

AbstractID: 8879 Title: QuASA²R - a digital data Quality Assurance Submission, Archive, Analysis, and Review system for advanced technology clinical trials in radiation therapy

Purpose: The QuASA²R clinical trials quality assurance (QA) system, developed by the Image-guided Therapy QA Center (ITC), provides multiple cooperative groups one of the most advanced medical informatics infrastructures currently in use for radiation therapy clinical trials QA. The recently renewed ATC grant has provided funds for further refinement/development of this system. A status update of QuASA²R for protocol case data QA, submission, archive, analysis, and review is presented.

Method and Materials: Development of QuASA²R is guided by the considerable experience and success of ITC computer scientists and QA personnel in supporting advanced technology clinical trials, recognition of QA tool needs for future protocols involving emerging technologies (e.g. IGRT, ART), and compatibility with caBIG infrastructure. ITC has embraced a flexible, modular architecture with emphasis on well-defined interfaces, which allows integration of commercial “off-the-shelf” and open-source software and focuses custom software development/enhancements on features not otherwise available. This approach enables step-wise implementation and upgrading of system components while providing continuous support of ongoing protocols.

Results: A major update of QuASA²R is underway involving replacement of current treatment-planning-system-based imaging/treatment planning/verification database with specialized DICOM archive software supporting a tiered storage structure. The DICOM archive supports diagnostic imaging, DICOM RT objects, and meta-data related to diagnosis, treatment, and outcomes assessment for protocol patients. Updates to QA utilities that aid ITC staff in performing *Digital Data Integrity QA (DDIQA)* continue to be implemented. The open-source CERR software system has been integrated into QuASA²R for format conversion, QA review, and secondary data analysis.

Conclusion: The QuASA²R system has demonstrated a continuing robustness, having archived over 6000 datasets. Its modular design allows updates to meet changing requirements of advanced technology clinical trials. Experience with new updates and a roadmap for future upgrades over the next 12 months will be presented.

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