

REPORT TO THE AAPM THERAPY PHYSICS COMMITTEE

Report No. 129

November 1, 2007 - March 1, 2008

a) Administrative

During 2007, Jose Bencomo retired from M. D. Anderson. Because funding from the NCI has been flat or even reduced slightly (in real dollars) the effect has been a reduction in funding of 3-5% each year. Consequently, it was not possible to replace Dr. Bencomo, and the RPC now has 6 physicists.

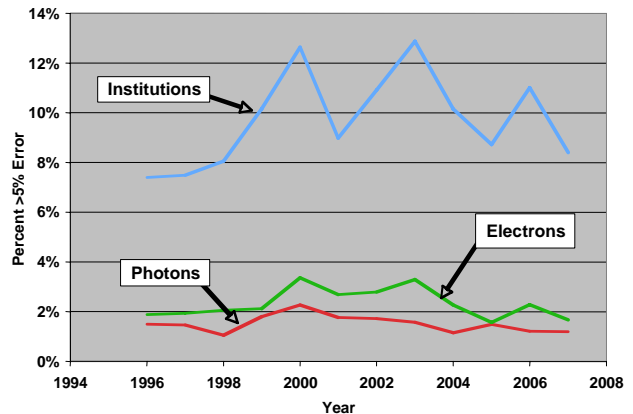
b) Studies and Results

The RPC presently monitors 1,560 megavoltage therapy sites in North America, Europe, and elsewhere in the world, that participate in cooperative group clinical trials funded by the NCI. The cooperative groups monitored include ACOSOG, ACRIN, CALGB, COG, ECOG, GOG, NABTT, NCCTG, NSABP, RTOG and SWOG. We also communicate regularly with the Cancer Trials Support Unit (CTSU) to assure that institutions participating through their programs are properly monitored. During 2007, the RPC reached an agreement with the NCI and the EORTC to make the RPC's monitoring capability available to EORTC members, for a fee that covers our costs. Today, 19 EORTC members are taking advantage of this service.

On-Site Dosimetry Reviews: In calendar year 2007, RPC physicists performed on-site dosimetry evaluations at 35 institutions, evaluating about 250 beams (a "beam" is a single photon beam or a cadre of electron beams). Thirty (86%) of the institutions received at least one recommendation for actions that should improve their quality assurance programs. During the last three years, additional procedures including measurement of small fields were added, to help evaluate IMRT.

In response to a mandate from the NCI, the RPC is developing procedures and assembling the equipment to conduct on-site dosimetry visits to proton facilities.

TLD: During calendar 2007, 13,729 beams (distinct energies) were monitored with TLD at the monitored institutions. Overall, 1.5% of the irradiated TLD received doses that disagreed with the institution's stated dose by more than 5%. However, these errors were distributed over a larger number of institutions; during 2007, 8.4% of the monitored institutions had at least one beam outside our 5% (or 5 mm in depth dose) criteria for agreement. As of March 1, 2007, 90% of US and Canadian institutions we monitor have converted to TG-51.

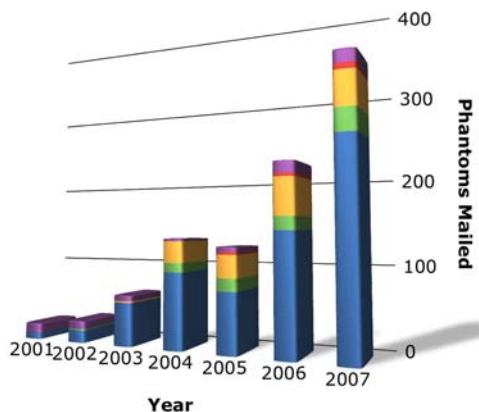


During the last year, the improvements made by the RPC to the TLD monitoring program have resulted in faster turnaround of results. We now read TLD at 10-14 days after irradiation. This is the earliest point at which our data show the uncertainty contributed by fading is reduced to acceptable levels.

During the last year, the RPC has evaluated its TLD system in proton beams. About 30 irradiations with proton beams of many different residual ranges have been conducted, and demonstrate reliable responses. The TLD program has subsequently been extended to proton facilities, and the first irradiations from three of the institutions indicate good results.

Also during the last year, the RPC has been evaluating optically stimulated luminescence (OSL) as a possible replacement for TLD. Two graduate students, Jaclyn Homnick and Adam Springer, conducted a series of preliminary measurements that showed promising results. Ms. Homnick presented these data at the HPS midwinter symposium in January 2007. Ms. Homnick is now conducting a more thorough evaluation of OSL under conditions simulating use by the RPC for her MS thesis. However, the results to date indicate that measurements with OSL have comparable uncertainty to TLD and little energy dependence. OSL however, is considerably less labor intensive to analyze.

Credentialing Processes: The RPC participates in the credentialing of institutions for protocols involving advanced technologies including brachytherapy, IMRT, stereotactic radiosurgery (SRS) and stereotactic body radiation therapy (SBRT). This activity is partially supported by a subcontract from the Advanced Technologies for Clinical Trials grant. For IMRT and SRS, credentialing includes irradiation of an anthropomorphic phantom provided by the RPC that contains anatomic structures and dosimeters. Most data have been acquired with the head & neck phantom, and to date the phantom has been irradiated 475 times. About 25% of the institutions irradiating the phantom failed to meet the RPC/RTOG criteria (7%/4mm) on the first attempt. The pass rate has actually improved in recent years, which is believed to be at least in part due to improvements to Pinnacle software that facilitates the modeling of beam data.



Since mid-2007, the RPC has funded a subcontract with Dr. Joe Deasy at Washington University to develop software to enable the RPC to perform a 2D comparison, with a gamma-index analysis, of irradiations of our phantoms. A preliminary version of the software has been received which is now being used routinely.

As part of the mandate from the NCI, the RPC is investigating modifications to the anthropomorphic phantoms to make them suitable for proton beams. The first phantom to be modified is the pelvic phantom, for which a new dosimetry insert is being manufactured for the TLD and film dosimetry systems.

Low-Energy Brachytherapy Sources: Dr. Ibbott represents the RPC on a subcommittee and several task groups appointed by the AAPM to address the use of new sources. The RPC acts as a clearinghouse of information and makes available on a web site a list of sources meeting the AAPM dosimetric prerequisites.

Intersociety QA Symposium: Dr. Ibbott was a member of the organizing and program committees of the recent Intersociety symposium on "QA for Radiation Therapy and the Challenges of Advanced Technologies" held in Dallas in February 2007. The publications from the symposium are expected to be published in a special issue of IJROBP soon.

Planning Workstation: An educational grant from Varian Corporation enabled the RPC to acquire an Eclipse treatment planning workstation. The TPS is being used to re-calculate institutions' treatment plans for verification.

Database: Funding was received from ASTRO to help support an expansion of the RPC database to include all radiotherapy facilities in the US. During the past months, a staff member has contacted all facilities identified by Ballas et. al. (Int. J. Radiation Oncology Biol. Phys., Vol. 66, No. 4, pp. 1204 -1211, 2006). This process has eliminated some errors in the work by Ballas, and has identified many additional facilities, with the result that the database now contains 2787 US facilities.

The ASTRO agreement also calls for the RPC to expand its annual survey of facilities to accumulate data regarding the institutions' staffing and

treatment statistics. A web-based survey form was developed and is presently being pilot-tested.

Webpage: The RPC webpage continues to be updated. The most valuable feature continues to be credentialing information.

Clinical Advisory Committee: A group of 5 radiation oncologists was formed as a clinical advisory committee. The Committee is contacted when questions arise regarding RPC operations.

c) **Plans**

Plans for this budget period are not significantly changed from those outlined in the application for the current grant cycle.

On-Site Dosimetry Reviews: Each FTE traveling physicist should review 50 beams.

Mailed TLD Program: Our criteria for acceptability have not been changed. An OSL dosimetry system is being evaluated under conditions simulating the RPC's mailed dosimeter program. Monitoring of proton facilities has been instituted and is continuing.

Credentialing: We will continue to work with the cooperative groups to focus our efforts appropriately. Modifications to the phantoms are being investigated for proton beams.

Patient Treatment Review: Except for some studies evaluated by the RTOG QA office, the RPC is the only QA office that focuses on technical evaluation of radiation dose (dosimetry review). The RPC will continue to review some fraction of patients to assess the quality of the data currently being submitted. The Eclipse workstation will be incorporated more fully into our review of patient records, to replace in-house developed software used for recalculation of dose distributions.

Anthropomorphic Phantoms: Additional H & N and thorax phantoms have been constructed to meet the demand for credentialing for existing protocols and newly developed protocols. Special attention continues to be given to the evaluation of heterogeneity corrections in lung protocols.

Liaison with Cooperative Groups, AAPM, etc.: The AAPM Therapy Physics Committee continues as our scientific advisory body. The RPC participated in the development and conduct of a

roundtable conference on quality assurance practices in radiation oncology held at the NCI in September 2005. This workshop became the impetus for the Intersociety QA Symposium held February 20-22 in Dallas, TX.

Data Transfer: The RPC, through the ATC subcontract, continues to develop and implement electronic data exchange capabilities. We now use electronic data routinely in the evaluation of phantom irradiations.

Webpage: We continue to add capabilities to the RPC webpage, and have converted our TLD review mechanism to a fully electronic process. Discussions have been held with the AAPM regarding access to the RPC database for data mining activities.

d) **Response to NCI Review**

As part of the NCI site visit in July 2004, the review committee provided a detailed list of comments and recommendations. These comments have been summarized and the RPC's proposed responses, and actions already taken, are listed below. [NOTE: This list is provided and updated annually.]

1. Prioritization

- a. RPC must develop a "master plan", rather than responding in an ad-hoc fashion to requests from study groups.

We agree that this would assist us in planning, but are concerned that it would reduce our responsiveness to the study groups. Study group priorities sometimes change with short notice. We pay close attention to the study groups' protocol priorities, and adjust our priorities accordingly. For example, the NCI recently placed great emphasis on monitoring proton beams. If the RPC had continued to focus on other priorities we would have been unable to respond quickly to this need.

2. Interactions with Radiation Physics Department

- a. The clinical rotations need to be improved further. RPC physicists should experience a broader range of clinical and anatomic sites, and get hands-on experience in planning and delivery using advanced technologies.

Effective July 1, 2006, by a decision made by

Dr. Mohan and Dr. Gillin, the rotation of RPC physicists through the MDACC clinic has been terminated. Instead, we have been offered the opportunity for brief, focused visits to the clinic to work closely with a clinical physicist on a topic of interest to the RPC. Our workload has prevented us from fully taking advantage of this opportunity.

- b. The RPC needs to demonstrate more collaborative research with the Department of Radiation Physics. Collaborations should be created during the clinical rotations, and maintained afterwards.

The RPC has addressed this issue with the Department, and a number of collaborations have been developed. The list of collaborations has been reviewed with Dr. Mohan, and in fact continues to grow, even as the number of physics faculty at the RPC has decreased from five to two.

3. Visits

- a. The priority list for visits is quantitative, but the threshold score of 12 is arbitrary; the RPC needs to estimate the impact on reported dose as a function of priority score.

The priority score is not only an indication of the likelihood of an incorrect dose, but also the number of patients potentially affected. The RPC has demonstrated that the institutions that had received visits accounted for 95% of the patients put onto clinical trials, in the study groups most closely monitored by the RPC. This is now more than 770 institutions. The remaining ~700 institutions collectively registered only 5% of patients on clinical trials. Therefore, our choice of a threshold score of 12 is clearly appropriate and no adjustments are envisioned.

4. Remote Audit Tools

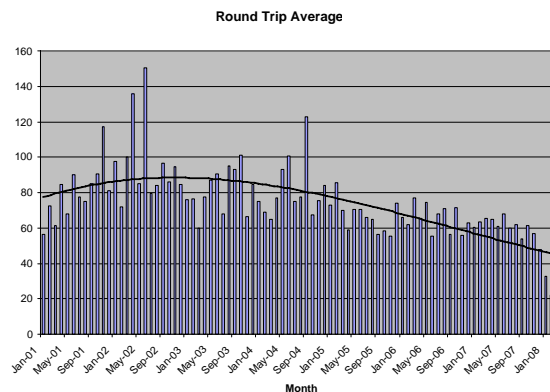
- a. Consider reducing/eliminating monitoring of electron beams with TLD.

Effective 10/1/04, we eliminated the routine measurement of electron %dd. Instead, we measure %dd on all beams for new machines, and whenever repeats are required. The output of electron beams is now monitored biennially rather than annually.

- b. Determine if changing to a 12-month cycle has improved institutional compliance.

Institutional compliance has improved since 2001, as shown in the graph below. It is likely that

changing the cycle contributed to this improvement, and it is also likely that improvements to our procedures for pursuing delinquent institutions has contributed a further improvement.



- c. Pursue with study chairs enforcing compliance with a warning/final letter indicating the impact on study group membership.

This recommendation has been implemented and is performed on a regular basis.

5. Database/Computer Technology

- a. RPC's plans for improvements to the database, and especially automated data-collection capabilities, aren't sufficiently specified. RPC didn't provide a clear and well-defined direction for further development. RPC didn't provide detailed plans for maintenance and upgrading of the operating system and database product. RPC did not explain methods for determining priority and assigning resources to development of new projects. RPC's plans for remote data collection and entry were not specified. RPC's next application must make more clear what has been accomplished and what we are proposing to do.

The RPC's current funding level does not permit us to adequately address all of these criticisms. However, progress has been made on a number of issues related to these recommendations:

1. RPC has recently implemented automatic data transfer from the TLD readers to our database, and allows for electronic review of TLD results.
2. RPC continues to implement new versions of

our visit software that facilitate the automated transfer of data from our visits into our database.

3. *RPC is currently negotiating with M. D. Anderson to transfer our database to an Oracle RAC server maintained by the institution. Doing so will upgrade the RPC to a current version of Oracle software, and will provide us with newer capabilities. This will also involve a considerable amount of effort to upgrade our database software to the current version of Oracle software.*

b. The RPC web page content falls below industry standards.

Improvements to the RPC website have been implemented recently. The web site now is competitive.

c. Only the current Newsletter appears on the web site.

We will call greater attention to the link in our Newsletters to our FAQ page where all past RPC Newsletters are available.

d. Institutions should be able to enter information through a web interface, possibly directly into the Oracle database, rather than by sending documents by email.

RPC has implemented a direct web interface to allow institutions to enter information directly. This capability was piloted with the NSABP/RTOG partial breast irradiation protocol and is now implemented for several other protocols. In addition, a web-based questionnaire has been developed that replaces the annual TLD questionnaire, and allows respondents to enter considerably more data about their institutions.

e. Questionnaires for specific trials should be refined to minimize free text entry and rely more on check off format.

We piloted such improvements for the NSABP/RTOG trial of partial breast irradiation and have implemented similar changes for subsequent trials.

f. RPC especially needs to develop plans to automate data collection to meet the demand for review of RTOG 0413/NSABP B-39 charts. This needs to be a major focus of the IT group.

We have implemented this for credentialing for the NSABP/RTOG trial of partial breast irradiation. Our record demonstrates our success in this regard.

However, further improvements will require additional resources for the IT group.

g. RPC should continue progress toward a paperless operation.

We are making progress toward this goal. Electronic review and reporting of TLD measurements was implemented in 2006 and has helped to reduce our turnaround time.

6. Standard Data

a. No specific recommendations.

7. Credentialing/Pre-Approval of Institutions/Individuals

a. RPC should continue development of advanced anthropomorphic phantoms that can evaluate dosimetry in sites with significant organ motion.

A new liver phantom was developed for RTOG 0438 that is shipped to an institution together with a reciprocating platform. The reciprocating platform has also been used with the thorax phantom to evaluate lung treatments under conditions simulating respiratory motion.

b. There is concern that RPC can meet the demand for chart review. The upcoming RTOG/NSABP PBI trial was mentioned in this context.

RPC has clearly demonstrated its ability to meet the demands for credentialing and chart review for the RTOG/NSABP PBI trial. A summary of the volume of credentialing and rapid reviews performed to date appears below.

RTOG 0413 Credentials:

	Rad. Oncs.	Institutions
3D CRT	933	424
Mammosite	608	296
Multicatheter	126	47
<i>Total distinct institutions credentialed: 522</i>		

Patient Chart Review:

Protocol	Review	Cases
0413	Rapid + timely reviews	197
0417	External + brachy	9
0418	IMRT rapid review	83 (63 in 2007)
	Brachytherapy boost	18
0529	IMRT rapid review	37 (80 reviews)

8. Clinical Trials Cooperative Groups Needs

- a. RPC must be proactive to assure that we receive data from investigators in a timely fashion.

We have limited control over the rate at which study groups send us patient data, but our new electronic capabilities will facilitate faster turnaround. The PBI trial might stimulate a change in behavior of the NSABP.

- b. RPC should determine the source of errors in charts and communicate this to study groups to educate members.

We still plan to publish our experience with GOG charts. Whether or not we can do this in other cases will depend on the approval of the study groups.

- c. RPC should use its clinical advisory committee to determine how to reduce the error rate in reporting.

We will investigate this with our clinical advisory committee.

- d. The QA workshop must be conducted, and RPC is encouraged to seek NCI support (either an R-13 grant, or use the NCI workshop program mechanism.) RT chairs should participate, not just group chairs.

The Intersociety symposium on "QA for Radiation Therapy and the Challenges of Advanced Technologies" was held February 20-22 in Dallas. The papers are expected to be published in a special issue of IJROPB soon.

9. Interactions with the Radiation Oncology Community

- a. RPC needs to engage in more collaboration with physicians.

We are continuing to encourage study chairs to include us when reports of trials are written, but authorship of study reports is always fiercely contested. However, we have been involved in several recent publications describing the results of clinical trials. See, for example, our publication on RTOG 95-17 in IJROBP in December 2007.

- b. Physicians other than the department chair should get feedback after a visit.

It is not clear how we can influence this. In fact, the exit interview is frequently conducted with a physician other than the department chair, subject to the availability of the chair.

- c. The Clinical Advisory Committee should meet with RT Chairs regularly.

The five members of the Advisory Committee are active on study group committees, and several are RT chairs. RPC funding does not allow us to conduct meetings of the Clinical Advisory Committee with RT chairs.

- d. At least two newsletters a year should be sent to the physician community.

During the past several years, RPC resources have been directed towards other critical needs. The frequency of the newsletter has decreased. Several presentations have been given to physician groups over the last two years, which highlight the activities of the RPC. These have been received well. See the summary of presentations later in this report. See Appendix II.

- e. A workshop, similar to the proposed QA workshop, needs to be provided to appeal to a broader audience, including physicians who are interested in clinical trials but are not in leadership positions.

Through the ATC, additional workshops are planned.

- f. RPC's mission may need to be expanded by NCI to address standardization in areas such as cryosurgery and radiofrequency ablation.

We will pursue this with NCI. Additional resources will be required.

10. Research Design and Methods

- a. This was not as well described or detailed as other aspects of the grant. RPC needs to provide more detail, and include specific goals and timelines for new research activities.

This will be addressed in our next renewal application.

- b. RPC physicists should be given "protected research time".

This is unlikely to happen given today's funding climate.

- c. RPC's publication record is still "modest".

We are continuing to increase the rate at which our posters and presentations are converted into publications. However, now that our faculty complement has decreased from five physicists to two, it is unlikely that our publication rate will increase.

- d. RPC should focus on IMRT, image-guided therapy, and collaboration with the Radiation Physics Department.

We are continuing to increase our collaborative efforts with the Clinical Physics Section. RPC's experience with the phantoms demonstrates our focus on IMRT and SBRT. We continue to investigate the best ways to conduct audits of image-guided therapy.

11. Dissemination of Information

- a. RPC should consider an "opt-in" mailing list through ASTRO to enable it to reach radiation oncologists and others outside AAPM.

We will approach ASTRO about such a capability.

- b. RPC web site should include citations of publications, with links to PubMed and/or journal websites.

Direct links to articles in on-line journals are generally not permitted, but we presently provide links to the journals. In some cases, full publications can be downloaded from our web site.

- c. More information needs to be made available on the web site, including policies, procedures, membership information, questionnaires, data entry forms, technical reports, and research results.

We agree, and will continue to expand and enhance the web site.

PARTICIPANT FEE:

Institutions invoiced FY08	1496
No XRT/Canceled/Inactive	4
Invoiced by RDS	1
Institutions paid	1208

PUBLICATIONS AND ABSTRACTS

Publications Accepted/Published (2005-present):

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Abstracts

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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.
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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.
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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.
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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.

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 IEC Meeting, Athens, Greece, November 8-17, 2007.

Geoffrey Ibbott attended the ABR Meeting, Cabo San Lucas, Mexico, February 2-9, 2008.

Geoffrey Ibbott visited Dr. Satoshi Ishikura at the National Cancer Center Hospital in Tokyo, Japan and also attended the Bangkok/Pattaya for Medical Physics Meeting in Bangkok, Thailand, February 18-26, 2008.

VISITS TO INSTITUTIONS

1. David Followill performed radiological physics measurements and reviewed patient dosimetry at the Fox Chase Cancer Center, Philadelphia, PA, November 12-15, 2007.
2. Jessica Lowenstein Leif performed radiological physics measurements and reviewed patient dosimetry at the Fox Chase Cancer Center, Philadelphia, PA, November 12-15, 2007.
3. Andrea Molineu performed radiological physics measurements and reviewed patient dosimetry at the Lehigh Valley Hospital, Allentown, PA, November 13-15, 2007.
4. Paola Alvarez performed radiological physics measurements and reviewed patient dosimetry at the Lehigh Valley Hospital, Allentown, PA, November 13-15, 2007.
5. J. Francisco Aguirre performed radiological physics measurements and reviewed patient dosimetry at the SUNY Health Science Center and the King County Medical Center, Brooklyn, NY, December 11-14, 2007.
6. Jessica Lowenstein Leif performed radiological physics measurements and reviewed patient dosimetry at the Rad. Onc. Assoc. of Sacramento - Mercy General, and the Rad. Onc. Assoc. - Marshall, Sacramento, CA, January 7-10, 2008.
7. Andrea Molineu performed radiological physics measurements and reviewed patient dosimetry at the Rad. Onc. Assoc. of Sacramento - Mercy General, and the Rad. Onc. Assoc. - Marshall, Sacramento, CA, January 7-10, 2008.
8. David Followill performed radiological physics measurements and reviewed patient dosimetry at the Baptist Memorial Health Hospital, Memphis, TN, February 4-7, 2008.
9. Paola Alvarez performed radiological physics measurements and reviewed patient dosimetry at the Wheeling Hospital, Wheeling, WV, February 19-21, 2008.
10. Jessica Lowenstein Leif performed radiological physics measurements and reviewed patient dosimetry at the Abington Memorial Hospital, Abington, PA, February 25-28, 2008.
11. J. Francisco Aguirre performed radiological physics measurements and reviewed patient dosimetry at the Maryland Regional Cancer Center, Silver Spring, MD, February 26-March 1, 2008.

MEETINGS ATTENDED

(November 1, 2007 - March 1, 2008)

1. Geoffrey Ibbott attended the ATC Steering Committee Meeting, Washington, DC, November 5-6, 2007.
2. Geoffrey Ibbott attended the RSNA Meeting, Chicago, IL, November 24-29, 2007.
4. Scott Davidson attended a research meeting at Washington University, St. Louis, MO, December 13-27, 2007.
5. Geoffrey Ibbott attended the RTOG Semi-Annual Meeting, San Diego, CA, January 17-20, 2008.
6. David Followill attended the RTOG Semi-Annual Meeting, San Diego, CA, January 17-20, 2008.
7. Jessica Lowenstein Leif attended the GOG Meeting, San Diego, CA, January 24-26, 2008.
8. Joye Roll attended the GOG Meeting, San Diego, CA, January 24-26, 2008.
9. Maria Bellon attended a meeting at the UT South Western Medical Center, Dallas, TX, January 24-27, 2008.
10. Dorene Biagas attended the NCURA Grants Conference, San Antonio, February 11-13, 2008.
11. Maria Bellon attended a meeting at the UT South Western Medical Center, Dallas, TX, February 10-14, 2008.

Respectfully submitted,



Geoffrey S. Ibbott, Ph.D.

EXPENDITURES OF THE RADIOLOGICAL PHYSICS CENTER

(RPC Grant and the Advanced Technology Subcontract)

November 1, 2007 - March 1, 2008

PERSONNEL (salaries, fringe benefits): **\$744,436.00**

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	SUNY Health Science Ctr. and King County Med. Ctr., Brooklyn, NY	\$1,438.68
Aguirre, Francisco	Maryland Regional Cancer Ctr., Silver Spring, MD	\$1,628.81
Alvarez, Paola	Lehigh Valley Hospital, Allentown, PA	\$331.87
Alvarez, Paola	Wheeling Hospital, Wheeling, WV	\$1,290.07
Followill, David	Fox Chase Cancer Center, Philadelphia, PA	\$958.83
Followill, David	Baptist Memorial Health Hospital, Memphis, TN	\$737.74
Lowenstein, Jessica	Fox Chase Cancer Center, Philadelphia, PA	\$717.40
Lowenstein, Jessica	Rad. Assoc. of Sacramento, Two Med. Plaza, Mercy General, Auburn Rad, Onc. Marshall, and Mercy San Juan, Sacramento, CA	\$716.44
Lowenstein, Jessica	Abington Memorial Hospital, Abington, PA	\$1,403.88
Molineu, Andrea	Lehigh Valley Hospital, Allentown, PA	\$487.20
Molineu, Andrea	Rad. Assoc. of Sacramento, Two Med. Plaza, Mercy General, Auburn Rad, Onc. Marshall, and Mercy San Juan, Sacramento, CA	\$717.56
	Total	\$10,428.48

Meetings:

Bellon, Maria	UT South Western Medical Ctr., Dallas, TX	\$488.98
Bellon, Maria	UT South Western Medical Ctr., Dallas, TX	\$820.00
Biagas, Dorene	Sponsored Project Administration, San Antonio, TX	\$805.10
Davidson, Scott	Washington University, St. Louis, MO	\$482.98
Davidson, Scott	Washington University, St. Louis, MO	\$557.09
Followill, David	RTOG Semi-Annual Meeting, San Diego, CA	\$986.18
Homnick, Jacklyn	Health Physics Society Meeting, Oakland, CA	\$683.52
Ibbott, Geoffrey	ATC Steering Committee, Washington, DC	\$351.95
Ibbott, Geoffrey	RSNA Meeting, Chicago, IL	\$1,698.96
Ibbott, Geoffrey	RTOG Semi-Annual Meeting, San Diego, CA	\$931.79
Lowenstein, Jessica	GOG Meeting, San Diego, CA	\$671.14
Roll, Joye	GOG Meeting, San Diego, CA	\$686.65
	Total	\$9,164.34

CONSULTANTS		\$1,089.00
SUPPLIES:		\$34,017.00
Office supplies, laboratory and record keeping, TLD, TLD supplies, software, equipment, etc.		
OTHER EXPENSE:		\$35,908.00
Postage, telephone, reprints, copying, computer fees, equipment repair, registration fees, tuition, freight/delivery, etc.		
SPACE RENTAL:		\$81,424.00
Total Expenditures November 1, 2007 - March 1, 2008		\$916,466.82
Indirect costs @ 26%		\$238,281.37
	TOTAL	\$1,154,748.19

RPC Report to TPC March 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
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	