Advanced Technology Consortium
DICOM Conformance Statements

Revised April 29, 2008

The Advanced Technology QA Consortium DICOM Conformance Statement specifies the requirements for submission of protocol-compliant data for advanced-technology, multi-institutional clinical trials in radiation therapy to ATC data centers. This Conformance Statement is structured as follows:

1. The **ITC File Set Reader Application** conformance statement describes the use of DICOM objects and attributes for images and radiotherapy treatment planning data to be submitted for ATC protocols. This document focuses primarily on the requirements for the objects to be submitted and is written in the context of submission of a DICOM Part 10 File Set, either on removable media (CD-R) or as files to be transferred via the Internet.

2. A summary statement outlining special requirements for DICOM objects to be used for protocol-compliant data submissions is provided as an accompanying document.

PLEASE NOTE: The ATC has submitted a DICOM Correction Proposal (CP-434, Final Text Nov. 1, 2005) to clarify the interpretation of the **Grid Frame Offset Vector** (3004,000C) attribute in the RT Dose IOD (see DICOM Part 3, Section C.8.8.3.2).

Description of the Grid Frame Offset Vector (3004,000C) in Section C.8.8.3.2 in the Multi-frame module of the RT Dose IOD states that the attribute contains an array of *n* elements indicating the plane location of the data. This statement, however, does not state the coordinate system in which the position is to be specified. As a result of this ambiguity, early implementers have interpreted this attribute as either (1) absolute axial (longitudinal) positions in the patient coordinate system, or (2) relative offsets of the dose grid frame from the point specified by the Image Position (Patient) (0020,0032) attribute.

The image coordinate system's relationship to the patient coordinate system is defined by the Image Orientation (Patient) (0020,0037) attribute, which specifies the direction cosines of the first row and the first column with respect to the patient. Interpreting the Grid Frame Offset Vector (3004, 000C) as absolute patient longitudinal coordinates, i.e., (1) above, presents difficulties in the case that the axes of the dose distribution are rotated with respect to those of the patient coordinate system. Thus, it is proposed that the language of Section C.8.8.3.2 be modified to state explicitly that values of the Grid Frame Offset Vector (3004, 000C) represent positions of dose planes with respect to the first dose plane transmitted, i.e., the point at which the Image Position (Patient) (0020,0032) attribute is defined. Thus, the first element of the Grid Frame Offset Vector (3004, 000C) will always be zero.

To support existing implementations, use of absolute patient z coordinates (i.e. where the offset of the first plane is non-zero) is supported, in the case where the dose image coordinate system is not rotated.

Please contact the Image-guided Therapy Center (314-747-5414 or itc@wustl.edu) for additional information. The ATC DICOM Conformance Statement and related documents are available online at http://atc.wustl.edu/resources