

Iraj Abedi, PhD

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Chief Medical Physicist,
Department of Radiation Therapy, Isfahan Milad Hospital

Educational Summary

PhD (Medical Physics) 2012-2018	Isfahan University of Medical Sciences, Isfahan, Iran
M.Sc. (Medical Physics) 2008-2011	Isfahan University of Medical Sciences, Isfahan, Iran
B.Sc. (Radiology) 2004-2006	Tehran University of Medical Sciences, Tehran, Iran
Associate Degree (Radiology) 2002-2004	Isfahan University of Medical Sciences, Isfahan, Iran

Research Summary

PhD Thesis	Feasibility Study of Dose Painting by Contouring in Prostate Cancer, Using Multiparametric MRI
M.Sc. Thesis	Postmenopausal Dose in Bone Densitometry by DEXA and its Relation to Height, Weight and Body Mass Index

Journal Papers

- 2011** Salamat MR, Tavakkoli MB, Abedi I, "Postmenopausal Dose in Bone Densitometry by DEXA and its Relation to Height, Weight and Body Mass Index", Journal Isfahan Medical Science, 2011.
- 2012** Salamat,MR, Salamat AH, Abedi I, Relationship between body mass index and weight with bone mineral density in men using DEXA method.
- 2013** Salamat,MR, Salamat AH, Abedi I, Relationship between Weight, Body Mass Index, and Bone Mineral Density in Men Referred for Dual-Energy X-Ray Absorptiometry Scan in Isfahan, Iran. Journal of Osteoporosis, 2013.
- 2016** Nateghian Z, Abedi I, Dashti GR and Faraji R, Frontal Sinus Pattern and Evaluation of Right and Left Frontal Sinus Volume According to Gender, Using Multi Detector CT Scan, 2016.
- 2017** Abedi, I; Tavakkoli, MB; Rabbani M; Jabbari K; Sirous M; Yadegarfar Gh, Multiparametric Magnetic Resonance Imaging of Prostate Cancer: Association of Quantitative Magnetic Resonance Parameters with Histopathologic Findings. IJR, 2017.
- 2017** Abedi, I; Tavakkoli, MB; Rabbani M; Jabbari K, Amouheidari AR, Dosimetric and Radiobiological Evaluation of Multiparametric MRI-guided Dose Painting in radiotherapy of Prostate Cancer, Journal of Medical Signals & Sensors, 2017.
- 2017** Tavakkoli MB, Maleki M, Akhavan A, Amouheidari AR, and Abedi I, Comparison of different treatment plans in Hodgkin radiotherapy with neck and mediastinal involvement using POP Technique, Journal Isfahan Medical Science, 2017.
- 2017** Tavakkoli MB, Farhang Sh, Abedi I, Hippocampal Sparing in Radiation Therapy by Dose Painting in

- High-grade Glioma Tumors, Journal Isfahan Medical Science, 2017.
- 2017** M Tavakoli, I Abedi, K Jabbari, A Amouheidari, Dosimetric and Radiobiological Evaluation of Multiparametric Mri-guided Dose Painting in Radiotherapy of Prostate Cancer: su-i-gpd-t-363, Medical Physics, 2019.
- 2018** Tavakoli M. B., Maleki M. *, Akhavan A., Hadisinia T., Abedi I. Comparison and Evaluation of Different Treatment Plans with IFRT Field and 6 and 18 MV Energies in Hodgkin's Lymphoma Involvement Neck and Mediastinum, J Biomed Phys Eng, 2018.
- 2018** Karimi S, Amouheidari AR, Abedi I, Shokrani P, the effect of replacing the inner ear contour with cochlear contour on the cochlear dose-volume calculations in traditional 2D and 3D conformal brain radiation therapy, Journal Isfahan Medical Science, 2018.
- 2018** Shanei A, Jaafari A, Abedi I, Amouheidari AR, Dosimetric Comparison of Left Breast Cancer Radiation Therapy Using 3D conformal and Intensity-Modified Radiotherapy, Journal Isfahan Medical Science, 2018.
- 2018** Saadatmand P, Abedi I, Amouheidari AR, Shanei A, Evaluation of Radiobiological Effects of Dental Filing in Intensity Modulated Radiation Therapy in Patients with Nasopharyngeal Cancer, Journal Isfahan Medical Science, 2018.
- 2018** Abdemanfi M, Tavakkoli MB, Akhavan A, and Abedi I, Evaluation of pulmonary function modifications based on upper and lower doses of lung cancer in patients with breast cancer, Journal Isfahan Medical Science, 2018.
- 2018** Saadatmand P, Abedi I, Amouheidari AR, Shanei A, Evaluation of the Effect of Dental Filling Material on IMRT Treatment Planning in Patient with Nasopharyngeal Cancer, Iranian journal of Radiation Research, 2018.
- 2018** Shoa, P, Abedi I, Tavakkoli MB, Amouheidari AR, Jabbari K, Estimation of the Visual System Complication Probability on Children with Medulloblastoma after Craniospinal Irradiation with Three-Dimensional Conformal Radiotherapy, Iranian journal of Radiation Research, 2018.
- 2018** Comparison of dosimetric radiotherapy of whole left-breast cancer using conventional tangential wedge-based techniques (CTT) and three intensity modulation techniques (IMRT), Iranian Journal of Medical Physics, 2018.
- 2019** M Abdemanafi, MB Tavakoli, A Akhavan, I Abedi, Changes in lung volume parameters regarding the received dose in the lobes of the lungs after locoregional radiotherapy of breast cancer, Reports of Practical Oncology & Radiotherapy, 2019.
- 2019** P Saadatmand, A Amouheidari, A Shanei, I Abedi, Dose perturbation due to dental amalgam in the head and neck radiotherapy: A phantom study, Medical Dosimetry, 2019.
- 2019** Afkande R, Abedi I, Shanei A, Rabbani M, Shamsian S, Evaluation of the accuracy of magnetic susceptibility imaging in comparison with contrast enhancement MRI in detection of multiple sclerosis active plaques, Journal Isfahan Medical Science, 2019.
- 2019** Mazloomi F, Abedi I, Shanei A, Amouheidari AR, Application of dose gradient index in optimizing IMRT treatment planning in patients with optic nerve meningioma, Journal Isfahan Medical Science, 2019.
- 2019** Akbari M, Tavakoli MB, Abedi I, Izadpanahi MH, Khanbabapour, S, Evaluation of the correlation of Ki-67 in prostate cancer cells with diffusion imaging indices, Journal Isfahan Medical Science, 2019.
- 2019** Abdemanafi M, Tavakoli MB, Akhavan A, Abedi I, Evaluation of the Lung Dose in Three-dimensional Conformal Radiation Therapy of Left-Sided Breast Cancer: A Phantom Study, Journal of Medical Signals & Sensors, 2019.
- 2019** M Abdemanafi, MB Tavakoli, A Akhavan, I Abedi. Radiobiological comparison of 3D conformal and intensity modulated radiation therapy in the treatment of left-sided breast cancer, International Journal of Radiation Research, Volume 18, No 2.

- 2019** A Shanei, I Abedi, P Saadatmand, AR Amouheidari, H Akbari-Zadeh. Comparison of 3D conformal and intensity modulated radiotherapy in early stage oral tongue cancer: Dosimetric and radiobiological evaluation. *International Journal of Radiation Research* 18 (1), 33-42.
- 2020** S Elmtalab, I Abedi, M Choopan Dastjerdi, A Shanei. Evaluation of risk of secondary thyroid cancer caused by neutron dose equivalent from brain tumor 3D-conformal radiation therapy (3D-CRT). *Journal of Isfahan Medical School* 38 (586), 569-574.
- 2020** MR Choopani, I Abedi, M Mahmoodi, J Bagheri. Practical Approach to Reducing Patients' Radiation Dose in Multidetector Computed Tomography-128 Using Modification of Scan Parameters. *Journal of Isfahan Medical School* 38 (596), 769-775.
- 2021** A Kazemzadeh, I Abedi, A Amouheidari, A Shirvani. Dosimetric comparison of treatment of left breast cancer using two different dose schedules Dosimetric comparison of treatment of left breast cancer using two different dose schedules. *Tehran University Medical Journal TUMS Publications* 78 (9), 582-588.
- 2021** A Kazemzadeh, I Abedi, A Amouheidari, A Shirvani. A radiobiological comparison of hypo-fractionation versus conventional fractionation for breast cancer 3D-conformal radiation therapy. *Reports of practical Oncology and radiotherapy* 26 (1), 86-92.
- 2021** N Abdi, I Abedi, M Naserpour, M Rabbani. Evaluation of the accuracy of dynamic contrast enhanced MRI in the diagnosis of invasive prostate neoplasm using pathological findings. *Tehran University Medical Journal TUMS Publications* 79 (6), 418-424.
- 2021** I Abedi, N Abdi, M Rabbani. Optimal b-value in diffusion weighted imaging for detection active multiple sclerosis plaque, using contrast enhancement imaging. *Journal of Isfahan Medical School (IUMS)* 39 (609), 1-5.
- 2021** Samireh Badrigilan, Shahabedin Nabavi, Ahmad Ali Abin, Nima Rostampour, Iraj Abedi, Atefeh Shirvani, Mohsen Ebrahimi Moghaddam. Deep learning approaches for automated classification and segmentation of head and neck cancers and brain tumors in magnetic resonance images: a meta-analysis study. *International journal of computer assisted radiology and surgery* 16 (4), 529-542.
- 2021** Z Alirezaei, AR Amouheidari, I Abedi, F Davanian, P Shokrani. Optimization of CT slice thickness in 3D-CRT and IMRT planning of low grade glioma. *International Journal of Radiation Research* 19 (2), 291-298.
- 2021** S Elmtalab, I Abedi. Investigating the out-of-field doses and estimating the risk of secondary thyroid cancer in high-grade gliomas radiation therapy with modulated intensity and 3D-conformal: a phantom study. *International Journal of Radiation Research* 19 (3), 569-574.
- 2022** S Elmtalab, AH Karimi, FSK Mehr, H Zamani, I Abedi, F Pashaei. Estimating Radiotherapy-Induced Secondary Cancer Risk Arising from Brain Irradiation at High Energy: A Monte Carlo Study. *Frontiers in Biomedical Technologies* 9 (1).
- 2022** S Elmtalab, A Shanei, MH Choopan Dastjerdi, H Brkić, I Abedi. Determination of the Neutron Contamination During Brain Radiotherapy Using a Moderated-Boron Trifluoride Detector and the MCNP Monte Carlo Code. *Radiation Protection Dosimetry* 198 (3), 129-138.
- 2022** F Mazloomi, I Abedi, A Shanei, F Dalvand, A Amouheidari. Investigating the number of radiation fields in intensity-modulated radiotherapy plans of optic nerve sheath meningioma patients using dose gradient index. *Biomedical Physics & Engineering Express*.
- 2022** H Bagheri, MB Tavakoli, I Abedi, A Amouheidari. Evaluation and Comparison of Target and At-Risk Organ Dosimetry in Radiation Therapy of Prostate Cancer Patients Using Three-Dimensional Conformal Radiotherapy (3D-CRT) and Intensity-Modulated Radiation Therapy (IMRT). *Journal of Isfahan Medical School* 40 (664), 159-164.
- 2022** M Jalilian, I Abedi, M Sharifi. Evaluation of the relationship between axon injury and clinical symptoms in patients with multiple sclerosis using diffusion tensor MRI imaging. *Tehran University*

Medical Journal TUMS Publications 80 (2), 108-113.

- 2022 Z Papi, I Abedi, F Dalvand, AR Amouheidari. Classification and Staging of Brain Glioma Tumors Using Magnetic Resonance Imaging and Machine Learning Algorithms. Journal of Isfahan Medical School 40 (665), 188-193.
- 2022 Z Papi, I Abedi, F Dalvand, A Amouheidari. Automatic segmentation of glioma tumors from BraTS 2018 challenge dataset using a 2D U-Net network. Tehran University Medical Journal (TUMS) Publications 80 (4), 293-299.
- 2022 S Elmtalab, I Abedi, Z Alirezaei, MH Choopan Dastjerdi, G Geraily. Semi-experimental assessment of neutron equivalent dose and secondary cancer risk for off-field organs in glioma patients undergoing 18-MV radiotherapy. Plos one 17 (7), e0271028.
- 2022 MR Choopani, I Abedi, F Dalvand. Pragmatic approaches to reducing radiation dose in brain computed tomography scan using scan parameter modification. Journal of Medical Signals and Sensors 12 (3), 219-226.
- 2022 I Abedi, N Abdi, M Naserpour, M Rabbani. Evaluation and determination of the optimal b-value in diffusion weighted magnetic resonance imaging using 1.5 Tesla system in the diagnosis of prostate cancer. Razi Journal of Medical Sciences 29 (6).
- 2023 A Yousefi, S Ketabi, I Abedi. A novel mathematical model to generate semi-automated optimal IMRT treatment plan based on predicted 3D dose distribution and prescribed dose, Medical Physics, 2023.
- 2023 A Yousefi, S Ketabi, I Abedi. Novel Method for More Efficient Optimizing the Knowledge-Based Planning: Specific Voxels of each Structure Influenced by Dominant Beamlets (SVSIBD), Medical Physics (under review).
- 2023 Rezvan Afkandeh, Maziar Irannejad, Iraj Abedi and Masoud Rabbani. Automatic detection of active and inactive multiple sclerosis plaques using the Bayesian approach in susceptibility weighted imaging. Acta Radiologica, 2022.
- 2023 A Esmailzadeh, I Abedi, A Khorasani. Investigating variation of dose gradient index by different grid sizes in intensity-modulated radiation therapy of optic nerve sheath meningioma, Applied Radiation and Isotopes, 2023.
- 2023 Mohammad Reza Choopani, Iraj Abedi, Fatemeh Dalvand. Quality assessment of computed tomography images using a channelized hotelling observer: Optimization of protocols in clinical practice, Advanced Biomedical Research, 2023.

Clinical Lab Experience

Isfahan Milad Hospital 2011-2022	QA of Linac, 3D Treatment Planning, Chart checking, QA, IMRT, VMAT, SBRT
Isfahan Ashrafi Hospital 2009-2018	QA of MRI and CT scan, medical physicist

Books

March 2011	1500 Test for Medical Physics
Dec 2013	MRI Techniques for Radiology Students
Sep 2014	Principle of Radiation Therapy, Khan, 2014
Dec 2016	Principle of Computed Tomography, Searam

Awards

- Dec 2016* Best Student Book Award - Khan Radiotherapy Book
- July 2018* Top speaker at the 12th Iranian Congress of Medical Physic

Research Projects

- May 2012* Abedi I, Salamat MR, Relationship between body mass index and weight with bone mineral density in men using DEXA.
- May 2016* Nateghian Z, Abedi I, Dashti Gh, Evaluation of tympanic foramen using high-resolution computed tomography (HRCT) images.
- Feb 2017* Abedi I, Naserpour M, Abdi N, Determination of optimal b-value in MRI diffusion imaging using 1.5 Tesla system in the diagnosis of prostate cancer.
- Nov 2018* Abdemanfi M, Tavakkoli MB, and Abedi I, Evaluation of pulmonary function tests based on upper and lower doses of lung cancer patients using thermoluminescence dosimeter and treatment planning system.
- Nov 2018* Shoaie P, Tavakkoli MB, and Abedi I, Evaluation of received lens dose and estimation of cataract risk in radiation therapy of children with medulloblastoma using treatment planning system calculations and results from thermoluminescence dosimeter.
- July 2018* Saadatmand P, Shanei A, Abedi I, The effect of dental fillers on the design of IMRT treatment in radiation therapy of patients with nasopharyngeal carcinoma.
- July 2018* Abedi I, Jaafari A, Shanei A, Evaluation and comparison of the risk of pericarditis and pneumonia in three-dimensional comparative and severely modulated radiotherapy in patients with left breast cancer.
- May 2018* Akbari M, Tavakkoli MB, Abedi I, Izadpanahi MH, Evaluation of the correlation of Ki-67 in prostate cancer cells with MRI diffusion imaging indices.
- July 2018* Abedi I, Elm Talab S, Determination of equivalent dose of off-photon and neutron radiation in the treatment of high grade glioma tumors with IMRT.
- Dec 2018* Mazloomi F, Abedi I, Shanei A, Application of dose gradient index in optimizing IMRT treatment design in patients with optic nerve meningioma.
- Jun 2019* Abedi I, Akbarizadeh, H, Shanei A, Evaluation and Comparison of Dose Distribution and Side Effects in Three-Dimensional conformal and Intensity Modulated Radiation Therapy in Patients with tongue Cancer.
- Jun 2019* Abedi I, Afkande R, Shanei A, Rabbani M, Evaluation of the accuracy of magnetic susceptibility imaging method in comparison with contrast enhancement MRI in detection of multiple sclerosis active plaques.
- Jun 2019* Abedi I, Choopani M, Effect of Slice Thickness and Filtering on Creation of Minimum Dose Images and Standard Equivalent Quality Using BMMD-7 CT Phantom on 128- Multi-Slice CT Scan.
- Sep 2019* Evaluation of anatomical and morphological changes of brain glioma tumor using machine learning algorithms in magnetic resonance images, following 3D- conformal radiation therapy.

<i>Sep 2019</i>	Intelligent artificial neural network application in automatic detection of active multiple sclerosis plaque using susceptibility weighted imaging.
<i>Jun 2020</i>	Investigating and determining the stage and grade of benign and malignant brain tumors in MRI diffusion images using the gamma distribution model.
<i>Apr 2020</i>	Investigation of the effect of grid size dose calculation on the dose gradient index in the optimization of treatment planning in intensity modulated radiation therapy (IMRT) in patients with optic nerve sheath meningioma.
<i>Sep 2020</i>	Investigating the relationship between light Neurofilament serum levels and axonal damage in multiple sclerosis patients using diffusion tensor MRI imaging.
<i>Jul 2020</i>	Investigating and comparing the sensitivity and specificity of apparent diffusion coefficient maps in cardiac MRI diffusion imaging with T2 maps in the diagnosis of cardiac ischemia.
<i>Jun 2021</i>	Feasibility of using intelligent neural network in automatic treatment planning in intensity modulated radiation therapy in brain tumor patients.
<i>Jun 2021</i>	Quantitative study of brain glioma tumor changes following 3D- CRT method using diffusion weighted MRI.
<i>Agu 2021</i>	Synthesis of boron-containing organic-mineral hybrid system and investigation of its in vivo effects in melanoma cancer by BNCT method.
<i>Agu 2021</i>	Investigating the convolutional neural network approach in predicting tumor dose distribution and tissues at risk in Tomotherapy of prostate cancer patients.
<i>Sep 2021</i>	Examining the power of the deep neural network based on Attention, to predict the Tomotherapy dose distribution of prostate cancer patients.
<i>Nov 2021</i>	Investigating the diagnostic accuracy of the magnetic susceptibility imaging method compared to the MRI contrast enhancement imaging method in detecting active plaques in multiple sclerosis.
<i>Nov 2021</i>	Investigating the correlation of Ki-67 factor in prostate cancer cells with apparent diffusion coefficient index in multi b-value diffusion MRI imaging with 1.5 Tesla.
<i>Des 2021</i>	Investigating the equivalent dose of out-of-field neutrons in the eye lens and thyroid in radiotherapy of high-grade glioma tumors using a 3D-CRT method.
<i>Des 2021</i>	Investigating the dose gradient index in optimizing the different planning treatments intensity modulated radiation therapy (IMRT) in patients with optic nerve sheath meningioma.
<i>Des 2021</i>	Comparison between three-dimensional and intensity-modulated radiation therapy methods in the amount of dose reached to the lens and thyroid, caused by scattered photons during the treatment of high-grade glioma at different energies.
<i>Jua 2022</i>	Investigating the received dose and the risk of secondary cancer in the bladder and rectum in prostate radiation therapy with three-dimensional and intensity-modulated techniques.

<i>Jua 2022</i>	Evaluation and comparison of dose distribution and side effects in 3D-CRT method and intensity modulated in patients with tongue cancer.
<i>Feb 2022</i>	Designing a radiobiological model for predicting the damage of healthy brain tissue in radiotherapy of brain tumors based on image and molecular biomarkers.
<i>March 2022</i>	Modeling prediction of uncomplicated response to radiotherapy using quantitative features of magnetic resonance images in prostate cancer patients.
<i>March 2022</i>	Feasibility of implementing "dose painting" in radiosurgery technique of brain metastases using the multi-parametering MRI images and strong optimization.
<i>Apr 2022</i>	Investigating and determining the received dose by the bowel volume (bowel bag) in prostate radiotherapy with 3D-CRT and Tomotherapy methods.
<i>Apr 2022</i>	Calculation and comparison of the received dose by lower jaw in head and neck cancer with three methods of intensity modulated radiation therapy (IMRT), three-dimensional conformal radiation therapy (3D-CRT) and helical Tomotherapy (HT).
<i>July 2022</i>	Calculation and comparison of the received dose by parotid gland in head and neck radiotherapy in three methods of intensity modulated radiation therapy (IMRT), three-dimensional conformal radiation therapy (3D-CRT) and helical Tomotherapy (HT).
<i>Agu 2022</i>	Investigating the boron-containing compound in the treatment of breast cancer by BNCT method.
<i>Sep 2022</i>	Determining the synergistic effect of electron beam radiation in the presence of iron oxide nanoparticles attached to the chemotherapy drug cisplatin on melanoma cells.
<i>Sep 2022</i>	Investigating the effect of radiation therapy in the presence of iron oxide nanoparticles bound with chemotherapy drug cisplatin on melanoma cells.
<i>Sep 2022</i>	Evaluating the efficiency of electron beams and ultrasound waves in the presence of cisplatin attached to iron oxide magnetic nanoparticles (B16F10) on melanoma cell line.

Congress

Dec 2004	Iranian Paramedical Students Congress, Tehran, Iran
Sep 2013	Advanced radiation protection, Practical Course, Tehran, Iran
Apr 2015	Small Field Dosimetry Workshop, Isfahan, Iran
Dec 2016	2nd Asia-Pacific Osteoporosis Meeting, Sydney, Australia
Apr 2017	Advanced Radiation Therapy, Workshop, Tehran, Iran
Dec 2017	Quality control of imaging devices, Practical Course, Tehran, Iran
Sep 2017	AAPM 59th Annual Meeting & Exhibition - Meeting Program
June 2018	12th Iranian Congress of Medical Physic
Sep 2018	National Congress of Ion Therapy, Workshop, Tehran, Iran

Apr 2019	Export Network in Head and Neck Cancer: Focus on IMRT/VMAT rules, policies, and techniques. From theoretical to daily routine practice, Tehran-Iran. Erfan Niayesh Hospital
Oct 2021	Image Guided and Adaptive Radiotherapy, Workshop by ESTRO.
March 2022	Radiotherapy for Physicists, 'Clinical Observation Program', offered by Acibadem Mehmet Ali Aydinlar University in Istanbul, Turkey, between March 25 and April 1, 2022.

Teaching Experience

<i>2016-currently</i>	Instructor, " Dosimetry in Radiology", Isfahan University of Medical Sciences
<i>2014-currently</i>	Instructor, " MRI techniques, Isfahan University of Medical Sciences
<i>2016-currently</i>	Instructor, " Physics of Computed Tomography ", Isfahan University of Medical Sciences
<i>2016-currently</i> <i>2012-2014</i>	Instructor, " CT scan Techniques ", Isfahan University of Medical Sciences
<i>2016-currently</i>	Instructor, " Physics of Ultrasound ", Isfahan University of Medical Sciences
<i>2017-currently</i>	Instructor, " Protection against ionization radiation ", Isfahan University of Medical Sciences
<i>2019-currently</i>	Instructor, " Physics of Radiotherapy ", Isfahan University of Medical Sciences
<i>2014-2016</i>	Instructor, " MRI Imaging Hospital Training, Isfahan University of Medical Sciences
<i>2019-currently</i>	Instructor, " Dosimetry in Medical Physics", Isfahan University of Medical Sciences
<i>2019-currently</i>	Instructor, " Physics of Advanced Radiotherapy ", Isfahan University of Medical Sciences