Rebecca M. Howell, PhD, DABR, FAAPM
Associate Professor Radiation Physics
Director, Late Effects Research Group
Director, Radiation Dosimetry Services
The University of Texas MD Anderson Cancer Center

Biography: Rebecca M. Howell, PhD, is a tenured Associate Professor at The University of Texas MD Anderson Cancer Center and a Fellow of the American Association of Physicists in Medicine (AAPM). She received her MS (2001) and PhD (2005) from the University of Texas Health Science Center San Antonio. Dr. Howell is certified by the American Board of Radiology and has over 15 years of clinical experience. She has published 60 peer-reviewed papers and is/has been Principal and Co-investigator on several extramurally funded research grants and service agreements. Her research focuses on out-of-field dose and late effects of radiation therapy. She is recognized for her expertise in neutron dosimetry for both photon and proton therapy. She is Director of the Late Effects group at MD Anderson, which does retrospective dose reconstructions for numerous late effects studies for several large national and international cohorts including Childhood Cancer Survivor Study, St. Jude Life, Adult Life after Childhood Cancer in Scandinavia, and the Late Effects of Childhood Cancer task force of the Dutch Childhood Oncology Group. Dr. Howell was member of AAPM Task Group 158, which recently published (08/2017) "Measurement and calculation of doses outside the treated volume from external-beam radiation therapy"; as a member of TG-158, Dr. Howell provided expertise on secondary neutrons in photon and proton radiation therapy. Dr. Howell is also the Director of the Radiation Dosimetry Service, which provides independent peer review of beam output for over 2000 institutions in the United States and 150 institutions in other countries.

Presentation Title: Secondary Neutrons from Proton Radiation Therapy

Selected Publications on Secondary Neutrons and Late Effects of Radiotherapy

1. Howell RM, Ferenci MS, Hertel NE, Fullerton GD. Investigation of secondary neutron dose for 18 MV dynamic MLC IMRT delivery. Med Phys 32(3):786-93, 2005. PMID: 15839351.
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3. Howell RM, Hertel NE, Wang Z, Hutchinson J, Fullerton GD. Calculation of effective dose from measurements of secondary neutron spectra and scattered photon dose from dynamic MLC IMRT for 6 MV, 15 MV, and 18 MV beam energies. Med Phys 33(2):360-8, 2006. PMID: 16532941.
4. Kry SF, Howell RM, Titt U, Salehpour M, Mohan R, Vassiliev ON. Energy spectra, sources, and shielding considerations for neutrons generated by a flattening filter-free clinac. Med Phys 35(5):1906-11, 2008. PMID: 18561666.
5. Howell RM, Kry SF, Burgett E, Followill D, Hertel NE. Effects of tertiary MLC configuration on secondary neutron spectra from 18-MV x-ray beams for the Varian 21EX linear accelerator. Med Phys 36(9):4039-4046, 2009. PMCID: PMC2738743.
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11. Howell RM, Burgett EA, Wiegel B, Hertel NE. Calibration of a Bonner sphere extension (BSE) for high-energy neutron spectrometry. Rad Meas 45:1233-1237, 2010.
12. Howell RM, Scarboro SB, Taddei PJ, Krishnan S, Kry SF, Newhauser WD. Methodology for determining doses to in-field, out-of-field and partially in-field organs for late effects studies in photon radiotherapy. Phys Med Biol 55(23):7009-23, 2010. PMCID: PMC3001332.
13. Taddei PJ, Howell RM, Krishnan S, Scarboro SB, Mirkovic D, Newhauser WD. Risk of second malignant neoplasm following proton versus intensity-modulated photon radiotherapies for hepatocellular carcinoma. Phys Med Biol 55(23):7055-65, 2010. PMCID: PMC3001302.
14. Howell RM, Giebeler A, Koontz-Raisig W, Mahajan A, Etzel CJ, D'Amelio AM, Homann KL, Newhauser WD. Comparison of therapeutic dosimetric data from passively scattered proton and photon craniospinal irradiations for medulloblastoma. Radiat Oncol 7:116, 2012. e-Pub 7/2012. PMCID: PMC3430590.
15. Rechner LA, Howell RM, Zhang R, Etzel C, Lee AK, Newhauser WD. Risk of radiogenic second cancers following volumetric modulated arc therapy and proton arc therapy for prostate cancer. Phys Med Biol 57(21):7117-32, 11/2012. e-Pub 10/2012. PMID: 23051714.
16. Giebeler A, Newhauser WD, Amos RA, Mahajan A, Homann K, Howell RM. Standardized treatment planning methodology for passively scattered proton craniospinal irradiation. Radiat Oncol 8:32, 2013. e-Pub 2/2013. PMCID: PMC3606426.
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18. Zhang R, Howell R, Homann K, Giebeler A, Taddei P, Mahajan A, Newhauser W. Predicted risks of radiogenic cardiac toxicity in two pediatric patients undergoing photon or proton radiotherapy. Radiat Oncol 8(1):184, 7/2013.
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20. Zhang R, Howell RM, Taddei PJ, Giebeler A, Mahajan A, Newhauser WD. A comparative study on the risks of radiogenic second cancers and cardiac mortality in a set of pediatric medulloblastoma patients treated with photon or proton craniospinal irradiation. Radiother Oncol 113(1):84-8, 10/2014. e-Pub 8/2014. PMCID: PMC4256116.
21. Howell RM, Burgett EA, Isaacs D, Price Hedrick SG, Reilly MP, Rankine LJ, Grantham KK, Perkins S, Klein EE. Measured Neutron Spectra and Dose Equivalents From a Mevion Single-Room, Passively Scattered Proton System Used for Craniospinal Irradiation. Int J Radiat Oncol Biol Phys 95(1):249-57, 5/2016. e-Pub 12/2015. PMID: 27084645.
22. Turcotte LM, Liu Q, Yasui Y, Arnold MA, Hammond S, Howell RM, Smith SA, Weathers RE, Henderson TO, Gibson TM, Leisenring W, Armstrong GT, Robison LL, Neglia JP. Temporal Trends in Treatment and Subsequent Neoplasm Risk Among 5-Year Survivors of Childhood Cancer, 1970-2015. JAMA 317(8):814-824, 2/2017. PMID: 28245323.
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25. Kry SF, Bednarz B, Howell RM, Daur L, Followill D, Klein E, Paganetti H, Wong B, Wuu CS, Xu GX. AAPM TG 158: Measurement and calculation of doses outside the treated volume from external-beam radiation therapy. Med Phys Accepted Author Manuscript. doi:10.1002/mp.12462