SRS/SBRT QA   Featuring SRS MapCHECK®

PO-GePV-P-42   SRS MapCHECK
Dosimetric Evaluation of Sub-Millimeter Robotic Corrections for Multiple Metastases Single Isocenter Plans

L Muller*, H Tillery, St Peters, Albany, NY

- "Purpose: To quantify the dosimetric impact of 6DOF corrections for multiple-metastasis, single-isocenter SRS cases."

- "Conclusion: We have demonstrated that…Exactrac setup corrections produce demonstrably better agreement between planned and calculated doses. This work supports current clinical practice to verify and adjust the patient at each couch angle."

PO-GePV-T-342   SRS MapCHECK
Consistency in Response Between Two Copies of a High-Resolution Diode Array for SRS Dosimetry

B Barraclough1*, J Hansen2, (1) University of Wisconsin, Madison, WI, (2) Washington University, St. Louis, MO

- "Purpose: To evaluate variability in response between two copies of Sun Nuclear's SRS MapCHECK diode array."

- "Methods: …The irradiations tested the devices' dependencies on beam angle, pulse repetition rate (PRR), dose per pulse (DPP), total dose, and field size for flattened and unflattened 6MV and 10MV beams. Angular dependence was tested with both axial and vertex beams. DPP was varied by changing SDD…"

- "Results**: Differences in dependence on beam angle were less than 1% for angles >10° from parallel with the array for axial and vertex orientations**…**Dose linearity varied by <0.2%** between the two devices from 10 to 3500 cGy. **Variability in field size dependence was <0.5%** for all field sizes except for the 10FFF 1cmx1cm field, where the greatest difference was 0.9%. Finally, **passing rates from each device were at least 94.8% and within 3% of each other** using a 1%/1mm gamma comparison (lung SBRT and 3D SRS, all energies)…"

- **"Conclusion: The two diode arrays responded similarly across a wide range of tests. Only small differences in dependence to various conditions were observed. Gamma passing rates matched closely with more stringent criteria than used clinically."**

TH-A-TRACK 6-6   SRS MapCHECK
Geometric and Dosimetric Verification for a Novel Stereotactic Radiosurgery System: ZAP-X

Y Niu*, Y Yuan, A Rashid, D Pang, Department of Radiation Medicine, MedStar Georgetown University Hospital, Washington, DC

- "Purpose: …to verify the delivery accuracy of ZAP-X and validate the dosimeric accuracy of its dedicated treatment planning system (TPS)."

- "Results: Routinely performed end-to-end test for iso-positioning accuracy resulted in deviations of less than 0.7 mm. Absolute point dose measurements of TLD and OSLD agreed with TPS calculation within 3.5% with average difference -1.9±1.8% and 2.3±0.6%, respectively. **Relative and absolute dose profiles measured by Gafchromic film and SRS MapCheck showed an average gamma pass rates of 98.06% and 98.93% when using 3%/1mm criteria."**

PO-GePV-T-389   SRS MapCHECK
Dosimetric Impact of Peripheral MLC Leaves for Stereotactic Radiosurgery

X Zhao*, E Covington, A Alexandrian, R Popple, University of Alabama at Birmingham, Birmingham, AL

- "Purpose: To investigate the impact of multi-leaf collimator (MLC) characteristics on patient-specific quality assurance (PSQA) measurement agreement for stereotactic radiosurgery (SRS) treatment plans"

- "Methods: **328 multi-target 10MV flatting-filter-free HyperArc (Varian Medical Systems, Palo Alto, CA) plans using AcurosXB_15511 were measured with the SRS MapCHECK**…."

PO-GePV-T-352   SRS MapCHECK
Comparison of SRS QA Tools On IROC Head Phantom Plan

C Teng1*,2, N Vassell2, E Sudentas1, T Nguyen3, Y Lo4, (1)Mount Sinai West, New York, NY, (2)Mount Sinai Chelsea, New York, NY, (3) MD Anderson Cancer Center, Houston, ,(4) Mount Sinai Health System, New York, NY

PO-GePV-T-185   SRS MapCHECK
Stereotactic Patient QA Evaluation Between MapCheck SRS 2D Array, Electronic Portal Image Dose (EPID) and EBT3 Gafchromic Film Dosimetry

P Tsiamas*, W Cruz, W Fontenot, J Limmer, Texas Oncology - Houston, TX

FEATURED TALKS from Sun Nuclear at AAPM

Sunday, July 25 - 10:30 am EDT
Patient Specific QA Guided Tour: Improving Patient Outcomes through Automation of Error Detection During Treatment
Jennifer Hamilton, M.E., DABR, Sun Nuclear

Monday, July 26 - 10:30 am EDT
What's New from Sun Nuclear - SNC Patient™ v8.5
Kristin Van Casteren, Product Physicist, Sun Nuclear

Tuesday, July 27 - 11:30 am EDT
What's New from Sun Nuclear - Essential Tools for Stereotactic Treatments
Chris Bowen, M.S., DABR, Medical Physicist, Mosaic Life Care Cancer Center

Wednesday, July 28 - 10:30 am EDT
What's New from Sun Nuclear - SunCHECK™ Platform Enhancements
Jason Tracy, M.S., DABR, RT(T), Sun Nuclear

Patient QA — Featuring ArcCHECK® & MapCHECK®

PO-GePV-T-422 ArcCHECK

Characterization of Single-Dose Radiotherapy (SDRT) Performance in a New High-Speed Ring Gantry-Based LINAC System

OM Oderinde1*, S Khan1, A Da Silva1, S Tian2, X Yang2, K Higgins2, SM Shirvani1, G Kuduvalli1, (1) RefleXion Medical, Hayward, CA,(2) Emory University, Atlanta, GA

PO-GePV-T-329 ArcCHECK

Preliminary Treatment Planning System Commissioning Results for the First Clinical Biology-Guided Radiotherapy Machine

N Kovalchuk1*, B Han1, E Simiele1, D Capaldi1, D Breitkreutz1, T Yeung2, J White2, D Zaks2, M Owens2, S Maganti2, A Purwar2, L Vitzthum1, D Chang1, L Xing1, M Surucu1, (1) Stanford Radiation Oncology, Stanford, CA (2) Reflexion Medical, Inc

PO-GePV-T-306 MapCHECK

Streamline the Annual Relative Dosimetry QA Check with MapCheck

M Zhang*, D Lovelock, H Zhang, L Voros, Y Song, Department of Medical Physics, Memorial Sloan Kettering Cancer Center, Ny, NY

Patient QA — Featuring PlanIQ™

PO-GePV-M-213 PlanIQ

Effect of VMAT Improvement Before and After Referring to Radiation Therapy Planning QA Software

M Sasaki1*, et al, (1) Department of Therapeutic Radiology, Institute of Biomedical Sciences, Tokushima University Graduate School, Tokushima, JP

PO-GePV-T-191 PlanIQ

Utilization of a Plan Quality Prediction Software to Investigate Patient Specific QA Passing Rates

P Irmen1*, C Stambaugh2, C Melhus2, (1) Inova Health System, Fairfax, VA, (2) Tufts Medical Center, Boston, MA

Machine QA — Featuring 1D SCANNER™, IC PROFILER™

PO-GePV-T-308 1D SCANNER   IC PROFILER

On the Performance of LINAC Annual Quality Assurance Without the Need for a 3D Water Tank

H Kadji1*, B Lewis1,2, R Teboh Forbang1,2, (1) Hackensack Meridian Health at Mountainside Medical Center, Montclair, NJ, (2) Hackensack Meridian Health at Hackensack University Medical Center, Hackensack, NJ

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

PO-GePV-M-80 DoseCHECK

Sun Nuclear DoseCHECK Vs Varian Mobius: Commissioning and Characterisation for Ethos Adaptive Independent Dose Calculations

R Brown1*, R Bromley1, C Stanton1, B Zwan2, J Booth1, A Briggs1, (1) Northern Sydney Cancer Centre, Royal North Shore Hospital, Sydney, AU, (2) Central Coast Cancer Centre, Gosford, AU

- "Purpose: **To evaluate the accuracy and performance of DoseCHECK and Mobius as independent plan verification software for the purpose of pre-treatment quality assurance of Varian Ethos adaptive plans**."
- "Methods: DoseCHECK and Mobius were commissioned in accordance with international best practice documents on treatment planning system (TPS) commissioning and quality assurance, including: AAPM TG53, TG119, MPPG5a and IAEA TECDOC1583. All plans were sent to DoseCHECK and Mobius for independent dose calculation, and compared to measurement on the treatment delivery system (TDS)…"
- "Conclusion: **DoseCHECK and Mobius were commissioned and found to be within tolerance of all tests recommended in international best-practice guidelines.** Both systems were used to independently verify plan dose calculation for pre-treatment QA of Ethos adaptive plans."

PO-GePV-T-365 DoseCHECK

Evaluation of Model-Based Dose Algorithms Using HU as a Density Surrogate for FFF-SBRT of Island Lung Lesions

B Bismack*, S Devpura, I Chetty, Henry Ford Health System, Detroit, MI

- "Purpose: To investigate dosimetric parameters of 4 algorithms for lung cancer patients treated with flattening filter free stereotactic body radiotherapy using HU as a surrogate for PTV density."

TH-F-TRACK 3-6 PerFRACTION

Investigation Into the Relationship Patient Setup Accuracy and In-Vivo Transit Dosimetry for Image-Guided Volumetrically Modulated Total Body Irradiation (TBI)

S Taneja*, J Teruel, M Malin, P Galavis, A Mccarthy, S Ayyalasomayajula, C Hitchen, N Gerber, Y Yuan, D Barbee, NYU Langone Medical Center, New York, NY

- "Methods: **A total of 192 fields were investigated**. Each VMAT plan consisted of four isocenters: head, chest, abdomen, and pelvis…**Transit dosimetry was measured per arc, and analyzed using SNC PerFRACTION [SunCHECK Patient] with a gamma criteria of 10%/5mm, 5%/5mm, and 5%/7mm.**
- "Results**: Transit dosimetry showed that the average pass rate across all fields was 99.6%, 97.0%, and 99.2% for 10%/5mm, 5%/5mm, and 5%/7mm gamma criteria, respectively."**
- "Conclusion: Transit dosimetry showed high pass rates using our couch residual tolerances, which confirmed the plan uncertainty analysis performed during treatment planning."