

Dennis A Cheek, PhD DABR

202 Clubhouse Drive ♦ Nicholasville, KY 40356
(406) 530-4754 ♦ Dennis.Cheek@uky.edu

Education

The University of Texas Health Science Center at San Antonio

Ph.D. in Radiological Sciences

Graduation requirements completed: December 2004

Dissertation Title: A Unified Optimization Platform Comparison of Three Radiosurgery Techniques:
Gamma Knife, BrainLAB Static Gantry micro-MLC, and Nomos Serial Tomotherapy MIMiC.

Washington University, St. Louis, MO

Mechanical Engineering

Attendance: September 98 – May 99

Southwestern University, Georgetown, TX

B.A. Cum Laude in Math, minor in Physics

Graduation: May 1998

Southwestern Semester Exchange Student: *London, England, Fall 1996*

Certifications: American Board of Radiology (ABR) in Therapy Physics 2008.

NRC AMP: HDR, Gamma Knife Perfexion, and Ophthalmic use of Strontium-90.

Work Experience

University of Kentucky (Radiation Medicine)

Lexington, KY

Feb 2015– Present

Assistant Professor

Clinical Experience: (including but not limited to)

- Provided clinical support for external beam radiation, brachytherapy, and Gamma Knife radiosurgery.
- Appointed Director of Brachytherapy Physics. (Summer 2016)
- Developed independent calculation program for Gamma Knife Perfexion second checks.
- Developed and revamped brachytherapy forms to comply with regulations and clinical needs.
- Developed/programmed a radiation source inventory system in order to fully comply with the state regulations.
- Developed/programmed HDR, Cs-131, and I-125 secondary calculation spreadsheets.
- Developed/programmed a Cs-131 spreadsheet to calculate the necessary activity needed for a planar implant.
- Accepted and commissioned a bard sure-point stepper and a BK ultrasound unit for prostate LDR implants.
- Commissioned Variseed 8.0 for Cs-131 calculations on a new platform.
- Developed Syed preplanning technique utilize prior images and the Brachyvision platform.
- Helped implement new HDR security system, developed operating instructions, and trained staff on the security system.

Teaching Experience: (including but not limited to)

- Co-instructor for RAS545 Radiation Hazards and Protection. (Spring 2015)
- Primary instructor for RAS545 Radiation Hazards and Protection. (Spring 2016 and 2017)
- Advisor to James Giltz research project regarding Gamma Knife double check software. (2015)
- Advisor to Steven Bosman, Victoria Gee, and Walker Zimmerman (2016)
- Developed new brachytherapy practicum for the medical physics students.
- Presented lectures to the medical residents regarding electrons and SBRT.

Software:

- Treatment Planning: Varian Eclipse 11, BrachyVision 11, and Gamma Plan 10.1
- Mosaiq 2.41

Equipment:

- Varian Truebeam and Ex class linacs
- Tomotherapy
- Gamma Knife Perfexion
- GE RT16 LightSpeed Scanner (w/ RPM for 4D-CT and DIBH)
- Varian Varisource Ir-192 remote afterloader
- Sun Nuclear Mapcheck2
- IBA Blue Phantom

Clinical Experience: (including but not limited to)

- Clinical Program Development:
 - Lead Physicist in the development of a two new radiation oncology centers, including department design, equipment purchases, and clinical program setup.
 - Billings Clinic, 2008
 - Community Medical Center in Missoula, MT, 2014.
 - Led Physicists and Dosimetrists in clinical duties.
 - Interact with Physicians and Administration concerning departmental goals and clinical issues.
 - Developed physics policies and procedures for department.
 - Helped implement a paperless department with Aria.
 - Administrator of Aria and IEM interfaces.
 - Helped develop and implement a 10 CFR 37 security program for the acquisition of a Gamma Knife Perfexion.
- Commissioning and Acceptance:
 - Performed acceptance tests on Varian Trilogy, IX, Acuity, Varisource IX, Brachyvision, Eclipse, Brainlab's SRS system, and Gamma Knife Perfexion.
 - Commissioned Eclipse treatment planning system for a Varian Trilogy and IX machines.
 - Measured beam data and commissioned BrainLab's IPlan treatment planning system.
 - Commissioned RapidArc.
 - Commissioned multiple HDR applicators.
 - Commissioned SBRT program.
 - Commissioned Gamma Knife Perfexion
 - Oversaw commissioning and clinical implementation of deep inspiration breath hold (DIBH) for left breast.
- Shielding Design:
 - Performed shielding design for a new radiation therapy facility including mazeless shielding for a Varian Trilogy, Varian IX, Varian Varisource HDR, and a Gamma Knife.
 - Performed shielding design for 6 CT scanners
 - Performed shielding design for PET/CT department including 3 injections, 1 hot bathroom, and 1 hot lab.
 - Performed various shielding calculations for C-Arm, mammography, radiographic, gamma camera rooms, and nuclear medicine injection rooms.
 - Communicated regularly with respective hospital departments, architects, and construction workers in regards to shielding design and construction.
 - Performed shielding surveys, generated reports, and helped submit documents to state agencies and the NRC.
- HDR:
 - Performed Prostate, SAVI, Mammosite, Vaginal cylinder, T&O, Tandem and Ring, Syed, and Miami HDR treatments with the Varian Varisource Afterloader and BrachyVision treatment planning system.
 - Performed daily, quarterly, and annual quality assurance procedures.
 - Wrote and maintained policy and procedures for program.
- LDR:
 - Commissioned a I-125 Oncura BrachyMESH program for lung lesions.
- Nuclear Medicine:
 - Participated in Bexxar, Zevalin, and Samarium treatments.
 - Performed dose calculations for Bexxar treatments.
- Clinical Trials and RPC Validations:
 - Performed and passed the RPC H&N IMRT, H&N VMAT, spine, SRS, and lung motion phantoms.
 - Performed/oversaw credentialing process for various RTOG, GOG, and NCCTG protocols.

Software:

- Treatment Planning: Varian Eclipse 10, BrainLab iPlan, BrachyVision 10, and Gamma Plan 10.1
- Varian Aria 10
- Radcalc with VMAT module

Software Developed in Excel/Visual Basic:

- Winston Lutz portal image analysis. Software would analyze Winston Lutz portal images and report deviations.
- HDR Billing Program. Software would receive inputs regarding a HDR procedure and report the appropriate codes.
- TG43 based secondary check point dose calculations for HDR and I-125 seeds.

Equipment:

- Varian Trilogy (w/ RPM for DIBH), IX, and Acuity Simulator
- Gamma Knife Perfexion
- GE RT16 LightSpeed Scanner (w/ RPM for 4D-CT and DIBH)

- Brainlab SRS system
- Varian Varisource IX Ir-192 remote afterloader
- PTW MP2 Scanning Water Tank
- Sun Nuclear Mapcheck2
- Sun Nuclear DailyQA3

Mentorship:

- Applied in 2012 to be a AAPM Summer Study Undergraduate mentor.
- Mentored Grant Emery in a summer job shadow. Grant received a 2013 AAPM Summer Undergraduate Fellowship.
- Mentored Mark Newpower in a summer job shadow. Mark is now attending U. of Oklahoma Medical Physics Program.
- Developed medical physics lectures and mentored Weber State radiation therapy students.

Mary Bird Perkins Cancer Center (NCCCP program)

Baton Rouge, LA

Feb 2005– Dec 2007

Clinical/Academic Medical Physicist

Clinical Experience:

- Developed treatment plans utilizing Tomotherapy, ADAC, and Novalis treatment planning systems.
- Developed and implemented custom software for clinical implementation of Tomotherapy.
- Performed initial chart checks on conventional therapy, IMRT, IMRS, HDR, and LDR plans.
- Performed monthly QA on Varian linacs, Elekta linacs, and Varian HDR units.
- Provided medical physics coverage in the delivery of vaginal and mammosite HDR deliveries.
- Directed summer student research projects in 2005 and 2006.
- Taught and guided LSU medical physics graduate students.
- Accepted and implemented a TomoTherapy cluster and ADAC server into the research and education department.
- Developed standardized linac annual forms and procedures for the clinic.
- Performed annuals on Varian linacs.
- Performed IMRT QA with the MapCheck device and with film-chamber measurements.
- Partner in evaluating and implementing remote planning for ADAC.

Software:

- Treatment Planning: ADAC, Tomotherapy, BrainLab, Brachyvision, Variseed
- IMPAC
- RIT 113
- MuCheck

Software Developed in Visual Basic:

- Plan comparison and evaluation program. Software would import planning information from multiple planning systems including images, contours, and dose distributions. Software contained common and uncommon evaluation tools such as isodose display, DVH analysis, and radiobiological indices.
- Region of interest translator. Program would translate ADAC contours a given x-y-z distance.
- Tomotherapy dose distribution import into ADAC. Program would translate Tomotherapy dose files based on patient orientation in order to properly import them into ADAC. Program could also add Tomotherapy dose files.
- Tomotherapy log analyzer.

Equipment:

- Accelerators: Varian 21ex, 21c, Elekta SLI, Novalis, Tomotherapy
- GE PET/CT
- Wellhofer Blue phantom and RFA-200
- Sun Nuclear Daily QA 2
- Sun Nuclear MapCheck

Cancer Therapy and Research Center

San Antonio, TX

June 1999 – January 2005

Medical Physics Graduate Student (contracted to work 20 hours per week in the clinic)

Clinical Experience: (including but not limited to)

- Performed monthly calibrations and mechanicals.
- Developed and performed IMRT/IMRS QA and plan validation for Nomos MIMiC and Varian MLCs.
- Participated in IMRS and SBRT treatments and validations.
- Participated in BAT SXi ultrasound targeting for IMRT/IMRS of prostate and SBRT.
- Performed weekly chart checks for photon, electron, and IMRT/IMRS treatments.
- Participated in acceptance and commissioning of a Varian 600cd.
- Participated in Varian accelerator annuals.
- Participated in total body irradiation and total skin electron therapy.
- Performed treatment planning with Prowess, ROCS, and CORVUS.

- Experience with TLD calibrating, annealing, batching, and reading.
- Experience with MOSFET dosimetry.
- Partook in LDR and HDR treatments.
- Performed daily QA of Varian accelerators with Sun Nuclear and CNMC systems.
- Performed cross calibration of ionization chambers and electrometers.
- Partook in COMS eye plaque and Pinpoint LDR treatments.

Software:

- Treatment Planning: Prowess, ACQSIM CT Simulation, CORVUS, PLATO, ROCS
- IMPAC
- RIT 113

Software Developed in Visual Basic:

- Developed 3D optimization software planning system for Gamma Knife, MLC, and MIMiC based Tomotherapy.
- Developed 3D point alignment software to report translation, rotation, etc. of lesion from successive CT scans. The program was used clinically and four papers have been published using software.
- Software development of an independent computerized monitor unit routine (ICMUR) for photons and electrons.
- Developed 3D volumetric alignment software to report translation, rotation, etc. of lesion from repeat CT scans.

Equipment:

- Accelerators: Varian 600c, 600cd, 2100c, 2100cd, 23ex (80 and 120 leaf MLCs)
- Nomos MIMiC
- Nomos BAT SXi
- Picker PQ 5000 CT / Pinpoint
- Sun Nuclear and CNMC daily QA
- Wellhofer scanning phantoms
- CRS scanning system

Continuing Education/Training Classes

- AAPM Clinical Brachytherapy Physics Summer School, June 2017
- University of Pittsburgh Principles and Practices of Gamma Knife Radiosurgery, Special Emphasis on Perfexion Training, September 2013.
- AAPM Diagnostic Review Course, August 2013.
- AAPM Radiation Oncology Program Accreditation meeting, February 2013.

I have attended the following vendor education classes.

- Varian Medical Systems: BrachyVision Training, February 2008.
- Varian Medical Systems: OBI Physics, March 2009.
- Varian Medical Systems: Portal Dosimetry 8.8, March 2009.
- Varian Medical Systems: Eclipse Administration and Physics 8.9, April 2009.
- Varian Medical Systems: EIP IMRT Administration and Physics 8.9, April 2009.
- Varian Medical Systems: High Energy C Support, May 2009.
- BrainLab Academy: Treatment Planning and Physics, September 2009.

M. S. Advisory Committee

- Allen Beardmore, M.S., 2007

M. S. Supervisory Committee

- Shima Ito

Publications

- J. Feddock, **D. Cheek**, C. Steber, J. Edwards, S. Slone, W. Luo, and M. Randall. Re-irradiation using permanent interstitial Brachytherapy (PIB): a potentially durable technique for salvaging recurrent pelvic malignancies. *International Journal of Radiation Oncology, Biology, and Physics*, accepted for publication on 8-21-2017.
- J. Feddock, P. Aryal, C. Steber, J. Edwards, **D. Cheek**, and M. Randall. Outpatient template-guided permanent interstitial brachytherapy using ¹³¹Cs in gynecologic malignancies: initial report. *Brachytherapy*, 16(2), 393-401, 2017.
- J. Gibbons, K. Smith, **D. Cheek**, and I. Rosen. Independent calculation of dose from a Helical Tomotherapy Unit. *Journal of Applied Clinical Medical Physics*, 10(1), 103-119, 2009.
- A. Beardmore, I. Rosen, **D. Cheek**, R. Fields, and K. Hogstrom. Evaluation of MVCT images with skin collimation for electron beam treatment planning. *Journal of Applied Clinical Medical Physics*, 9(3), 43-57, 2008.

- D. Cheek**, I. Rosen, J. Gibbons, and K. Hogstrom. Accuracy of TomoTherapy treatments for superficial PTVs. *Medical Physics*, 35(8), 3565-3573, 2008.
- D. Cheek**, A. Holder, M. Fuss, and B. Salter. The relationship between the number of shots and the quality of Gamma Knife radiosurgeries. *Optimization and Engineering*, 6(4): 449-462, 2005.
- M. Fuss, B. Salter, **D. Cheek**, A. Sadeghi, J. Hevezi, and T. Herman. Repositioning accuracy of a commercially available thermoplastic mask system. *Radiotherapy & Oncology*, 71: 339-345, 2004.
- M. Fuss, B. Salter, P. Rassiah, **D. Cheek**, S. Cavanaugh, and T. Herman. Repositioning accuracy of a commercially available double-vacuum whole body immobilization system for stereotactic body radiation therapy. *Technology in Cancer Research & Treatment*, 3(1): 59-67, 2004.
- M. Fuss, S. Cavanaugh, C. Fuss, **D. Cheek**, and B. Salter. Daily stereotactic ultrasound prostate targeting: inter-user variability. *Technology in Cancer Research & Treatment*, 2(2): 161-170, 2003.
- B. Salter, M. Fuss, D. Vollmer, A. Sadeghi, C. Bogaev, **D. Cheek**, T. Herman, and J. Hevezi. The TALON removable head frame system for stereotactic radiosurgery/radiotherapy: Measurement of the repositioning accuracy. *International Journal of Radiation Oncology, Biology, and Physics*, 51(2): 555-562, 2001.

Presentations

- J. Feddock, **D. Cheek**, C. Steber, J. Edwards, and M. Randall. Replacing the Syed: initial safety results of a new treatment technique using Cesium-131 permanent interstitial brachytherapy (PIB) for advanced gynecologic cancers. ASTRO 59th Annual Meeting. 2017. (*poster presentation*)
- D. Pokhrel, **D. Cheek**, E. Johnson, and J. Molloy. Reporting Dose-To-Water (Dw) vs Dose-To-Medium (Dm) of the Acuros-XB Algorithm in the Treatment of Lung Stereotactic Body Radiosurgery/Radiotherapy. AAPM 59th Annual Meeting. 2017. (*poster presentation*)
- D. Cheek**, K. Hogstrom, J. Gibbons, and I. Rosen. Evaluation of dose from TomoTherapy irradiation of superficial PTVs. AAPM 49th Annual Meeting, 2007. (*poster presentation*)
- R. Hesston, J. Gibbons, and **D. Cheek**. Dosimetric effects of image quality in a TomoTherapy MVCT Dataset. AAPM 49th Annual Meeting, 2007. (*poster presentation*)
- J. Gibbons, K. Smith, **D. Cheek**, and I. Rosen. Clinical evaluation of an independent dose check algorithm for helical TomoTherapy. AAPM 49th Annual Meeting, 2007. (*oral presentation*)
- D. Cheek**, K. Hogstrom, C. Robertson, I. Rosen, J. Gibbons. Independent point dose verification using TomoTherapy quality assurance phantom. AAPM 49th Annual Meeting, 2007. (*poster presentation*)
- R. Hesston, J. Gibbons, and **D. Cheek**. Evaluation of the dosimetric accuracy of a commercial adaptive radiotherapy process. AAPM 49th Annual Meeting, 2007. (*poster presentation*)
- A. Beardmore, I. Rosen, **D. Cheek**, K. Hogstrom, and R. Fields. Evaluation of MVCT images containing lead alloy masks for electron beam treatment planning. AAPM 49th Annual Meeting, 2007. (*oral presentation*)
- D. Perrin, K. Hogstrom, and **D. Cheek**. Cerenkov light from phantom cassettes in absolute dose measurements using radiographic film. AAPM 49th Annual Meeting, 2007. (*oral presentation*)
- D. Cheek**, TomoTherapy for superficial tumors. AAMD 32nd Annual Meeting, 2007. (*invited 50 minute oral presentation*)
- D. Cheek**, K. Hogstrom, J. Gibbons, and I. Rosen. Utility of film dosimetry for assessing TomoTherapy treatments of superficial PTVs. AAPM 48th Annual Meeting, 2006. (*poster presentation*)
- J. Gibbons, K. Smith, **D. Cheek**, and I. Rosen. Independent calculation of dose for a helical TomoTherapy treatment plan. AAPM 48th Annual Meeting, 2006. (*poster presentation*)
- D. Cheek**, M. Fuss, C. Cheng, and B. Salter. A unified optimization platform comparison of three radiosurgery techniques: Gamma Knife, BrainLAB static gantry micro-MLC, and Nomos serial tomotherapy MIMiC. Southwest Chapter of American Association of Physicists in Medicine, 2004. (*oral presentation*) and AAPM 46th Annual Meeting, 2004 (*poster discussion*)
- C. Cheng, **D. Cheek**, M. Fuss, and B. Salter. Dosimetric evaluation of a modified array of 5mm circular pencil beams for serial tomotherapy. AAPM 46th Annual Meeting, 2004. (*oral presentation*)
- D. Cheek**, M. Fuss, C. Cheng, and B. Salter. Characterization of relationship between number of shots allowed and conformality index, by simulated annealing optimization, for Gamma Knife. AAPM 45th Annual Meeting, 2003. (*oral / poster presentation*)
- B. Salter, L. Voeltz, **D. Cheek**, and M. Fuss. Characterizing the dosimetric impact of BAT ultrasound alignment for prostate. AAPM 45th Annual Meeting, 2003. (*poster presentation*)
- B. Salter, C. Cheng, **D. Cheek**, M. Fuss, and J. Hevezi. Characterization of plan quality improvement when using multiple couch angles for serial tomotherapy. AAPM 45th Annual Meeting, 2003. (*poster presentation*)

Computer Skills

<i>Languages:</i>	Visual Basic, C++, Java
<i>Platforms:</i>	Windows and UNIX based platforms
<i>Other Applications:</i>	AMPL, LATEX, Mathematica, Matlab