

PROGRAM

Virtual 8th MR in RT Symposium

April 19th -21st 2021
hosted by German Cancer Research Center
Heidelberg, Germany

www.dkfz.de/mrinrthd2021

HOST:
dkfz. GERMAN CANCER RESEARCH CENTER IN THE HELMHOLTZ ASSOCIATION
Research for a Life without Cancer

PARTNERS:
HIRO Heidelberg Institute for Radiation Oncology
HEIDELBERG UNIVERSITY HOSPITAL

Virtual 8th MR in RT Symposium 2021

April 19 -21 2020 German Cancer Research Center

Version: April 15th 2021

Mon. April 19, 2021	Main Stage	Poster sessions	Virtual Exhibitions	Industry
8:30 -9:00	**Welcome Lounge**			
9:00-9:25	**Welcome:** M. Ladd *Vice president DGMP*		**Further Recordings & Virtual e-Poster Exhibition**	**Virtual Industrial Exhibition**
	Opening: O. Jäkel, J. Debus			
9:30-9:55	**Keynote:** L. Henke – How we got to the SMART trial (20+ 5)			
	Chairs: O. Jäkel, J. Debus			
10:00-11:00	**S1: Clinical 1**	Poster Session 1: **Quality Assurance**		
	Chairs: S. Combs, H.-P. Schlemmer	**Chairs:** S. Dorsch, B. Raaymakers		
	S01.01: ID: 151: J. Debus: Challenges of Clinical Trials in MRinRT (12+3)	P01.01: ID 47: L. S. Stark: Development of a phantom for adaptive end-to-end testing in magnetic resonance guided radiotherapy		
	S01.02: ID 142: S. Corradini: Early clinical trial experience of online of adaptive MR-guided at LMU Munich (12+3)	P01.02: ID 66: K. I. Penev: Physiological targeting features of a 4D deformable tumor phantom for MR/CT IGRT QA		
	S01.03: ID 98: N. Tyagi: Ablative SBRT treatment of pancreas patients on Elekta Unity MR-Linac (8+2)	P01.03: ID 4: J. Wyatt: Using CBCT for Dosimetric Quality Assurance of MR-Only Radiotherapy		
	S01.04: ID 45: E.-M. Kretschmer: Same-day MRI-linac guided single fraction radiosurgery for painful non-spine bone metastases (8+2)	P01.04: ID 29: X. Miao: Patient-specific QA of geometric accuracy in MRI-based RT planning		
	Discussion	P01.05: ID 87: E. Hellwich: Quantification and reduction of susceptibility artefacts for a quality assurance phantom in MRgRT		
		Discussion		
11:00-11:30	**Coffee Break**			
11:30-12:25	**S2: MR Imaging in Radiotherapy 1**	Poster Session 2: **Dosimetry**	**Further Recordings & Virtual e-Poster Exhibition**	**Virtual Industrial Exhibition**
	Chairs: S. Nill, M. Ladd	**Chairs:** L. Burigo, C. Karger		
	S02.01: ID: 120 H.-P. Schlemmer: New developments in functional MRI (12+3)	P02.01: ID 103: M. Marot: Validation of charged particle transport algorithm in magnetic field in TOPAS Monte Carlo code		
	S02.02: ID 69: I. Sidibe: 3D MR spectroscopic imaging for differentiating progression from pseudoprogression in glioblastoma (8+2)	P02.02: ID 85: M. Schneider: Experimental determination of the EPOM for ionization chambers in a 1.5 T MR-Linac		

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	S02.03: ID 16: F. Raschke: Dose dependent cerebellar atrophy in glioma patients after radio(chemo)therapy (8+2)	P02.03: ID 27: T. Mertens: Beam model validation of the MRIdian® Linac with the THALES 3D MR SCANNER.		
	S02.04: ID 96: W. Bano: Joint radial trajectory correction for fast T2* mapping on an MR-Linac (8+2)	P02.04: ID 34: F. Jäger: A Monte Carlo study of proton dosimetry of Farmer-type ionization chambers in magnetic fields		
	Discussion	P02.05: ID 20: I. Bessieres: Non-isocentric positioning of the ArcCHECK system for Patient Specific QA on 0.35T MR-linac		
		Discussion		
12:30-13:25	**Lunch Break and Industrial Session 1**	**Lunch Break**		
	Moderation: O. Jäkel		**Further Recordings & Virtual e-Poster Exhibition**	**Virtual Industrial Exhibition**
	12:35 - 12:55: Sponsor: Elekta: K. Brown: Elekta Unity: Designed for now and the future			
	13:00 - 13:20: Sponsor: Philips: R. Hoogeveen & L. Warner: Leading MR-RT innovations for clinical practice			
13:30-14:25	**Young Investigator Session 2020**			
	Chair: G. Gillmann, N. Wahl			
	YI01.01: ID 19: S. Gantz: Experimental investigation of ghosting artefacts in in-beam MRI during proton pencil beam scanning (6+2)			
	YI01.02: ID 67: M. Rabe: Experimental validation of generating 4 Hz 4D-MRI from orthogonal cine-MRI on a 0.35 T MR scanner (6+2)			
	YI01.03: ID 82: S. Pojtinger: Influence of beam quality on magnetic field correction factors for ionization chambers in MRgRT (6+2)			
	YI01.04: ID 51: S. Schneider: Reduction of respiratory pancreas motion using an MRI and proton therapy compatible abdominal corset (6+2)			
	YI01.05: ID 30: T. Bruijnen: Free-breathing motion compensated 3D T2-weighted turbo spin-echo MRI for body imaging (6+2)			

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14:30-15:30	**S3: MR guided Particle Therapy 1**	Poster Session 3: **Clinical**	**Further Recordings & Virtual e-Poster Exhibition**	**Virtual Industrial Exhibition**
	Chairs: G. Landry, O. Jäkel	**Chairs:** J. Hörner-Rieber, S. Corradini		
	S03.01: ID: 116: K. Parodi: MRI-guided particle therapy: challenges and prospects (12+3)	P03.01: ID 8: F. Weykamp: MR-guided stereotactic body radiotherapy of liver tumors: Initial clinical experience		
	S03.02: ID: 126 E. Troost: MR-integrated proton therapy - yet another hype? (12+3)	P03.02: ID 9: S. Koerber: Stereotactic MRI-guided radiation therapy for Localized prostatE cancer – the SMILE protocol		
	S03.03: ID 46: L. Burigo: Proton IMPT planning in a 1 T perpendicular split-bore MRI system (8+2)	P03.03: ID 12: P. Hoegen: MR-guided adaptive stereotactic radiotherapy for hepatic metastases - the MAESTRO trial		
	S03.04: ID 3: G. Meschini: Time-resolved respiratory motion modeling for gated carbon ion radiotherapy of pancreatic cancer (8+2)	P03.04: ID 33: M. Felter: SABR for infra-diaphragmatic soft tissue metastases: SOFT, a phase 2 study		
	Discussion	P03.05: ID 97: E. Palmér: Synthetic CT for 2D and 3D patient positioning in head and neck radiotherapy		
		Discussion		
15:30-16:00	**Coffee Break**			
16:00-16:55	**Panel 1: How to generate Clinical Evidence?**		**Further Recordings & Virtual e-Poster Exhibition**	**Virtual Industrial Exhibition**
	Moderation: P. Parikh, J. Debus			
	Statement Speakers: C. Chung, V. Valentini, M. Philippens, M. Guckenberger, A. Tree			
17:00-17:55	**S4: MR guided Radiotherapy and Treatment Planning 1**	Poster Session 4: **MR Imaging in Radiotherapy**		
	Chairs: C. Thieke, J. Lagendijk	**Chairs:** J. M. Balter, T.Platt		
	S04.01: ID: 118: B. Raaymakers: Getting from on-line to real-time MRI guided adaptive radiotherapy (12+3)	P04.01: ID 84: A. Pakaeva: Measurement of B0 field variations with gantry position on an MR-linac system.		
	S04.02: ID 90: M. Lo Russo: 1.5 T MR-linac planning study to compare two different strategies of rectal boost irradiation (8+2)	P04.02: ID 57: E. Kaza: ACR phantom comparison of coil setups for head and neck radiation therapy MRI simulation.		
	S04.03: ID 55: P. Borman: MLC-tracking on the Elekta Unity MR-linac: first experimental validation for central lung SBRT (8+2)	P04.03: ID 5: J. Wyatt: Evaluating the image quality of PET-MR images acquired in the radiotherapy position		
	S04.04: ID 59: M. Terpstra: Real-time 3D motion estimation with deep learning for real-time adaptive MRI-guided radiotherapy (8+2)	P04.04: ID 41: D. Bird: Evidence of OAR dose reduction for anal and rectal cancer MR-only planning treatments		
	Discussion	P04.05: ID 88: S. Dorsch: Performance of deformable image registration for the integration of diagnostic MR images to treatment planning		
		Discussion		

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Mon. April 19, 2021	Main Stage	Meet & Greet		
18:00-18:50	**S5: Radiomics/Data Science**	Meet the hosts of the symposium (**Prof. Jäkel & Prof. Debus**) online from 6 – 6.50pm for further discussions in a live online meeting room on our platform.		
	Chairs: N. Dinapoli, K. Giske			
	S05.01: ID: 121: K. Maier-Hein: Deep learning in Medical Imaging (12+3)			
	S05.02: ID 43: R. Dal Bello: Investigation of delta radiomics during fractionated SBRT in patients treated for liver metastases (8+2)			
	S05.03: ID 38: C. Jamtheim Gustafsson: Deep learning based classification for standardization of prostate cancer RT structure annotations (8+2)			
	S05.04: ID 63: M. F. Spadea: Deep Convolutional Neural Network (DCNN) multiplane approach to pseudoCT generation from MR images (8+2)			
	Discussion			
19.00	**End**			
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Tue. April 20, 2021	Main Stage	Poster sessions	Virtual Exhibitions	Industry
8:30 -9:00	**Welcome Lounge**			
9:00-9:55	**S6: Functional Imaging**	Poster Session 5: **MR guided Radiotherapy and Treatment Planning**	**Further Recordings & Virtual e-Poster Exhibition**	**Virtual Industrial Exhibition**
	Chairs: T. Nyholm, M. Ladd	**Chairs:** L. Burigo, C. Kurz		
	S06.01: ID: 124: D. Thorwarth: Functional Imaging on MR-Linacs: Potential and limitations (12+3)	P05.01: ID 113: A. Sethi: Evaluation of Dosimetric Benefits of MR Guided Adaptive RT		
	S06.02: ID 107: R. Winter: R2* MRI based tumor control probability modelling for dose painting by contours in rectal cancer (8+2)	P05.02: ID 70: N. Tyagi: Interfraction motion assessment of upper GI organs during MR-guided ablative SBRT treatment		
	S06.03: ID 100: S. Böke: Serial DWI measurements in HNC treated on a 1.5T MR-Linac and benchmark against a 3T MR-scanner (8+2)	P05.03: ID 23: A. Dunlop: MRgRT workflow development and recommendations for H&N treatment using the Elekta Unity MR-linac		
	S06.04: ID 60: C. Beijst: MRI/PET for radiotherapy simulation: high-resolution pathophysiological guidance for small tumors (8+2)	P05.04: ID 102: P. Borman: Respiratory motion mitigation using visual biofeedback on the Unity MR-linac		
	Discussion	P05.05: ID 52: P. Kimstrand: Prototyping real-time adaptive treatments for IMRT/SBRT on the Elekta Unity MR-Linac		
		Discussion		
10:00-11:00	**S7: QA/QA and Workflow**	Poster Session 6: **Functional Imaging**		
	Chairs: M. Philippens, C. Karger	**Chairs:** C. Gillmann, D. Thorwarth		
	S07.01: D. Jaffray (12+3): Quality as an Innovation Enabler in RT	P06.01: ID 28: E. Kooreman: First T1ρ mapping results on a 1.5 T MR-linac		
	S07.02: ID: 128: S. Nill: Quality Assurance for online adaptive MRgRT (12+3)	P06.02: ID 21: D. Barten: Development of a 3D cine-MRI acquisition technique to quantify bowel motion in cancer patients		
	S07.03: ID 68: B. Pouymayou: Analysis of Spatial Integrity on a 0.35T MR-Linac: characterizing the influence of metallic implants (8+2)	P06.03: ID 36: F. Mayer: Accelerated non-Cartesian cine MRI reconstruction on CUDA capable architectures		
	S07.04: ID 42: M. Schneider: MATLAB-scripted QA workflows for MR in RT, via Access-i-based remote control on MAGNETOM MR scanners (8+2)	P06.04: ID 53: Y. Zhang: Development of a hierarchical model of abdominal configuration from golden angle radial MRI		
	Discussion	P06.05: ID 40: G. Ekchian: MRI-Measured Quantitative Oxygen Sensors		
		Discussion		
11:00-11:30	**Coffee Break**			

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11:30-12:25	**Young Investigator Session 2021**		**Further Recordings & Virtual e-Poster Exhibition**	**Virtual Industrial Exhibition**
	Chair: N. Wahl, C. Gillmann			
	YI02.01: ID 54: L. Bosma: Quantitative investigation of dose accumulation error from intra-fraction motion for prostate cancer (6+2)			
	YI02.02: ID 32: L. Dünger: Reduced white matter diffusion in glioblastoma patients after radiotherapy with photons and protons (6+2)			
	YI02.03: ID 31: H. Eijkelenkamp: Planning Target Volume margin assessment for online adaptive MR-guided boost in rectal cancer (6+2)			
	YI02.04: ID 65: A. Elter: Development of anthropomorphic phantom materials for end-to-end testing in MR-guided ion therapy (6+2)			
	YI02.05: ID 11: S. Gantz: Experimental investigation of a stopping proton beam in liquid water using MR imaging (6+2)			
	YI02.06: ID 35: -M. Groot Koerkamp: Bulk-density and deep learning synthetic CT for single-fraction neoadjuvant PBI on an MR-linac (6+2)			
12:30-12:55	**Highlight Talk:** ID: 146: N. Dinapoli: Machine Learning: What is achievable and what is the benefit for RO? (20+5)			
	Chairs: K. Giske, J. Hörner-Rieber			
13:00-13:55	**Lunch Break and Industrial Session 2**	**Lunch Break**		
	Moderation: S. Klüter		**Further Recordings & Virtual e-Poster Exhibition**	**Virtual Industrial Exhibition**
	13:05 - 13:25: Sponsor: RaySearch Laboratories: E. Traneus: MR based planning in RayStation			
	13:30 - 13:50: Sponsor: Siemens Healthineers: N. Mistry: Synthetic CT re-imagined – an AI-based approach for MR-only workflows in brain and pelvis			

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14:00-14:55	**S8: Dosimetry**	Poster Session 7: **MR guided Particle Therapy**	**Further Recordings & Virtual e-Poster Exhibition**	**Virtual Industrial Exhibition**
	Chairs: S. Klüter, L. de Prez	**Chairs:** N. Wahl, S. Nill		
	S08.01: ID: 145: J. de Pooter: Radiation dosimetry in magnetic fields: from reference fields towards small fields (12+3)	P07.01: ID 76: B. Gebauer: Determination of magnetic field correction factors for dosimetry in MR-integrated proton therapy		
	S08.02: ID 93: T. Tekin: Magnetic field correction factors of diode detectors and the role of enhanced density components (8+2)	P07.02: ID 92: G. G. Rincon: An extension of the analytical treatment planning system matRad for MR-guided proton therapy		
	S08.03: ID 108: I. Blum: Investigations of the role of chamber's construction towards the magnetic field correction factors (8+2)	P07.03: ID 104: C. Sepúlveda: Beam modeling of a proton pencil beam scanning beam line integrated with a low-field open MR scanner		
	S08.04: ID 99: N. Tyagi: Evaluation of irradiation geomtery and airgaps in the IROC QA mini-phantom for a 1.5T MRlinac system (8+2)	P07.04: ID 91: D. Pross: Fast Monte Carlo dose calculations in constant magnetic fields for MR-guided proton therapy		
	Discussion	Discussion		
15:00-15:55	**Panel 2: Directions for Functional Imaging**	**Meet & Greet:**		
	Moderation: U. van der Heide, D. Thorwarth	"Image-guided versus MR-only guided RT – workflows, challenges and pitfalls", organized by S. Stefanowicz and T. Jagt for young medical physicists and everyone who is interested!		
	Statement Speakers: D. Zips, P. Parikh, M. Intven, T. Nyholm, M. Ladd			
16:00-16:30	**Coffee Break**			
16:30-17:25	**S9: MR guided Radiotherapy and Treatment Planning 2**	Poster Session 8: **MCS, Data Modelling, Radiomics**	**Further Recordings & Virtual e-Poster Exhibition**	**Virtual Industrial Exhibition**
	Chairs: U. Oelfke, M. Alber	**Chairs:** G. Fallone, R. Floca		
	S09.01: ID: 127: J. Balter: Human modeling using MRI for RT (12+3)	P08.01: ID 105: S. Rahbek: Decomposition-based framework for prediction of radiotherapy response from longitudinal DW-MRI data		
	S09.02: ID 78: M. Boekhoff: Dosimetric evaluation of in-silico simulated MR-guided esophageal cancer radiotherapy (8+2)	P08.02: ID 48: T. Tekin: Influence of the magnetic field on the effective point of measurement of ionization chambers		
	S09.03: ID 83: B. Eiben: Respiratory motion models for the MR-Linac: how much data is required? (8+2)	P08.03: ID 25: D. Cusumano: Delta Radiomics analysis in pancreatic cancer patients treated using MR-guided Radiotherapy		
	S09.04: ID 109: F. Reinders: MR–guided elective neck irradiation targeting individual lymph nodes: a new concept (8+2)	P08.05: ID 81: G. Zhao: Segmentation-oriented Generative Adversarial Network for Synthetic-CT in MR-only Treatment Planning		
	Discussion	Discussion		

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17:30-18:30	**S10: Clinical 2**		**Further Recordings & Virtual e-Poster Exhibition**	**Virtual Industrial Exhibition**
	Chairs: D. Zips, J. Hörner-Rieber			
	S10.01: C. D. Fuller: Clinical experience with the MR Linac at MDA (12+3)			
	S10.02: ID: 117: B. Slotman: Five years of MRI guided adaptive radiotherapy (12+3)			
	S10.03: ID 64: J. van Timmeren: Adaptive radiotherapy for head-and-neck cancer – volume changes and migration of salivary glands (8+2)			
	S10.04: ID 1: S. Regnery: MAGELLAN: MR-guided adaptive stereotactic body radiotherapy for lung tumors in ultracentral location (8+2)			
	Discussion			
18.30	**End**			

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Wed. April 21, 2021	Main Stage	Virtual Exhibitions	Industry
8:30-9:00	**Welcome Lounge**		
9:00-9:55	**Debate Pro and Contra: The MR Linac will make X-Ray guided RT obsolete**	**Further Recordings & Virtual e-Poster Exhibition**	**Virtual Industrial Exhibition**
	Debate Speakers: J. Lagendijk vs. F. Lohr		
	Moderation: P. Keall, O. Jäkel		
10:00-10:55	**S11: MR Imaging in Radiotherapy 2**		
	Chairs: M. Intven, J. Seco		
	S11.01: ID: 115: U. van der Heide: MRI for personalized radiotherapy (12+3)		
	S11.02: ID 10: A. van Lier: Geometric MRI errors in prostate cancer patients with hip implants on a 1.5T MR-linac: hit or miss? (8+2)		
	S11.03: ID 110: T. Bruijnen: Parallel imaging stream for multi-purpose real-time adaptive MRI-guided prostate radiotherapy (8+2)		
	S11.04: ID 49: F. Tensaouti: Quality control of 3D MR spectroscopy imaging data in glioblastoma: can we do without the expert? (8+2)		
	S11.05: ID 14: L. Meijers: Online correction for geometric fidelity in MR-Linac treatments (8+2)		
	Discussion		
11:00-12:00	**Coffee Break & Industrial Session 3**	**Coffee Break**	
	Moderation: C. Gillmann	**Further Recordings & Virtual e-Poster Exhibition**	**Virtual Industrial Exhibition**
	11:05 - 11:25: Sponsor: TheraPanacea: A. Schulte: Get smarter - AI in Radiation Oncology		
	11:30 - 11:50: Sponsor: Qfix: MR image & Treat – Image & Treat on the Same Device		
12:00-12:25	**S12: MR guided Particle Therapy 2**		
	Chairs: O. Jäkel, E. Troost		
	S12.01: ID 152: J. Debus: The ARTEMIS Project Heidelberg (10+2)		
	S12.02: ID 24: E. Semioshkina: Magnetic shielding factor for artefact-free in-beam MR imaging during proton pencil beam irradiation (8+2)		
	Discussion		
12:30-13:25	**Panel 3: Which Technological Developments are needed?**		
	Moderation: G. Liney, O. Jäkel		
	Statement Speakers: J. Lagendijk, P. Keall, D. Jaffray, U. Oelfke, J. Debus		
13:30-13:45	**Closing:** O. Jäkel, J. Debus		
	Award Ceremony		
	Proposals and Voting next meetings and adjourn		
14:00	**End**		

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Further Recordings (max. 8 minutes)

The pre-recorded talks are available the whole time on our virtual platform 24/7.

Topic: MR Imaging in RT

RO2.01: ID 17: M. Lerner: MRI-only based treatment with a commercial deep-learning generation method for synthetic CT of brain

RO2.02: ID 72: S. Doussin: Movement Assessment of OAR and breast using free-breathing, self-gated 4D MRI

RO2.03 ID 101: F. Putz: 4D evaluation of Head and Neck tumors – new ways of tumor assessment and contouring

RO2.04: ID 39: D. Bird: MR and sCT reference images for CBCT verification within an anal and rectal cancer MR only workflow

Topic: MR guided RT & Treatment Planning

RO4.01: ID 114: G. Grimbergen: Tumor Motion Analysis of Pancreatic Cancer Patients During Ungated MRgRT with Abdominal Corset

RO4.02: ID 71: M. Chamberlain: Head and neck radiotherapy on the MR-Linac: a multicentre planning challenge on MRIdian-platform

RO4.03: ID 106: R. Goodburn: Ultrashort Echo-Time Trajectory Correction with a Gradient Impulse Response Function on an MR Linac

Topic: QA/ QA and Workflows

RO7.01: ID 22: L. Nierer: Use of treatment plan complexity analysis as a QA tool in MR-guided online adaptive radiotherapy

RO7.02: ID 58: S. Dorsch: Measurement of isocenter accuracy and image distortion in MRgRT

RO7.03: ID 89: E. Palmér: Treatment planning and quality control of an MRI only workflow for H&N patients using CNN based sCT

RO7.04: ID 26: E. Kaza: Multi-slice setup and automated data analysis for ViewRay MRIdian Linac receive coil QA

RO7.05: ID 2: R. Speight: IPEM Guidance on the use of MRI for external beam radiotherapy treatment planning

Topic: Dosimetry

RO8.01: ID 86: J. Begg: Magnetic field correction factors via a cross-calibration using a conventional linac

RO8.02: ID 111: I. Blum: Investigation of diode-type detectors under small field conditions in magnetic field

RO8.03: ID 94: M. F. Klavsen: Time-resolved dosimetry in MR-linac without image distortion

E-Posters

Topic: MR Imaging in Radiotherapy

EP04.01: ID 7: A. Simkó: MRI modality transfer using a generative adversarial network.

EP04.02: ID 73: M. Habatsch: Novel RT Planning Workflow for Breast MRI in Supine Setup

EP04.03: ID 80: M. Schneider: Evaluation of B0 Susceptibility-Induced Geometric Distortion at Low-Field-Strength for MR in RT

EP04.04: ID 95: S. Masitho: Dosimetric impact of MR-CT registration inaccuracies in MR-based radiotherapy for brain

Topic: MR guided Radiotherapy and Treatment Planning

EP05.01: ID 15: D. den Boer: Comparison of Library of Plans and MR-Linac strategies for whole bladder RT based on MR-Linac data

EP05.03: ID 62: J. Chick: Treatment of patients with artificial hips on the Elekta Unity MR-Linac

EP05.04: ID 44: B. George: Evidence of high-quality, accurate and deliverable MR-guided stereotactic ablative radiotherapy

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Sponsors:

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