SUN NUCLEAR
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ESTRO 2024
A Selection of Studies Featuring Sun Nuclear Solutions

Patient QA – SunCHECK® Patient
Featuring DoseCHECK™ & PerFRACTION™

PO-1829
Clinical audit of a new transit dosimetry system at University Hospitals Coventry and Warwickshire
S. Baker, et al, NHS Trust, Coventry, United Kingdom

- System's audit to ensure all clinically relevant issues were detected, to evaluate the suitability of tolerances, and to identify potential improvements to the workflow. Included changes that affect patient dose such as weight loss, tissue swelling, tumour shrinkage, density changes, position errors, machine faults, or errors in the planning process
- **Conclusion**: "The PerFRACTION system enabled early identification of issues such as changes in patient anatomy and set-up, leading to prompt clinical review and corrective actions. A quantifiable improvement was found in workflow efficiency when compared with the previous system, including reduction in the time needed for post-processing and investigation. The integrated design of the software enabled monitoring across the treatment pathway and provisional audit results enabled evidence-based improvements to the current workflow."

PO-2691
Use of the EPID to actively monitor single fraction stereotactic treatments
P. Doolan, et al, German Oncology Center, Limassol, Cyprus

- Proactive use of EPID to verify single fraction SRS: treatment plan is split in two (10% and 90% of dose), if first part is within tolerances, second is delivered.
- **Conclusion**: "Splitting high dose plans into multiple smaller plans is a potential solution to conduct online treatment monitoring of single fraction stereotactic plans, with the aim of detecting potential machine errors or patient anatomy variations."

PO-739
Differences between clinical 6 MV unflattened dose distributions and pre-treatment dose control
Marcus Krantz, et al, Sahlgrenska University Hospital, Department of Medical Physics and Biomedical Engineering, Gothenburg, Sweden

PO-1001
Multi-modality techniques for organ dose estimation & adaptive strategies in hypopharynx cancers
R. Hajare, et al, Homi Bhabha Hospital, Mysuru, India

PO-2481
Subcentimetric Lung Metastases and Stereotactic Body Radiotherapy: and Clinical Outcomes
S. Velazquez, et al, HUVR, Sevilla, Spain

PO-2505
Can EPID-based 2D in vivo dosimetry detect delivery errors in spine SBRT?
F. Leo, et al, Santa Creu i Sant Pau, Barcelona, Spain

Patient QA
Featuring PerFRACTION™ & ArcCHECK®

PO-444
Sensitivity and specificity evaluation of PerFRACTION in a HALCYON 2.0
P. Navarro-Palomas, et al, Val d'Hebron, Barcelona, Spain

- Study to evaluate sensitivity and specificity of PerFRACTION under different known errors introduced in the treatment plans
- **Conclusion**: "When modifying plans, representing linac errors, similar values of the change in PTV mean dose were obtained with PerFRACTION and Eclipse. If a standard gamma passing rate criterion is used, PerFRACTION is more sensitive to detect linac errors than experimental measurements."

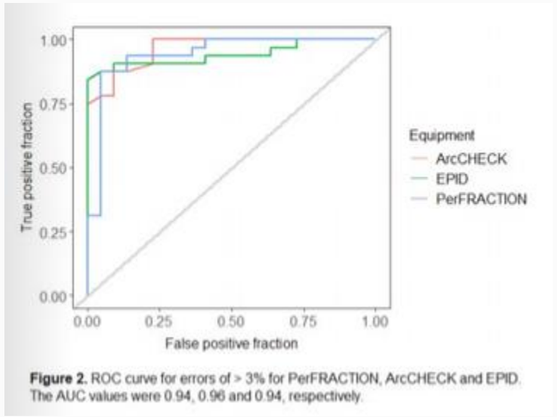

Figure 2. ROC curve for errors of > 3% for PerFRACTION, ArcCHECK and EPID. The AUC values were 0.94, 0.96 and 0.94, respectively.

PO-1222
EPID pre-treatment PSQA with SunCHECK PerFRACTION: A single center comparison with ArcCHECK
S. Linsalata, et al, Azienda Ospedaliero Universitaria Pisana Medical Physics, Pisa, Italy

- Comparison of PerFRACTION F0 vs ArcCHECK measurements to evaluate Perpendicular Composite (PC) vs. True Composite (TC)
- **Conclusion**: "Our comparison between the EPID pre-treatment PSQA system SunCheck PerFRACTION and ArcCheck, on a sample of thirty VMAT plans, shows no significant differences in GPRs distributions for different dose-DTA criteria, suggesting the possibility of using this EPID pre-treatment dosimetry system, less time consuming, as substitute of a traditional TC pre-treatment PSQA method like ArcCheck, provided that proper dose-DTA criteria and action limits are chosen."

Patient QA
Featuring ArcCHECK®

PO-570
Shorter irradiation time for palliative care patients treated with VMAT for spinal metastases
Charlotte D Geurds, et al, HMC Radiotherapie, Leidschedam, Netherlands

PO-73
Plan-specific quality assurance in an inhomogeneous phantom including 3D-printed vertebrae
Felix Eilers, et al, University Hospital Würzburg, Department of Radiation Oncology, Würzburg, Germany. Ilmenau University of Technology, Biomedical Engineering, Ilmenau, Germany

PO-1205
Comparing Monte Carlo and Collapsed Cone algorithms for ArcCHECK analysis of complex treatment plans
Guus Spenkelink, et al, Haaglanden Medical Center, Department of Medical Physics, Leidschendam, Netherlands.

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Patient QA
Featuring ArcCHECK®

PO-267
An in-house machine log-based tool for monitoring MLC positional errors in online treatment
Pak Hang Nam, et al, Hong Kong Sanatorium & Hospital, Medical Physics Department, Hong Kong

PO-2724
Patient interchangeability between beam-matched accelerators
Diego Jurado-Bruggeman, et al, Institut Català d'Oncologia (ICO), Medical Physics and Radiation Protection, Girona, Spain. Girona Biomedical, Research Institute (IDIBGI), ONCORFIM, Girona, Spain.

PO-2716
Implementation of a distributed PSQA model across a network of matched linear accelerators for SABR
Jonathan Dunning, et al, GenesisCare, Physics, Melbourne, Australia.

PO-2521
Commissioning and Validation of AlignRT InBore™ system on the Ethos™ Linear accelerator
Ananda Ramchandra Jadhav, et al, Sir H N Reliance Foundation Hospital and Research Centre, Radiation Oncology, Mumbai, India

PO-2678
A quantitative measure of plan quality for VMAT plans
Samuele Cavinato, et al, Veneto Institute of Oncology IOV-IRCCS, Medical Physics Department, Padua, Italy

PO-1196
Dosimetric validation of Total Marrow with Lymphoid Irradiation with Volumetric Arc Therapy
Reena Devi Phurailatpam, et al, ACTREC, Tata Memorial Centre, Radiation Oncology, Mumbai, India. Homi Bhabha National institute, Academics, MUMBAI, India

Stereotactic QA
Featuring SRS MapCHECK® and StereoPHAN™

PO-2377
Calibration procedure and clinical validation of an high resolution diode array in Tomotherapy
Tiago Ventura, et al, IPO Coimbra, Medical Physics Department, Coimbra, Portugal

- **Methods**: "The diode array SRS MapCHECK and associated StereoPHAN phantom (Sun Nuclear) are suitable devices for SRS/SBRT PSQA but they are usually used in conventional linear accelerators…The aim of this study was to adapt both array and absolute dose calibration procedures to Tomotherapy and validate its clinical use."
- **Conclusion**: "The SRS MapCHECK diode array in the StereoPHAN phantom after proper calibration has proved to be a useful tool for PSQA in Tomotherapy, efficiently replacing other more labour intensive verification methods."

PO- 1933
High-resolution Diode array vs film for QA of trigeminal neuralgia treatments with Cyberknife
David Sevillano, et al, U. Ramón y Cajal, Medical Physics, Madrid, Spain. Universidad Complutense de Madrid, Department of Radiology, Rehabilitation and Physiotherapy, Madrid, Spain

- **Conclusion**: "SRS MapCHECK and film showed comparable abilities to detect geometrical errors in delivery of trigeminal neuralgia with Cyberknife. Based on SPC analysis, and once a systematic error due to misrepresentation of the array central detector in the planning CT, SRS MapCHECK showed enough reproducibility to established tolerance limits of ±0.75mm. Gamma index passing rates with SRS MapCHECK show a good behavior of the system when measuring absolute dose distributions."

PO-2253
SRS/SBRT patient-specific QA device comparison: Electronic QA devices vs film dosimetry
Tamir Shacham, et al, Assuta Medical Centers, Radiotherapy, Tel Aviv, Israel

PO- 1239
Dosimetric evaluation of gating treatment delivery to moving target versus static target
Jaime Reverter Pérez, et al, Sergas, Radiophysics, Vigo, Spain

PO- 1266
Evaluating the impact of MLC models and beam qualities on PSQA in lung SBRT plans.
Fadhilah Ibrahim, et al, National Cancer Centre Singapore, Division of Radiation Oncology, Singapore

Stereotactic QA
Featuring MultiMet-WL QA

PO-906
Comparing off-axis Winston-Lutz test between ExacTrac® and cone-beam computed tomography in TrueBeam
Yan Kit Wah, et al, St. Teresa's Hospital, Oncology Centre, Hong Kong, Hong Kong

PO- 2303
Investigation of the spatial accuracy of a Halcyon linear accelerator using the MultiMet-WL cube
Mathieu Marot, et al, Klinikum Esslingen, MVZ Radiotherapy and Radiooncology, Esslingen am Neckar, Germany

Stereotactic QA
Featuring STEEV, SHANE & E2E® SBRT Phantoms

PO-1275
Commissioning of Prosoma Core for SRS treatments
Anna Bangiri, et al, Nottingham University Hospitals NHS Trust, Radiotherapy Physics, Nottingham, United Kingdom. University of Nottingham, School of Medicine, Nottingham, United Kingdom.

PO-1384
Clinical Implementation of Prosoma Core for SRS treatments
Anna Bangiri, et al, Nottingham University Hospitals NHS Trust, Radiotherapy Physics, Nottingham, United Kingdom. University of Nottingham, School of Medicine, Nottingham, United Kingdom.

PO-2252
A multicenter pilot study based on IAEA E2E methodology for IMRT/VMAT audits
Mihai T. Dumitrache, et al, Emergency Central Military Hospital "Dr. Carol Davila", Radiotherapy, Bucharest, Romania.

- **Summary**: SHANE Phantom used to perform End-to-End (E2E) testing based on IAEA methods for IMRT/VMAT. Concluded E2E dosimetry audit can contribute to achieving a better understanding of the local performance of radiotherapy implementation of the IMRT/VMAT techniques in clinical practice.

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Motion Management & MRgRT QA
Featuring Zeus, Dynamic Thorax, and IMRT Thorax Phantoms

PO-1651
The impact of ground-glass opacities on dose calculation accuracy for lung SBRT – CIRS Thorax Phantom
Carla Cases, et al, Clinic Barcelona, Radiotherapy, Barcelona, Spain

PO-2150
Feasibility testing of a motion phantom for quantitative Dynamic contrast-enhanced MRI
Jessica Lye, et al, Olivia N.J Cancer Centre, Melbourne, Australia

PO-1120
Accuracy of Single-Isocenter treatment for multiple targets with different respiratory movements
Yusuke Kojima, et al, Shinshu University Hospital, Matsumoto, Japan

PO-1685
Validation of CBCT SABR planning - A roadmap with KV-CBCT calibration curves for the Monaco system
Arun Jaganathan, et al, Nuffield Health Cancer Centre London, London, United Kingdom

PO-840
Experimental 4D validation of clinical control infrastructure for thorax patients in proton therapy
Pietro Pisciotta, et al, University Medical Center Groningen, Groningen, Netherlands

PO-898
Validation of Affordable Depth Camera System for Monitoring Deep Inspiratory Breath Hold
Marian Axente, et al, Emory University School of Medicine, Atlanta, USA

PO-1863
HyperSight CBCT directly suitable for offline adaptive radiotherapy for prostate, but not for lung
Nienke D. Sijtsema, et al, Erasmus MC Cancer Institute, Rotterdam, Netherlands

PO-1599
Optimization of the comparison metric for EPID in vivo dosimetry of lung treatment
Marco Esposito, et al, The Abdus Salam International Centre for Theretical Physics, Medical Physics, Trieste, Italy. Azienda sanitaria USL Toscana Centro, S.O.C. Fisica Sanitaria Firenze-Empoli, Firenze, Italy

Machine QA
Featuring SNC Detectors, Solid Water & Advanced Electron Density Phantom

PO-1135
Dosimetric Results of Four Different Sun Nuclear Edge Diode Dosimeters for Small Field Measurements
B. Baslangic, et al, Acibadem Hospital, Eskisehir, Turkey

PO-1458
Characterization of a solid water material for true end-to-end testing
R. Thing, et al, University of Southern Denmark, Vejle, Denmark

PO-926
Does patient size affect the CT-numbers of bones?
Erik Pettersson, et al, University of Gothenburg, Sweden

PO-1583
Phantom-based optimization of virtual monoenergetic image reconstruction in dual-energy CT
Anne Richte, et al, University Hospital Wuerzburg, Germany

Diagnostic Imaging QA – CT & Ultrasound
Featuring Electron Density, CT Phantoms

PO-1186
Evaluation of the Direct Density Algorithm for Metal Artifact Reduction
Javier Sánchez-Esperón, et al, University Hospital Virgen del Rocío, Department of Medical Radiation Physics, Seville, Spain

PO-517
A simplistic site-specific approach to fanbeam CBCT HU calibration for RT planning using Elekta XVI
Dominika I Oborska-Kumaszynska, et al, Nuffield Health Cancer Centre London, Physics, London, United Kingdom

Dosimetry
Featuring ATOM® Phantom & Proton Therapy Dosimetry Head Model

PD-1980
Validation in a clinical setting of a deep learning-based out-of-field dose estimation tool
Nathan Benzazon, et al, Department of Radiation Oncology, Villejuif, France

PO-1636
Real-time in vivo verification of proton therapy using new Monte Carlo framework for head phantom
Zahra Ahmadi Ganjeh, et al, Particle Therapy Research Center (PARTREC), Department of Radiation Oncology, Groningen, Netherlands

PO-1563
Towards real-time range verification for head and neck treatments based on in-beam PET imaging
Brian Zapien Campos, et al, Particle Therapy Research Center, University Medical Center Groningen, Radiation Oncology, Groningen, Netherlands

PO-831
Online-adaptive proton therapy: Feasibility of prompt-gamma verification for CBCT-based adapted plan
Stefanie Bertschi, et al, OncoRay – National Center for Radiation Research in Oncology, Faculty of Medicine and University Hospital Carl Gustav Carus, Technische Universität Dresden, Helmholtz-Zentrum Dresden - Rossendorf, Dresden, Germany

PO-918
Evaluating prompt gamma ray timing for proton therapy verification under quasi-clinical irradiations
Krystsina Makarevich, et al, Dresden University of Technology, Helmholtz-Zentrum Dresden-Rossendorf, OncoRay – National Center for Radiation Research in Oncology, Faculty of Medicine and University Hospital Carl Gustav Carus, Dresden, Germany