accuracy of Therapeutic Activities – Silvano Gnesin
- FG7 MRT Dosimetry Education – Katarina Sjögreen-Gleisner
- FG8 Simplified Dosimetry – Sasha Ivashchenko & Deni Hardiansyah

Notably, the article "Time-Activity Data Fitting in Molecular Radiotherapy: Methodology and Pitfalls" by the former FG1 received the 2024 Galileo Galilei Award for the best publication in Physica Medica. Congratulations to the authors!

Priority 3: Teaching, Education & Dissemination

Twenty-four pre-recorded webinars on clinical nuclear medicine dosimetry are available on EFOMP eLearning: Webinars. These served as prerequisites for the in-person ESMPE School in Prague, 13–15 February 2025, attended by 60 on-site and 60 virtual participants. Webinars are also available on YouTube.

Priority 4: Communication

SIG_FRID members are encouraged to share relevant information via the SIG_FRID email list or Slack, including upcoming events, pertinent publications, PhD opportunities, job openings, or grants. For information originating from organisations other than EFOMP, please contact the SIG_FRID Board first at: board.sig_frid@efomp.org.

EU Matters

- RATIONALE COST Action (Radionuclide Theragnostics for Personalised Medicine) welcomes new members. This initiative offers excellent networking opportunities in theragnostic imaging and dosimetry, as well as short-term visits, student exchanges, and educational Schools. More information

- European Partnership for Personalised Medicine: New Fast Track and Venture Creator Programmes are available for participants. More information

- EU4Health Work Programme 2025: The European Commission has adopted this programme to guide strategic health policy priorities, supporting citizen protection and innovation. Key focus areas include cardiovascular health, digital health, cancer, health technology assessment, crisis preparedness, medicines, medical devices, and substances of human origin. Funding is available through grants and public procurement to advance health across Europe. More information

Priority 5: Professional, Regulatory & Economic Matters

The final report of the SimpleRad project (link) is now available at https://op.europa.eu/s/z4YL. Manuel Bardiès presented the report at a workshop in Sweden, while Carlo Chiesa shared it with 70 radiochemists at an Italian workshop. Carlo Chiesa will present the same topic at another Italian meeting in September.

A survey prepared by Carlo Chiesa and Lidia Strigari, exploring the clinical and legal possibilities of administering commercial LUTATHERA® more than four times (not as re-treatment, but for optimisation), has received additional responses from Poland and the Czech Republic, supplementing replies from France, Germany, Italy, the Netherlands, Spain, Sweden, Norway, Switzerland, Mexico, and the USA. SIG_FRID members in other countries are kindly asked to forward the survey to a regulatory officer, pharmacist, or nuclear medicine specialist. While medical physicists may respond, they are not the primary target. In the EU, the four-administration limit is strict in Italy and the UK; in France, re-treatment is possible without optimisation, whereas in other countries up to six administrations may be allowed after a board discussion.

The EMA concept paper initiative proposes creating a workgroup to develop guidelines for incorporating optimisation in clinical trials for new radiopharmaceutical registration. The SIG_FRID Steering Committee supports an official EFOMP initiative to urge the EMA to expedite this process. Many trials are already underway with FAP-targeting agents and alpha-emitter-labelled radiopharmaceuticals, all designed to deliver fixed activities within a set maximum number of administrations. Timely EMA guidelines are therefore crucial to avoid the concept paper remaining an excellent but ultimately unproductive academic discussion.

Incoming Meetings

- 38th EANM Annual Congress, 4–8 October 2025, Barcelona: Details
- 2nd Symposium on Molecular Radiotherapy Dosimetry, 13–15 November 2025, Athens: Details
- EMA Multi-Stakeholder Workshop, 17 November 2025, Amsterdam: Details

How to Become a SIG_FRID Member
SIG_FRID is open to professionals interested in radionuclide dosimetry. Membership is available to all EFOMP members. Instructions for joining can be found on the SIG_FRID page of the EFOMP website: SIG_FRID Membership.

Pablo Mínguez Gabiña (PhD Lund University) is a senior medical physicist at the Gurutzeta/Cruces University Hospital in Barakaldo, Spain and a part-time professor at the faculty of engineering of the University of the Basque Country in Bilbao. He is the Vice-Chair of the Steering Committee of SIG_FRID.

Historical Explorations of Medical Physics 3: Dreams, Reality, Legacy, and Caution Collide?

About 4.00 am on 28 Mar 1979, pumps that were critical to cooling the system stopped working in a large Pennsylvania nuclear plant. This led to an automatic shutdown of system parts. The incident, at one of the two Three Mile Island (TMI) reactors, was about to become the worst US civil nuclear accident. Information available about the scale/ severity of the accident was limited. Tens of thousands were evacuated. Some radiation was released; much was contained and cleaned up. Officials said it was within acceptable levels. Yet, few believed them, and many from the area attribute subsequent health problems to the accident.

A NEW REALITY?

Almost fifty years later, on 26th May 2025 a friend from the Czech Republic emailed me. A mutual acquaintance in Stockholm had sent him a four-page document, with Donald J Trump as putative author. I suspect most of you will have heard of him; and it was one of his Executive Orders (EO)[1] One of many he signs in large staccato writing with a big black marker that my grandchildren would love.

The EO is one of four that intimately affects radiation protection in general and will possibly include safety with medical uses of radiation. Its stated purpose is to simplify and undermine licensing processes for new civil nuclear power systems in the US. It proposes hollowing out the scientific and risk management sections of the NRC (Nuclear Regulatory Commission) and establishing a new division of 20+ people to issue new licences rapidly. The order has attracted little comment, although there were some rumblings, when the Chairman of the NRC was suddenly fired shortly after the executive order.

Figure 1. NRC logo (left) and former NRC Chairman, Chris Hanson (right) who was fired shortly after the EO was issued.

The EO aspires to liberate America from dependence on geopolitical rivals and quickly descends into the MAGA agenda. In defence of its position, it points out that up to 1978, 133 nuclear power plants were authorised. Since then, few have been licensed and of these only 2 are in civil use. It doesn't explain how the inflection point in licensing happened in 1978. In fact, 1978 is a decoy for the real inflection date, 1979, the year of the TMI accident.

TMI ACCIDENT AND OTHER INCIDENTS

The investigation of the TMI accident established that its causes included equipment problems, bad instruments, and mistakes by the operators. A relief valve got stuck open, letting cooling water leak out, but the control room instruments wrongly showed it was closed. So, the operators didn't realize the reactor core was overheating and partially uncovered. Their actions, based on wrong information, made things worse. About half the core melted down. A small amount of radioactive gas was released. Officially, it didn't cause any health problems.

Subsequent investigations demonstrated the importance of good instruments, proper training, emergency planning etc. After TMI, US nuclear safety systems became more demanding. This made new plants more expensive and slowed down approval of new licences. People were scared, some reactors shut down, and building new ones was paused. The event changed how the US handled nuclear power. Other countries, such as France and South Korea, continued growing their nuclear programs with better designs and guidance from emerging international bodies like the IAEA. Ultimately, the TMI 1979 event accounts for the more difficult US licensing environment.

The incident was, in many ways, a dress rehearsal for the Chernobyl and Fukushima accidents. Both are well known and will not be further discussed here. Another major incident occurred at Windscale in the UK on 10th Oct 1957 and must not be forgotten. The site was originally a military one dedicated to producing plutonium.

Figure 2. TMI nuclear generating station with two reactors, each with two large cooling towers.

A combination of procedural errors and faulty design led to the Windscale reactor graphite moderators catching fire. The blaze lasted for three days and radioactive materials, including iodine-131 and polonium-210 were released into the atmosphere and spread across northern England, Ireland, and parts of Europe. The site was repurposed for waste disposal and, like a reformed criminal, was given a new name: Sellafield. Liquid radioactive waste was routinely discharged into the Irish Sea, and there were significant leaks. One in 2005, involved 83,000 litres of highly radioactive liquid escaping from a cracked pipeline. It persisted for several months before being detected. All of this had profound implications for environmental health, public trust, and nuclear policies in the UK and beyond. It is fair to say that public trust, though improved, has not been fully restored following these incidents.

THE EXECUTIVE ORDER

The executive order radically changes the US regulatory framework and thereby hopes to rapidly expand its nuclear industry. However, it also creates fundamental problems for radiation protection, including medical applications. It undermines and removes a key component of policy development in the area. That is, how to address safety when the data on risk to the public, patients, and workers is incomplete. The problem is that we don't know if low radiation doses will induce cancer, but there are reasons to think it may. A practical approach may be to assume that the risk at lower doses is proportionate to well-known risks at higher doses, i.e. essentially the LNT hypothesis. That is not to argue the hypothesis is true — it is a way of compensating, however ineptly, for a lack of knowledge. Uncertainty like this is common when science touches public policy e.g. with Covid, public health, climate change, vaccines, etc. Most international guidance aligns with this approach.

Trump's approach undermines this. It states explicitly that the LNT and ALARA models 'are flawed' and 'produce irrational results'. Further, it states that ‘the NRC shall adopt determinate radiation limits. This effectively means a regulatory system without the LNT and ALARA. The notion of dose limits may be altered beyond recognition and based on deterministic effects alone. Cardiologists, radiologists, some medical physicists and others often argue from such positions. But as has been said many times: the absence of proof that cancers happen is not proof of their absence.

If we assume there is some cancer risk, and calculate it on the above proportionate basis, the situation looks worrying. For example, a recent paper using this approach has shocked and outraged some. It found the CT examinations performed on 62 million US patients in 2023 may result in ~103,000 additional future cancers. Put another way, this indicates that CT-associated cancers could eventually account for 5% of all new cancers. This may or may not happen — we don’t know. But if it could happen it is necessary to be cautious about it. When we don’t know, and it is possible that the consequences could be very serious, we must be prudent. In my view, this approach can’t be avoided. It is not reasonable when there isn’t data, to act as though there is no risk, when risk is possible[2].

This is not a problem unique to radiation. Rather, it is the sharp edges of a much bigger problem, i.e. significant political pressure to apply new technologies with incomplete data. When science is incomplete and society demands its application, politics may not provide a good solution. Politics may decide to downplay the risk and go ahead. Trump has so decided — his approach with radiation is another version of drill baby, drill. Politics may also decide, as Angela Merkel did, to close all of Germany’s nuclear reactors, to avoid the possibility of risk, real or imagined. Neither is a scientific, data driven approach, and neither is optimum. Economic framing of the problems also leads to unsatisfactory solutions.

Somewhere between politics, economics and science, there are ways of trying to bring rationality into these decisions. The best approach, in my view, is to look to secular ethics for guidance. The UN has been helpful and guides that in situations where the data is incomplete and there is a possible risk of serious fatal outcomes, we must take protective action in a way that is cautious — what is known as the precautionary principle must apply. WHO adds values like PRUDENCE, SOLIDARITY and others. Using these to guide action, provides better solutions for humanity than leaving it to politics or economics.

UNEXPECTED ALLIES FOR CHANGE?

To complicate matters, there are factions in the medical and allied professions that feel we are too cautious. This is unwise, though understandable in, for example, the world of private practices. These professionals and their professional bodies have, possibly inadvertently, provided a fig leaf for Trump like initiatives. They have been complicit in facilitating a walk away from prudence and neglect of solidarity and the common good. Some involved are shocked to see the implications of what they had thoughtlessly been supporting.

A US professional organization (to which I belong) issued policy statements over the last 15 years that undermine the prudential approach, discount radiation risks, and promote CT scans without due consideration of the risks/ benefits involved. They suggest that missing a scan could mean missing something important, which of may be true. But even if so, it is not the full story. The underlying message is to leave the decision to radiologists and professionals, many of whom are sceptics about the prudential approach and may have a vested interest at variance with it.

As a profession, our position is over reliant on regulation. Should Trump’s approach prevail, the most powerful case for our existence is, ironically, based on ethics. On the other hand, the trust and the stock of our profession has been placed in the Banks of Science and Regulation. Both could easily default. In the US, both Science and Regulation have already been substantially devalued. They are busted flushes, and the contagion could easily spread.

The system of RP is global. It may prove easier to demolish than other global activities like trade (WTO) and health (WHO). European RP organisations have not to date called out these destructive positions. HERCA is an honourable exception and issued a statement supporting the LNT approach and ALARA. On the other hand, The US Idaho National Laboratory has issued a report effectively advocating that both be abandoned.[3]

PS, AND BACK TO TMI

To return to where we started — the 1979 TMI accident. The rogue reactor remained unusable, but a second one on the site resumed operation in 1985. Eventually, in 2019 the whole site was closed, and plans were made to decommission it. But that was not to be. It was recently announced that the TMI site will reopen in 2028. Microsoft will be the sole customer for the electricity produced. Perhaps, not surprising as Bill Gates is an advocate for Nuclear Power? Like Sellafield, the plant will be renamed as: Crane Clean Energy Centre. The real question now must be, if Bill Gates/ Microsoft were able to get TMI going officially again, was Trump's executive order really necessary?

Hopefully, we will have a better story to tell in medical physics when we look back on this in a decade or two. But, if we do, it will depend on rediscovering our real identity so that it is not over dependent on legislation and recognises the demands of its ethics/ social/ medical connections.

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Jim Malone is Professor (Emeritus) of Medical Physics/ former Dean of Medical School, Trinity College/ St James's Hospital, Dublin. He works/ed regularly with WHO, IAEA, IEC, ICRP and the EC. Publications include books: Ethics for Radiation Protection in Medicine, Mystery and the Culture of Science, and Tales from the Ivory Tower, an unusual memoir.

Development of Iodine Enriched Occasional Radiation Exposure Indicators

Accidental exposure to ionising radiation, in particular γ-rays, can result from various sources: equipment malfunction, leakage from radiation sources, or even hostile action involving radioactive materials. While occupational exposure is well regulated, the detection and assessment of unintentional exposure remain a challenge due to the limitations of existing monitoring technologies, which are often costly, complex, or lack sensitivity [1–4].

For this purpose, a promising PVA-iodide indicator is proposed in this work, which changes its optical properties from a clear solution to a faint red colour in the dose range of 0.2–10 Gy. This type of PVA-I gel offers advantages such as simplicity, portability, and cost-effectiveness. The main colour-change mechanism of this indicator is due to radiation-induced oxidation of iodide to triiodide, forming a red PVA-triiodide complex, which shows a characteristic peak at ~490 nm [5].

The experiment consisted of three parts:

- Fabrication of experimental PVA-based samples containing different concentrations of potassium iodide (KI), sodium tetraborate ($Na^2[B^4O^5(OH)^4]\cdot 8H^2O$), and glycerol ($C^3H^8O3$);
- Irradiation of experimental samples with 6 MV X-ray beam;
- Pre- and post-irradiation analysis of the optical properties of the experimental samples using a spectrometer.

It was found that an aqueous medium was required for the desired chemical alteration (iodide oxidation and PVA-triiodide complex formation). Two promising indicator solutions were produced: with 2 w% KI (S1) and 5 w% KI (S2). The former was stable (no visible colour change) even seven days after preparation, but the sensitivity was quite low. That is why a larger concentration of KI was used in the latter solution. The indicator turned slightly red seven days after preparation but exhibited higher sensitivity (Figure 1).

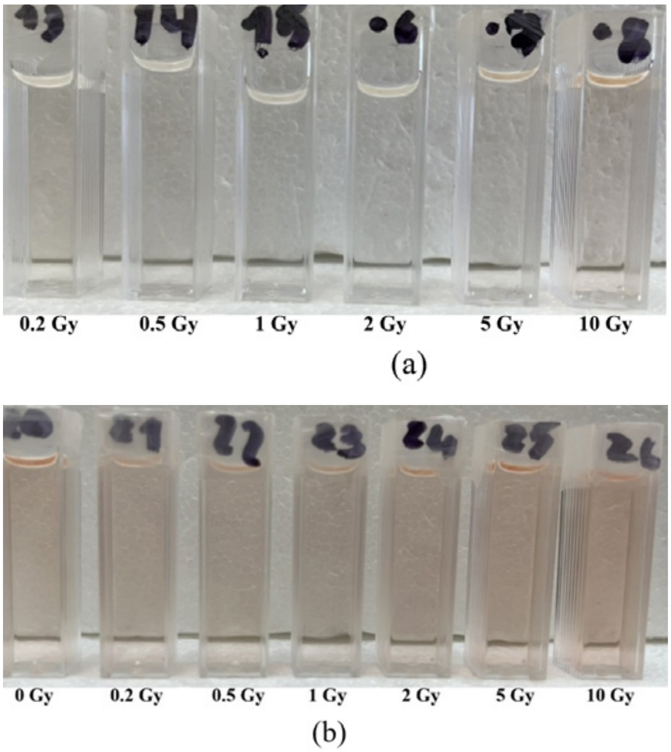

Figure 1. Photographs of the color changes of: S1 (2 w% KI) (a) and S2 (5 w% KI) (b) indicator solutions.

Obtained UV-Vis absorbance spectra of irradiated S2 (5 w% KI) indicator solution was comparable to similarly composed samples provided by other authors [6]. The UV-Vis absorbance spectra fragments

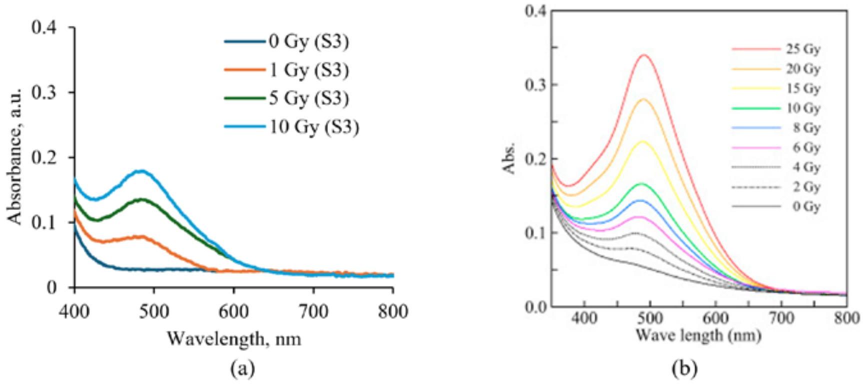

Figure 2. Comparison of the UV-Vis absorption spectra fragments: irradiated S2 (5 w% KI) indicator solution (a) and irradiated PVA + Gellan Gum + KI + Fructose gel (b) [6].

with the indicated absorbance peak at ~490 nm related to the formed PVA-triiodide complex for both indicators are provided in Figure 2. The obtained sensitivity values for S1 (2 w% KI) and S2 (5 w% KI) indicator solutions were 0.0058 Gy^{-1} and 0.0135 Gy^{-1} respectively, while the sensitivity provided by other authors was ~0.011 Gy^{-1}. In conclusion, additional experiments are required to ensure better sensitivity to radiation and more resistance to ambient conditions, such as light and temperature.

References:

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Gabrielius Stankus is an X-ray diagnostics machine specialist at Asanmeda. He earned his Master's in Medical Physics from Kaunas University of Technology in 2025 and will pursue a PhD in Materials Engineering at KTU, focusing on radiochemistry and particle accelerators for advanced medical and industrial applications.

DICOM: An Essential Tool for the Medical Physics Expert

The full procedures and bylaws of the DICOM Standards Committee are available at DICOM Web.

DICOM® – Digital Imaging and Communications in Medicine – is the international standard for medical images and related information. It defines formats for images that can be exchanged with the quality and data necessary for clinical use. DICOM® is implemented in almost every radiology, cardiology, and radiotherapy device (X-ray, CT, MRI, ultrasound) and increasingly in other medical domains, such as ophthalmology and dentistry. With hundreds of thousands of devices in use, DICOM® is one of the most widely deployed healthcare messaging standards globally, with billions of images currently used in clinical care.

Figure. DICOM standard logo.

Since its first publication in 1993, DICOM® has transformed radiology, replacing X-ray film with a fully digital workflow. Much like the Internet enabled new consumer applications, DICOM® has facilitated advanced imaging technologies that have reshaped clinical medicine—from emergency departments to cardiac stress testing and breast cancer detection. DICOM® is recognised by ISO as ISO 12052.

The goals of DICOM are simple: ensure compatibility and improve workflow efficiency between imaging and information systems worldwide. It is a cooperative standard maintained by working groups (WGs) that focus on specific tasks. The full list of WGs can be found here.

Key DICOM Working Groups (of interest to MPEs)

- WG-02 Projection Radiography & Angiography
- WG-07 Radiotherapy
- WG-28 Physics

WG-28, in particular, develops and reviews Correction Proposals (CPs) and supplements requiring physics expertise and addresses the needs of medical physics experts (MPEs). Its activities are closely linked with WG-02, and several joint publications are available at DICOM Current Standards and DClunie Status.

Notable Supplements

- Supplement 191 – Patient Radiation Dose Structured Report (RDSR): Creates structured reports for estimated patient radiation doses from CT, projection X-ray, and radiopharmaceutical administration (diagnostic and therapeutic). Occupational exposure and external beam/ion therapy or brachytherapy are excluded. Implementation is limited, so MPEs should encourage vendors to adopt this SOP class.

- Supplement 212 – XA Protocol Storage: Defines storage SOP classes to distribute and record X-ray angiography protocols.

- Supplement 245 – RDSR Informative Annex: Developed jointly by WG-28 and WG-02, this provides guidance on creating and using RDSRs across multiple modalities (angiography, mammography, radiography, CT, dentistry). Radiopharmaceutical exposures are excluded.

In nuclear medicine therapy, accurate documentation of dosimetric evaluations remains a challenge. Cooperation between the EFOMP QSPECT WG, WG-28, and WG-02 is ongoing to create CPs capable of handling these clinical and dosimetric data.

Why DICOM Matters for MPEs

Familiarity with DICOM is now essential for MPEs. It enables comprehensive dose tracking, standardised patient exposure documentation, and safe management of equipment acceptance tests. Correct implementation of DICOM supports interoperability, improves workflow efficiency, and enhances patient safety—making it a critical skill for modern medical physics practice.

Alberto Torresin is Professor of Diagnostic Imaging at Università Statale di Milano and Consultant for Regione Lombardia. He specialises in coordinating interdisciplinary research in radiotherapy, medical imaging, MRI, nuclear medicine, and AI, with expertise in quantitative imaging for clinical and research applications across CT, MRI, radiotherapy, and stereotactic procedures.

Guiding the Dose: How DRLs Shape Safer Interventional Neuroradiology

Interventional neuroradiology has assumed an increasingly important role in the treatment of complex neurological conditions, such as cerebral thrombectomy, embolisation of cerebral aneurysms, embolisation of arteriovenous fistulas and arteriovenous malformations, among others.

These procedures, although highly effective and minimally invasive, often involve prolonged exposure to ionising radiation, posing significant challenges to the radiological safety of both patients and healthcare professionals. In this context, diagnostic reference levels (DRLs) have emerged as a key tool for monitoring, controlling and optimising the doses administered.

DRLs are dose values established on the basis of current clinical practice, serving as comparative benchmarks rather than legal limits. Their application enables the identification of situations where administered doses consistently exceed (or fall below) expected values, thereby prompting corrective actions or improvements in protocols. In interventional neuroradiology procedures, which often involve real-time imaging, variability in techniques, case complexity and operator experience can lead to significant differences in the doses delivered. Therefore, the existence of specific national DRLs for these interventions is essential.

A critical aspect related to DRLs is the follow-up of patients who exceed recommended dose thresholds, particularly those defined by the International Atomic Energy Agency's (IAEA) SAFRAD (Safety in Radiological Procedures) initiative. This initiative recommends the systematic recording of radiation exposures during interventional procedures, especially when dose values associated with increased risk of deterministic effects, such as skin erythema, radiation-induced alopecia and other tissue reactions, are reached or exceeded. In such cases, it is crucial to establish an appropriate clinical follow-up plan to enable the early identification of adverse effects, their proper management and the collection of data for ongoing procedural improvement.

According to SAFRAD, the main dose thresholds that should trigger clinical follow-up measures are listed in Figure 1.

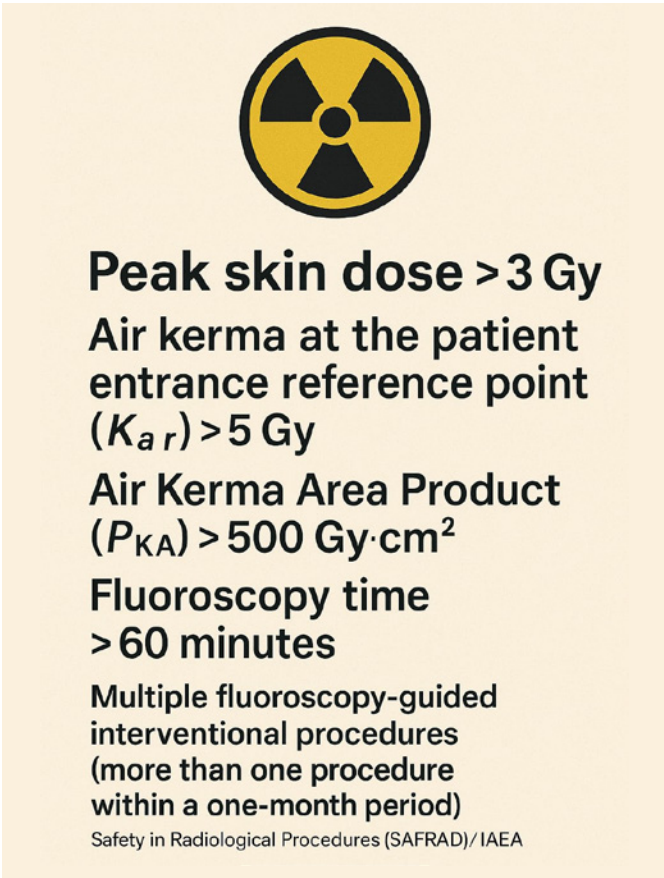

Figure 1. Dose limits according to SAFRAD.

These dose descriptors are listed in order of their significance with respect to tissue reactions.

Monitoring and analysing cases that exceed DRLs not only contributes to patient safety but also provides valuable opportunities for institutional learning. Comparison of clinical practices at both national and international levels allows the identification of unjustified variations and supports the standardisation and optimisation of protocols. The involvement of multidisciplinary staff, including physicians, radiographers and medical physics experts, is essential to ensure a comprehensive and effective approach to dose management.

Furthermore, the systematic use of DRLs fosters a culture of radiological safety and supports compliance with legal and regulatory requirements, such as the Euratom Directive 2013/59, which mandates that Member States establish and use DRLs for medical procedures. At the same time, it provides a solid foundation for clinical audit initiatives, research and continuous quality improvement in interventional radiology services.

In summary, local and national DRLs play a crucial role in interventional neuroradiology by promoting safer, more consistent and more efficient practices. Their integration into monitoring systems, together with rigorous clinical follow-up of patients who exceed recommended thresholds, represents an essential strategy to ensure radiological protection and the quality of care provided.

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Rogério Lopes is an Interventional Radiographer and Radiation Protection Officer at ULS Gaia e Espinho, Portugal, a PhD student in Occupational Safety and Health, and an Assistant Lecturer at Coimbra Health School. His specialisation is the medical use of ionising radiation, with a focus on radiation protection in interventional radiology.

More than Machines: The Human Side of Medical Physics

Can direct patient care redefine our professional identity?

Being a medical physicist is pretty awesome. We work at the cutting edge of medical technology, discussing science over coffee and having fun while playing an essential part in saving lives. Still, while we're deep in quality checks, dose distributions, and risk optimisation, most patients never see us. We're often tucked behind consoles; they entrust their care to invisible processes.

Of course, hospital life isn't always easy. The mental load of working in healthcare is real. We know that. But we hardly ever admit how it affects us. When healthcare workers are asked what makes it all worth it, a common answer is the connection with patients: the opportunity to witness, firsthand, the impact they're making—that sense of doing good, and seeing the good being done.

That's why the question pops up in our circles: How does the physics community feel about being absent from patient interaction? And, truthfully, could we actually help by changing that?

This question was posed by medical physicists at UC San Diego, who are introducing the "Physics Direct Patient Care Initiative". Their idea is that clinical medical physicists should expand the scope of the profession by establishing independent professional relationships with patients to advance care. Their team is therefore evaluating the impact of direct patient care by physicists on patient experience and operational efficiency through a series of clinical trials and research projects.

You can read their findings here: *"Examining the Effect of Direct Patient Care for Medical Physicists: A Randomized Prospective Phase III Trial".*

Throughout their work, the investigators found that patients often harbour anxiety about the technological components of radiation-oncology treatment. It's perfectly understandable: patients are commonly warned about the harmful effects of radiation, and they may feel uneasy about a large machine revolving around them and delivering invisible beams intended to cure. This confusion frequently translates into many unanswered questions. That's precisely why, in recent years, medical physicists at UC San Diego have begun taking an active role in direct patient consultations, to explain and demystify these complex treatments.

When I learned about the Physics Direct Patient Care Initiative and UC San Diego's commitment to bringing medical physicists into direct patient consultations, I thought: this is exactly what's missing in our profession. Two clear reasons drive that belief. First, patients genuinely benefit when they gain a deeper understanding of how their treatment works: physicist consults have been shown to reduce anxiety and improve technical satisfaction in a Phase III trial. Second, I believe it's time for medical physicists to evolve beyond the "strictly scientific and technical role" we have traditionally held.

This is, of course, my personal opinion, and I know that many of us are perfectly happy with the role as it currently stands. But I also believe that we can learn a lot from a heartfelt connection with patients. After talking with many young medical physicists across Europe, I've noticed that some of us feel constrained by the usual "behind-the-scenes" position and are ready to take a step forward into the open.

Now, I'm reaching out to all of you to hear your thoughts on this: How do you feel about limited patient interaction? Would you be open to playing a more patient-facing role if we had proper training and institutional support? That's why I designed a short survey; just scan the QR code to share your insights. The survey welcomes input from all areas of medical physics (not just radiation therapy) and will help us understand whether physicist-led patient consults could take root here in Europe.

Virginia Piva is a Medical Physics Resident at Niguarda Hospital, Milan, and a research fellow in particle therapy at the National Institute for Nuclear Physics. She focuses on radiotherapy advances and clinical AI applications. Committed to science communication, she promotes public understanding of medical physics. Virginia joined the C&P Committee in 2024.

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2nd Medical Physics and Radiation Protection Picnic, Zagreb

On Saturday, 15 March 2025, Dubrava University Hospital became a hub for young people, science, and medicine at the 2nd Medical Physics and Radiation Protection Picnic. This science popularisation event, aimed primarily at secondary school and university students, brought together over 150 participants, including students, lecturers, parents, and special guests from the Association of Cancer Patients and Survivors "ALL for HER."

Organised by the Croatian Society for Medical Physics (CROMPA) and the Croatian Radiation Protection Association (CRPA), the event featured a varied programme designed to demonstrate that medical physics and radiation protection are not simply "professional niches" understood by a select few, but fields directly connected to patient health and safety—and highly engaging as potential career paths.

Interest exceeded expectations: even before preparations were complete, more than 160 participants had registered. We were particularly delighted that some students had travelled all the way from the coastal city of Split to take part, highlighting the growing appeal and significance of this event.

What did we learn?

The programme officially began at 10 am with opening remarks by Hrvoje Hršak (CROMPA) and Ivana Coha (CRPA). We also received a warm welcome from the deputy director of Dubrava University Hospital, Jelena Popić.

This was followed by plenary lectures on: Natural radioactivity (Ivana Coha), Radon in households (Tomislav Bituh), The creation of radiological images (Ana Buinac), and Patient protection during imaging (Ivana Kralik).

Figure 1. Poster for the Picnic of Medical Physics and Radiation Protection.

What did we see?

The workshops were designed to provide hands-on learning experiences. Thanks to the excellent organisation by Ivana Kralik and the dedication of our young society members, who ensured order and adhered to the schedule, all visitors were able to attend every session.

Figure 2. Real-time radiation dose measurement workshop.

Figure 3. Protective equipment for staff workshop.

The workshops included:

Real-time radiation dose measurement, led by Marija Majer and Željka Knežević with their assistants Mercedes Horvat and Luka Pasariček. This workshop was especially impressive as it took place in semi-darkness, allowing participants to see how thermoluminescent dosimeters react and glow when heated.

Monte Carlo simulations in medical physics, presented by Tomislav Bokulić, whose enthusiasm and ability to simplify complex concepts delighted everyone.

Radiotherapy dose distribution planning, led by Ivana Alerić, Giovanni Ursi, and Hrvoje Hršak. For the first time, visitors had the opportunity to see what the planning process involves and how much expertise and careful consideration goes into providing high-quality therapy.

Mobile laboratory for measuring environmental radioactivity, led by Petra Tagliaretti and Tea Čvorišćec, who expertly handled numerous questions from visitors intrigued by the unusual vehicle that serves as a laboratory.

Protective equipment for staff, turned into a small fashion show thanks to the creativity and effort of Mihaela Justić.

Nuclear power plants and their operation, explained by Matija Pisk, who presented the interior of a nuclear power plant in an interesting and accessible way.

Professors and students, satisfied and full of ideas

We were especially pleased that school professors expressed satisfaction and interest in working together for future initiatives. For example, a physics professor from Zagreb's XV Gymnasium, commented that the lectures "exactly matched" his curriculum and several others expressed interest in organising additional lectures or visits to clinics and research institutes in the future.

Figure 4. Group photo of all participants.

Conclusion

This year's Picnic once again showed that we have many interesting and important topics to share with young people. The event ended around 2 pm, with smiles, new knowledge and a sense that together we had accomplished something valuable.

Ana Buinac is a Medical Physicist at the Department of Medical Physics, University Hospital Centre Zagreb, Zagreb, Croatia. She started her career as a Medical Physicist in Radiation Oncology. Since 2017 she has been working in the field of Diagnostic and Interventional Radiology. Her interests are radiation protection and quality assurance.

2nd Technical Meeting of the International Atomic Energy Agency Dosimetry Audit Network

Figure 1. Participants of the 2nd Technical Meeting of the International Atomic Energy Agency Dosimetry Audit Network.

From 9th to 12th June 2025, the International Atomic Energy Agency (IAEA) Headquarters at the Vienna International Centre hosted the second Technical Meeting of the IAEA Dosimetry Audit Network (DAN). The meeting was motivated by a high-priority recommendation from the SSDL Scientific Committee to support Dosimetry Audit Networks established in different regions by developing audits that provide confidence in their local auditing processes. The meeting had multiple objectives: to consolidate the DAN community, support DANs, promote international cooperation, develop a model for international recognition of DANs, harmonise audit methodologies, and provide feedback and recommendations to the IAEA.

The meeting was directed by Jamema Swamidas, Head of the IAEA Dosimetry Laboratory, and her team. It gathered 95 participants from 66 countries worldwide, nearly doubling the attendance of the first technical meeting held in 2021, which had 56 participants from 35 countries. The majority of attendees were medical physicists (46%) and representatives from Dosimetry Audit Networks (29%), alongside regulators and exhibitors.

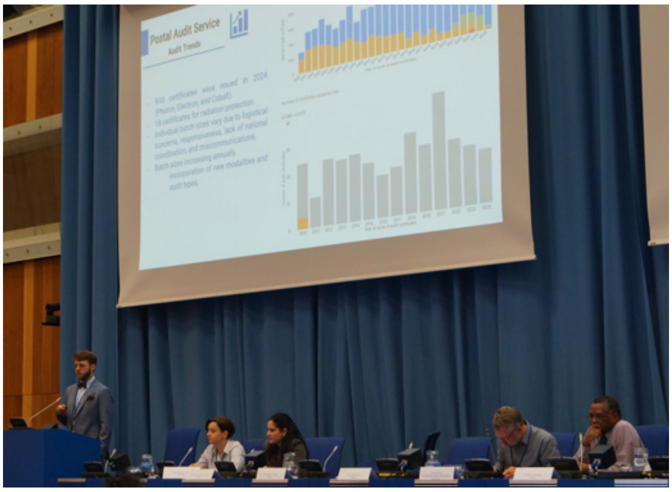

Figure 2. Benjamin Kellogg (IAEA) presenting IAEA/WHO Audit program during session on Reference dosimetry audit.

Figure 3. Discussion with Leon de Prez about Film handling and scanner commissioning (Film Dosimetry Workshop).

Figure 4. Workshop participants in front of the IAEA Dosimetry Laboratory in Seibersdorf.

Welcome and opening remarks were delivered by May Abdul Wahab (Director of the Division of Human Health) and Ferid Shannoun (World Health Organization). Keynote presentations covered quality and safety in radiotherapy, IAEA activities in radiation metrology and radiotherapy medical physics, and IAEA support for DAN status updates and global availability of dosimetry audits in radiotherapy. These were presented by Stephen Kry (USA), Mauro Carrara (IAEA), and Jamema Swamidas.

Over three days, seven comprehensive sessions were held: Dosimetry Audit Networks, Inter-comparison and Collaboration across DANs, Dosimetry Audits and Quality Assurance of Clinical Trials, Reference Dosimetry, Non-Reference Dosimetry, End-to-End and Other Complex Dosimetry Audits, and Dosimetry Systems.

A highlight of the meeting was a guided visit to the IAEA Dosimetry Laboratory in Seibersdorf, where two workshops were organised: Verification and QA of Treatment Planning Dose Calculations (End-to-End IMRT audit using the IAEA SHANE methodology) and Film Dosimetry. Each workshop was divided into two sessions covering treatment planning systems and linear accelerators, and film handling, scanner commissioning, and analysis of ROI dose and 2D dose.

During the workshops, participants were divided into four groups and guided by IAEA Dosimetry Laboratory staff (Liset Rosales, Krzysztof Chelminski, Benjamin Kellogg, and Mario Quintero) alongside an international group of experts: Mohammed Hussein (UK), Christian Fiandra and Serenella Russo (Italy), Eduard Gershkevitch

Figure 5. Jamema Swamidas (IAEA) and international experts during panel discussion on Dosimetry Audit Network Recognition.

(Estonia), Joerg Lehmann (Germany), Paulina Wesolowska (Poland), Leon de Prez (Netherlands), Andrew Alves (Australia), and Brigitte Reniers (Belgium).

On the final day, two panel discussions were held: Regulations in Dosimetry and Clinical Audits, and DAN Recognition/DAN Charter, generating extensive discussions among experts and attendees. The meeting concluded with a summary and recommendations to the IAEA, presented by the Director, Jamema Swamidas.

Slaven Jurković is head of Department of Medical Physics and Radiation Protection at University Hospital Rijeka and associate professor at Medical Faculty of University of Rijeka, Croatia. Member of the EFOMP Communication and Publication Committee.

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9th SEFM–SEPR Congress in Toledo

Figure 1. Official poster of the conference.

More than a thousand experts gathered in Toledo from 27–30 May for the 9th SEFM–SEPR Congress, organised by the Spanish Society of Medical Physics (SEFM) and the Spanish Society of Radiological Protection (SEPR). The biennial event brought together researchers, healthcare representatives, regulators and industry to exchange knowledge, debate advances and address current and future challenges in the field.

Over 900 works were presented, 165 professionals participated as speakers and moderators, and more than 30 exhibitors showcased the latest commercial innovations.

Held under the theme "Exploring Frontiers: Innovation, Safety and Health", the congress addressed key issues including the safe and effective use of ionising radiation, the impact of artificial intelligence on healthcare, and the implementation of proton therapy and other technological advances driving "an unstoppable transformation towards new medical solutions".

In her opening remarks, Marisa Chapel Gómez, Head of Medical Physics and Radiological Protection at the University Hospital of Toledo and Chair of the Organising Committee, highlighted the "tireless work, rigour and dedication" of the scientific commissions that ensure the congress's high standards. She also underlined the value of industry participation: "Commercial houses and exhibitors show the latest developments, which helps us see trends in clinical advances and the progress being made for the benefit of patients."

Figure 2. Networking session at the SEFM-SEPR.

Chapel emphasised the clinical impact of technological progress, noting that new equipment emits lower doses of radiation while producing more efficient images, reducing side effects and improving treatment outcomes.

Figure 3. Plenary session of the 9th SEFM-SEPR.

Maruxa Pérez, President of SEFM, stressed the importance of a multidisciplinary approach to modern, precision healthcare, and the crucial role of medical physicists: “Our role as experts is essential in rapidly expanding areas such as radiotherapy—particularly proton therapy—and nuclear medicine. Medical physicists are key both in quality assurance programmes and in dosimetry calculations.”

Carlos Castell serves as the Manager of the Spanish Society of Medical Physics (SEFM). Having worked with the SEFM since 2015, he has fulfilled various coordination and management roles, notably leading training initiatives and supporting the Post-COVID reorganisation of educational activities.

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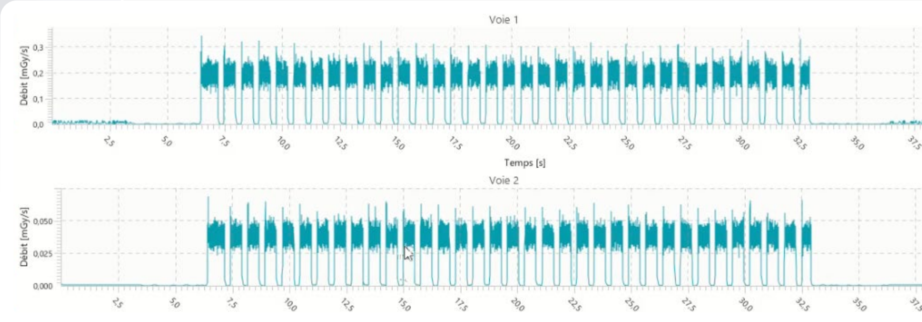

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Gathering of medical physicists in Trieste

Figure 1. Participants and lecturers of the EFOMP School: New Technologies in Radiotherapy.

The Abdus Salam International Centre for Theoretical Physics hosted EFOMP School: New Technologies in Radiotherapy (21-22/5/25), EFOMP Officers Meeting (23/5/25) and 12th Alpe Adria Medical Physics Meeting (22-24/5/25) in Trieste, Italy.

EFOMP School

The European Federation of Organisations for Medical Physics (EFOMP) concluded its two-day school on New Technologies in Radiotherapy, drawing 110 participants from 36 countries. The event spotlighted cutting-edge developments in FLASH therapy, Spatially Fractionated Radiotherapy (SFRT), radionuclide therapy, and Stereotactic Body Radiotherapy (SBRT).

Joao Seco (DKFZ, Germany) opened the program with an overview of FLASH and SFRT, emphasizing their potential to enhance tumor control while reducing toxicity. Lidia Strigari (University Hospital of Bologna, Italy) followed with a detailed presentation on alpha and beta radionuclide therapies, highlighting their growing role in targeted cancer treatment.

Joao Seco returned to discuss the integration of SBRT with FLASH, exploring the synergy between precision and ultra-high dose rates.

The second day featured Eeva Boeman (Tampere University Hospital, Finland), who presented clinical applications of SBRT, and Marco Esposito (ICTP, Trieste, Italy), who addressed in vivo dosimetry techniques for treatment verification. The school concluded with Francesco Romano (INFN Catania, Italy), who examined the challenges of dosimetry in FLASH therapy.

The EFOMP School reaffirmed the importance of international collaboration in advancing radiotherapy and medical physics, offering a platform for knowledge exchange and innovation.

Alpe Adria Medical Physics Meeting

Organizer of the 12th Alpe Adria Medical Physics Meeting was the Italian Association of Medical Physicists (AIFM) in cooperation with the Medical Physics Societies of Austria, Croatia, Hungary, North Macedonia, Serbia and Slovenia. During three days more than 100 participants enjoyed an extensive scientific program of the meeting and nicely organized social events with a view on the beautiful Adriatic seaside.

Figure 2. Božidar Casar (Slovenia) and Renato Padovani (Italy), the founders of the Alpe Adria Medical Physics Meeting series, during a conference dinner. "Third man", Werner Schmidt (Austria) is missing.

Scientific part of the meeting was related to the main areas of application of physics in medicine with separate sessions dedicated to research in medical physics and also to development and application of artificial intelligence. Opening remarks were given by the representatives of the host Sandro Scandolo (ICTP) and the main organizer Carlo Cavedon (AIFM). Honorary lecture on AI in medicine was delivered by Andreas Dekker (Maastricht University Medical Center and Maastro Clinic, Netherlands). Each conference session was introduced by a distinguished invited speaker. Hence, two Radiotherapy sessions were introduced by Božidar Casar (Institute of Oncology Ljubljana, Slovenia) and Piotr Andrzejewski (Medical University Vienna, AKH Vienna, Department of Radiooncology, Austria), Research in Diagnostic session by Paolo Cardarelli (INFN Ferrara, Italy), Radiology session by Renata Longo (Department of Physics, University of Trieste and INFN Trieste, Italy), Nuclear medicine session by Lidia Strigari (IRCCS Azienda Ospedaliero-Universitaria di Bologna Department of Medical Physics, Italy) and Radiation protection session by Željka Knežević Media (Ruđer Bošković Institute Radiation Chemistry and Dosimetry Laboratory Zagreb, Croatia).

Figure 3. Opening remarks featured by Sandro Scandolo, Senior Coordinator of the ICTP Research Division .

Central part of the meeting was dedicated to the EFOMP prize which was introduced by Paola Bregant (Maggiore Hospital Cancer Center Trieste, Italy) and presented by the president of the EFOMP Efi Koutsouveli to professor Slavik Tabakov. The EFOMP prize awardee delivered a lecture about the Encyclopaedia of Medical Physics which he edited.

The scientific committee vote-in for the best works presented at the meeting by young medical physicists. Among more than 30 candidates three young physicists were awarded. President of the EFOMP presented awards to Ana Marija Kožuljević (University of Zagreb Faculty of Science, Zagreb, Croatia), Kristian Stojšić (University Hospital Rijeka, Medical Physics and Radiation Protection Department, Rijeka, Croatia) and Lorenz Wolf (Division of Medical Physics, Department of Radiation Oncology, Medical University of Vienna, Austria).

During more than 20 years, an important part of the AAMP meetings is informal mingling among colleagues and friends during coffee breaks but also in the local pubs and bars when the night comes. It is always joyful and rewarding to meet old friends and acquaint yourself with new ones.

Directors of the AAMPM2025, Paola Bregant,

Figure 4. Midnight oil session in Bar Bohemienne.
Young physicists Ana Marija Kožuljević and Kristian Stojšić awardees for the best presentations along with another bright young physicist Ivan Pribanić.

Luca Brombal, Marco Esposito, Renata Longo, Renato Padovani and Mara Severgnini along with their team did a great job organizing AAMPM2025 in such a special place for physicists.

It was not announced during the closing session as it used to be but informal information said that the very next Alpe Adria Medical Physics Meeting is going to be organized in 2027 by Croatian Medical Physics Association somewhere in Croatia.

Marco Esposito is a Research Scientist and Head of Medical Physics at the International Centre for Theoretical Physics, Trieste. He has over 13 years' experience as a Clinical Medical Physicist in Florence, specialising in radiotherapy and MRI. He has served as an Adjunct Professor at the University of Florence, teaching CT and MRI physics, and has authored 44 peer-reviewed publications in medical imaging and radiation therapy.

Slaven Jurković is head of Department of Medical Physics and Radiation Protection at University Hospital Rijeka and associate professor at Medical Faculty of University of Rijeka, Croatia. Member of the EFOMP Communication and Publication Committee.

Baltic States Ultrasound Workshop: From Basic Principles to Quality Assurance

On 23 May 2025, the *Ultrasound Workshop: From Basic Principles to Quality Assurance* was held at Vilnius University Hospital Santaros Klinikos in Lithuania. This event formed part of an ongoing initiative by the Baltic States Medical Physics Societies—comprising the Latvian Society of Medical Engineering and Physics, the Estonian Society for Biomedical Engineering and Medical Physics, and the Lithuanian Society of Medical Physicists—to promote knowledge sharing and best practices in non-ionising radiation and quality control.

The workshop followed a successful series of seminars on magnetic resonance imaging organised in Latvia the previous year. Recognising the growing importance of ultrasound diagnostics, the Baltic States Medical Physics Societies decided to continue the seminars on non-ionising radiation and quality control in these areas.

The event was officially opened by Dr Kirill Skovorodko, Medical Physics Expert and President of the Lithuanian Society of Medical Physicists. Welcoming addresses were delivered by Assoc. Prof. Birutė Gricienė, Head of the Clinical Radiation Supervision Department, and Assoc. Prof. Artūras Samuilis, Head of the Radiology and Nuclear Medicine Centre. Participants from across the Baltic region attended, making the workshop a key platform for cross-border exchange of expertise and experiences.

The primary objective of the workshop was to enhance understanding of ultrasound diagnostic methods, the integration of artificial intelligence, quality control principles, and emerging trends in the field. The programme featured both theoretical and practical components led by Björn Johansson (Figure 1), an ultrasound systems specialist from Siemens Healthineers, Sweden, with over 20 years' experience in this field. Using a variety of phantoms and transducers, he demonstrated hands-on procedures for quality control testing in ultrasound diagnostics. At the end of the workshop, participants had the opportunity to see how ultrasound machines operate and to practise using different phantoms (Figure 2).

Figure 1. Björn Johansson presents the main aspects of ultrasound imaging.

The aim of the seminar was to strengthen the competencies of specialists in various fields of ultrasound clinical services in order to ensure high-quality diagnostic imaging, to support the development of legal regulations for the quality control of ultrasound and magnetic resonance

Figure 2. Different ultrasound phantoms used for practice.

tomography systems, and to promote more active involvement of medical physicists in these diagnostic areas.

The seminar marked a significant step towards strengthening the qualifications of medical physicists and other specialists in radiological imaging, and contributes to ensuring the consistent and high-quality operation of diagnostic systems.

During the workshop (Figure 3), specialists discussed current practices, existing issues, and future plans for seminars and workshops in related fields.

Figure 3. Event participants from the Baltic countries.

Kirill Skovorodko, PhD, works as MPE at Vilnius University Hospital Santaros Klinikos and President of the Lithuanian Society of Medical Physicists.

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6th European Congress of Medical Physics in Valencia, Spain

Figure 1. Palace of Congresses in Valencia.

We are delighted to extend a warm invitation to the European Congress of Medical Physics 2026 (ECMP 2026)—a premier international forum for the medical physics community. Hosted in Valencia, Spain, from 23–26 September 2026, this biennial event will bring together professionals, researchers, clinicians, and industry leaders from across Europe and beyond.

Under the inspiring theme *"Advancing Healthcare through Physics: Bridging Science and Patient Care for a Sustainable Future"*, ECMP 2026 will emphasise the vital role of medical physics in shaping the future of healthcare. As the boundaries between science, clinical practice, and technology continue to evolve, this Congress will demonstrate how medical physicists are uniquely positioned to drive innovation, improve patient outcomes, and support sustainable health systems.

Organised under the auspices of the **European Federation of Organisations for Medical Physics (EFOMP)**, ECMP is held every two years in a different European country. The Congress promotes the advancement and dissemination of medical physics knowledge and technology and champions the profession across Europe and worldwide.

We are pleased to announce that abstract submission for ECMP 2026 will soon open. Contributions are welcome across a wide range of cutting-edge topics, including:

- Radiotherapy
- Medical Imaging
- Innovative Therapy Techniques
- Novel Imaging Approaches and Technologies
- Theragnostics
- Radiation Protection
- Radiobiology
- Non-ionising Radiation, including Audiology
- Artificial Intelligence in Medical Physics

These topics reflect the diversity and evolving nature of our profession. We encourage submissions exploring scientific breakthroughs, clinical applications, interdisciplinary collaboration, and transformative innovations that integrate science with patient-centred care.

In addition to scientific sessions, ECMP 2026 will feature interactive workshops, roundtable discussions, keynote lectures from international experts, and specialised tracks for early-career professionals. The Congress will provide vibrant networking opportunities, foster partnerships, and support professional development. The technical exhibition will offer an excellent chance to engage with exhibitors and learn about the latest advances and equipment.

Sustainability, equity, and inclusivity will be central to the Congress. As healthcare systems face increasing pressures—from environmental challenges to resource constraints—ECMP 2026 seeks to cultivate a medical physics community that is technically skilled, socially responsible, and forward-thinking.

Whether you are an experienced expert, an emerging researcher, a clinical physicist, or an industry innovator, ECMP 2026 offers a unique opportunity to share your work, gain insights, and contribute to the collective progress of medical physics.

Join us in advancing our field and reinforcing the bridge between science and patient care. Together, we can ensure that today's innovations build a healthier, more sustainable tomorrow. We are confident that ECMP 2026 will deliver a successful congress addressing the most relevant scientific developments in medical physics now and in the near future.

We look forward to receiving your abstracts and welcoming you to **Valencia, Spain**, in September 2026.

With kind regards,
Joao Seco and Jose Perez-Calatayud

Joint Chairs of ECMP 2026 Scientific Committee
ECMP 2026 Organizing Committee
European Congress of Medical Physics 2026

João Seco Professor at the DKFZ Heidelberg, is Chair of the European School for Medical Physics Experts and Vice Convenor of EFOMP's Particle Therapy SIG. With a PhD from ICR London, he previously taught at Harvard University and now leads ion beam research focusing on imaging and radiation-induced DNA damage mechanisms at the DKFZ and the Department of Physics and Astronomy, University of Heidelberg.

José Pérez-Calatayud is Head of the Radiotherapy Physics Department at Hospital Universitari i Politècnic La Fe in Valencia and leads the IRIMED research unit. A graduate in Physics with a PhD, he has made significant contributions to radiotherapy and brachytherapy. Recognised as one of the fifty most influential medical physicists of the past half-century by the IOMP, he was awarded the 2023 ESTRO Lifetime Achievement Award for his outstanding work in the field.

6th ECMP 2026

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Bridging Science and Patient Care for a Sustainable Future

KEY DATES

Registration and Abstract Submission Opens	Abstract Submission Closes	Early Bird Registration Closes
1st Dec. 2025	**16th March 2026**	**1st June 2026**

ecmp2026.efomp.org

Organize

EFOMP European Federation of Organisations for Medical Physics

SEFM Sociedad Española de Física Médica

Welcome nation

Polskie Towarzystwo Fizyki Medycznej PTFM

EUTEMPE-EFOMP Course “MPE04 – Innovation in Diagnostic Radiology: Hot Topics and Challenges”

Figure 1. Group photo of participants at the EUTEMPE-EFOMP course.

From 9 to 11 June 2025, the EUTEMPE-EFOMP course “MPE04 – Innovation in Diagnostic Radiology: Hot Topics and Challenges” was held in Italy at the Department of Physics and Earth Sciences, University of Ferrara.

The course offered participants an overview of key developments in diagnostic radiology, covering advances in spectral and phase imaging, photon-counting technologies, and computational methods applied to clinical radiology, including AI, Radiomics, and in-silico Virtual Clinical Trials. A total of 20 participants from across Europe attended. Following an online preparatory phase, the course comprised three days of in-person lectures, interactive sessions, and discussions on emerging topics and challenges in diagnostic radiology.

Utilising the joint laboratories of the University of Ferrara and the National Institute for Nuclear Physics (INFN), hands-on activities enabled participants to explore the latest technological developments in innovative detectors and computational methodologies. As Professor Melchiore Giganti, Director of the local Radiology Department, noted, “the event also provided an important opportunity to discuss the potential clinical impact of these technologies, considering expected benefits in diagnostic precision and optimisation of therapeutic pathways, as well as current limitations and challenges to effective integration into clinical practice.”

Figure 2. Course attendees engaged in a lecture discussion.

The course was delivered by a distinguished faculty of physicists, medical physicists, and radiologists. Contributors included Angelo Taibi (University of Ferrara), Luca Brombal (University of Trieste), Paolo Cardarelli and Gianfranco Paternò (INFN, Ferrara), Luigi Manco (Sant’Anna Hospital, Ferrara), Lidia Strigari (Sant’Orsola Hospital, Bologna), Katrien Houbrechts (UZ Leuven, Belgium), and medical specialists Melchiore Giganti and Luca Urso (Ferrara University Hospital). This diverse faculty provided a comprehensive perspective on the potential and challenges of emerging radiology technologies.

The course took place in the historic city of Ferrara, whose medieval and Renaissance heritage provided an inspiring backdrop. Social events, including dinners and a walking tour, fostered networking, discussion, and international collaboration among participants.

Figure 3. Course participants during a visit to the facilities.

Feedback from the evaluation survey highlighted the high quality of the course and the value of interactive discussion and networking:

- “Fantastic course, well organised, very beneficial. Presented material in such a way that it could be practically applied in our own clinical settings.”
- “The participants were included in discussions more than in any course I have attended so far. Lectures were well-adjusted to the audience, making the discussions lively and engaging. The interactivity of some lectures, with surveys and other activities, was excellent for maintaining attention and participation.”
- “Great lecturers and topics, well-balanced learning and socialising, amazing atmosphere and networking opportunities. I hope to attend the next one.”

In conclusion, the EUTEMPE-EFOMP course in Ferrara proved to be a highly formative and stimulating experience. It enhanced participants’ understanding of cutting-edge developments in diagnostic radiology, encouraged critical discussion on clinical integration, and promoted collaboration across institutions and countries. By combining scientific excellence with practical insight, the course equipped attendees to navigate and contribute to the rapidly evolving field of medical physics. Initiatives like this remain essential for training the next generation of experts as innovation continues to reshape clinical practice.

Paolo Cardarelli – Researcher at INFN Ferrara, specialising in applied physics and biomedical X-ray imaging. Member of the Medipix4 collaboration, he leads projects developing spectral imaging technologies and advanced photon-counting detectors for biomedical diagnostics.

Angelo Taibi – Full Professor of Medical Physics at the University of Ferrara. Expert in diagnostic radiology, nuclear medicine, and blood circulation biophysics. Involved in digital mammography projects and consulting for women's healthcare companies, and currently managing a human physiology experiment on the International Space Station.

Early Career Article Award Winner!

Making Personal Connections: My Experience at the ENEN BSc and MSc Nuclear Competition & Summer School 2025

As a student eager to grow professionally during my studies, I have been fortunate to participate in several exciting opportunities open to Medical Physics and Radiation Protection students. Choosing one experience to write about above all others was not easy, but the ENEN BSc. and MSc. Nuclear Competition & Summer School 2025 at the Budapest University of Technology and Economics (BME) was my top choice, not only for the academic and professional rigour, but particularly for the positive spirit it fostered: a gathering of minds, skills and cultures united by a strong desire for shared scientific and professional advancement.

We started the week with thematic talks on nuclear education networks, career pathways, soft skills for resilience and structured training opportunities across Europe. These sessions reminded us that our professions move forward when we all share knowledge and when we support each other.

The competition kicked off with separate tracks for BSc. and MSc. participants. Presentations by the participants spanned medical physics, nuclear physics and engineering, radiation protection, and nuclear-waste management, showcasing the dedication of Europe's young scientists.

I presented my own thesis, "Development of a Free Open-Source Tool for Semi-Automated Quality Control of Diagnostic Planar X-ray Images: Focus on Ease of Integration into a QATrack+ Workflow." My work tackles an increasingly relevant challenge in radiological imaging quality control, namely, the fragmented and error-prone nature of spreadsheet-based methods used in many Medical Physics departments today. I proposed a custom Python-based tool designed for integration into the existing QATrack+ infrastructure. Seeing my work so well received by experts was immensely rewarding: their feedback confirmed that this work was solving genuine, real-world challenges and highlighted ways to adapt the tool for diverse, multinational regulatory requirements.

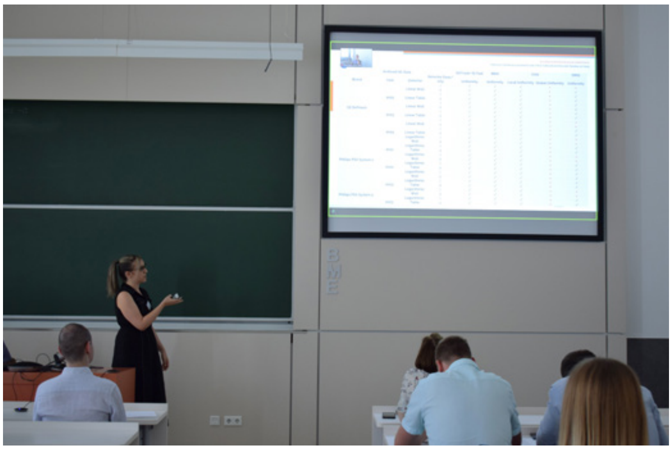

Figure 1. Presenting my thesis "Development of a Free Open-Source Tool for Semi-Automated Quality Control of Diagnostic Planar X-ray Images: Focus on Ease of Integration into a QATrack+ Workflow" as part of the BSc. Category.

At the Budapest National Institute of Oncology, we rotated through a series of practical workshops that began with verifying ionization-chamber stability. This was followed with participation in radiochromic-film dosimetry, patient-specific QA for IMRT/VMAT, stereotactic end-to-end tests, brachytherapy source checks and small-field measurements. We then set up a water phantom to commission beam profiles, explored chromosome-aberration assays, identified terminal deletions, dicentrics, rings, reciprocal translocations and quadriradial chromosomes as markers of DNA double-strand breaks. We practised contouring CT/MRI datasets while optimising multi-field treatment plans for LINAC delivery. The day concluded with a live demonstration of the CyberKnife system's patient immobilisation, image guidance and robotic non-coplanar beam delivery.

Figure 2. CyberKnife at the National Institute of Oncology, showcasing robotic non-coplanar beam delivery for stereotactic radiotherapy.

We toured the Institute of Nuclear Techniques at BME, beginning with the BME Training Reactor—an extraordinary, once-in-a-lifetime chance to stand metres from an operating reactor core, explore the control room and review strict safety protocols. We then observed real-time heat-transfer experiments in the Transparent Thermal-hydraulics Test Loop (TRATEL) before concluding with a session on a computer-simulated nuclear-power-plant, where we practised reactor transients and emergency procedures. This gave me the opportunity to experience other areas of the nuclear sciences and widen my concepts of Radiation Protection.

Figure 3. BME Training Reactor tour, where we stood metres from the operating core while learning about safety systems, control operations, and reactor physics in practice.

Finally, the week culminated in the awards ceremony, where the event's sense of unity and collaboration shone the brightest. We applauded every participant and celebrated each winner. There was no hint of disappointment, instead, genuine joy for every colleague, who by then had become like a life-long friend. That moment captured the essence of this experience: make connection, not competition. In just a few days, a collaborative community formed, full of shared curiosity and mutual respect, laying a strong foundation for future Europe-wide collaborations and partnerships.

This summer school has cemented my desire to build a career at the crossroads of clinical practice and research within a European context. I return to my country with new technical skills, deeper insights into emerging trends, and, most importantly, lasting connections with the next generation of medical physicists, radiation protection and other nuclear professionals.

To fellow students and early-career professionals I say: seek these moments, engage wholeheartedly, and remember it is the people and shared enthusiasm that make these events truly life-changing.

Figure 4. Certificate presentation (from left to right) Dr. Csilla Pesznyák, Prof. Francisco Javier Elorza, Dr. Štefan Čerba, Ms. Clarissa Attard, Dr. Marek Kirejczyk, and Dr. Lois Tovey.

Clarissa Attard is a Master's student in Medical Physics at the University of Malta. She is interested in programming for quality control optimisation, diagnostic and nuclear applications in medicine, and patient radiation protection and safety, aiming to enhance clinical practice through innovative, data-driven approaches and collaborative research.

Upcoming Conferences and Educational Activities

This list was correct at the time of going to press.
For a complete, up-to-date list, please visit our **EVENTS WEB PAGE**

Oct 6th, 2025 - Nov 21st, 2025
Hybrid Courses in the Field of Particle Therapy 2025
Heidelberg, Germany or online

Oct 8th, 2025 - Oct 11th, 2025
41st Annual Scientific Meeting of the ESMRMB
Marseille, France

Oct 29th, 2025 - Oct 30th, 2025
57th Annual Meeting of the Swiss Society of Radiobiology and Medical Physics - CERN
Geneva Swetzerland

Nov 6th, 2025 - Nov 8th, 2025
The 17th International Conference & Workshop "Medical Physics in the Baltic States 2025"
Kaunas, Lithuania

Nov 10th, 2025 - Nov 14th, 2025
Occupational dosimetry in diagnostic and interventonal radiology
(EUTEMPE course)
Braunschweig, Germany

Nov 13th, 2025 - Nov 15th, 2025
EFOMP - 2nd Symposium on Molecular Radiotherapy Dosimetry: The Future of Theragnostics (SMRD2)
Athens, Greece

Nov 27th, 2025 - Nov 29th, 2025
Data Analysis with Python for Medical Physicists
Online

Feb 19th, 2026 - Fe 21th, 2026
EFOMP - European School for Medical Physics on Porto -Portugal

Feb 19th, 2026 - Feb 21st, 2026
ESMPE on Radiation Biology,
Porto, Portugal

Apr 23rd, 2026 - Apr 25th, 2026
ESMPE on Advancing Breast Imaging with AI
Tallinn, Estonia

Oct 29th, 2026 – Oct 31st, 2026
ESMPE on Stereotactic Body Radiotherapy
Cluj, Romania

Sep 23rd, 2026 - Sep 26th, 2026
The 6th Ecmp 2026 European Congress of Medical Physics (Ecmp2026)
Valencia, Spain

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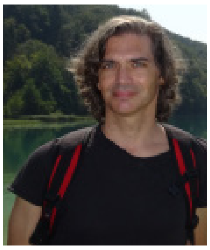

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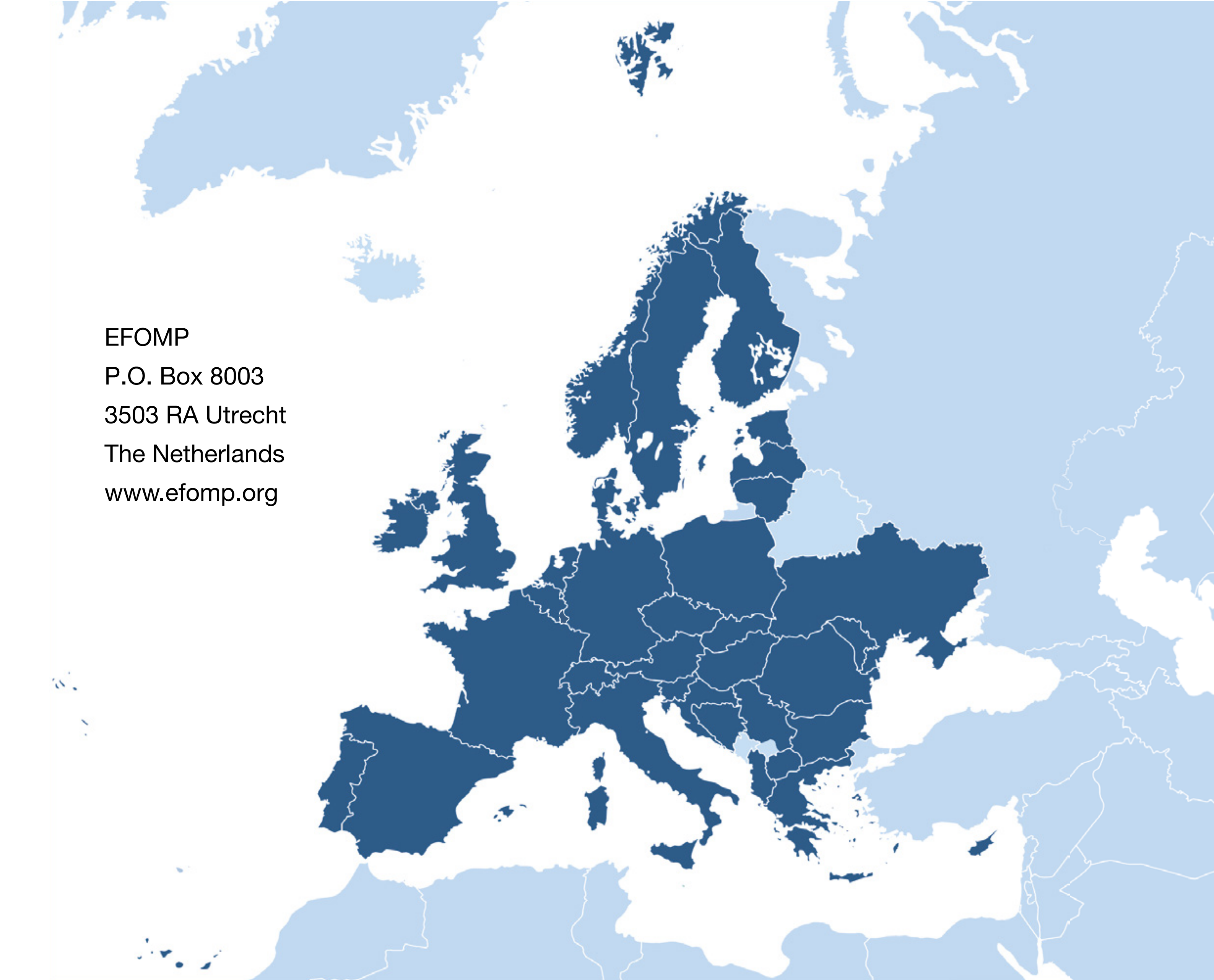

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EFOMP

EUROPEAN FEDERATION
OF ORGANIZATIONS
FOR MEDICAL PHYSICS

The European Federation of Organisations in Medical Physics (EFOMP) was founded in May 1980 in London to serve as an umbrella organisation for medical physics societies in Europe. The current membership covers 37 national organisations which together represent more than 10.000 medical physicists and clinical engineers working in the field of medical physics. The office moved to Utrecht, the Netherlands, in January 2021.

The motto developed and used by EFOMP to underline the important work of medical physics societies in healthcare is “Applying physics to healthcare for the benefit of patients, staff and public”.

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