



Karl Kenneth Bush

Clinical Associate Professor, Radiation Oncology - Radiation Physics

CONTACT INFORMATION

- **Administrative Contact**

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Bio

ACADEMIC APPOINTMENTS

- Clinical Associate Professor, Radiation Oncology - Radiation Physics

ADMINISTRATIVE APPOINTMENTS

- Physics Co-Chair, New Technologies Committee, Stanford University, (2013- present)
- Co-Chair, Stanford/Varian Executive Steering Committee, Stanford University, (2013- present)
- Co-Chair, Radiation Oncology Quality and Safety, Stanford University, (2012- present)
- Director, Oncology Information Systems, Department of Radiation Oncology, Stanford University, (2013- present)

HONORS AND AWARDS

- Post-Doctoral Fellowship, BCCA Center for Innovative Technology (2009)
- 1st Prize Winner - Scientific Poster Symposium, Canadian Organization of Medical Physicists (2005)
- 1st Prize Winner – Young Investigator Symposium Award, Western Canada Physics Annual Conference - Wescan (2008)
- 1st Prize Winner – J.R. Cunningham Young Investigator Symposium Award, Canadian Organization of Medical Physics (2008)
- Harold F. Batho Prize, BC Cancer Agency Annual Academic Symposium (2012)

BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Member, American Association of Physicists in Medicine (2011 - present)
- Member, Canadian Organization of Medical Physicists (2005 - present)
- Member, American Society for Radiation Oncology (2013 - present)

PROFESSIONAL EDUCATION

- Board Certification, Canadian College of Physicists in Medicine , Therapeutic Medical Physics (2013)
- Residency, BC Cancer Agency (CAMPEP Accredited) , Medical Physics (2012)
- PhD, University of Victoria (CAMPEP Accredited) , Medical Physics (2009)
- MSc, University of Victoria (CAMPEP Accredited) , Medical Physics (2006)

Research & Scholarship

CLINICAL TRIALS

- Exploratory Evaluation of AR-42 Histone Deacetylase Inhibitor in the Treatment of Vestibular Schwannoma and Meningioma, Not Recruiting

Publications

PUBLICATIONS

- **Impact of Audio-Visual Assisted Therapeutic Ambience in Radiotherapy (AVATAR) on Anesthesia Use, Payer Charges, and Treatment Time in Pediatric Patients.** *Practical radiation oncology*
Balazy, K. E., Gutkin, P. M., Skinner, L., von Eyben, R., Fowler, T., Pinkham, D. W., Rodriguez, S., Maxim, P. G., Donaldson, S. S., Loo, B. W., Bush, K., Hiniker, S. M.
2020
- **Cost Analysis of Audiovisual-Assisted Therapeutic Ambience in Radiation Therapy (AVATAR) Aided Omission of Anesthesia in Radiation for Pediatric Malignancies.** *Practical radiation oncology*
McClelland, S., Overton, K. W., Overshiner, B., Bush, K., Loo, B. W., Skinner, L. B., Watson, G. A., Holmes, J. A., Hiniker, S. M., Maxim, P. G.
2019
- **Optimizing efficiency and safety in external beam radiotherapy using automated plan check (APC) tool and six sigma methodology.** *Journal of applied clinical medical physics*
Liu, S., Bush, K. K., Bertini, J., Fu, Y., Lewis, J. M., Pham, D. J., Yang, Y., Niedermayr, T. R., Skinner, L., Xing, L., Beadle, B. M., Hsu, A., Kovalchuk, et al
2019; 20 (8): 56–64
- **The role of bone marrow and spleen irradiation in the development of acute hematologic toxicity during chemoradiation for esophageal cancer.** *Advances in radiation oncology*
Chin, A. L., Aggarwal, S., Pradhan, P., Bush, K., von Eyben, R., Koong, A. C., Chang, D. T.
2018; 3 (3): 297–304
- **Practical workflow for rapid prototyping of radiation therapy positioning devices** *PRACTICAL RADIATION ONCOLOGY*
Gensheimer, M. F., Bush, K., Juang, T., Herzberg, B., Villegas, M., Maxim, P. G., Diehn, M., Loo, B. W.
2017; 7 (6): 442–45
- **Chemoradiation impairs normal developmental cortical thinning in medulloblastoma.** *Journal of neuro-oncology*
Kundu, P., Li, M. D., Durkee, B. Y., Hiniker, S. M., Bush, K., von Eyben, R., Monje, M. L., Yeom, K. W., Donaldson, S. S., Gibbs, I. C.
2017
- **Pulmonary function after lung tumor stereotactic ablative radiotherapy depends on regional ventilation within irradiated lung.** *Radiotherapy and oncology*
Binkley, M. S., King, M. T., Shrager, J. B., Bush, K., Chaudhuri, A. A., Popat, R., Gensheimer, M. F., Maxim, P. G., Henry Guo, H., Diehn, M., Nair, V. S., Loo, B. W.
2017; 123 (2): 270-275
- **Trajectory Optimization in Radiotherapy Using Sectioning (TORUS).** *Medical physics*
Locke, C. B., Bush, K. K.
2017
- **Initial clinical outcomes of audiovisual-assisted therapeutic ambience in radiation therapy (AVATAR).** *Practical radiation oncology*
Hiniker, S. M., Bush, K., Fowler, T., White, E. C., Rodriguez, S., Maxim, P. G., Donaldson, S. S., Loo, B. W.
2017
- **Pre-treatment non-target lung FDG-PET uptake predicts symptomatic radiation pneumonitis following Stereotactic Ablative Radiotherapy (SABR).** *Radiotherapy and oncology*
Chaudhuri, A. A., Binkley, M. S., Rigdon, J., Carter, J. N., Aggarwal, S., Dudley, S. A., Qian, Y., Kumar, K. A., Hara, W. Y., Gensheimer, M., Nair, V. S., Maxim, P. G., Shultz, et al
2016; 119 (3): 454-460
- **Independent calculation of monitor units for VMAT and SPORT.** *Medical physics*
Chen, X., Bush, K., Ding, A., Xing, L.

2015; 42 (2): 918-?

- **Assessing the dosimetric impact of real-time prostate motion during volumetric modulated arc therapy.** *International journal of radiation oncology, biology, physics*
Azcona, J. D., Xing, L., Chen, X., Bush, K., Li, R.
2014; 88 (5): 1167-1174
- **Assessing the Dosimetric Impact of Real-Time Prostate Motion During Volumetric Modulated Arc Therapy** *INTERNATIONAL JOURNAL OF RADIATION ONCOLOGY BIOLOGY PHYSICS*
Diego Azcona, J., Xing, L., Chen, X., Bush, K., Li, R.
2014; 88 (5): 1167-1174
- **Nonisocentric treatment strategy for breast radiation therapy: a proof of concept study.** *International journal of radiation oncology, biology, physics*
Li, R., Xing, L., Horst, K. C., Bush, K.
2014; 88 (4): 920-926
- **Nonisocentric treatment strategy for breast radiation therapy: a proof of concept study.** *International journal of radiation oncology, biology, physics*
Li, R., Xing, L., Horst, K. C., Bush, K.
2014; 88 (4): 920-926
- **Development of a fast and feasible spectrum modeling technique for flattening filter free beams** *MEDICAL PHYSICS*
Cho, W., Bush, K., Mok, E., Xing, L., Suh, T.
2013; 40 (4)
- **Penile metastases originating from a pancreatic primary tumor: a case report** *J Radiat Oncol*
Tello, T. L., Zeidan, Y. H., Bush, K., Schwartz, E., Kunz, P., Chang, D. T.
2012; 2 (1): 107-112
- **Understanding the impact of RapidArc therapy delivery errors for prostate cancer.** *Journal of applied clinical medical physics*
Oliver, M., Bush, K., Zavgorodni, S., Ansbacher, W., Beckham, W. A.
2011; 12 (3): 3409-?
- **Dosimetric validation of Acuros® XB with Monte Carlo methods for photon dose calculations** *Medical Physics*
Bush, K., Gagne, I. M., Zavgorodni, S., Ansbacher, W., Beckham, W.
2011; 38 (4): 2208-2221
- **Clinical significance of multi-leaf collimator positional errors for volumetric modulated arc therapy** *RADIOTHERAPY AND ONCOLOGY*
Oliver, M., Gagne, I., Bush, K., Zavgorodni, S., Ansbacher, W., Beckham, W.
2010; 97 (3): 554-560
- **IEC accelerator beam coordinate transformations for clinical Monte Carlo simulation from a phase space or full BEAMnrc particle source** *AUSTRALASIAN PHYSICAL & ENGINEERING SCIENCES IN MEDICINE*
Bush, K. K., Zavgorodni, S. F.
2010; 33 (4): 351-355
- **Monte Carlo evaluation of RapidArc oropharynx treatment planning strategies for sparing of midline structures** *Phys Med Biol*
Bush, K., Zavgorodni, S., Gagne, I., Townson, R., Ansbacher, W., Beckham, W.
2010; 55 (16)
- **Inference of the optimal pretarget electron beam parameters in a Monte Carlo virtual linac model through simulated annealing** *MEDICAL PHYSICS*
Bush, K., Zavgorodni, S., Beckham, W.
2009; 36 (6): 2309-2319
- **Monte Carlo Dose Calculations in Advanced Radiotherapy** *PhD Dissertation*
Bush, K. K.
2009
- **Monte Carlo simulation of RapidArc radiotherapy delivery** *PHYSICS IN MEDICINE AND BIOLOGY*
Bush, K., TOWNSON, R., Zavgorodni, S.
2008; 53 (19): N359-N370

- **A technique for generating phase-space-based Monte Carlo beamlets in radiotherapy applications** *PHYSICS IN MEDICINE AND BIOLOGY*
Bush, K., Popescu, I. A., Zavgorodni, S.
2008; 53 (18): N337-N347
- **Sci-Fri AM: YIS-03: Simulated annealing optimization of the pre-target electron beam in Monte Carlo virtual linac models.** *Medical physics*
Bush, K., Zavgorodni, S., Beckham, W.
2008; 35 (7): 3410-?
- **Azimuthal particle redistribution for the reduction of latent phase-space variance in Monte Carlo simulations** *PHYSICS IN MEDICINE AND BIOLOGY*
Bush, K., Zavgorodni, S. F., Beckham, W. A.
2007; 52 (14): 4345-4360
- **Direct aperture optimization for IMRT using Monte Carlo generated beamlets** *MEDICAL PHYSICS*
Bergman, A. M., Bush, K., Milette, M., Popescu, I. A., Otto, K., Duzenli, C.
2006; 33 (10): 3666-3679
- **Monte Carlo direct aperture optimization (MC-DAO) for IMRT** *48th Annual Meeting of the American-Association-of-Physicists-in-Medicine*
Bergman, A. M., Bush, K., Milette, M., Popescu, I. A., Otto, K., Duzenli, C.
AMER ASSOC PHYSICISTS MEDICINE AMER INST PHYSICS.2006: 2198-99
- **Monte Carlo BEAMlets for inverse treatment planning by direct aperture optimization** *Interactions*
Bush, K., Bergman, A., Milette, M., Popescu, T., Otto, K., Duzenli, C.
2006; 52 (2)