

Susha Pillai, M.Sc, M.S, DABR

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EDUCATION

University of Missouri Columbia, MO • M.S in Nuclear Engineering (Medical Physics), 1999
Dissertation: Phoswich Detectors with DSP Analysis for Low Energy, Low Activity Photon measurements

M.G University Kerala, India • M.Sc. in Physics, 1996
Area of Research: Tunnel effect-Quantum Mechanics

PROFESSIONAL EXPERIENCE

Oregon Health & Science University Portland, OR (July 2009 - Present)

Senior Medical Physicist/Assistant Professor

- Extensive experience in treatment planning, patient specific QAs, Routine Linac QAs, Radiation Safety and Teaching in an academic hospital with daily patient load of 80-100 in the main center and 25-30 patients per day in the two satellite centers.
- The center utilizes the following:
 - Main center: One Varian Trilogy, One Novalix Tx, One Elekta Versa, one Tomotherapy HD,
 - Two Satellite Centers: One Elekta infinity with Agility MLC & One Elekta Synergy with Agility MLC.
 - GYN HDR with Varisource HDR and *BrachyVision*, Varian Medical Systems
 - LDR Prostate Seed Implants with *Variseed*, Varian Medical Systems
 - Hypermia Unit & INTRABEAM & MOBETRON IORT System
 - 3D, IMRT, and RapidArc VMAT planning with *Eclipse*, Varian Medical Systems
 - 3D & IMRT planning with Pinnacle System
 - IMRT and VMAT planning with MONACO TPS system
 - SRS and SBRT with *iPlan*, BrainLab
 - Eyeplaque
- Following software/tools were used to perform patient specific checks and measurements, such as IMRT QA, special dosimetry, and special medical physics consults.
 - *RadCalc*, Lifeline Software
 - *MapCheck*, Sun Nuclear
 - *OCTAVIUS-Seven29 array*, PTW
 - *Delta4- ScandiDos*
 - *IC Profiler* Sun Nuclear
 - Starcheck (maxi) 2D chamber Array PTW
 - *In-vivo* Dosimeter-TLDs, MOSFETs, OSLDs
 - MP3 water scanning system PTW, MEDPHYSTO software, LA48 Linear Chamber Array
 - ARAI & MOSAIQ R&V system
 - VELOCITY Deformable registration tool
- Clinical Responsibilities & Commissioning Experience includes,
 - Patient specific QA with *MapCHECK*, Sun Nuclear, Delta4 Scandidos, Octavius, Tomotherapy-Cheese phantom
 - Patient plan second checks with *Rad.Calc*, Lifeline Software
 - Measured electron block cutout factors
 - All of the machine quality assurance procedures for Varian Trilogy, Elekta Versa and Tomotherapy linear accelerator
 - Planning and radiation safety for prostate seed implants with I-125, *Variseed*, Varian Medical Systems
 - Weekly patient chart checks and chart completion procedures.
 - HDR treatment planning and treatment delivery
 - INTRABEAM treatment procedures
 - MOBETRON IORT treatment procedures
 - ABC Elekta device for Breath hold treatment delivery
 - *In-vivo* Dosimetry for different treatment sites including pacemaker using TLDs, MOSFETs & OSLDs.
 - Assume radiation safety responsibilities for the department including Staff training, initial & annual rad safety refresher, equipment inventory & radioactive material inventory.
 - Commissioning experience: Siemens Primus & Artiste, HDR- Varisource brachytherapy system, TBI, TSI, MOSFET, OSLD for MV & Low KV X-rays, ABC breath hold device, TMI Irradiation technique using Tomotherapy HD system, INTRABEAM system for Breast treatment, intraOp MOBETRON IORT system.
- Teaching Experience: “Radiation Therapy Physics “ to Medical Physics graduate students, Physics residents,

Radiation Oncology Residents and Radiationtherapy Technology Students

University of Nebraska Medical Center, Omaha, NE (July 2001- June 2009)

Medical Physicist/Assistant Professor (July 2005 – June 2009)

Interim Chief of Clinical Physics (May 2008 –Sept 2008)

Medical physics/Instructor (July 2001 – June 2005)

- Direct oversight of Medical Dosimetrists & Physicists
- 3D & IMRT using *Pinnacle*, ADAC 3D & IMRT treatment planning experience using Pinnacle, CORVUS treatment planning & Iplan/Brainlab TPS system
- Clinical duties includes:
 - Patient specific QA with *MapCHECK*, SunNuclear, IBA Matrix
 - Patient plan second checks with *Rad.Calc*, Lifeline & MU check Software
 - Electron cutout measurements Daily clinical routine includes chart check, weekly chart check, chart completion procedure, electron cutout measurements
 - All of the machine quality assurance procedures for Siemens-PRIMUS, ONCOR & ARTISTE , varian-600C & 2300CD.
 - LDR Brachytherapy Procedure for prostate seed implants, Eyeplaque procedures, Syed implants using Ir-192 ribbons, Intracavitary LDR brachytherapy using Cs-137, High Dose Rate Intracavitary Brachytherapy using Varisource and brachyvision TPS system
 - Teaching Experience: “Radiation Therapy Physics “ to Medical Physics Residents and Radiation therapy Technology Students
- Commissioning experience: TBI, TSI, MOSFET s, Commissioning Siemens-ARTISTE and Beam modelling for Pinnacle, Commissioning HDR Varisource for Mammosite treatments.

Honors and Awards

“2014 Outstanding Physics Teacher” award from Dept of radiation Oncology-Oregon health & Science University.

“2013 Outstanding Physics Teacher” award from Dept of radiation Oncology-Oregon health & Science University

Two time Silver-U award winner from the chancellor of the University of Nebraska Medical Center for the outstanding performance.

LICENSURE AND CERTIFICATIONS

The American Board of Radiology Tuscon, AZ • Therapeutic Medical Physics

2004 – Present

PROFESSIONAL SERVICE & MEMBERSHIPS

- AAPM Committee Membership: Member of Task Group 182 AAPM Recommendations on Electronic Brachytherapy Quality Management (2012 – present)
- Affiliate Adjuvant Faculty: OSU Oregon State University (2013 – present)
- ACR Accreditation Committee Member: Oregon Health & Science University, Portland, OR (2014-present)
- Medical Physics residency Committee, Oregon Health & Science University, Portland, OR (2014-present)

Posters AND Oral Presentations

“*Commissioning of OSLDs as an In-vivo Dosimeter in INTRABEAM Radiotherapy for Early Stage Breast Cancer.*” Susha Pillai, Richard Crilly, Wolfram Laub, Oregon Health & Science University, Portland, OR, Med.Physics 40, 209(2013) Poster Presentation at AAPM meeting, 2013.

“*Novel Secondary Quality Assurance Procedure for the INTRABEAM System Ion chamber using commercial OSLDs*” J Keller, W Laub and S.Pillai Oregon health & Science University, Portland, OR Med.Physics 40, 235 (2013) Poster Presentation at AAPM meeting, 2013.

“*Physics & Dosimetry of Intrabeam System: an Intraoperative Brachytherapy platform*” by Susha Pillai & Junan Zhang” Oral Presentation at Region I AAMD Northwest Chapter AAPM spring meeting March 2011.

“*Performance Comparison of In Vivo Dosimeters – TLDs, MOSFETs & OSLDs for Patients Receiving Total Body irradiation*” Susha Pillai, Wolfram Laub, Tony He, Oregon Health & Science University, Portland, OR, Poster Presentation at AAPM meeting, 2011.

"Evaluation of Eclipse AAA Dose Calculation Accuracy In The Presence of A Titanium Spinal Fixation Device" Toney He, Wolfram Lau, Susha Pillai, Oregon Health & Science University, Portland, OR, Poster Presentation at AAPM meeting, 2011.

"Benchmark measurements in heterogeneous phantoms under conditions of electronic disequilibrium " S Pillai, TD Solberg, PM Medin, IJ Chetty, University of Nebraska Medical Center, Omaha, NE. Poster Presentation at AAPM meeting, 2007.

"An evaluation on the influence of MU number and field length on MV-CBCT image quality on a Siemens Oncor linac machine" H Li, T Solberg, S Pillai, University of Nebraska Medical Center, Omaha, NE. Poster Presentation at AAPM meeting, 2007

"Analysis of Photon Beam Data from Multiple Institutions: An Argument for Reference Data", S Li, P.Medin,S.Pillai and T. Solberg, University of Nebraska Medical Center, Omaha, NE. Med.Phys 33, 1991 (2006) Poster Presentation at AAPM meeting, 2006.

"Frameless Radiosurgery Using Stereoscopic X-ray Guidance: System Characteristics and 2 Year Clinical Experience", J.Mullins, S.Li, S. Pillai, P.Medine and T.Solberg University of Nebraska Medical Center, Omaha, NE. Med.Phys 33, 2215 (2006) Poster Presentation at AAPM meeting, 2006.

"Comparison of IMRT plans with tissue heterogeneity corrections using the Pinnacle³ and CORVUS treatment planning systems." S. Pillai, K.M. Ayyangar, S.Li, R. Nehru, W.Zhen, C.Enke. Poster Presentation at AAPM meeting, 2005.

"Independent dosimetric validation of Novalis IMRT and Dynamic Conformal plans using PHILIPS Pinnacle³ Treatment Planning system." R. Nehru, R. Foster, P Sourivong, K. Ayyangar, S. Li, S. Pillai, D Djajaputra, A. Fung, R. Thompson, C. Enke. Poster Presentation at AAPM meeting, 2005.

"Development of 3D planning for obese patients larger than CT FOV using PHILIPS Pinnacle³ treatment planning system." R. Nehru, , M. Headley, K. Ayyangar, R. Thompson, S. Pillai, R. Natarajan, S. Li, C. Poster Presentation at AAPM meeting, 2005

"Target Localization of Intensity Modulated Radio-surgery Patients Using ExacTrac system" S Li, K Ayyangar, S Pillai, R Nehru, A Fung, D Djajaputra, R Thompson, N Raman, W Zhen, and C Enke, Med.Phys 32, 2045(2005).

"Comparison of NOMOS CORVUS and ADAC Pinnacle IMRT planar dose calculations with measurements using MapCheck"; K.Ayyangar, S.Li, R.Nehru, P.Sourivong, S.Pillai, A,Fung, N,Raman, K.Zhen, R.Thompson and C.Enke, Univ of Nebraska Medical Center, Omaha, NE; Medical Physics 2004, 31(6):1872. Poster Presentation at AAPM meeting, 2004.

"Prostate Motion and Isocenter Adjustment with BAT Ultrasound Localization", Int. J. of Radiation Oncology Biol. Phys. Vol 60 issue 1 Sept 2004 S615-S616. A. Fung, N. V. Raman, W. Zhen, R. B. Thompson, S. Li, R. M. Nehru, S. Pillai, K. M. Ayyangar, C. A. Enke, Radiation oncology, University of Nebraska Medical Center, Omaha,NE 46th Annual ASTRO Meeting.

"An Analysis of the Delivery of IMRT Segments Using the IMPAC Recorded Data"; K.M. Ayyangari, M. Yoe-Sein, S. Li, S. Pillai, V.S.Chivukula, C.B. Saw, W. Zhen, N. Raman, C. Enke, Univ Nebraska Medical Center, Omaha, NE; Medical Physics 2003, 30(6):1493.Poster Presentation at AAPM meeting, 2003

"Dose Linearity and Dose Uniformity of Sub-Fields for IMRT"; C. Saw*, S. Li, K. Ayyangar, M. Yoe-Sein, S. Pillai, W. Zhen, C. Enke, J. Celi ; Medical Physics 2003, 30(6):1492. Poster Presentation at AAPM meeting, 2003

"Comparison of a Complex Prostate Plan Using Three IMRT Planning Systems"; K. Ayyangar*, S. Li, C. Saw, M. Yoe-Sein, S. Pillai, V. Chivukula, C. Enke, Univ Nebraska Medical Center, Omaha, NE; Medical Physics 2003, 30(6):1487. Oral Presentation at Missouri River Valley Chapter-AAPM meeting, May 2003

"Emerging Role of Multi-Modality Fusion in Radiation Therapy" ; S.Pillai, M.S., K. Ayyangar, Ph.D., A. Fung, Ph.D., R. Nehru, Ph.D., M. Headley, B.S., Charles A. Enke, M.D., Raman Natarajan, M.D., Weining Zhen, M.D., Robert Thompson, M.D., Oral Presentation at Radiation Oncology Educational Event, District 7 Organization, NE.

Publications:

"Impact of irradiation and immunosuppressive agents on immune system homeostasis in rhesus macaques" Meyer C¹, Walker J², Dewane J¹, Engelmann F³, Laub W², Pillai S², Thomas CR Jr², Messaoudi I^{1,3}. Clin Exp Immunology 2015 Apr 22nd.

"Effects of Total Body Irradiation on T-cell and B-cell Subsets as well as macrophage in Rhesus Macaque" Int Journal of Radiation Oncology Biology Physics, Vol 84, Issue 3, Supplement , November 2012 Pages S684. ASTRO 54th meeting. J. Walker^{1,2}, C.R. Thomas², J. Dewane³, K. Habberthur³, S. Pillai², W. Laub², I. Messaoudi^{3,4}

"Experimental verification and clinical implementation of a commercial Monte Carlo electron beam dose calculation algorithm. Med. Phys. 35 (3) , March 2008 pp 1028-103 ¹Margarida Fragoso Ph.D, ¹Sushakumari Pillai, M.S, ²Timothy D. Solberg, Ph.D, ¹Indrin J. Chetty, Ph.D ¹ University of Nebraska Medical Center, Omaha, Nebraska ².UT Southwestern Medical Center, Dallas, Texas.

"Dose volume histogram comparison between ADAC Pinnacle and NOMOS Corvus system for IMRT" K.M Ayyangar, A.Y.C. Fung, S.Li, S.Pillai, M.M. Yoe-sein, W.Zhen and C.A .Enke, Australian Physical & Eng sciences in Medicine, V28, No1, 2005.

"Effects of field parameters on IMRT plan quality for gynecological cancer: A case study" Albert Y.C. Fung, Charles A Enke, Komanduri M Ayyangar, Robert B Thompson, Weining Zhen, Natarajan V Raman, David Djajaputra, Sicong Li, Ramasamy M Nehru, Sushakumari Pillai, Paul Sourivong, Mary Headley, Ann L Yager, Journal of Applied Clinical Physics 02/2005; 6(3); 46-62.

"Clinical Implementations of Intensity-modulated Radiation Therapy" C.B Saw Ph.D., K. Ayyangar, Ph.D., Weining Zhen, M.D., Maung Yoe-Sein, M.S., S. Pillai, M.S., and Charles A. Enke, M.D., Medical Dosimetry, Vol 27, No.2, pp 161-169, 2002.

"Graphical user Interface for Management of Advanced Radiotherapy delivery systems"; C.B.Saw, K.M. Ayyangar, W. Zhen, S. Pillai, M. Yoe-Sein, CA Enke, DJ Carlson, JC Celi; Electromedica 70, 2002, no.2 p 118-122.

"Verification of Lung Density Correction Algorithm used in a Commercial IMRT planning system" Medical Physics Journal, Sept 1998; T.K.M.Nair Ph.D, A.S Gray M.S, K.V. Boydston B.S Joe Arrington cancer center and Susha Pillai, University of Missouri, Columbia.

"Phoswich Detectors with DSP Analysis for Low Energy, Low Activity Photon measurements," Trans. Am. Nucl. Soc., 80, 64-65 (June, 1999); Pillai, S., J. Feng and W.H. Miller Ph.D.