DAVID H. THOMAS, Ph.D.

Current Position

Assistant Professor - Department of Radiation Oncology
University of Colorado School of Medicine

University of Colorado School of Medicine
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Aurora, CO, 80045
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Education

M.S. Physics (MPhys) (June 2004).
University of St Andrews,
St Andrews, Fife, Scotland, UK.

M.S. Electrical & Computer Engineering (May 2005)
Georgia Institute of Technology
Atlanta, Georgia

Ph.D., Medical Physics (September 2010)
University of Edinburgh,
Edinburgh, Midlothian, Scotland, UK

Post-doctoral Fellow (June 2012)
University of Edinburgh,
Edinburgh, Midlothian, Scotland, UK

Post-doctoral Fellow (June 2014)
University of California Los Angeles
Los Angeles, California.

Certificate of Medical Physics (June 2016)
University of California Los Angeles
Los Angeles, California.

Medical Physics Residency (June 2016)
University of California Los Angeles
Los Angeles, California.

Professional Experience

University of Colorado School of Medicine,
Department of Radiation Oncology, Aurora, CO
Assistant Professor, July 2016 – Present

Clinical Activities

Primary clinical activities: My primary clinical responsibilities include radiation treatment plan checks, patient specific quality assurance (QA), machine QA, patient treatment planning, patient dosimetry measurements, and general physics troubleshooting and support. support. I am the lead physicist for the Radiosurgery treatment machine, and I am responsible for all of the machine troubleshooting efforts and routine quality assurance (QA). I provide physics services for the SRS program and have designed patient treatment plans for over 30 SRS cases in the past 6 months. I provide physics services to the Rocky Mountain Gamma Knife center, and have been performing the machine daily and monthly QA, and covering and planning radiosurgery treatments. I have supported about 200 patients' SRS treatments in the past year. I provide Physics coverage for LDR Prostate seed cases, as well as providing physics coverage for the Tomotherapy machine at Loantree (2016-2020), including; onsite physics coverage including treatment planning and patient specific QA; monthly machine QA; troubleshooting and performing physics QA after service when required. I have been the lead physicist for past two major software upgrades to the departments Record and Verify (Aria) system. Overall, I spend 32 hours a week on direct patient care physics activities

Research and Scholarship

A common thread in my early research career was the development of new quantitative methods that combine theoretical analysis with experimental in-vitro and in-vivo data to help address fundamental questions across a number of fields, from physics to vascular biology. I have developed a multidisciplinary research portfolio that spans from in-vivo preclinical imaging to improving imaging of human breathing motion. My work has led to 44 peer-reviewed articles (20 in the past 5 years), over 50 conference presentations, and 8 international awards for research. My current research focus is designing innovative approaches to measuring radiation dose distribution in-vivo, and the implementation of advance computational methods and artificial intelligence to improve the quality and safety of Clinical Radiation Therapy.

Teaching Activities

Clinical Teaching: As part of the Medical Physics Residency Program I act as Deputy Residency Director. I am the primary mentor for the imaging and special procedures rotation. I developed and oversee monthly study and review sessions for the physics residents within the department, with a focus on ABR board preparations. I act as an 'adjuct' instructor for the UCLA CAMPEP Accredited Certificate Program in Medical Physics, teaching labs in two courses, and proctoring remote exams.

Lecture/Workshop: I teach three lectures per year to both physics and medical residents as part of the Physics Resident Education Curriculum.

Research Teaching: In the past four years I have mentored a postdoctoral fellow and four medical physics residents. In total, these fellows have published a peer-reviewed paper (Medical Physics), with three more in preparation, and presented 9 abstracts at national conference (AAPM).

Honors and Awards

July 2004	Bobby Jones Post-graduate Fellowship
July 2005	The Royal Society JM Lessells Scholarship.
July 2009	Student Paper Award IEEE Ultrasonics, Ferroelectrics, and Frequency Control Society.
Feb 2011	Young Investigators Technical Research Award 16th European Contrast Ultrasound Symposium

May 2013	Norm Baily Research Award, 1st Place, AAPM Southern California Chapter.
July 2013	Best-in-Physics Award, AAPM 55th Annual Meeting, First Author.
May 2014	Norm Baily Research Award, 1st Place, AAPM Southern California Chapter.
May 2014	UCLA Chancellor's Award for Postdoctoral Research, Nominee.
May 2015	Norm Baily Research Award, 1st Place, AAPM Southern California Chapter.
May 2016	Norm Baily Research Award, 1st Place, AAPM Southern California Chapter.

Professional Activities

2018 -	QI Committee	Department of Radiation Oncology
2020 -	Scientific Review Council	University of Colorado Cancer Center Protocol Review and Monitoring System

Intellectual Property and Patents

July 2017 **DH Thomas** & Moyed, M, "'Pseudo-4D' Localizer Radiographs: A Novel Imaging Technique for Evaluating the Motion at Simulation",U.S. Provisional application pending
February 2020, **DH Thomas**, "Methods and System for Reducing Potential for Errors in Patient Positioning by Automatic Positioning and Device Detection." US Provisional patent application 62/978,695.

Review Activities

Reviewer (*ad hoc*)	*Medical Physics*, *Physics in Medicine and Biology*, *Journal of Applied Clinical Medical Physics*
Scientific Reviewer	AAMP Annual Meeting, 2017 – 2020

Licensure and Board Certification

2017 Diplomat American Board of Radiology
Therapeutic Medical Physics

2018 Authorized Medical Physicist University of Colorado Hospital
Radioactive Materials License

2018 Authorized Medical Physicist Rocky Mountain Gamma Knife
Radioactive Materials License

Invited Presentations

2014 **David H. Thomas**, "A novel 4D CT acquisition and analysis technique".
Joint MGH / Brigham and Women's Hospital Physics Seminar. August 2014.

Teaching Record

University of Colorado School of Medicine:

1. Primary Mentor, Medical Physics Residency Program, Imaging and Special Procedures, 2018 – 2020
2. Primary Mentor, Medical Physics Residency Program, Special Research and Topics, 2020 –

3. Primary Mentor, Medical Physics Residency Program, ABR Boards Preparation Course, 2017 –
4. Secondary mentor, Medical Physics Residency Program, Workflow/Detectors, 2017 -
5. Secondary mentor, Medical Physics Residency Program, SRS/SBRT, 2017 -

Other:
2010 Lecturer, Postgraduate Medical Ultrasound course, Glasgow Caledonian University
2011 Lecturer, Biomedical Imaging M.S., University of Edinburgh, Scotland, U.K.

Book Chapters

2014 "Intra-fraction Motion in Radiation Oncology", Advances in Medical Physics:
David H. Thomas and Daniel A. Low. Medical Physics Publishing, ISBN: 9781930524637.

2016 "General Physics Principles in Brachytherapy",
Sang-June Park and **David H. Thomas,** Handbook of Image-Guided Brachytherapy, Springer-Nature Publishing, ISBN: 978-3-319-44825-1.

Grant Support

Agency: American Cancer Society	**Performance Dates:** 01/2018-01/2019
Title: *High Resolution X-Ray induced Acoustic Computed Tomography for in-vivo dosimetry and imaging applications.*	**Role: PI**

Agency: Colorado Clinical and Translational Sciences Institute	**Performance Dates:** 05/01/2018-04/30/2019
Title: *High Resolution X-Ray induced Acoustic Tomography for in-vivo dosimetry applications*	**Role: PI**

Agency: Cancer League of Colorado	**Performance Dates:** 07/01/2018-06/30/2019
Title: *X-Ray Acoustic Computed Tomography guided Adaptive Radiotherapy.*	**Role:** PI

Agency: Colorado Clinical and Translational Sciences Institute	**Performance Dates:** 05/01/2021-04/30/2022
Title: *Endoskeletal nanodrops for x-ray photoacoustic dosimetry*	**Role: Co-PI**

Clinical Trials and Protocols

Pilot Study of Dynamic Contrast Enhanced Computed Tomography (DCE-CT) Imaging for the assessment of radiation therapy outcome for liver cancer patients
Role: Co-PI.
Status: Opened 2019, currently accruing

Papers in Refereed Journals [44]

1. Butler MB, **Thomas DH**, Pye SD, Moran CM, McDicken WN, Sboros V. The acoustic response from individual attached and unattached rigid shelled microbubbles. *Applied Physics Letters.* 2008;93(22):223906.
2. **Thomas DH**, Butler M, Anderson T, et al. Single microbubble response using pulse sequences: initial results. *Ultrasound in Medicine and Biology.* 2009;35(1):112-119.
3. **Thomas DH**, Looney P, Steel R, et al. Acoustic detection of microbubble resonance. *Applied Physics Letters.* 2009;94(24):243902.
4. **Thomas DH**, Butler M, Dermitzakis A, Anderson T, McDicken W, Sboros V. The acoustic scatter from single bisphere microbubbles. *Ultrasound in Medicine and Biology.* 2010;36(11):1884-1892.
5. **Thomas DH**, Looney P, Butler M, et al. The fate of resonant and off-resonant microbubble signals in response to consecutive imaging pulses. Paper presented at: Ultrasonics Symposium (IUS), 2010 IEEE2010.
6. Butler MB, **Thomas DH**, Silva N, Pye SD, Sboros V. On the acoustic response of microbubbles in arteriole sized vessels. *Applied Physics Letters.* 2011;99(19):193702.
7. Sboros V, Averkiou M, Lampaskis M, et al. Imaging of the ovine corpus luteum microcirculation with contrast ultrasound. *Ultrasound in Medicine and Biology.* 2011;37(1):59-68.
8. **Thomas DH,** Butler M, Anderson T, et al. The "quasi-stable" lipid shelled microbubble in response to consecutive ultrasound pulses. *Applied Physics Letters.* 2012;101(7):071601.
9. Jani SS, Robinson CG, Dahlbom M, et al. A Comparison of Amplitude-Based and Phase-Based Positron Emission Tomography Gating Algorithms for Segmentation of Internal Target Volumes of Tumors Subject to Respiratory Motion. *International Journal of Radiation Oncology* Biology* Physics.* 2013;87(3):562-569.
10. Low DA, White BM, Lee PP, et al. A novel CT acquisition and analysis technique for breathing motion modeling. *Physics in Medicine & Biology.* 2013;58(11):L31.
11. **Thomas DH,** Butler M, Pelekasis N, Anderson T, Stride E, Sboros V. The acoustic signature of decaying resonant phospholipid microbubbles. *Physics in Medicine & Biology.* 2013;58(3):589.
12. **Thomas DH,** Lamb J, White B, et al. A Novel Fast Helical 4D-CT Acquisition Technique to Generate Low-Noise Sorting Artifact–Free Images at User-Selected Breathing Phases. *International Journal of Radiation Oncology* Biology* Physics.* 2014;89(1):191-198.
13. White BM, Santhanam A, **Thomas DH,** et al. Modeling and incorporating cardiac-induced lung tissue motion in a breathing motion model. *Medical physics.* 2014;41(4).
14. Dou TH, **Thomas DH**, O'Connell D, Bradley JD, Lamb JM, Low DA. Simulation of 4DCT tumor motion measurement errors. *Medical physics.* 2015;42(10):6084-6089.
15. Dou TH, **Thomas DH**, O'Connell DP, Lamb JM, Lee P, Low DA. A Method for Assessing Ground-Truth Accuracy of the 5DCT Technique. *International Journal of Radiation Oncology* Biology* Physics.* 2015;93(4):925-933.
16. Liu J, Zhang X, Zhang X, et al. 5D respiratory motion model based image reconstruction algorithm for 4D cone-beam computed tomography. *Inverse Problems.* 2015;31(11):115007.
17. O'Connell DP, **Thomas DH**, Dou TH, et al. Comparison of breathing gated CT images generated using a 5DCT technique and a commercial clinical protocol in a porcine model. *Medical physics.* 2015;42(7):4033-4042.
18. Ruan D, **Thomas DH,** Low DA. Objective function to obtain multiple representative waveforms for a novel helical CT scan protocol. *Medical Physics.* 2015;42(3):1164-1169.
19. Chow PE, **Thomas DH**, Agazaryan N, et al. Dosimetric effects of couch position variability on treatment plan quality with an MRI-guided Co-60 radiation therapy machine. *Medical physics.* 2016;43(8Part1):4514-4519.

20. Dou TH, Min Y, Neylon J, **Thomas DH,** Kupelian P, Santhanam AP. Fast simulated annealing and adaptive Monte Carlo sampling based parameter optimization for dense optical-flow deformable image registration of 4DCT lung anatomy. Paper presented at: Medical Imaging 2016: Image-Guided Procedures, Robotic Interventions, and Modeling2016.
21. Kamrava M, Agazaryan N, Cao M, et al. Assessment of Intrafraction Motion of the Vaginal Apex During Postoperative MRI-Guided Radiation Therapy. *International Journal of Radiation Oncology• Biology• Physics.* 2016;96(2):E302.
22. Nguyen D, **Thomas DH,** Cao M, O'Connor D, Lamb J, Sheng K. Computerized triplet beam orientation optimization for MRI-guided Co-60 radiotherapy. *Medical physics.* 2016;43(10):5667-5675.
23. O'Connell D, Shaverdian N, Kishan A, et al. Clinical Validation and Implementation of the 5DCT Technique for Breathing-Gated Image Generation for Lung Cancer Treatment Planning. *International Journal of Radiation Oncology• Biology• Physics.* 2016;96(2):E687.
24. **Thomas DH**, Ruan D, Williams P, et al. Is there an ideal set of prospective scan acquisition phases for fast-helical based 4D-CT? *Physics in Medicine & Biology.* 2016;61(23):N632.
25. Yang Y, Cao M, Sheng K, et al. Longitudinal diffusion MRI for treatment response assessment: Preliminary experience using an MRI-guided tri-cobalt 60 radiotherapy system. *Medical physics.* 2016;43(3):1369-1373.
26. Lamb J, Cao M, Kishan A, et al. Online Adaptive Radiation Therapy: Implementation of a New Process of Care. *Cureus.* 2017;9(8).
27. Lamb JM, Ginn JS, O'Connell DP, et al. Dosimetric validation of a magnetic resonance image gated radiotherapy system using a motion phantom and radiochromic film. *Journal of Applied Clinical Medical Physics.* 2017;18(3):163-169.
28. Low DA, Yang L, Chen J, et al. Analysis of motion blurring artifact in fast helical free-breathing thoracic CT scans. *Medical Physics.* 2017;44(4):1456-1461.
29. McClelland JR, Modat M, Arridge S, et al. A generalized framework unifying image registration and respiratory motion models and incorporating image reconstruction, for partial image data or full images. *Physics in Medicine & Biology.* 2017;62(11):4273.
30. O'Connell D, **Thomas DH**, Dou T, et al. Adaptive weighted median filtering for reduced blurring when fusing co-registered fast helical CT images. *Biomedical Physics & Engineering Express.* 2017;3(6):067002.
31. O'Connell D, Shaverdian N, Kishan A, et al. Comparison of lung tumor motion measured using a model-based 4DCT technique and a commercial protocol. *Practical Radiation Oncology.* 2017.
32. Sboros V, Butler M, Perperidis A, et al. Vessel Classification Using Ultrasound Contrast Imaging. *Ultrasound in Medicine and Biology.* 2017;43:S42.
33. Shaverdian N, Yang Y, Hu P, et al. Feasibility evaluation of diffusion-weighted imaging using an integrated MRI-radiotherapy system for response assessment to neoadjuvant therapy in rectal cancer. *The British journal of radiology.* 2017;90(1071):20160739.
34. Efthymiou K, Pelekasis N, Butler M, **Thomas DH**, Sboros V. The effect of resonance on transient microbubble acoustic response: Experimental observations and numerical simulations. *The Journal of the Acoustical Society of America.* 2018;143(3):1392-1406.
35. Ginn JS, O'Connell D, **Thomas DH**, Low DA, Lamb JM. Model-Interpolated Gating for Magnetic Resonance Image–Guided Radiation Therapy. *International Journal of Radiation Oncology* Biology* Physics.* 2018;102(4):885-894.
36. O'Connell D, **Thomas DH**, Lamb JM, et al. Dependence of subject-specific parameters for a fast helical CT respiratory motion model on breathing rate: an animal study. *Physics in Medicine & Biology.* 2018;63(4):04NT04.
37. O'Connell D, Ruan D, **Thomas DH**, et al. A prospective gating method to acquire a diverse set of free-breathing CT images for model-based 4DCT. *Physics in medicine and biology.* 2018.
38. **Thomas DH**, Santhanam A, Kishan AU, et al. Initial clinical observations of intra-and interfractional motion variation in MR-guided lung SBRT. *The British journal of radiology.* 2018;91(xxxx):20170522.

39. **Thomas DH**, Tan J, Neylon J, et al. Investigating the minimum scan parameters required to generate free-breathing motion artefact-free fast-helical CT. *The British journal of radiology.* 2018;91(1082):20170597.
40. O'Connell D, **Thomas DH**, Lewis JH, et al. Safety-oriented design of in-house software for new techniques: A case study using a model-based 4 DCT protocol. *Medical physics.* 2019;46(4):1523-1532.
41. Schubert LK, Hendrickson K, Miften M, et al. The current state of physics plan review training in medical physics residency programs in North America. *Practical radiation oncology.* 2019.
42. Forghani F, Mahl A, Patton TJ, et al. [**Thomas, DH** = senior author] Simulation of x-ray-induced acoustic imaging for absolute dosimetry: Accuracy of image reconstruction methods. *Medical Physics.* 2020;47(3):1280-1290.
43. **Thomas DH**, Miller B, Rabinovitch R, et al. Integration of automation into an existing clinical workflow to improve efficiency and reduce errors in the manual treatment planning process for total body irradiation (TBI). *Journal of Applied Clinical Medical Physics.* 2020.
44. **Thomas DH**, Schubert LK, Vinogradskiy Y, et al. Deep Learning approach for automatic detection and identification of patient positioning devices for radiation therapy. *Medical Physics.* 2020.

Conference Abstracts and Presentations [80]

1. **Thomas DH**, Butler M, Anderson T, McDicken W, Sboros V. P5B-10 Single Microbubble Acoustics with Signal Processing: Initial Experience with Amplitude Modulated Pulse Sequences. Paper presented at: Ultrasonics Symposium, 2007. IEEE2007.
2. Butler M, **Thomas DH**, Moran C, McDicken W, Sboros V, Pye S. Comparison of the acoustic response of attached and unattached BiSphere™ microbubbles. Paper presented at: Ultrasonics Symposium, 2008. IUS 2008. IEEE2008.
3. Looney P, **Thomas DH**, Steel R, Anderson T, Pelekasis N, Sboros V. A realistic model for ultrasound contrast microbubbles: initial results. Paper presented at: WIMRC Cavitation Forum2008.
4. Butler M, Dermitzakis A, **Thomas DH**, Pye SD, Sboros V. Survival of single microbubbles insonated in solution and in narrow tubes. Paper presented at: Ultrasonics Symposium (IUS), 2009 IEEE International2009.
5. Butler MB, Zhang A, **Thomas DH**, et al. 0363: Acoustic Investigation of Attached, Single Microbubbles. Ultrasound in Medicine & Biology. 2009;35(8):S50.
6. Looney P, **Thomas DH**, Steel R, Anderson T, Pelekasis N, Sboros V. A new theoretical model for cracked microbubbles. Paper presented at: Ultrasonics Symposium (IUS), 2009 IEEE International2009.
7. **Thomas DH**, Sboros V, Emmer M, Vos HJ, de Jong N. Optical observations of microbubble oscillation in small tubes. Paper presented at: Ultrasonics Symposium (IUS), 2009 IEEE International2009.
8. Butler MB, Dermitzakis A, **Thomas DH**, Looney P, Pye S, Sboros V. Single microbubble acoustics in small tubes. Paper presented at: Proc Int Conf Acoust2010.
9. **Thomas DH**, Looney P, Butler M, et al. The fate of resonant and off-resonant microbubble signals in response to consecutive imaging pulses. Paper presented at: Ultrasonics Symposium (IUS), 2010 IEEE2010.
10. **Thomas DH**, Butler M, Looney P, Pelekasis N, Sboros V. The effect of resonance on transient microbubble response; response; experimental and theoretical observations. Paper presented at: Ultrasonics Symposium (IUS), 2012 IEEE International2012.
11. Aliotta E, **Thomas DH**, Gaudio S, et al. TU-C-141-06: Improving Image Quality in 4D-CT Scans Using Deformable Registration and Selective Averaging. Medical Physics. 2013;40(6):434-435.
12. Gaudio S, **Thomas DH**, White B, et al. SU-E-J-138: Breathing Motion Model Comparison Inside and Outside the Lung. Medical Physics. 2013;40(6):182-182.

13. Jani S, Dahlbom M, White B, et al. SU-D-500-05: Comparison of Gating Algorithms in 4D-PET for Mobile Tumor Segmentation. Medical Physics. 2013;40(6):106-106.
14. Lamb J, Jani S, White B, et al. SU-E-J-82: Ground-Truth Tests of Deformable Image Registration Using Matched PET-CT Image Pairs. Medical Physics. 2013;40(6):169-169.
15. Low D, Lamb J, Lee P, **Thomas DH**, White B. OC-0058: A novel 4DCT technique for breathing motion modeling. Radiotherapy and Oncology. 2013;106:S22.
16. Low D, Lamb J, White B, et al. A New 4DCT Technique. International Journal of Radiation Oncology* Biology* Physics. 2013;87(2):S671-S672.
17. Low D, **Thomas DH**, White B, et al. SU-E-J-126: Development of a Prospective Gating Algorithm for a Novel 4DCT Technique: Retrospective Data Analysis. Medical Physics. 2013;40(6):179-179.
18. **Thomas DH**, White B, Gaudio S, et al. MO-F-WAB-07: A Novel 4D CT Acquisition and Analysis Technique to Account for the Effect of Cardiac Induced Lung Tissue Motion During Free Breathing. Medical Physics. 2013;40(6):411-411.
19. **Thomas DH**, White B, Gaudio S, et al. TU-G-141-01: **BEST IN PHYSICS (JOINT IMAGING-THERAPY)**-A Novel 4D CT Acquisition and Analysis Technique to Generate Low Noise Artifact-Free Images at User Selected Breathing Phases. Medical Physics. 2013;40(6):456-456.
20. **Thomas DH**, Sboros V, Emmer M, Vos H, De Jong N. Microbubble oscillations in capillary tubes. IEEE transactions on ultrasonics, ferroelectrics, and frequency control. 2013;60(1).
21. White B, **Thomas DH**, Lamb J, et al. WE-A-134-08: Modeling Cardiac Induced Lung Tissue Motion for a Quantitative Breathing Motion Model. Medical Physics. 2013;40(6):470-471.
22. Butler MB, Dermitzakis A, Looney P, **Thomas DH**, Pye SD, Sboros V. A setup for the assessment of the effect of tubular confinement on the acoustic response of microbubbles. Paper presented at: Engineering in Medicine and Biology Society (EMBC), 2014 36th Annual International Conference of the IEEE2014.
23. Dou T, **Thomas DH**, Lamb J, Low D. SU-EJ-25: Analysis of Commercial 4DCT Flaws and the Potential Benefits of a New Technique for Irregular Breathing Patients. Medical Physics. 2014;41(6):160-160.
24. Dou T, **Thomas DH**, Lamb J, Low D. SU-D-17A-05: A Method to Determine the Accuracy of a Proposed Breathing Motion Model-Based 4DCT Technique. Medical Physics. 2014;41(6):117-117.
25. Gao Y, **Thomas DH**, Low D, Gao H. SU-D-17A-03: 5D Respiratory Motion Model Based Iterative Reconstruction Method for 4D Cone-Beam CT. Medical Physics. 2014;41(6):117-117.
26. Low D, **Thomas DH**, Lamb J, et al. OC-0501: Comparison between existing and proposed 4DCT protocols. Radiotherapy and Oncology. 2014;111:S196-S197.
27. Perperidis A, **Thomas DH**, Averkiou M, et al. Automatic dissociation between microvasculature and larger vessels for ultrasound contrast imaging. Paper presented at: Engineering in Medicine and Biology Society (EMBC), 2014 36th Annual International Conference of the IEEE2014.
28. **Thomas DH**, Tan J, Neylon J, et al. TH-C-18A-11: Investigating the Minimum Scan Parameters Required to Generate Free-Breathing Fast-Helical CT Scans Without Motion-Artifacts. Medical Physics. 2014;41(6):559-559.
29. Dermitzakis A, Butler MB, **Thomas DH**, Sboros V. The polydisperse acoustic signature of rigid microbubbles. Paper presented at: Engineering in Medicine and Biology Society (EMBC), 2015 37th Annual International Conference of the IEEE2015.
30. Dou T, **Thomas DH**, O'Connell D, Lamb J, Low D. TH-CD-303-04: A Method for Assessing Ground-Truth Accuracy of a Motion Model Based 4DCT Technique. Medical physics. 2015;42(6):3729-3729.
31. Lamb J, Agazaryan N, Cao M, Low D, **Thomas DH**, Yang Y. SU-EJ-198: Out-Of-Field Dose and Surface Dose Measurements of MRI-Guided Cobalt-60 Radiotherapy. Medical physics. 2015;42(6):3310-3311.
32. Lamb J, Kamrava M, Agazaryan N, et al. SU-EJ-206: Adaptive Radiotherapy for Gynecological Malignancies with MRIGuided Cobolt-60 Radiotherapy. Medical physics. 2015;42(6):3312-3313.

33. Liu J, Gao Y, **Thomas DH**, et al. TH-CD-303-11: Simultaneous Reference-Image and Deformation-Field Reconstruction for 4DCBCT with Periodic and Non-Periodic Breathing Based On 5D Respiratory Motion Model. Medical physics. 2015;42(6):3731-3731.
34. O'Connell D, **Thomas DH**, Dou T, Lamb J, Yang L, Low D. SU-EJ-234: Application of a Breathing Motion Model to ViewRay Cine MR Images. Medical physics. 2015;42(6):3319-3319.
35. O'Connell D, **Thomas DH**, Dou T, Lamb J, Yang L, Low D. SU-C-BRA-05: Fast Generation of Respiratory Gated CT Images at User Selected Breathing Phases On a Graphics Processing Unit. Medical physics. 2015;42(6):3196-3196.
36. O'Connell D, **Thomas DH**, Kishan A, et al. Generation of Lung Tumor Internal Target Volumes (ITV) Using A Novel Breathing Gated Imaging and Analysis Technique. International Journal of Radiation Oncology• Biology• Physics. 2015;93(3):E610.
37. Ruan D, Dou T, **Thomas DH**, Low D. MO-FG-204-02: Reference Image Selection in the Presence of Multiple Scan Realizations. Medical physics. 2015;42(6):3569-3569.
38. Santhanam A, Seyfi B, **Thomas DH**, Ilegbusi O. TH-CD-303-01: On Characterizing 4D Lung Motion Using Coupled Multi-Physics Framework of Computational Fluid Dynamics, Linear Elasticity Estimation and 4D Lung Deformable Image Registration. Medical physics. 2015;42(6):3728-3728.
39. **Thomas DH**, O'Connell D, Lamb J, et al. SU-F-303-17: Real Time Dose Calculation of MRI Guided Co-60 Radiotherapy Treatments On Free Breathing Patients, Using a Motion Model and Fast Monte Carlo Dose Calculation. Medical physics. 2015;42(6):3541-3541.
40. Yang LL, Dou T, O'Connell D, et al. TU-F-CAMPUS-J-05: Quantitative Evaluation of the Relationship Between Tissue Velocity and Motion-Artifacts of Free-Breathing Low-Dose Fast-Helical CT Scans. Medical physics. 2015;42(6):3646-3646.
41. Yang LL, O'Connell D, Dou T, **Thomas DH**, Lamb J, Low DA. SU-EJ-156: Velocity-Based Reference Scan Selection for Motion-Model Error Reduction of 5DCT. Medical physics. 2015;42(6):3300-3300.
42. Yang Y, Low D, Cao M, et al. TH-CD-204-06: Diffusion MRI for Treatment Response Assessment of MRI-Guided Tri-Cobalt 60 Radiotherapy. Medical physics. 2015;42(6):3733-3733.
43. Chow P, **Thomas DH**, Agazaryan N, et al. SU-FJ-125: Effects of Couch Position Variability On Dosimetric Accuracy with An MRI-Guided Co-60 Radiation Therapy Machine. Medical Physics. 2016;43(6):3435-3436.
44. Dou TH, Min Y, Neylon J, **Thomas DH**, Kupelian P, Santhanam AP. Fast simulated annealing and adaptive Monte Carlo sampling based parameter optimization for dense optical-flow deformable image registration of 4DCT lung anatomy. Paper presented at: SPIE Medical Imaging2016.
45. Kamrava M, Agazaryan N, Cao M, et al. Assessment of Intrafraction Motion of the Vaginal Apex During Postoperative MRI-Guided Radiation Therapy. International Journal of Radiation Oncology• Biology• Physics. 2016;96(2):E302.
46. Lamb J, Ginn J, O'Connell D, et al. SU-F-J-151: Evaluation of a Magnetic Resonance Image Gated Radiotherapy System Using a Motion Phantom and Radiochromic Film. Medical physics. 2016;43(6):3442-3442.
47. Low D, **Thomas DH**, Dou T, Lee P, Lewis J, O'Connell D. PO-0880: Clinical implementation of 5DCT workflow. Radiotherapy and Oncology. 2016;119:S422.
48. Nguyen D, **Thomas DH**, Cao M, O'Connor D, Lamb J, Sheng K. TH-AB-BRA-02: Automated Triplet Beam Orientation Optimization for MRI-Guided Co-60 Radiotherapy. Medical Physics. 2016;43(6):3853-3854.
49. O'Connell D, **Thomas DH**, Dou T, et al. SU-D-202-06: Prospective Free-Breathing CT Scan Selection for 5DCT. Medical physics. 2016;43(6):3342-3342.

50. O'Connell D, Shaverdian N, Kishan A, et al. Clinical Validation and Implementation of the 5DCT Technique for Breathing-Gated Image Generation for Lung Cancer Treatment Planning. International journal of radiation oncology, biology, physics. 2016;96(2S):E687.
51. Rwigema J, **Thomas DH**, Cao M, Yoshizaki T, Chen A. Intrafraction Organ Motion Tracking With Real-Time MRI-Guided Radiation Therapy for Head and Neck Cancer. International Journal of Radiation Oncology• Biology• Physics. 2016;94(4):878.
52. **Thomas DH**, Kishan A, Santhanam A, et al. SU-G-BRA-04: Simulation of Errors in Maximal Intensity Projection (MIP)-Based Lung Tumor Internal Target Volumes (ITV) Using Real-Time 2D MRI and Deformable Image Registration Based Lung Tumor Tracking. Medical physics. 2016;43(6):3635-3636.
53. Yang L, O'Connell D, Lee P,…, **Thomas DH**, et al. SU-F-J-135: Tumor Displacement-Based Binning for Respiratory-Gated Time-Independent 5DCT Treatment Planning. Medical physics. 2016;43(6):3438-3438.
54. Yang Y, Cao M, Kamrava M, …,**Thomas DH**, et al. WE-FG-202-11: Longitudinal Diffusion MRI for Treatment Assessment of Sarcoma Patients with Pre-Operative Radiation Therapy. Medical physics. 2016;43(6):3829-3829.
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