

To: ATC Steering Committee

**From: J. A. Purdy, Ph.D.
ATC Principal Investigator**

Date: November 15, 2005

RE: Response to ATC Steering Committee Meeting, Washington D.C., April 6, 2005

The ATC wishes to thank the members of the ATC Steering Committee (ATCSC) and the other interested parties that attended this meeting for providing input and review for this important NCI sponsored project. We particularly liked the format of the meeting this year in that it not only provided a review of the past year's accomplishments by the ATC and its responsiveness to Steering Committee input, but also provided input from other parties that are working on similar digital data interchange issues. We feel strongly that the presentations by ACRIN, CIP, and industry (IMPAC) representatives were very helpful and will aid in developing realistic future goals for the ATC. We also appreciated the timing of the meeting to allow several of the ATC members to attend the 6th National Forum on Biomedical Imaging in Oncology which was sponsored by the Cancer Imaging Program of the NCI, since there are many common elements between the ATC capabilities and the developing use of biomedical imaging in oncology.

We have listed each Steering Committee comment below and provided our response following each of the questions:

1. ATC must eventually adopt a completely open architecture and open source strategy for its long term viability. At present, some proprietary software modules are used. In the long term, this is a serious potential vulnerability that could be corrected by making a gradual conversion of all software to open system architecture. This may be inevitable for many practical reasons, but the principle of "open" technology for ATC is important for long term viability and success.

Response: We agree that the principle of "open" technology for ATC is important for long term viability and success, but for the foreseeable future *ATC Method 1* (ITC's FTP and Remote Review Tool) will remain the "workhorse" to accomplish our mission, as we have 8 active protocols and 5 closed protocols that we are supporting. Also, the development of a robust *ATC Method 2* (RCET's NetSys/WebSys) remains a high priority. However, the fact is that thus far we have not been successful in accomplishing this task. Now that one group (NCIC) has taken ownership in a portion of this software (NetSys), their effort will be leveraged to improve the robustness and perhaps speed the development of Method 2. A testing timetable for Method 2 has been established and is posted on the ATC website under the ATC Steering Committee. Note that this timeline clearly points out that, unfortunately, we are still at Step 1 in the testing process. With regard to future software development, RCET and ITC have been instructed to utilize caBIG and caCORE informatics technology where possible in all future tool developmental projects.

2. The ATC has existing on-line archives and has developed processes to update, extend and improve the archives' utility. A major reason for assembling the archives is to perform secondary analyses, but even more fundamentally, to address important questions that were

not posed at the time each trial was designed. ATC needs an inventory of important questions that can be answered by interrogating this archive. Furthermore, ATC needs to complete demonstration projects that show the archive is successful in addressing these questions.

Response: We agree that the treatment planning verification database at the ITC and the outcomes database at the RTOG is a valuable resource. However, the ATC is not funded to independently perform studies utilizing these databases. Instead, we are funded to help facilitate such studies. We have been extremely successful in this endeavor as evidenced by the 11 peer reviewed publications on RTOG protocols 94-06 and 93-11, and by the successful R01's awarded to Dr. Sue Tucker (RTOG 94-06 data) and Dr. Joe Deasy (RTOG 93-11 data). In addition, this database led to a secondary analysis paper by Dr. Mack Roach in which he utilized the 94-06 archived CT dataset to contour the penile bulb using the ITC's Remote Review Tool and the archived 3D dose distribution to generate DVH's that could be analyzed using the RTOG outcomes regarding impotency for these patients. [Roach III, M., Winter, K., Michalski, J., Cox, J., Purdy, J., Bosch, W., Lin, X. and Shipley, W.: Penile Bulb Dose and Impotence After Three-Dimensional Conformal Radiotherapy for Prostate Cancer on RTOG 9406: Findings From A Prospective, Multi-Institutional, Phase I/II Dose-Escalation Study. *Int J Radiat Onco Biol Phys*, 60 (5):1351-1356, 2004].

3. ATC serves many constituencies, including the radiation oncology community, NCI radiation research program, cooperative groups, cancer centers, industry, and especially cancer patients and their families. The needs of each constituency are important, but the mechanism for assessing these needs is informal. A needs assessment should be done so resources and future plans can be aligned with priority requirements.

Response: All ATC members are kept apprised of ATC activities and particularly supported protocols on the monthly ATC teleconference. In addition, the RTOG provides a list of developing protocols to the ITC and the RPC which clearly lists those developing protocols requesting ATC support. We are also vigorously pursuing interactions with other groups, e.g., NCIC, COG, JCOG, and EORTC. A priority list is maintained and is posted on the ATC website under the ATC Steering Committee.

4. DICOM has evolved with IHE and related initiatives to take an "enterprise view" rather than a site or image-centric view of information. Many aspects of IHE – the Integrated Healthcare Enterprise – deal with modeling and addressing workflow, so the technical assets can be most effectively used. ATC should endeavor to study and apply IHE technology to the workflow of clinical trials that involve radiation therapy. This is a particularly attractive area for ATC to pursue, given the great success they have demonstrated with DICOM-RT development.

Response: The ATC is very much involved with the IHE-Radiation Oncology effort. In fact, submission of data for an ATC Clinical Trial Protocol is included in the IHE-RO Integration Profile. An update of ATC IHE-RO activities is a standing agenda item for all ATC Teleconferences and face-to-face meetings.

5. Given the commitment made to caBIG, caCORE and related cancer informatics technology by NCI, ATC should study and plan the use of these elements in their current and future tools development projects. An outline of how integration with caBIG and caCORE and related

informatics technologies will be accomplished should be prepared and considered in long term planning for the future of the ATC.

Response: We agree. RCET and to the extent ITC develops new software has been instructed to utilize caBIG and caCORE informatics technology in all future tool development projects. Also, please note that the ATC is represented as a funded participant in the newly created caBIG In Vivo Imaging Workspace.

Other points raised concern the efforts made by the ATC to facilitate future outcomes research. Specifically, should ATC be working with its customers to structure access to the data in a way to enable mining across study groups and perhaps even QA organizations? First the ATC SC needs to understand that the ATC is a virtual organization. The ITC is the only ATC member thus far that has an archived treatment planning verification (TPV) digital database containing all the RT objects that can be linked to the cooperative group's outcomes database. The data belong to the RTOG, NSABP, and JCOG, specific to their protocols, but is managed by the ITC. We believe that the approach that the ITC, RTOG, NSABP, and JCOG has implemented is working. Both ITC and the cooperative groups mentioned are cooperating with individual researchers request by being supportive in their request. An example is the work we have done in support of Dr. Sue Tucker and Dr. Joe Deasy's RO1 applications. As the ATC becomes more involved with the caBIG effort, we certainly will work to facilitate data sharing and to become caBIG compliant.