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## BIOGRAPHICAL SKETCH

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NAME: Chester S. Reft

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POSITION TITLE: Associate Professor

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EDUCATION/TRAINING (*Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.*)

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INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
Carnegie Institute of Technology, Pittsburgh, PA	B.S	1966	Physics
University of Pittsburgh, Pittsburgh, PA	Ph.D.	1973	Physics
University of Chicago, Chicago, IL	Post Doc	1982	Medical Physics

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### A. Personal Statement

My current areas of research involve the precise in-vivo patient and in-phantom absorbed dose measurements in photon and electron radiation fields to verify the prescribed dose as well as to evaluate the dose to critical organs outside of the radiation field using thermoluminescent detectors and optically stimulated luminescent detectors. I am investigating the potential use of these detectors for measuring the peripheral dose to patients from neutrons produced by photon beams with energies greater than 10 MV as well as from proton and carbon therapy beams. Other studies include the perturbation effects and correction factors for ionization chambers in radiation fields; their use to measure the effects of high atomic number materials such as bone or metallic prostheses on the radiation fields both near and distal from them and their subsequent effect on the patient treatment plans.

### B. Positions and Honors

#### Positions and Employment

1972-1975 Captain Signal Corporation, U.S. Army-Assigned to Harry Diamond Laboratories, Washing D.C.

1975-1977 Research Associate, Old Dominion University, Norfolk, VA

1977-1978 Assistant Professor, Old Dominion University, Norfolk, VA

1978-1979 Research Associate, Physics Department, Old Dominion University, Norfolk, VA

1979-1980 Assistant Professor, Physics Department, Old Dominion University, Norfolk, VA

1980-1982 Postdoctoral Fellow, University of Chicago, Medical Physics Section, Chicago, IL

1982-1988 Clinical Medical Physicist, Michael Reese/University of Chicago Center for Radiation Therapy, Medical Physics Section, Chicago, IL

1988-Present Assistant Professor of Clinical Radiation Oncology, Department of Radiation and Cellular Oncology, The University of Chicago, Chicago, IL

#### Other Experience and Professional Memberships

1959 National Defense Educational Award (3 years) - graduate school.

1963 Calgon Corporation Scholarship (3 years).

1962-1966 Dean's List for four semesters - undergraduate.

1981-present Member of the American Association of Physicists in Medicine (AAPM)

2000-present Member of the Radiation and Drug Research advisory Committee (RDRC) at the University of Chicago

2009-2013	Chairman of the Working Group on Radiation Dosimetry of the AAPM
2009-present	Member of AAPM Task Group 155 on Small Field and Non-Equilibrium Photon Beam Dosimetry
2010-present	Member of AAPM Task Group 191 on Recommendation on the Clinical Use of Luminescent Dosimeters
210-present	Member of AAPM Task Group 203 on the Management of radiotherapy patients with implanted cardiac pacemakers and defibrillators
2009-present	Member of AAPM Therapy Physics Committee
2008-present	Program Director of the therapy physics residency program
2011-present	Member of the Residency Education Program Review Committee
2013-present	Chair of the Residency Education review Committee

### Honors

2003 Elected a fellow of the AAPM

2004 and 2006 Teacher of the year award in medical physics residency program

2009 Kurt Rossman Award for Excellence in Teaching in 2009

### **C. Contributions to Science**

1. All of my research efforts have been in the area of dosimetry. This includes both absolute and relative dosimetric as well as in-vivo and in-vitro measurements with various radiation detectors. My early work involved determining the various correction factors for ionization chamber for measuring absorbed dose in megavoltage photon, electron and neutron therapy beams. This studies resulted in the following peer-reviewed publications:

- a. N. Scher, D. Pie, F. Kuchnir, C. Reft, R. Weichselbaum, and W. Panje. Radiotherapy of the resected mandible following stainless steel plate fixation. *Laryngoscope* 98:561 (1988).
- b. Reft and F. Kuchnir. Experience in neutron-dose output measurements with mailable PIN diodes. *Radiation Protection Dosimetry* 23:437-439 (1988).
- c. Reft. Output calibration in solid water for high energy photon beams. *Medical Physics* 16 (2): 299-301 (1989).
- d. Reft, F. Kuchnir, I. Rosenberg, and L. Myriantopoulos. Dosimetry of Sr-90 ophthalmic applicators. *Medical Physics* 17:641-646 (1990).
- e. Reft and F. Kuchnir. Measurement of the replacement correction factor for parallel-plate chambers in electron fields. *Medical Physics* 18:1237-1243 (1991).
- f. Kuchnir and C. Reft. Experimental determination of fluence perturbation factors for five parallel-plate ionization chambers. *Medical Physics* 20:331 (1993).
- g. C. Reft, F. Kuchnir, L. Dewerd, J. Micka, and F. Attix. A comparison of methods for calibrating parallel-plate chambers. *Medical Physics* 21:1953 (1994).
- h. C. Reft and F. Kuchnir. Measured overall perturbation factors at depths greater than  $d_{max}$  for ionization chambers in electron beams. *Med. Phys.* 26: 208-213 (1999).
- i. C.S. Reft and F.T. Kuchnir. Experimental determination of the overall perturbation factor for the NACP chamber in electron beams. *Phys. Med. Biol.* 46, N49-N55 (2001).
- j. B.Mijnheer, S. Beddar, J. Izewska and C. Reft, In vivo dosimetry in external beam radiotherapy, *Med. Phys.* 40, 070903 (2013)

2. My more recent efforts have been in the use of thermoluminescent dosimeters (TLDs) and optically stimulated luminescent detectors for use in radiotherapy. These studies involved measuring the neutron dose to patients undergoing radiation therapy with photon energies greater than 10 MV with either 3D conformal or intensity modulated radiation therapy. I am also investigating using glow curve analysis for TLDs to measure the high and low Linear Energy Transfer components in a mixed radiation fields such as neutron, proton and carbon therapy beams. These studies resulted in the following peer-reviewed publications:

- a. C.S. Reft, R. Runkel-Muller and L. Myriantopoulos, In vivo and phantom measurements of the secondary photon and neutron doses for prostate patients undergoing 18 MV IMRT, *Med. Phys.* 33, 3734-3742 (2006)

- b. C.S. Reft, The energy dependence and dose response of a commercial optically stimulated luminescent detector for kilovoltage photon, megavoltage photon and electron, proton, and carbon beams, *Med. Phys.* 36, 1690-1699 (2009)

3. As the program director of our therapy physics residency program and chair of the Residency Education Program Committee, I am intimately involved in the clinical training of medical physicists. The goal of our residency programs is to produce clinically competent medical physicists to work in the areas of radiation therapy, imaging and nuclear medicine and be qualified to take the American Board of Radiology Board examination in the areas of Imaging, Radiation Therapy or Nuclear Medicine. I also serve as the chair of the Residency Education Program Review Committee that is responsible for accrediting medical physics residency programs.

**List of additional peer-reviewed publications:**

- a. F. Kuchnir, C. Pelizzari, and C. Reft. Experimental verification of the accuracy of a 2-D dose calculation algorithm for beams incident on curved surfaces. *Radiation Protection Dosimetry* 23:479-481 (1988).
- b. G. Chen, C. Reft, D. Spelbring, F. Kuchnir, I. Rosenberg, and H. Sutton. Treatment planning comparison of low and high energy mixed beam therapy. *Radiation Protection Dosimetry* 23:483-486 (1988).
- c. F.T. Kuchnir and C.S. Reft. Experimental values for  $P_{wall,x}$  and  $P_{repl,E}$  for five parallel-plate, ion chambers - a new analysis of previously published data, A Letter to the Editor. *Medical Physics* 18:367 (1992)
- d. F.T. Kuchnir, S.W. Bullock, C.S. Reft and D.H. Hallahan. 3D Treatment Planning and Dose Delivery Verification: A Case Report, *Medical Dosimetry* 16:225 (1991).
- e. Kuchnir and C. Reft. Reply to comments on the experimental determination of the replacement correction factor for parallel-plate ionization chambers in high-energy electron beams. *Medical Physics* 20:739 (1993).
- f. S. Li, C. Pelizzari, C. Reft, H. Sutton, and G.T.Y. Chen. Computer-aided geometric reconstruction of Fletcher-Suit source positions. *Medical Physics* 21:1123 (1994).
- g. L. Dewerd, J. Micka, C. Reft, and F. Kuchnir. Values of  $N_{gas}/N_x A_{ion}$  and  $N_{gas}/N_k A_{ion}$  for parallel plate chambers. *Medical Physics* 22:481 (1995).
- h. G. Sibley, A. Mundt, S. Goldman, J. Nachman, C. Reft, R. Weichselbaum, D. Hallahan, and L. Johnson. Patterns of failure following total body irradiation and bone marrow transplantation with or without a radiotherapy boost for advanced neuroblastoma. *Int. J. Radiat. Oncol. Biol. Phys.* 32:1127 (1995).
- i. Reft, C. Rash, J. Dabrowski, J. Roeske and D. Hallahan. Eye shielding for patients treated with total body irradiation. *Med. Dosimetry.* 21: 73-78 (1996).
- j. J. Bradley, C. Reft, S. Goldman, C. Rubin, J. Nachman, R. Larson and D. Hallahan. High-energy total body irradiation as preparation for bone marrow transplantation in leukemia patients: treatment technique and related complications. *Int. J. Radiat. Oncol. Biol. Phys.* 40: 391-396 (1998).
- k. P.H. McGinley, A.H. Dhaba'an, and C.S. Reft. Evaluation of the contribution of capture gamma rays, x-ray leakage, and scatter to the photon dose at the maze door for a high energy medical electron accelerator using a Monte Carlo particle transport code. *Med. Phys.* 27:225-230 (2000).
- l. C.S. Reft et. Al. Dosimetric Considerations for Patients with Hip Prostheses Undergoing Pelvic Irradiation. Report of the AAPM Radiation Therapy Committee Task Group 63. *Med. Phys.* 30:1162-1182 (2003)
- m. Su, C.S. Reft, C. Rash, J. Price and A. B. Jani, A Case Study of Radiotherapy Planning For Bilateral Metal Hip Prosthesis Prostate Cancer Patient, *Med. Dosimetry*, 30, 169-175 (2005)

- n. H.A. Al-Hallaq, C. S. Reft and J.C. Roeske, The Dosimetric effects of tissue heterogeneities in intensity-modulated radiation therapy (IMRT) of the head and neck. Phys. Med. Biol. 51, 1145-1156 (2006).
- o. D.K. Yousefzadeh, M.B. Ward and C.S. Reft, Internal Barium Shielding to minimize Fetal Irradiation in Spiral Chest CT: A Phantom Simulation Experiment, Radiology 239, 751-758 (2006).
- p. M. Altman, B.Vesper, B. Smith, M. Stinauer, C. Pelizzari, B. Aydogan, C. Reft, J. Radosevich, S. Chmura and J. roeske, Characterization of a novel phantom for 3-D in vitro cell experiments, Phys. Med. Biol., 75,54N (2010)
- q. B. Thomadsen, H. Heaton, C. Reft et al, Off label use of medical producats used in radiation therapy: Wummary report of AAPOM TG 121, Med. Phys. 37, 2300 (2010)

**Additional recent publications of importance to the field (in chronological order)**

- a. C.S. Reft and F.T. Kuchnir, overall perturbation factor for parallel-plate chambers in electron beams at depths greater than  $d_{max}$ , J.P. Seuntjens and P.N. Mobit, ed., Medical Physics Publishing (Madison, WI, 2002)

**D. Research Support**

**Ongoing Support**

None

**Completed Support**

None