

REPORT TO THE AAPM THERAPY PHYSICS COMMITTEE

Report No. 130

March 1, 2008 – July 1, 2008

Personnel

There has been only one change in staffing at the RPC since the previous report; Ms. Amy Springer left the RPC in May. We will be interviewing candidates for her replacement in the near future.

Ms. Nadia Hernandez returned from maternity leave at the beginning of June. She has resumed her responsibilities which include managing many aspects of the phantom irradiation program and handling some aspects of the RPC visits to institutions.

Institutions Monitored

The RPC is aware of 2,381 radiation therapy facilities in the United States. Of these, the RPC is monitoring 1,559. World wide, a total of 1,643 institutions are presently being monitored, of which 32 are in Canada and 52 are elsewhere in the world. Many of the international institutions were added to the RPC's roster through an agreement with the EORTC. EORTC members are required to request monitoring from an external agency, and the RPC is recommended to these members.

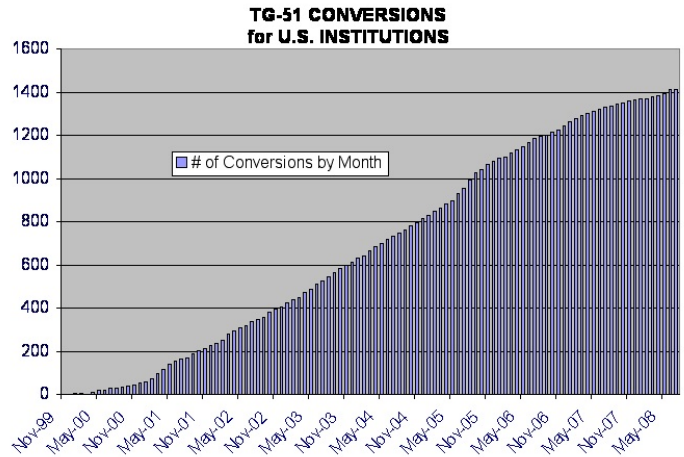
TLD Audits

Last year 13,729 beams were measured with TLD at 1,580 institutions. As has been the situation for the last several years, the number of TLD measurements falling outside our 5% or 5 mm criteria is only approximately 2% (a little higher for electron beams). However, the discrepancies are distributed so that about 9% of monitored institutions were found to have at least one beam outside our criteria last year.

67 institutions are currently delinquent in returning their TLD by four months or more (2 months or more for repeat measurements). Of this number, 34 institutions were seriously delinquent by at least six months (at least three months for repeats). We have recently stepped up the aggressive pursuit of institutions that allow their TLD to become seriously delinquent, resulting in a large number of TLD blocks being returned to the RPC over the last couple of months. We intend to continue this aggressive pursuit to reduce the number of seriously delinquent institutions.

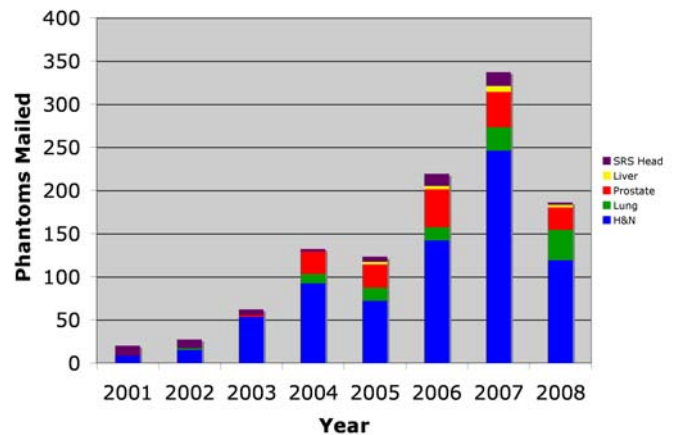
The TLD data indicated that 1,414 or approximately 91% of U.S. institutions have converted to TG-51. The rate at which

institutions are converting has decreased, but the total number is continuing to increase.



Credentiaing Procedures

The RPC credentials institutions to participate in advanced technology clinical trials using both benchmarks and phantoms. Five model of phantom are now being used for credentialing, including a pelvis IMRT phantom (4 in service, 4 under construction), a head and neck phantom (30 in service), a brain SRS phantom (2 in service), a lung SBRT phantom (9 in service), and a liver SBRT phantom (2 in service).



A set of moving platforms have been constructed to simulate respiratory motion. These can be provided with any

phantom, but are intended primarily for use with the liver and lung phantoms. The number of phantoms mailed each year since the inception of the phantom credentialing program is shown in the figure. As indicated by the figure, the number of phantoms mailed continues to increase. (Data for 2008 represent 6 months.)

The number of institutions successfully completing each of several credentialing requirements is shown in Table 1. As has been reported before, approximately one fourth of the institutions irradiating an RPC phantom failed on the first attempt to meet the criteria for agreement agreed upon between the RPC and RTOG. For the IMRT phantoms the criteria are 7% and 4 mm DTA. The RPC is making several presentations at this meeting that describe trends in the phantom irradiations program.

Table 1

Successful Completion of RPC Credentialing Procedures

<u>Site</u>	<u>Technique</u>	<u>Irradiations</u>	<u>Number Passing</u>
H&N	IMRT	558	425
Pelvis	IMRT	109	89
Lung	SBRT	55	42
Liver	SBRT	13	6
Benchmark*	IMRT	89	55

*Includes reviews done by QARC.

Table 2 lists the reviews performed for the partial breast protocol, RTOG 0413/NSABP B-39. The RPC is responsible for brachytherapy reviews. We are presently evaluating applications at the rate of about 1 per week.

Table 2

<u>Review Type</u>	<u>Number</u>
PBI	1566
WBI	1572
PBI Patients with completed reviews	1085
Of the PBI cases:	
Rapid Reviews	337
Timely Reviews	565
Open Reviews	145
Random Reviews	38
Dose-Volume Analysis Scores	
Per Protocol	924
Minor corrections	157
Major corrections	3
Repeat Timely Reviews	1

Improvements to Phantom Analysis Procedures

The RPC has awarded a subcontract to Joseph Deasy, Ph.D. at Washington University to develop an implementation of the Computing Environment for Radiology Research (CERR) software for RPC use. The modification enables the RPC to compare treatment planning data submitted by institutions that have irradiated an RPC phantom with the measurements from that phantom. The capabilities will include a two dimensional gamma analysis.

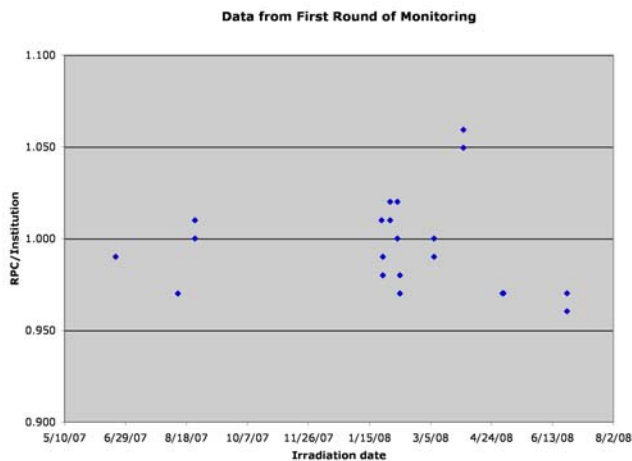
Previous RPC data has illustrated the differences in accuracy of heterogeneity corrections between modern algorithms such as the superposition/convolution algorithm and older algorithms such as pencil beam and Clarkson. The RPC's previous analysis compared calculations with and without heterogeneity correction at the center of a target volume located within the lung of an anthropomorphic thorax phantom. We also compared the dose measured with TLD at the center of the target volume to calculated doses. The RPC has more recently compared calculations and measured data using a 2D gamma index evaluation. The RPC re-evaluated 47 prior irradiations that passed the original criteria, considering the rectangular area encompassing the PTV, using criteria of 5% and 5 mm, and applying a threshold of 90%, 80% and 80% agreement for the axial, coronal, and sagittal planes respectively. 25/29 plans with "good" algorithms also passed the 2D evaluations. Only 3/8 plans with "poor" algorithms passed.

The RPC, in collaboration with Dr. Deasy and Washington University are also developing a Monte Carlo application for use at the RPC. This application will allow the RPC to independently recalculate institution's IMRT treatment plans (the RPC presently is developing the capability to recalculate 3D CRT plans using a Varian Eclipse workstation and RPC "standard data".)

Preparations for Proton Beam Protocols

The RPC recently extended the TLD monitoring program to all of the U.S. proton therapy centers. To date, all 5 clinical proton therapy centers have been monitored with TLD at least once. A graph of the data acquired to date appears below. The RPC is also planning a program of visits to proton facilities, similar to the on site dosimetry review visits currently performed at conventional radiotherapy centers. Equipment has been purchased and tools are being constructed to enable these visits. We expect to begin making visits in the early fall.

In addition, several of the RPC phantoms are being modified for use with proton beams. The pelvis phantom will be equipped with an improved dosimetry insert to accommodate radio chromic film and TLD's that will be suitable for proton therapy.



Future plans call for modifications to the RPC thorax phantom as well.

Research Presentations at the Annual Meeting

The RPC faculty and staff are presenting their research in 10 oral presentations, 8 posters, and numerous other reports during the AAPM annual meeting. Some of the research topics being discussed include 3D dosimeter systems; risk of secondary malignancies due to out of field dose; comparison of heterogeneity correction algorithms, evaluation of OSL dosimeters, improvements in IMRT delivery, development of Monte Carlo planning capability, and audits of TG-51 non-compliant beams.

PARTICIPANT FEE:

Institutions invoiced FY07	1497
No XRT/Canceled/Inactive	4
Invoiced by RDS	1
Institutions paid	1314

PUBLICATIONS AND ABSTRACTS

Publications Accepted/Published (2005-present):

1. Cho S, Vassiliev O, Lee S, Liu H, Ibbott G, Mohan R. Reference photon dosimetry data and reference phase space data for the 6 MV photon beam from Varian Clinac 2100 series linear accelerators. *Med. Phys.* 32:137-48, 2005.
2. Molineu A, Followill DS, Balter PA, Hanson WF, Gillin MT, Huq MS, Eisbruch A, Ibbott GS. Design and Implementation of an Anthropomorphic Quality Assurance Phantom for Intensity Modulated Radiation Therapy for the Radiation Oncology Group. *Int. J. of Radiat. Oncol. Biol. Phys.* 63:577-83, 2005.

3. Williamson J, Butler W, DeWerd L., Huq M, Ibbott G, Li, Z, Mitch M, Nath R, Rivard M, Todor D. Recommendations of the American Association of Physicists in Medicine regarding the Impact of Implementing the 2004 Task Group 43 report on Dose Specification for 103Pd and 125I Interstitial Brachytherapy. *Med. Phys.* 32:1424-39, 2005.
4. Zhang G, Guerrero T, Segars W, Huang T, Bilton S, Lin KP, Ibbott G, Dong L, Forster K. Elastic Image Mapping for 4D Dose Estimation in Thoracic Radiotherapy. *Radiation Protection Dosimetry* 115:497-502, 2005.
5. Gifford KA, Horton Jr. JL, Jackson EF, Steger III TR, Heard MP, Mourtada F, Lawyer AA, Ibbott GS. Comparison of Monte Carlo calculations around a Fletcher Suit Delclos ovoid with radiochromic film and normoxic polymer gel dosimetry. *Medical Physics* 32:2288-94, 2005.
6. Cho SH. Estimation of tumor dose enhancement due to gold nanoparticles during typical radiation treatments: A preliminary Monte Carlo study. *Physics in Medicine and Biology* 50:163-73, 2005.
7. Kry SF, Salehpour M, Followill DS, Stovall M, Kuban DA, White RA, Rosen II. Out-of-Field Photon and Neutron Dose Equivalents from Step-and-Shoot Intensity-Modulated Radiation Therapy. *Int J Radiat Oncol Biol Phys* 62:1204-16, 2005.
8. Kry SF, Salehpour M, Followill DS, Stovall M, Kuban DA, White RA, Rosen II. The Calculated Risk of Fatal Secondary Malignancies from Intensity-Modulated Radiation Therapy. *Int J Radiat Oncol Biol Phys* 62:1195-1203, 2005.
9. Halvorsen H, Das IJ, Fraser M, Freedman DJ, Rice III RE, Ibbott GS, Parsai EI, Robin Jr. TT, Thomadsen BR. AAPM Task Group 103 Report on Peer Review in Clinical Radiation Oncology Physics. *Journal of Applied Clinical Medical Physics* 6:50-64, 2005.
10. Tailor RC, Hanson WF, Wells N, Ibbott GS. Consistency of absorbed dose to water measurements using 21 ion-chamber models following the AAPM TG51 and TG21 calibration protocols. *Med Phys* 33:1818-28, 2006.
11. Randall M, Ibbott GS. Intensity-modulated radiation therapy for gynecologic cancers: pitfalls, hazards, and cautions to be considered. *Seminars in Radiat Oncol* 16:138-43, 2006.

12. Briere TM, Tailor R, Tolani N, Prado K, Lane R, Woo S, Ha C, Gillin MT, Beddar S. Patient dosimetry for total body irradiation using single-use MOSFET detectors. Submitted to Medical Physics, 2006.
13. Minniti R, Chen-Mayer H, Seltzer SM, Huq MS, Bryson L, Slowey T, Micka JA, DeWerd LA, Wells N, Hanson WF, Ibbott GS. The US radiation dosimetry standards for ^{60}Co therapy level beams, and the transfer to the AAPM accredited dosimetry calibration laboratories. Med Phys 33: 1074-7, 2006.
14. Ibbott G, Molineu A, Followill D. Independent evaluations of IMRT through the use of an anthropomorphic phantom. Technology in Cancer Research and Treatment 5:481-8, 2006.
15. Timmerman R, Galvin J, Michalski J, Straube W, Ibbott G, Martin E, Abdulrahman R, Swann S, Fowler J, Choy H. Accreditation and quality assurance for Radiation Therapy Oncology Group: Multicenter clinical trials using Stereotactic Body Radiation Therapy in lung cancer. Acta Oncologica 45:779-86, 2006.
16. Kry SF, Titt U, Ponisch F, Followill D, Vassiliev ON, White RA, Mohan R, Salehpour M. A monte carlo model for calculating out-of-field dose from a varian 6 MV beam. Med Phys 33:4405-4413, 2006.
17. Ibbott GS, Hanson WF, Martin E, Kuske RR, Arthur D, Rabinovitch R, White J, Wilenzick RM, Harris I, Tailor RC. Dose specification and quality assurance of RTOG protocol 95-17; a cooperative group study of 192Ir breast implants as sole therapy. Int J of Radiat Oncol Biol Phys 69:1572-78, 2007.
18. Li Z, Das RK, Dewerd LA, Ibbott GS, Meigooni AS, Perez-Calatayud J, Rivard MJ, Sloboda RS, Williamson JF. Dosimetric Prerequisites for Routine Clinical Use of Photon Emitting Brachytherapy Sources with Average Energy Higher than 50 Kev. Med Phys 34:37-40, 2007.
19. Mann AL, Kim JE, Aberg T, Blair NP, Dierner-West M, Followill D, Gilson MM, Olsen KR, Hawkins BS. Incidence of cataract and outcomes after cataract surgery in the first 5 years after ^{125}I brachytherapy in the COMS: COMS report No. 27. Ophthalmology 114:1363-71, 2007.
20. Kry SF, Followill D, White RA, Stovall M, Kuban D, Salehpour M. Uncertainty of calculated risk estimates for malignancies after radiotherapy. Int J Radiat Oncol Biol Phys 68:1265-71, 2007.
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22. Davidson, S, Ibbott G, Prado K, Dong L, Liao Z, Followill D. Accuracy of two heterogeneity dose calculation algorithms for IMRT in treatment plans designed using an anthropomorphic thorax phantom. Medical Physics 34:1850-57, 2007.
23. Followill D, Evans-Radford D, Cherry C, Molineu A, Fisher G, Hanson WF, Ibbott G. Design, Development, and Implementation of the Radiological Physics Center's Pelvis and Thorax Anthropomorphic Quality Assurance Phantoms. Medical Physics 34:2070-76, 2007.
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26. Frey GD, Ibbott GS, Morin RL, Paliwal BR, Thomas SR, Bosma J. The American Board of Radiology perspective on maintenance of certification: Part IV: Practice quality improvement in radiologic physics. Medical Physics 34:4158-63, 2007.
27. Butler WM, Bice WS, DeWerd LA, Hevezi JM, Huq MS, Ibbott GS, Palta JR, Rivard MJ, Seuntjens JP, Thomadsen BR. Third-party brachytherapy source calibrations and physicist responsibilities: report of the AAPM Low Energy Brachytherapy Source Calibration Working Group. Medical Physics, 2008 (in press).
28. Youngyih Han, et al. Dosimetry in an IMRT phantom designed for a remote monitoring program. Medical Physics 35:2519, 2008.
29. Ibbott GS, Ma CM, Rogers DWO, Seltzer SM, Williamson JF. Anniversary Paper: Fifty years of AAPM involvement in radiation dosimetry. Medical Physics, 35:1418, 2008.
30. Tailor RC, Ibbott GS, Tolani N. Thermoluminescence dosimetry measurements of brachytherapy sources in liquid water. Medical Physics 2008 (in press).

Abstracts

1. Kry S, Titt U, Poenisch F, Followill D, Vassiliev O, Mohan R, Salehpour M. A Monte Carlo Simulation of Out-Of-Field Radiation From An 18-MV Beam. *Medical Physics* 32: 1889, 2005.
2. Molineu A, Hernandez N, Alvarez P, Followill D, Ibbott G. IMRT Head and Neck Phantom Irradiations: Correlation of Results with Institution Size. *Medical Physics* 32:1983-4, 2005.
3. Davidson S, Followill D, Ibbott G, Prado K. The Evaluation of Several Commercial IMRT Treatment Planning Systems Heterogeneity Dose Calculation Algorithms Using An Anthropomorphic Thorax Phantom. *Medical Physics* 32:1988, 2005.
4. Homann K, Gates B, Salehpour M, Followill D, Kirsner S, Buchholz T, White R, Prado K. Evaluation of the Dose Within the Abutment Region Between Tangential and Supraclavicular Fields for Various Breast Irradiation Techniques. *Medical Physics* 32: 1995, 2005.
5. Lowenstein J, Roll J, Davis C, Holguin P, Duong H, Followill D, Ibbott G. Credentialing Requirements for NSABP B-39 / RTOG 0413. *Medical Physics* 32:2020-1, 2005.
6. Alvarez P, Molineu A, Hernandez N, Followill D, Ibbott G. Evaluation of Doses Delivered by SBRT to the Lung of An Anthropomorphic Thorax Phantom. *Medical Physics* 32: 2043, 2005.
7. Followill D, Molineu A, McGary J, Ibbott G. Clinical Reference Dosimetry of a "Hi-Art II" Helical Tomotherapy Machine. *Medical Physics* 32:2089, 2005.
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9. Shoales J, Followill D, Ibbott G, Balter P, Tolani N. Development of An Independent Audit Device for Remote Verification of 4D Radiotherapy. *Medical Physics* 32:2128, 2005.
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16. Lowenstein J, Roll J, Ibbott G. Common Dosimetry Errors in Cervix Patients Treated with Brachytherapy on Clinical Trials. *Medical Physics* 32:2107, 2005.
17. Ibbott G. The Radiological Physics Center's QA Activities. *Medical Physics* 32:2153-4, 2005.
18. Briere TM, Tailor RC, Tolani NB, Prado KL, Lane RG, Woo SY, Ha CS, Gillin MT, Beddar AS. In Vivo Dosimetry Using Disposable MOSFET Dosimeters for Total Body Irradiation. *Medical Physics* 32:1996, 2005.
19. Schild SE, McGinnis WL, Graham D, Hillman S, Ibbott G, Northfelt D, Garces Y, Yee G, Bollinger J, Jett J. Results of a Phase I Trial of Concurrent Chemotherapy and Escalating Doses of Radiation for Unresectable Non-Small Cell Lung Cancer. *International Journal of Radiation Oncology Biology Physics* 63:S44, 2005.
20. Molineu A, Alvarez P, Hernandez N, Followill DS, Ibbott GS. Analysis of Errors Made During 138 IMRT Irradiations of an Anthropomorphic Phantom. *International Journal of Radiation Oncology Biology Physics* 63:S58, 2005.
21. Simon W, Kozelka J, Rose M, Liu C, Palta J, Dempsey J, Lynch B, Bayouth J, Pavord D, Ibbott G, Followill D. LINAC dosimetry: benchmark data set uncertainty. *Med Physics* 33:2118, 2006.
22. Kry S, Followill D, White R, Salehpour M. Uncertainty analysis of risk of secondary fatal malignancies from radiotherapy treatments including IMRT. *Med Physics* 33:2257, 2006.

23. Simon W, Kozelka J, Rose M, Liu C, Palta J, Dempsey J, Lynch B, Bayouth J, Pavord D, Ibbott G, Tailor R, Followill D. LINAC dosimetry: benchmark data set requirements. *Med Physics* 33:2118, 2006.
 24. Lowenstein J, Davis C, Roll J, Harris I, Hall F, Followill D, Ibbott G. The credentialing process for the NSABP B-39/RTOG 0413 partial breast irradiation trial. *Med Physics* 33:2140, 2006.
 25. Alvarez P, Hernandez N, Followill D, Tailor R, Ibbott G. Characterization of EBT versus MD55 gafchromic® films for relative dosimetry measurements. *Med Physics* 33:2217-18, 2006.
 26. Hecox R, Gibbons J, Followill D, Ibbott G. Dose calculation accuracy in the presence of high-z materials using megavoltage CT for treatment planning. *Med Physics* 33:2087-8, 2006.
 27. Howell R, Kry S, Followill D, Hertel N, Wang Z, Salehpour M. Investigation of MLC effects on secondary neutron spectra for Varian, Siemens, and Elekta. *Med Physics* 33: 2249-50, 2006.
 28. Alvarez P, Molineu A, Hernandez N, Followill D, Ibbott G. Evaluation of heterogeneity corrections algorithms through the irradiation of a lung phantom. *Med Physics* 33:2214, 2006.
 29. Followill D, Molineu A, Alvarez P, Ibbott G. The state of radiotherapy physics through the eyes of a quality auditor. *Med Physics* 33:2283, 2006.
 30. Davidson S, Prado K, Ibbott G, Followill D. Heterogeneity dose calculation accuracy in IMRT using an anthropomorphic thorax phantom. *Med Physics* 33:2106, 2006.
 31. Followill D, Kry S, Salehpour M. Measurements of secondary radiation for electron and proton accelerators. *Med Physics* 33:2238-9, 2006.
 32. Alvarez P, Molineu A, Hernandez N, Followill D, Ibbott G. A Comparison of Heterogeneity Correction Algorithms within a Lung PTV. *Med Phys* 34:2521, 6/2007.
 33. Davidson S, Popple R, Ibbott G, Followill D. A Comprehensive Study on the Heterogeneity Dose Calculation Accuracy in IMRT using an Anthropomorphic Thorax Phantom. *Med Phys* 34:2520, 6/2007.
 34. Martin R, Bencomo J, Martin M, Bankson J, Heard M, Kaluarachchi K, Webb D, Wells N, Ibbott G. A Method for Extracting the Relevant MRI Information from Normoxic Polymer Gels Exposed to Low Doses. *Med Phys* 34:2405, 6/2007.
 35. Nitsch P, Ibbott G, Dieterich S, Followill D. Assessment of CyberKnife's Heterogeneity Dose Calculation Algorithm and Respiratory Tracking System using an Anthropomorphic Thorax Phantom. *Med Phys* 34:2641-42, 6/2007.
 36. Davidson S, Cui J, Followill D, Ibbott G, Deasy J. Benchmarking a Flexible Monte Carlo (MC) Tool Based on the Dose Planning Method (DPM) for use in evaluating IMRT Treatment Planning Systems. *Med Phys* 34:2574-75, 6/2007.
 37. Tailor R, Ibbott G, Tolani N. Design of a Jig for Thermoluminescence Dosimetry of Brachytherapy Sources in Liquid Water and the Determination of a Correction Factor for Water-Equivalent Plastics. *Med Phys* 34:2432, 6/2007.
 38. Ibbott G. Developing Medical Physics Technical Standards through the AAPM and ANSI. *Med Phys* 34:2519-20, 6/2007.
 39. Heard M, Adamovics J, Ibbott G. Development of a Modified 3D Radiochromic Dosimeter for Clinical Proton Beams. *Med Phys* 34:2435, 6/2007.
 40. Tailor R, Ibbott G, Lampe S, Bivens W, Tolani N. Dosimetric Characterization of Model CS-1 1131Cs Source by Thermoluminescence Dosimetry in Liquid Water. *Med Phys* 34:2239, 6/2007.
 41. Han Y, Shin EH, Yoon MK, Lee SB, Ju SG, Lim CL, Park SH, Kang SK, Lah JE, Cho SH, Ibbott G, Ahn YC. Dosimetry in an IMRT Phantom Designed for a Remote Auditing Program. *Med Phys* 34:2444, 6/2007.
 42. Bivens W, Ibbott G, Maryanski M, Heard M, Followill D, Zhu X. Linear Energy Transfer (LET) Dependence of BANG® Polymer Gel Dosimeters in Proton Beams. *Med Phys* 34:2467, 6/2007.
 43. Ibbott G. Requirements for Addressing Respiratory Motion in Cooperative Group Clinical Trials. *Med Phys* 34:2615-16, 6/2007.
 44. Ibbott G. RPC Programs. *Med Phys* 34:2584, 6/2007.
- Invited Articles**
1. Ibbott GS. The medical physics consult - gel dosimetry. *J of the Amer College of Radiol* 3:144-6, 2006.

Letters to the Editor/Newsletters

1. Nag S, Cardenas H, Chang S, Das IJ, Ibbott GS, Thomadsen B, Varia M. Reply to GEC-ESTRO-GYN letter. *Int. J. of Radiation Oncology, Biol. Phys.* 62:295-6, 2005.
2. Nag S, Cardenas H, Chang S, Das IJ, Ibbott GS, Lowenstein J, Roll J, Thomadsen B, Varia M. Reply to Narayan et al regarding ROB-D-05-00575. *Int. J. of Radiation Oncology, Biol. Phys.* (in press), 2005.
3. Butler WM, Huq MS, Li Z, Thomadsen BR, DeWerd LA, Ibbott GS, Mitch MG, Nath R, Rivard MJ, Williamson JF, Yue NJ, Zaider M. Third party brachytherapy seed calibrations and physicist responsibilities. *Medical Physics* 33:247-8, 2006.
4. Meigooni AS, DeWerd LA, Rivard MJ, Butler WM, Melhus CS, Nath R, Ibbott GS, Seuntjens JP. Response to "The need for a dose calibration protocol for brachytherapy sources". *Medical Physics* 34:367-368, 2007.

Book Chapters

1. Galvin JM, Ibbott GS. Commissioning and accreditation of a stereotactic body radiation therapy program. In: *Stereotactic Body Radiation Therapy*, Lippincott Williams & Wilkins, Philadelphia, pp. 85-93, 2005.
2. Ibbott GS. Radiation dosimetry: 3-dimensional. In: Webster JC, *Encyclopedia of Medical Devices and Instrumentation*, John Wiley & Sons, Hoboken, pp. 481-500, 2006.

PRESENTATIONS

INTERNATIONAL ACTIVITIES

Geoffrey Ibbott attended the Scientific Committee Meeting, Vienna, Austria, March 10-14, 2008.

Geoffrey Ibbott gave a seminar presentation at Colorado State University, Fort Collins, CO, April 28, 2008.

Geoffrey Ibbott gave a presentation at the ACMP Meeting, Seattle, WA, May 4, 2008

J. Francisco Aguirre attended the ICR 2008 Meeting, Marrakesh, Morocco, June 5-8, 2008.

Geoffrey Ibbott gave a presentation at the RTOG Meeting, RA Workshop, Philadelphia, PA, June 19, 2008.

VISITS TO INSTITUTIONS

1. Francisco Aguirre performed radiological physics measurements and reviewed patient dosimetry at the Maryland Regional Cancer Center, Silver Spring, MD, February 26-March 2, 2008.
2. Francisco Aguirre performed radiological physics measurements and reviewed patient dosimetry at the Centre Hospitalier Universitaire de Sherbrooke, Quebec, Canada, March 21-30, 2008.
3. Francisco Aguirre performed radiological physics measurements and reviewed patient dosimetry at the Erie Regional Cancer Center, Erie, PA, April 21-May 3, 2008.
4. Francisco Aguirre performed radiological physics measurements and reviewed patient dosimetry at the Lynn Regional Cancer Center, W. Palm Beach, FL, and the JFK Hospital, Edison, NJ, and Mountainside Hospital, Montclair, NJ, May 15-June 1, 2008.
5. Paola Alvarez performed radiological physics measurements and reviewed patient dosimetry at the St. Mary's Medical Center, Huntington, WV, March 24-26, 2008.
6. Paola Alvarez performed radiological physics measurements and reviewed patient dosimetry at the Erie Cancer Center, Erie, PA, April 21-23, 2008.
7. Paola Alvarez performed radiological physics measurements and reviewed patient dosimetry at the William Beaumont Hospital, Troy, MI, May 12-14, 2008.
8. David Followill performed radiological physics measurements and reviewed patient dosimetry at the Akron City Hospital, Akron, OH, March 3-5, 2008.
9. David Followill performed radiological physics measurements and reviewed patient dosimetry at the Cross Cancer Center, Edmonton, Canada, April 28-May 1, 2008.
10. Geoffrey Ibbott performed radiological physics measurements and reviewed patient dosimetry at the Norris Cancer Center, Los Angeles, CA, May 7-12, 2008.
11. Jessica Lowenstein Leif performed radiological physics measurements and reviewed patient dosimetry at the St. Mary's Medical Center, Huntington, WV, March 24-26, 2008.

12. Jessica Lowenstein Leif performed radiological physics measurements and reviewed patient dosimetry at the Cross Cancer Center, Edmonton, Canada, April 28-May 1, 2008.
13. Andrea Molineu performed radiological physics measurements and reviewed patient dosimetry at the Temple University Hospital, Philadelphia, PA, March 10-13, 2008.
14. Andrea Molineu performed radiological physics measurements and reviewed patient dosimetry at the Massey Cancer Center and the Massey Cancer Center at Stoney Point, Richmond, VA, April 21-24, 2008.
5. Irene Harris attended the NCCTG Meeting, Minneapolis, MN, April 9-10, 2008.
6. David Followill attended the ATC Meeting, St. Louis, March 27-28, 2008.
7. David Followill attended the RTOG Semi-Annual Meeting, Philadelphia, PA, June 19-22, 2008.
8. Geoffrey Ibbott attended the ATC Meeting, St. Louis, March 27-30, 2008.
9. Geoffrey Ibbott attended the ACMP Meeting, Seattle, WA, May 3-7, 2008.

MEETINGS ATTENDED

(March 1, 2008 – July 1, 2008)

1. Francisco Aguirre attended the Spring 2008 SWOG Meeting, Atlanta, GA, May 1-3, 2008.
2. Francisco Aguirre attended the QA and Dosimetry Symposium, Orlando, FL, May 15-23, 2008.
3. Francisco Aguirre attended the CALGB Meeting, Chicago, IL, June 27-29, 2008.
4. Cindy Davis attended the NSABP Meeting, Hollywood, FL, June 13-15, 2008.
10. Geoffrey Ibbott attended the PTCOG Meeting, Jacksonville, FL, May 21-24, 2008.
11. Geoffrey Ibbott attended the RTOG Semi-Annual Meeting, Philadelphia, PA, June 18-22, 2008.
12. Geoffrey Ibbott attended the NCCTG Meeting, Minneapolis, MN, April 9-10, 2008.

Respectfully submitted,



Geoffrey S. Ibbott, Ph.D.

**EXPENDITURES OF THE RADIOLOGICAL PHYSICS CENTER
 (RPC Grant and the Advanced Technology Subcontract)**

March 1, 2008 – July 1, 2008

PERSONNEL (salaries, fringe benefits): **\$844,903**

7 Physicists, 1 Supervisor of Quality Assurance Dosimetry Services, 1 Sr. QA Dosimetrist, 3 QA Dosimetrists, 1 Informatics Manager, 1 Database Administrator, 1 Programmer Analyst I, 1 Radiological Physics Supervisor, 5 Radiological Physics Technicians, 1 Coordinator of Research Data, 1 Department Administrator, 1 Office Manager, 1 Sr. Administrative Assistant, 1 Administrative Assistant, 1 Sr. Secretary, 1 Secretary and 3 Graduate Research Assistants.

TRAVEL

Visits:

Aguirre, Francisco	Maryland Regional Cancer Ctr., in Silver Spring, MD	\$1,282.09
	Centre Hospitalare Universitaire de Sherbrooke,	
Aguirre, Francisco	Fleurmont, Quebec, Canada	\$2,040.07
Aguirre, Francisco	Erie Regional Cancer Center, Erie, PA	\$1,545.72
Aguirre, Francisco	Lynn Regional Cancer Center, W Palm Beach, FL	\$1,149.80
	JFK Hospital, Edison, NJ, and Mountainside Hospital,	
	Montclair, NJ	\$1,666.37
Aguirre, Francisco	St. Mary's Medical Ctr., Huntington, WV	\$355.62
Alvarez, Paola	Erie Regional Cancer Center, Erie, PA	\$262.07
Alvarez, Paola	William Beaumont Hospital, Troy, MI	\$444.98
Followill, David	Akron City Hospital, Akron, OH	\$623.18
Followill, David	Cross Cancer Center, Edmonton, Canada	\$744.98
Ibbott, Geoffrey	Norris Cancer Center, Los Angeles, CA	\$521.58
Lowenstein, Jessica	St. Mary's Medical Ctr., Huntington, WV	\$507.64
Lowenstein, Jessica	Cross Cancer Center, Edmonton, Canada	\$609.73
Molineu, Andrea	Temple University Hospital, Philadelphia, PA	\$864.91
	Massey Cancer Center and Massey Cancer Center @	
	Stoney Point, Richmond, VA	\$870.13
	Total	\$13,488.87

Meetings:

Aguirre, Francisco	Spring 2008 SWOG Meeting, Atlanta, GA	\$522.42
Aguirre, Francisco	QA & Dosimetry Symposium, Orlando, FL	\$445.51
Aguirre, Francisco	CALGB meeting, Chicago, IL	\$1,069.01
Davis, Cindy	NSABP Meeting, Hollywood, FL	\$658.82
Harris, Irene	NCCTG Meeting, Minneapolis, MN	\$261.30
Followill, David	ATC Meeting, St. Louis, Mo	\$322.69
Followill, David	RTOG Semi-Annual Meeting, Philadelphia, PA	\$912.21
Ibbott, Geoffrey	ATC Meeting, St. Louis, MO	\$260.84
Ibbott, Geoffrey	ACMP Meeting, Seattle, WA	\$1,349.78
Ibbott, Geoffrey	PTCOG Meeting, Jacksonville, FL	\$782.96
Ibbott, Geoffrey	RTOG Semi-Annual Meeting, Philadelphia, PA	\$1,293.53
Molineu, Andrea	NCCTG Meeting, Minneapolis, MN	\$512.21
	Total	\$8,391.28

CONSULTANTS **\$19,239**

SUPPLIES: **\$35,703**

Office supplies, laboratory and record keeping, TLD,
 TLD supplies, software, equipment, etc.

OTHER EXPENSE:	\$56,122
Postage, telephone, reprints, copying, computer fees, equipment repair, registration fees, tuition, freight/delivery, etc.	
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SPACE RENTAL:	\$93,853
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Total Expenditures March 1, 2008 – July 1, 2008	\$1,071,700.15
Indirect costs @ 26%	\$278,642.04
TOTAL	\$1,350,342.19

RPC Report to TPC July 2008

<u>Clinical Study Groups</u>	<u>Office Reviewing Patient Records</u>	<u>Special Projects</u>
Gynecologic Oncology Group GOG	RPC	Radiotherapy manual Electronic Transfer of Patient Records Image Based Treatment Planning IMRT Guidelines Defining Treatment violations
National Surgical Adjuvant Breast and Bowel Project NSABP	RPC	IMRT Guidelines Partial Breast RT Credentialing
North Central Cancer Treatment Group NCCTG	RPC	Rapid Review of Lung Study 3D CRT Credentialing Stereotactic Phantom
Radiation Therapy Oncology Group RTOG	RTOG/RPC	IMRT H&N Phantom Prostate Phantom Prostate Implant Credentialing LDR/HDR Stereotactic Head Phantom Lung Phantom 4D Liver Phantom Cervix HDR/LDR Protocol Compliance Patient Calculation Program Partial Breast RT Credentialing IMRT Benchmark Case Lung Benchmark Case Spine Phantom
Southwest Oncology Group SWOG	QARC	3D Benchmark Case
Clinical Trial Support Unit CTSU	QARC, RPC, RTOG	RPC Institution List RTF Numbers TLD Monitoring Review RT Facility Questionnaire
American College of Radiology Imaging Network ACRIN	N/A	Participate in the development of guidelines for quality assurance of institution participating in ACRIN CT Dose Measurements
American College of Surgeons Oncology Group ACOSOG	QARC	RPC Institution List
Cancer and Acute Leukemia Group B CALGB	QARC	TRUS Prostate Approval Collaboration
Children's Oncology Group COG	QARC	3D Benchmark Case IMRT Benchmark Case/Phantom CT/MRI Fusion Benchmark
Eastern Cooperative Oncology Group ECOG	QARC	