ATC AdvancedTechnologyConsortium
Providing support in quality assurance and data management for radiation therapy clinical trials

To: **ATC Steering Committee**

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

Date: **December 19, 2008**

RE: **Response to 2008 ATC Steering Committee Recommendations, Concerns, and Questions**

The ATC wishes to thank the members of the ATC Steering Committee (ATCSC) and the other interested parties that attended the October 2, 2008 meeting for providing their input and review of this important NCI sponsored project. Please understand that the ATC is a team effort and the organizations and the individuals listed below have made significant contributions to the ATC efforts: NCI: JA Deye, (Project Officer); ITC: JA Purdy (ATC P.I.), WR Bosch, JM Michalski, WL Straube, JW Matthews, RJ Haynes, A Eccher; RTOG: WJ Curran, J Galvin, E Martin, L Quarles; RPC: GS Ibbott, D Followill, J Bencomo, A Molineu, J Lowenstein, I Harris, P Alvarez, J Roll, N Hernandez, H Duong; QARC: TJ FitzGerald, MM Urie, K Ulin. Our responses to the various recommendation, concerns, and questions raised by the ATCSC are as follows:

2008 ATC STEERING COMMITTEE RECOMMENDATIONS

General Recommendations

1. **ATCSC Recommendation:** Prepare a specific plan/timetable to be done in the next (annual) period.

   Response: *Please see* ***Attachment 1****.*

2. **ATCSC Recommendation:** A high-level meeting (ATC, NCI, RTOG, ACR/ACRIN) should be held to discuss the most efficient avenues for collaboration/coordination between ATC and ACRIN for imaging regarding IGRT versus diagnostic/treatment assessment imaging.

   Response: *We will depend on RTOG, RPC and QARC to continue to make ACRIN aware of ATC capabilities. It should be noted that Dr. Ibbott is a member of the ACRIN QC committee. He attends meetings and is in regular contact with Drs. Bruce Hillman and Mitch Schnall. Whenever appropriate, the potential contributions of the ATC are mentioned. We will encourage a high-level meeting to discuss means of increasing collaboration and improving coordination of efforts of mutual benefit.*

3. **ATCSC Recommendation:** Continue ATC support of industry-initiated studies with novel therapeutic agents as it provides a unique opportunity to study the interactions between these agents and modern RT technologies.

   Response: *We agree; e.g., the ATC(ITC) is presently supporting an AstraZeneca trial..*

4. **ATCSC Recommendation:** ATC should consider expanding its infrastructure, or at least better advertising ATC activities for single-institutional and non-RT clinical trials. While probably beyond horizon for the current funding cycle, ATC should start preparing to become a more global effort of clinical trial support (e.g., connecting with advanced technology in tissue banking).

Response: *We will take this recommendation under advisement, but the ATCSC should understand that the ATC is currently not charged by the NCI to expand its support to include single institution trials, or non-RT trials.*

5. **ATCSC Recommendation:** An ATCSC Conference Call with key members of the ATC and NCI should be held every 6 months to track and keep up with the happenings in the ATC.

   Response: *We agree. A conference call with the ATCSC and the ATC P.I and subcontractor P.I.s, Jim Deye, and B. Vikram and any other persons deemed appropriate by this group will be held in March/April 2009.*

6. **ATCSC Recommendation:** The ATC PI (with input from the subcontractor P.I.s) should provide the ATCSC a quantitative assessment of what has been accomplished in the past year two weeks prior to the ATCSC meeting.

   Response: *A copy of the latest ATC progress report will be sent by the ATC P.I. to the ATCSC two weeks prior to the ATCSC meeting.*

Development of Informatics Infrastructure Recommendations

7. **ATCSC Recommendation:** ATC should continue to push manufacturers of major radiation oncology equipment to implement full DICOM standards. They are mostly there but not all. More importantly, the implementation of a remote review tool (ideally web-based) would be of great value. ATC is probably in the best position to negotiate this much like the DICOM story. This along with an anonymization tool will enhance clinical trial technical data review, etc.

   Response: *We agree regarding implementation of DICOM standards. Many of the commercial TPS's have remote capabilities now. We agree that an anonymization tool for data submissions (or for intramural research studies) would be useful and will continue to encourage such development.*

8. **ATCSC Recommendation:** Highly encourage the use of commercial treatment planning systems (TPSs) to serve as remote QA review workstations.

   Response: *We agree. It should be noted that the ITC and the RPC already make significant use of commercial TPS workstations in fulfilling the ATC mission. The ITC has been using CMS Focus and FOCAL workstations in support of RTOG clinical trials since the RTOG 9406 protocol; and more recently the RPC has been using a Varian Eclipse workstation with RPC standard data, to independently recalculate patient doses for patients on clinical trials through several study groups. We are planning to explore the use of a commercial TPS for remote QA review via a Citrix server recently purchased by ITC.*

9. **ATCSC Recommendation:** Develop a database that will facilitate future research to explore possible relationship between treatment outcomes and patient race, socioeconomic status, institutional quality of care etc. Database will also promote research that could help to better define normal tissue tolerance for the different organ systems with modern RT treatment modalities.

   Response: *ATC will take this matter under advisement. We agree in principle; however, resources and priorities may prevent this effort from moving forward.*

10. **ATCSC Recommendation:** ATC should harness CaBIG/CaGRID efforts to further enhance QA/QI and review of outcomes for PI, staff, etc of clinical trials group.

Response: *We are working with the caBIG In Vivo Imaging Workspace. In particular, we have developed a strong relationship with Dr. Joel Saltz's group and are working to interface both QARC's MAX system and ITC's QuASA^{2}R system to the grid.*

11. **ATCSC Recommendation:** Continue to maintain the cooperation between the ATC, caBIG, VIEW and ACRIN.

    Response: *We are working closely with the caBIG In Vivo Imaging Workspace. QARC is keeping us well informed of the VIEW project and Brenda Young is working with us wearing both her RTOG and ACRIN hats to keep the ATC updated on relevant projects. A representative of the RPC attends ACRIN meetings and Geoff Ibbott is a member of the ACRIN QA committee, and reports to the ATC on the activities of this committee. In the future, reports from these individuals regarding these liaisons will be a standing agenda item for all ATC meetings except the ATC mini-meetings held at the RTOG semi-annual meetings.*

Credentialing/QA Recommendations

12. **ATCSC Recommendation:** Investigate possibilities to either adopt/modify an existing IGRT phantom or to initiate efforts to develop a new IGRT phantom for credentialing purposes.

    Response: *We agree. As stated at the ATCSC meeting, Dr. Purdy has appointed a standing ATC Credentialing/QA Committee (ACQAC) whose mission (See **Attachment 2**) is to help the ATC promote uniformity in credentialing/QA across cooperative groups (one of the specified goals of the ATC). This standing committee is made up of a representative from each of the ATC member organizations (Marcia Urie (Chair)-QARC, Dave Followill (Co-chair)-RPC, Jim Galvin-RTOG, and Bill Straube-ITC) and their first report back to the ATC is included as **Attachment 3**. Development of a consensus IGRT credentialing and case QA process is a high priority for the ATC. We have asked RTOG is to take the lead in this effort, with the understanding to work closely with the other ACQAC members to insure we end up with uniform IGRT credentialing methodology/criteria.*

13. **ATCSC Recommendation:** Need to reassess the types of tests that are done for credentialing. This is particularly important if ATC is to expand the QA program internationally. Issues related to credentialing for IGRT appear to still be under development, yet clinical trials are already requiring that support. Some credentialing tests may need to be done as benchmark tests rather than actual phantom irradiations or submitted patient data. The QARC imaging registration is a good example of a test of an institution's registration software and the review by the personnel. For imaging, benchmarks could be designed where individuals download a treatment planning scan and then image datasets for their type of machine (e.g. CT generated DRRs to be matched with kV or MV imaging). The institution could create a treatment plan and then register and submit the results of the registration for the simulated treatments. Clinical challenges could be part of the test dataset. For example, datasets from multiple days, verifying whether or not the treatment plan and then patient alignment for treatment is biased to a target or to avoiding a normal tissue for lung SBRT near the spinal cord. Then, the ATC could use this information to assess that part of the treatment process for daily imaging protocols. This procedure would be a different approach than requiring users to submit copies of screen shots showing the alignment prior to irradiation for patients. It would take more effort to be credentialed but then there would be less interaction needed on a per patient basis. Such an approach may address the appropriate part of the QA that must be assessed for the protocol. If that is the

case, then such a benchmark test could be supported in a straightforward way for international trials.

Response: *We agree that we need to reassess the types of tests that are done for credentialing and have asked the ACQAC to do just that. In particular, the ACQAC is reviewing the current IMRT credentialing methodologies (QARC benchmark and RPC phantoms) used in the U.S. We have asked the committee to base their recommendations on data and not bias, if at all possible. We think it is particularly important when looking at the credentialing tests to try and use statistical measures, such as (a) Sensitivity and (b) Specificity, to determine the number of true positives/negatives and false positives/negatives that occur with IMRT credentialing tests so that we set the credentialing "bar" right. Preliminary report regarding this matter will be given by the ACQAC at the January 15th, 2009 ATC mini-meeting.*

14. **ATCSC Recommendation:** New credentialing programs should be piloted at a small numbers of centers (academic and stand alone clinics) with feedback provided by the credentialing institution about the difficulty of the test, its appropriateness, and the amount of time required to complete the test.

    Response: *The ATC is very supportive of this suggestion, and it is being addressed by the ACQAC. It should be noted that some members of the ATC feel that this recommendation is already in place. Specifically, RPC believes that this is exactly what they have done with each of their credentialing procedures (phantoms, benchmarks, and questionnaires), and that QARC did the same with their IMRT benchmark. However, we do believe that this is an area that requires more discussion between members of the ATC and we will report back to the ATCSC on this matter. We are considering developing a more formal relationship with the AAPM subcommittee on clinical trials QA. We will follow-up with Jean Moran and Art Olch regarding this recommendation and report back to the ATCSC.*

15. **ATCSC Recommendation:** Recommend that advanced dose calculation heterogeneity calculations protocol requirements such as being used for RTOG 0617 continue.

    Response: *We agree and will continue to make that recommendation to cooperative groups and protocol chairs. We will continue to treat the evaluation of heterogeneity corrections as a priority to be led by the RPC.*

16. **ATCSC Recommendation:** ATC should formulate a way to better support smaller centers that clearly have challenges. These centers with 1-2 linacs and often only 1 physicist have traditionally had difficulty in credentialing and have a much higher failure rate. These same centers are often the very centers that support clinical care for disparate populations as well.

    Response: *We are fully supportive of helping institutions meet protocol credentialing requirements. In particular, we have assigned Mr. Bill Straube (ITC) to monitor CDRP institutions and extend even more personal help (through direct telephone conversations, emails) regarding interpretation and instructions for credentialing tests. In addition, the RPC expends considerable effort in assisting institutions that have difficulty meeting the credentialing requirements, and even achieving the basic machine output thresholds.*

Data Sharing/Data Mining Recommendations

17. **ATCSC Recommendation:** Develop a database inventory among ATC participants to facilitate more research with all the data that are being collected.

Response: *We have asked ITC, QARC, RTOG, and RPC to put together inventories of pertinent QA or treatment planning data that might be useful for research projects. First report of these inventories will be due at April 2009 ATC meeting at the RPC.*

18. **ATCSC Recommendation:** Develop clear process for investigators to access RPC/ITC/RTOG and potentially QARC data for secondary analyses. This can be modeled after the RTOG secondary analysis criteria.

    Response: *We believe the current ATC approach regarding data sharing is the best that we can do. We have established a clear process (data request form is posted on the ATC website) and are working to add links to cooperative groups' websites for their secondary analysis guidelines and data request forms. The ATC has demonstrated the ability to anonymize the data, and the ability to reformat the data in either DICOM or MatLab file format, and distribute the data by DVD or by internet download. However, the ATCSC must realize that the cooperative groups (or their grantee institution) own the individual protocol data. We are cooperating with individual researchers request by being supportive in their request and encouraging the cooperative group to agree to release the data. An example is the work we have done in support of Dr. Sue Tucker's and Dr. Joe Deasy's successful RO1 grant applications.*

19. **ATCSC Recommendation:** Develop a clear mechanism for investigators to propose projects to the appropriate trial group/QA Center. It does not seem like significant progress is being made on this issue.

    Response: *See responses to recommendations 17 & 18.*

20. **ATCSC Recommendation:** Development of means to allow data mining from external participants of the credentialing / QA database is recommended.

    Response: *See responses to recommendations 17 & 18.*

21. **ATCSC Recommendation:** Encourage efforts to make the QA database held predominantly by the RPC to be more readily accessible. This could be an amazing resource, particularly in the area of patient safety, where clinics (particularly small clinics with limited resources) could 'web in" to check the basic accuracy of their data, configurations, etc.

    Response: *See responses to recommendations 17 & 18. It must also be emphasized that the RPC works very hard to ensure the confidentiality of institution-specific data. It is only through this assurance of confidentiality that the radiation oncology and medical physics communities are as welcoming as they are of the RPC's support. This does not mean that mechanisms cannot be found to make the data more accessible, but it will require careful control over the type and amount of data that are made public.*

22. **ATCSC Recommendation:** Encourage the ATC QA groups to work together to further enhance outcomes initiatives by investigators.

    Response: *We certainly agree that we need to work together and we are all very supportive of outcomes initiatives. However, we still must work under the rules for data sharing as described in our response to recommendation 18.*

23. **ATCSC Recommendation:** ATC should play a role in mining the ATC/RPC database to enhance outcomes-based investigations.

Response: *We are not funded to perform data mining projects, but rather to build (and continue to enhance) the informatics infrastructure that facilitates such data mining*

24. **ATCSC Recommendation:** Efforts to demonstrate the utility of data sharing might help persuade protocol groups to move towards more open access of data for data mining.

    Response: *We agree and continue to encourage requests such as the examples of Dr. Sue Tucker and Dr. Joe Deasy's which led to successful RO1 grant applications.*

25. **ATCSC Recommendation:** The ATC should continue to be sensitive to the issue of the security of patient data. There was some discussion about whether or not reviewers could possibly have partial datasets downloaded on their local computers which they could use for a subset analysis. The organization should continue to keep its members informed. It was mentioned that a notice may be added for a reviewer when accessing the Web-based tools. In addition, the RTOG may want to consider adding information to the annual meeting book if it is not already there.

    Response: *We agree and continue to be ever vigilant regarding the security of submitted case digital data.*

26. **ATCSC Recommendation:** Ensure safeguards are in place for remote access of patient data.

    Response: *Safeguards are in place to ensure safety of archived case digital data.*

2008 ATC STEERING COMMITTEE CONCERNS / QUESTIONS

General Concerns/Questions

1. **ATCSC Concerns/Questions:** There is a substantial expansion of the imaging lab services at the RTOG headquarters. It was not clear what projects would require this space. One concern is whether or not the new laboratory space replaces some of the review that may be occurring at other locations for RTOG data (such as the ITC). The other concern involves the ATC relationship with ACRIN. While there should be strong advantages to working side-by-side with ACRIN, more deliberate coordination of efforts or joint projects are needed to keep the collaboration going.

   Response: *We depend on RTOG, RPC, and QARC to make ACRIN aware of ATC capabilities and encourage any initiatives that make our current efforts more synergistic. We believe the development of an ACR/RTOG Core lab for RT trials that is working closely with ACRIN will be a good thing and that it will free ITC resources to support other/more cooperative groups' advanced technology clinical trials.*

2. **ATCSC Concerns/Questions:** There is concern about the lack of radiology oversight of RT protocols. Diagnostic radiologists play a significant role in determining the GTV in most tumor sites. While our specialty is witnessing significant advances in area of accurate delivery of high doses of radiation to target tissues, we cannot be found lacking in our ability to 'identify' the full extent of the tumor. Complex imaging techniques such as MRI perfusion scans, PET scans etc are of great use in accurately defining target volumes. If we truly want to provide the best oncologic care for our patients we should be able to better integrate the advances in the fields of Radiation Oncology and Diagnostic Radiology by facilitating greater collaboration/oversight between both specialties. Any role the ATC can play in this effort will

go a long way in improving the efficacy and minimizing the toxicity of modern day radiation therapy.

Response: *We share this concern and have encouraged cooperative groups to reach out and bring in more diagnostic expertise (both physician and physicists). We have had some success in this area – Dr. Robert Jeraj has started attending the RTOG semi-annual meetings and Dr. FitzGerald has been successful in getting diagnostic radiologists involved with QARC rapid reviews for several COG protocols.*

3. **ATCSC Concerns/Questions:** One member expressed major concerns regarding the apparent lack of cooperation between the RTOG and ATC in certain areas like development of infrastructure/ laboratory space and implementation of certain contracts. This will specifically go against the very first stated objective of the ATC grant and will result in duplication of efforts and unwise use of the limited resources currently available. This individual urges the leadership of the ATC and RTOG to correct this trend.

   Response: *This is likely more perception than reality. We do agree there needs to be more communication regarding informatics infrastructure expansion at ATC member sites. However, as stated previously, we believe the development of an ACR/RTOG Core lab for RT trials that is working closely with ACRIN will be a good thing for ATC in that it will free ITC resources to support other/more cooperative groups' advanced technology clinical trials.*

4. **ATCSC Concerns/Questions:** It appears that the collaboration between ATC, QARC, RTOG, RPC and ACRIN is not as seamless as it was hoped for in the ATCSC meeting last year. Could sense some differences and also one of the ATCSC members seemed to have some information about problems that was not public knowledge. All members of the ATC need to work together to make ATC concept happen. The PI and co-PIs need to address these issues and inform the ATCSC of their plans to make this collaboration work for the better.

   Response: *The ATC P.I. and the ATC Project Officer will need more information on this matter before a response can be formulated.*

5. **ATCSC Concerns/Questions:** There was mention of the ATC Council of Industry Participants (ACIP) with a list of company names. It would be helpful to get more details on what each of these industry participants is bringing to the table. If they are going to work with ATC on software modifications that will be of utility to ATC clients, the ATCSC needs details on those items.

   Response: *The mission of the ACIP is to advise the ATC regarding the development of a clinical trials informatics infrastructure that facilitates and supports volumetric digital data submission, data archiving, and remote web-based QA review for clinical trials that utilize advanced technologies. The ATC informatics development effort has embraced a modular architecture philosophy with emphasis on well-defined interfaces and promotion of commercial "off-the-shelf" and open-source software products. Custom software component development is encouraged on only those QA features required, but not otherwise available commercially. By limiting the scope of module functions and using standards-based interfaces, maintenance/testing of new system components are also facilitated. Specifically, the ACIP will assist the ATC in realizing its vision and achieving its goals by (1) providing input regarding the latest informatics technology commercially available, and (2) periodically reviewing and assessing the ATC's informatics infrastructure and developmental plan/schedule. It will provide a written report documenting findings and recommendations to*

*the ATC on a yearly basis. A copy of the most current ACIP mission statement that lists the membership is enclosed (**Attachment 4**). Their first task is to put together a written report critiquing ATC(ITC)'s QuASA^{2}R development plan (**Attachment 5**) including recommendations/suggestions for change.*

6. **ATCSC Concerns/Questions:** It is unclear what the expectations are from the ACIP.

   ***Response:** See response to concern/question 5.*

7. **ATCSC Concerns/Questions:** A better understanding of the purposes of the ACIP is needed.

   ***Response:** See response to concern/question 5.*

8. **ATCSC Concerns/Questions:** Concerned about Dr Purdy stepping down as PI of ATC. May be there needs to be a transitioning period of some type where Dr Purdy stays as a consultant to ensure that the new PIs learn and get guidance from him.

   ***Response:** A transition period is now underway, and the matter of P.I. transfer has been discussed with Dr. Deye, the NCI Project Officer. Beginning on July 1, 2009, Dr. Purdy will step down as the P.I. for the ATC U24 grant (but remain as part of the grant effort) and turn over that responsibility to Drs. Bosch and Michalski who will serve as co-PIs. They will then be responsible for the overall direction and coordination of the ITC/ATC efforts and for ensuring that the grant's goals are realized. Dr. Purdy will assist them by continuing to participate in all ATC related teleconference including a weekly conference with Drs. Bosch and Michalski. Dr. Purdy will continue to provide input into credentialing and QA processes, protocol design, coordination of ATC QA Center efforts, and the design and development of ATC software needed to accomplish the ATC mission. Dr. Purdy will assist Drs. Bosch and Michalski in developing the agendas for any ATC Teleconferences and the multiple ATC face-to-face meetings. Dr. Purdy will assist Drs. Bosch and Michalski in preparing the end-of-year year progress report and all other official reports from the ATC and the ITC pertinent to advanced technology clinical trials. In summary, Dr. Purdy is (and will remain) very committed to the success of this grant and plans to stay fully engaged with ATC efforts for the remaining years of this grant.*

9. **ATCSC Concerns/Questions:** Concern expressed about the proposed change of ATC leadership announced by Dr. Purdy.

   ***Response:** See response to concern/question 8.*

<u>Development of Informatics Infrastructure Concerns/Questions</u>

10. **ATCSC Concerns/Questions:** One member expressed continuing disappointment in the lack of progress on the development of general review tools and data-sharing. Hoped that the current modular effort will minimize some of this re-direction in the future. Stated that the use of CERR and caBIG are keys to the overall success of the ATC and its impact on the community.

    ***Response:** We have already addressed the data sharing issue under response to the ATCSC recommendations. Regarding development of general review tools, we are making every effort to stay focused on the development approach/plan established for QuASA^{2}R. The ATC(ITC) informatics development effort, from the very beginning, was built around the CMS Focus file format and embraced a modular architecture using commercial (primarily CMS) "off-the-shelf" products and open-source software with emphasis on well-defined*

interfaces and standards. We originally called this the ATC Method 1, but in the new grant refer to it as the QuASA^{2}R (Quality Assurance Submission, Archive, Analysis, and Review) system. The ATC(ITC) invented the RTOG Data Exchange (RDE) using the AAPM Report 10 in order to receive what we determined to be a complete treatment planning data set (for clinical trial QA purposes) from each of the nine original institutions participating in the 3DOG/RTOG 94-06 protocol. Limitations in the RDE format, as well as a desire to use a more broadly-based industry standard, motivated the involvement of the ITC in developing an alternative method for clinical trials data submissions. In late 1994, representatives of several manufacturers met at Washington University with the ITC to discuss the possibility of developing DICOM objects to represent treatment planning information. A few weeks later, the DICOM Ad Hoc Committee on Radiotherapy Objects was formed at RSNA. Over the next several years, this committee, which ultimately became DICOM Working Group 7, developed the specifications for the RT information objects. A member of the ATC(ITC) (Dr. W. Bosch) has been involved with WG 7 from the beginning. In addition, the ATC was approved as an Organizational Member of the International Integrating the Healthcare Enterprise (IHE) as of March 6, 2008 and is represented by Dr. Bosch. Finally, it should be noted that the ATC continues to work directly with TPS vendors (mainly Dr. John Matthews), to assist in the testing of their implementation of ATC compliant DICOM export capabilities in commercial TPS software. Note, The ITC maintains a list of commercial ATC Compliant Treatment Planning Systems (TPS) on the ATC website which can produce data in a format suitable for submission on ATC-supported protocols.

As discussed at the ATCSC meeting, work is currently underway at the ITC to extend the capabilities of the QuASA^{2}R system to support QA for a broader range of imaging and treatment techniques. To manage the collection and evaluation of new data objects (functional imaging, 4-D CT, 2-D and 3-D IGRT images, and adaptive radiotherapy techniques), the ITC is replacing the current CMS-based imaging/treatment planning/verification (ITPV) database with DICOM archive software supporting a tiered storage structure on a highly-redundant Network Attached Storage (NAS) hardware (Pillar Data Storage, San Jose, CA). The DICOM archive software, Evercore (TeraMedica, Milwaukee, WI) will provide storage for diagnostic imaging, DICOM RT, and meta-data related to the diagnosis, treatment, and outcomes assessment for protocol patients. Updates to QA utilities that aid ITC staff in performing DDIQA continue to be implemented. An example is the integration of CERR for converting non-DICOM data received by the ITC to DICOM RT objects, for QA review, and for secondary data analysis. Please see our response to item #11 regarding our interface with the caBIG infrastructure.

11. **ATCSC Concerns/Questions:** Concern that there is a lack of funding for efforts to utilize / integrate efforts between caBIG and the ATC. Such an effort should be looked at closely, as the results could be very meaningful as caBIG will be important as outside forces (Congress) demand greater visibility in the sharing of data acquired through federal funding.

    Response: *As a participant in the Cancer Bioinformatics Grid (caBIG) In Vivo Imaging Workspace, the ATC(ITC, QARC) is working with Dr. Joseph Deasy and colleagues at Washington University and Dr. Joel Saltz and colleagues (Emory University) to develop compatible interfaces between the QARC-MAX system and the ITC-QuASA^{2}R system and the caBI) infrastructure.*

<u>Credentialing/QA Concerns/Questions</u>

12. **ATCSC Concerns/Questions:** Concern regarding the ability to do more universal institutional credentialing across protocols and protocol groups. In particular, there appears

to be poor sharing of data across protocols so that one protocol / protocol group could look at an institution's record and decide if (a) the information submitted meets the requirements of the protocol, or (b) what incremental information would be necessary to acquire. This could happen if there was a better data-sharing of institutional information across protocols (a kind of caBIG of institutions).

Response: *We share this concern and have appointed an ATC Credentialing/QA Committee to focus on this very issue to help the ATC promote uniformity in credentialing and QA criteria for advanced technology clinical trials' across cooperative groups and QA Centers. We are very much committed to having a universal Facility Questionnaire for all QA Centers finalized this year.*

13. **ATCSC Concerns/Questions:** Concern in progress being made in standardizing protocol guidelines for technologies such as IMRT, IGRT, SBRT and proton therapy. This will enable clinicians to write better protocols incorporating uniform guidelines for dose prescription and treatment delivery.

    Response: *We share this concern and hope that the appointment of the ATC Credentialing/QA Committee will result in improved progress in this area. We ask each participant to wear their ATC hats and not their QA Center hats to work together and help the ATC achieve uniformity in protocol guidelines regarding credentialing and QA criteria for advanced technology clinical trials' across cooperative groups and QA Centers. We are very much committed to showing more progress in this area by the time of next year's ATCSC meeting.*

14. **ATCSC Concerns/Questions:** International sites pose a significant challenge—need to establish a common process for credentialing and platform for case QA review. The controversy over annual QA versus something less than annual should be resolved quickly by looking at the QA data to see if much changes over 1 or 2 years.

    Response: *We agree and are in the process of reassessing the tests that are done for credentialing. Specifically we are looking at (a)* annual TLD verification of treatment machine calibration; (b) IMRT credentialing (benchmarks vs. phantoms); and (c) review of EORTC credentialing questionnaire (and harmonization of the current RTOG Facility Questionnaire so it is acceptable to QARC, RPC, and ITC).

15. **ATCSC Concerns/Questions:** Concern regarding ATC support of international trials and the appropriateness of QA standards. Since the ATC is a virtual entity, it would be interesting to explore whether or not the existing European QA group could join the umbrella of the ATC and be provided resources that could be used to support NIH-funded trials. For example, the EORTC could create a subcommittee specifically for NIH-funded trials to be part of ATC. An advantage of this approach would be that the European members would provide direct support to its own members. With the support from the appropriate groups within the ATC, this may also provide a more robust solution for the long-term from a resource and work-flow standpoint. It is understood that the link may be weak initially. At the minimum, some initial QA of the uploaded data could potentially be done by European members. Those members would then be able to provide assistance in addressing problems in real-time rather than having delays in communication due to the differences in time zones.

    Response: *Please see response to concern/question 14. We are in discussion with the leadership of EqualEstro, a CRO which supports EORTC clinical trials and are trying to harmonize credentialing/QA criteria.*

16. **ATCSC Concerns/Questions:** Concern that 27% of the data submitted to the ITC still requires human intervention. The ATC should make a concerted effort to decrease this value.

    Response: *ITC's Digital Data Integrity QA (DDIQA) experience is based on receiving/processing over 7000 digital datasets over 13+ years. Analysis of DDIQA metrics shows that approximately 30% of submissions are problematic and require resubmission, and that DDIQA effort expended is dependent on protocol complexity. Protocols requiring more than one fraction group have a much higher incidence of problematic submissions (50% vs. 25% for all other submissions). Protocols which include contouring of nodal volumes and large number of OARs are more time consuming and require more experienced QA staff to prepare for PCQA review. IMRT submissions include non-anatomical structures used for optimization. TVs and OARs need to be combined into a single protocol compliant structure set and doses for separate fraction groups must be combined into a single total dose. Hence, H&N IMRT cases can take as long as 2 person-hours to prepare for PCQA even for non-problematic data submissions. Procedures and tools developed by the ITC have made the DDIQA process more efficient, but we believe strongly (based on 13+ years of experience) that total automation of case dataset submission for QA review is not realistic at this time. ITC's DDIQA efforts contribute a great deal to educating physicists and physicians at participating institutions and improving the quality of subsequent patient treatments and data submissions. We will continue to work with cooperative groups to include clearer specific instructions on data submission in protocols, and will continue to try to make improvements in our DDIQA software tools in order to make the process more efficient.*

17. **ATCSC Concerns/Questions:** Concern was expressed regarding the continued high failure rate for RPC phantom tests used for credentialing - cause should be investigated.

    Response: *The ATC is certainly aware of this high failure rate and has asked the RPC to continue to closely analyze their data and determine if the phantom tests and pass/fail criteria used are appropriate (see RPC publications, including the special issue of the red journal from 2008). This is a difficult question and we have even suggested the possibility of having the data made available to other parties interested in this type of research to help answer this question. We appreciate the ATCSC's concern and will report back on this issue at the 6-month teleconference.*

Data Sharing/Data Mining Concerns/Questions

18. **ATCSC Concerns/Questions:** Although ATC is funded to some extent as a means of improving cooperation between protocol groups in radiation oncology, there is clearly more to do. It's clear that there is often an attitude of "It's my data" in the gut reactions from the organizations rather than a "let's find a way to make it work" attitude. If ATC can't make it work, how can we ever make it work in the outside world?

19. ***Response:*** *As stated previously, we believe the current ATC approach regarding data sharing has made some progress in this area. We are cooperating with individual researchers request by being supportive in their request and encouraging the cooperative group to agree to release the data. An example is the work we have done in support of Dr. Sue Tucker's and Dr. Joe Deasy's successful RO1 grant applications. Please rest assured that ATC is committed to "making it work in the outside world."*