

## **Nahid Chegeni**

Associate Professor  
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**Date of Birth:** 24th March, 1977.

### **Education:**

2009-2013 PhD, Medical Physics, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran, Concentrations: Medical Physics, Radiation therapy

1999-2002 MSc , Medical Physics, Iran Medical Science University, Tehran, Iran

1995-1999 BSc ,Applied Physics in Solid State, University of Isfahan, Isfahan, Iran

1991-1995 Mathematics and Physics Diploma, Maktab-al-Zahra High School

### **Executive History:**

- 20 July 2020 until now, Head of Medical Physics Department
- 12 July 2016 to 20 July 2020, Deputy Head of Medical Physics Department

### **Research Interests:**

My current research center around the field of Radiotherapy (dosimetry, and Monte Carlo simulation)

## **Employment:**

**Jul 2013 Until now Assistant professor, Ahvaz Jundishapur Medical Science University, Ahvaz, Iran.** (I teach physics in medicine and supervise PhD and MSc students in Medical Physics in the field of radiation therapy, Film dosimetry, and Monte Carlo simulation with MCNPX and Geant4.)

**Jan 2009- May 2013 Ph.D student, Jundishapur Medical Science University, Ahvaz, Iran.** (I taught physics in medicine and verified simulation code for Varian Linac 6 and 18MV)

## **Research Experience**

### **Current M.Sc. thesis supervised**

1. Comparison of hypofraction radiotherapy with conventional radiotherapy in breast cancer based on radiobiological modeling of TCP and NTCP (Feb 2021)
2. Evaluation of the bystander effect of mir-31 mediated MCF-7 cell on MDA-MB-231 breast cancer cell (Jun 2021)

### **M.Sc. thesis supervised**

1. Evaluation of scatter factors for small photon field using EBT2 Gafchromic film. Fariba Einy (Dec 2015)
2. Evaluation electron contamination in photon therapy using BEAMnrc, Seyed Khadijeh Hoseini (Sep 2016)
3. Electron contamination effect on photon dose distribution in treatment planning for cancerous patients; Farzaneh Mirkhaghani (Dec 2016)
4. Simulation of the photoneutron production for BNCT using LINAC, Saleh Boveyri (Jan 2017).
5. Determining the Effect of Source Surface Distance Variations on Percentage Depth Dose in Isocentric Radiation Therapy with 6MV Photons; Ali Zergan, (March 2017).
6. Study of the grid design effects on therapeutic ratio for Cancer cells in fractionated radiotherapy; Farshid Mahmoudi(Sep 2017).
7. Developing the dose distribution by combination of photon beams using weighting factors in radiation therapy for cancerous patients, Maryam Hazbavi (Oct 2018).
8. Determination of therapeutic standard field including the movement of the jaws of medical megavoltage accelerator in cancer patients; Raziye Fayazi Borojeni (Oct 2018)
9. Evaluation of neutron contamination for 18 MV photon beam in Spatially Fractionated Radiation therapy (SFR) technique; Amir Hossein Karimi (2018).
10. Evaluation of dose distribution variations in radiotherapy treatment planning due to factors affecting image quality; Elahe Soroshfard (2020).
11. Evaluating the absorbed doses of the pelvic in multiple imaging conditions common in trauma patients in diagnostic radiology using whole body phantom (2020).

## **Current Ph.D. thesis supervised**

### **Ph.D. thesis supervised**

1. Developing an Algorithm for Extracting CT Images from MRI; Fariba Farhadi Birgani (Sep 2018)
2. Comparative analysis of cisplatin-resistance pattern in resistant and sensitive ovarian carcinoma cell lines exposing to microwave electromagnetic field; Mansour Tayebi Khorami (Feb 2016).
3. Investigation of biophysical effects of the low LET radiation on DNA in presence of Gold nanoparticles using Geant4-DNA toolkit; Ebrahim Kohkan (2017)

### **M.Sc. thesis advised**

1. The combination of physical wedge for formation an arbitrary wedge field in radiation therapy of cancerous patients with megavoltage photons, Azin Shamsi (Jun 2015)
2. Optimization of dose distribution by suitable energy determination during electron therapy of surface tumors using Field-in-Field technique, Hamideh Naderi (May 2015)
3. A novel method for determination of phantom scatter factor ( $S_p$ ) of megavoltage photon beam in treatment of cancer tissues; Marziyeh Bagheri ( March 2017 )
4. Evaluation of variance reduction techniques in BEAMnrc code using Varian2100CD linear medical accelerator simulation (Nov 2021)

### **Ph.D. thesis advised**

1. Optimization of the miniature X-ray tubes using Monte Carlo simulation MCNPX code for electronic brachytherapy; Barat Barati (March 2017)
2. Evaluation of intravoxel incoherent motion diffusion imaging in prostate cancer detection; Abbas Rezaian (Oct 2017)
3. Analytical determination of charged particle's range and dose distributions in a water phantom with the presence of magnetic field; Marziyeh Tahmasebi (Oct 2017)
4. Modelling responses to spatially fractionated radiation therapy (GRID therapy) for melanoma cancer using CT scan images and considering bystander effect; Farshid Mahmoudi (Sep 2021)

### **Research Projects**

5. Determination of the effective atomic and mass numbers for biomedical and compounds materials in high energy photon interaction (U-90264)

6. Determination of mercury attenuation coefficient for mercury shielding system design for dose modulation at under shield treatment volume in Megavoltage photon beams (U-90298)
7. Design, construction, optimization and localization two functional system of Wi-Fi antenna - incubator to simulate the destructive effects of Wi-Fi on cells ( U-96090)
8. Investigating the influence of radiation therapy on breast cancer cell line MDA-MB-231, before and after knocking-out PI3KCA gene, using CRISPR technique( U-97047)
9. Investigating the effect of different CT image reconstruction kernels on Hounsfield Unit and dose distributions in treatment planning of breast ( U-97216)

### **Papers Published in International Journals:**

1. MJT Birgani, F Seif, N **Chegeni**, MR Bayatiani, Determination of the effective atomic and mass numbers for mixture and compound materials in high energy photon interactions, Journal of Radioanalytical and Nuclear Chemistry, 2012, 292 (3), 1367-1370
2. MJT Birgani, N **Chegeni**, M Zabihzadeh, N Hamzian, An analytical method to calculate equivalent fields to irregular symmetric and asymmetric photon fields, Medical Dosimetry, 2014, 39 (1), 54-59
3. MJT Birgani, N **Chegeni**, S Arvandi, SR Ghalaee, M Zabihzadeh, Analytical approach for determining beam profiles in water phantom of symmetric and asymmetric fields of wedged, blocked, and open photon beams, Journal of applied clinical medical physics, 2013, 14 (6), 1-13
4. MJT Birgani, N **Chegeni**, MA Behrooz, M Bagheri, A Danyaei, A Shamsi, An analytical method to calculate phantom scatter factor for photon beam accelerators, Electronic physician, 2017, 9 (1), 3523
5. N **Chegeni**, SB Pur, S Razmjoo, SK Hoseini, Optimization of the photoneutron target geometry for e-accelerator based BNCT. Electronic physician, 2017, 9 (6), 4590
6. MJ Tahmasebibirgani, R Maskani, MA Behrooz, M Zabihzadeh, H Shahbazian, J Fatahiasl, N **Chegeni**, Simulation of therapeutic electron beam tracking through a non-uniform magnetic field using finite element method, Electronic physician, 2017, 9 (4), 4171
7. B Barati, M Zabihzadeh, MJ Tahmasebi Birgani, N **Chegeni**, Assessment of two hemispherical and hemispherical-conical miniature sources used in electronic brachytherapy using Monte Carlo Simulation. Electron Physician 9 (2), 3845-3856
8. B Barati, M Zabihzadeh, MJ Tahmasebi Birgani, N **Chegeni**, J Fatahiasl, Evaluation of the Effect of Source Geometry on the Output of Miniature X-ray Tube for Electronic Brachytherapy through Simulation, J Biomed Phys Eng. 2018 Mar 1;8(1):29-42.

9. MJT Birgani, N **Chegeni**, M Zabihzadeh, M Tahmasbi, Analytical investigation of magnetic field effects on Proton lateral deflection and penetrating depth in the water phantom: A relativistic approach, *Electronic physician*, 2017, 9 (11), 5932
10. N **Chegeni**, AH Karimi, I Jabbari, S Arvandi , Photoneutron Dose Estimation in GRID Therapy Using an Anthropomorphic Phantom: A Monte Carlo Study, *Journal of medical signals and sensors* 2018, 8 (3), 175-183
11. Tahmasebi Birgani M. J., **Chegeni**, N., Farhadi Birgani F.\*, Fatehi D., Akbarizadeh Gh., Shams, A. Optimization of Brain Tumor MR Image Classification Accuracy Using Optimal Threshold, PCA and Training ANFIS with Different Repetitions, *J Biomed Phys Eng*, 2019,9(2) 189-198.
12. M J Tahmasebi Birgani, N **Chegeni**, M Tahmasbi, R Fayazi Borojeni\*, Jr FatahiAsl, M A Behrouz, Calculation of Equivalent Square Fields in Radiation Therapy by an Improved Vadash Correction Factor for Collimator Exchange Effects, *Asian Pacific Journal of Cancer Prevention*, 2018;19(11):3053-3057
13. N **Chegeni**, M J Tahmasebi Birgani, F Farhadi Birgani\*, D Fatehi, G Akbarizadeh, M Tahmasebi, Introduction of a simple algorithm to create synthetic-CT of the head from MRI, *Journal of medical signals and sensors* 2019; 9(2), 123-129
14. Tahmasebi Birgani M. J., **Chegeni** N., Tahmasebi m. , Hazbavi M. \*, Hoseini S. M. Calculating Weighting Factors for Mixing Megavoltage Photon Beams to Achieve Desirable Dose Distribution in Radiotherapy, *J Biomed Phys Eng*, 2019; 9(3), 279-284.
15. A Rezaeian\*, M J Tahmasebi Birgani, N **Chegeni**, M Sarkarian, M Gh Hanafi, Gh Akbarizadeh; Signal Intensity of High B-value Diffusion-weighted Imaging for the Detection of Prostate Cancer 2019; 9(4), 453-458
16. Karimi AH, **Chegeni** N, Jabbari I, Hassanvand M. The Effect of Neutron Contamination on Probability of Secondary Cancer in Radiotherapy of Pelvic Region with 18-MV Photons. *J Isfahan Med Sch* 2019; 37(519): 222-7
17. **Chegeni** N, Hosseini SK, Shahbazian H, Hassanvand M\*. Evaluation of the Electron Contamination in Photon Therapy Using BEAMnrc Code. *J Isfahan Med Sch* 2019; 37(535): 839-44.
18. Kouhkan E, **Chegeni** N, Hussain A. The effect of nucleus size on the cell dose in targeted radionuclide therapy – A Monte Carlo study. *J Med Signals Sens* 2020; 10:113-8.
19. N. **Chegeni**, E. Kouhkan, A. Hussain, M. Hassanvand; The effect of the nucleus random location on the cellular S-values – Based on Geant4-DNA, *Applied Radiation and Isotopes* 168 (2021) 109427

20. M Saeedi-Moghadam, M Tayebi, N **Chegeni**, S Sina, T Kolayi; Efficiency of non-lead and lead thyroid shields in radiation protection of CT examinations, *Radiation Physics and Chemistr*, Volume 180, March 2021
21. F Mahmoudi, D Shahbazi-Gahrouei, N **Chegeni**. The role of the spatially fractionated radiation therapy in the management of advanced bulky tumors, *Polish Journal of Medical Physics and Engineering*, 27(2) 2021, 123-135
22. A. Peiro, A. Danyaei, N. **Chegeni\***, M. Tahmasbi, J. Fatahiasl, Evaluation of entrance surface dose and scattered dose to the pelvis for common radiological examinations in analog and digital radiography: A phantom study, *Int. J. Radiat. Res.*, October 2021; 19(4): 937-945
23. F Mahmoudi, N **Chegeni**, A Bagheri, J Fatahi Asl, M Taghi Batiar, Impact of radiobiological models on the calculation of the therapeutic parameters of Grid therapy for breast cancer, *Applied Radiation and Isotopes* 174 (2021)
24. Tayebi-khorami M, **Chegeni** N, Tahmasbi-Birgani M, Daniyaei A, Fardid R, J Zafari, Enhancement of Cisplatin Sensitivity by Microwave Radiation in Ovarian Cancer Cells, *Pharmaceutical Sciences*, 2022, 28(2)
25. Tayebi-khorami M, **Chegeni** N, Tahmasbi-Birgani M, Daniyaei A, Fardid R, Zafari J. Construction a CO2 incubator for cell culture with capability of transmitting microwave radiation. *J Med Sign Sens* 2022;12:127-32.

### **Papers Published in National Journals**

1. A.A. Sharafi, A.R. Nikoufar, R. Mahdavi, N. **Chegeni**, "Surveying the Contralateral Breast Dose during the Primary Breast Irradiation of Mastectomized Patients in Three Hospitals in Tehran", *Iranian university of Medical science Magazin*, 2005 (46) 323-330
2. M. J., Tahmasebi Biragani, N. **Chegeni**, M. Zabihzadeh, S. Razmjoo, F. Seif, "Analytical approach for determining isodose 2D in water phantom regular and irregular fileds in radiation therapy", *Jentashapir Journal*, 2013(3), 203-215
3. M. J., Tahmasebi Biragani, F. Seif, M. R., Bayatiani, N. **Chegeni**, D. Khezerloo, M. Zabihzadeh, M. Hosseini, "Determination of Mercury Attenuation Coefficient for Mercury Shielding for Radiotherapy Patients", *Jundishapur Scientific Medical Journal*, 2013(3) 269-278
4. Tahmasebi Birgani M J, Naderi H, Zabihzaheh M, **Chegeni** N, Shahbazian H, Maskani R, Tabari Juybari R. Optimization of Percentage Depth dose by Combination of Electron Beams with Different Energies and Different Contribution. *Jundishapur Sci Med J* 2015;14(5):571-380.

5. **Chegeni** N, Tahmasebi Birgani MJ, Hosseini SM, Einy F, Atarod M, Asgarian Dehkordy Z, Emami H. Measurement of Collimator Scatter Factor for Photon Fields Using Gafchromic EBT2 Film and ion Chamber. Jundishapur Sci Med J 2015;14(6):641-652.
6. N **Chegeni**, Kh Hosseini, H Shahbazian, et. al. "Validation of the Linac Varian Simulated using BEAMnrc Code for 6MV Photon Energy, Jundishapur Sci Med J 2016;15(5):551-561.
7. N **Chegeni**, F Mirkhaghani, Kh Hosseini, S Razmjou-Ghalaei, R Maskani, M Talaii Gomari; "Electrons Contamination Effect on the Photon dose Distribution in the Planning Treatment for Cancerous Patients" Jundishapur Sci Med J 2017;16(1):65-79.
8. M J Tahmasebi Biragani, N **Chegeni**, M A Behrooz, M Zabihzadeh, A Habibi "Determination of the Collimator Scatter Factor by the Correction Sterling Formula for Asymmetrical Field Radiation Therapy with Megavoltage Photon beam" Jundishapur Sci Med J 2017;16(1):45-52.
9. Nahid **Chegeni**, Saleh Boveiry Pour, Sasan Razmjou-Ghalaei, Foad GoliAhmadabadi "Effect of the Incident Photon Energy and the Thickness of the tungsten Target on the Efficiency of Photoneutron Production for the Treatment of Cancer Patients" Jundishapur Sci Med J 2016;15(6):677-684
10. N **Chegeni**, M J Tahmasebi Birgani, M Tahmasbi, A Zargani, H Shabaziyan, Sh Arvandi "Determining the Effect of Source Surface Distance Variations on Percentage Depth Dose in Isocentric Radiation Therapy with 6MV Photons" Jundishapur Sci Med J 2017;16(3):317-326.
11. M J Tahmasebi Birgani, N **Chegeni**, M Tahmasbi, M Zabihzadeh "Effect of Magnetic Fields on Dose Distribution and Range of Photon Beams and Charged Particles in Radiation Therapy" JundishapurSci Med J 2017;16 (4):467-481.
12. Barati B, Kaydani M, Tahmasbi Birgani MJ, **Chegeni** N, Zabihzadeh M, Farhadi Birgani F, Omidi R. Evaluation of TG-43U1 in Miniature X-ray Tubes Used in Electronic Brachytherapy by Monte Carlo Simulation. Jundishapur Sci Med J 2020; 19(5):483-499
13. Tayebi-khorami M, **Chegeni** N, Tahmasbi-Birgani M, Daniyaei A, Fardid R, .Combination effect of microwave and cisplatin drug on ovarian carcinoma. Journal of Science and Engineering Elites, 5(3), 2021,
14. N **Chegeni**, F Rahim, M Tahmasbi, Z Farzanegan, S Kh Hosseini, Measurement and Calculation of Electron Contamination for Radiotherapy Photon Mode, Jundishapur J Health Sci. 2021 January; 13(1)

### **Papers Published in National Conference Proceedings**

### **Papers Published in International Conference Proceedings**

1. Chegeni, N., Tahmasebi Birgani, M.J, "Equivalent Field Calculation to irregular Symmetric and Asymmetric photon Fields", in oral and technical presentation, recognition and appreciation of research contributions to ICMRPR: International Conference on Medical Physics, Radiation Protection and Radiobiology, September, 19-20, 2013.
2. Chegeni, N., Tahmasebi Birgani, M.J, "Profile Calculation in Water Phantom of Symmetric and Asymmetric Photon Beam", in oral and technical presentation, recognition and appreciation of research contributions to ICMRPR: International Conference on Medical Physics, Radiation Protection and Radiobiology, September, 19-20, 2013.

## **Skills**

General skills in research project management and data analysis. Specific expertise and interests in:

### **Computing Skills:**

- Master MATLAB Programming.
- Dominate the simulation Code MCNPX and partially code Geant4
- Applications: Microsoft Office Suite, Internet Explorer, Endnote, and several e-mail packages.
- Operating Systems: Windows Vista, Windows XP

### **Specialized Skills:**

- Working with LINAC (Varian 2100C/D and Siemens PRIMUS Plus)
- Dosimetry of LINAC
- Skill in performing Treatment Planning
- Skill in cutting shield

### **Teaching Skills:**

- Postgraduate Demonstrator. Regularly supervise practical for undergraduate students.
- Non-operating Defense Concepts Workshop (Sep 2018-Feb 2019)

### **Other skills**

- Knowledge of research methodologies
- Statistical software.
- Data and information collection
- Writing and presenting reports



- Full driving license

## **Interests**

I am interest to Monte Carlo simulation specially Geant4- DNAtoolkit. And I also enjoy swim and was a member of the Jundishapur University swim team. In the tenth student Olympiad in Iran (Jul 2011), in 100m backstroke women, I was the tenth.

## **REFEREES**

### **Professor M.J. Tahmasebi Birgani**

Department of Radiation Oncology, Golestan Hospital, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran

## **Conferences, Presentations and Courses Attended**

- The 6<sup>th</sup> Iranian Congress of Medical Physics, Mashhad – Iran, 2004
- The 9<sup>th</sup> Iranian Congress of Medical Physics, Tehran – Iran, 2010
- 1st MEFOMP International of Medical Physics – SHIRAZ, November, 2-4, 2011
- ICMPPRR: International Conference on Medical Physics, Radiation Protection and Radiobiology, September, 19-20, 2013.

## **Awards, Fellowships, and Grants**

- Professor Parsaei Award (2013)

## **Professional Memberships**

- A member of the Iranian Association of Medical Physics