



**Southwest  
Oncology Group**  
A National Clinical Research Group

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TO: ALL SOUTHWEST ONCOLOGY GROUP MEMBER, CCOP, AFFILIATE  
MEDICAL ONCOLOGISTS AND RADIATION ONCOLOGISTS

FROM: Connie Ballon-Almanza, Radiation Therapy Designate

RE: Electronic Submission of Radiation Therapy Materials

**MEMORANDUM**

Attached please find "News from QARC." This information serves to encourage electronic submission of radiation therapy materials and provides guidelines for the submission of Diagnostic Imaging scans and Radiation Therapy data to the Quality Assurance Review Center (QARC) for Southwest Oncology Group protocols utilizing radiation therapy.

This information is also being distributed in the Southwest Oncology Group Newsletter, November issue.

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## News from QARC

We have seen a dramatic shift since the beginning of the year in the number of institutions providing diagnostic imaging and RT materials in electronic files. We are pleased to see this change and while we do continue to support film submission, we want to encourage more institutions to send data to QARC electronically. This can be done several ways. Below are some guidelines and helpful hints. Please note that there are **important** differences between Diagnostic Imaging Scans and Radiation Therapy Data.

### Diagnostic Imaging Scans

#### CT and MRI

Most CT and MRI scanners produce image files in DICOM (Digital Imaging and Communications in Medicine) format. DICOM is a standard that can be easily read by several commercial viewers. The DICOM files can be transferred to QARC either by CD or e-mail. If burned to a CD we prefer that only one patient is included on each CD, however, multiple studies for the same patient may be on the same CD. These are large files; therefore, at many sites the e-mail system would not be able to send these files as attachments. However, we do not have restrictions at QARC, so if you can send the DICOM file as an attachment, we can receive it.

DICOM files whether received via e-mail or CD have lots of information stored with the image. The images can be windowed and leveled by the reviewers at QARC allowing them to find the optimal contrast for reading the images. The scale embedded in the image remains intact allowing the reviewers at QARC to make accurate measurements from the images. When a digital picture of an image is taken and sent to QARC as a .jpg or dropped into a PowerPoint file, that type of information in the image is lost. Electronic pictures such as .jpg's, .bmp's and .tif's are fine for some data transfer but cannot be used for CT's or MRI's when a diagnostic review of those scans is required.

#### Radiographs/Plain Films

Plain films such as chest x-rays or bone x-rays are required by some studies. The x-ray machines that produce these images are less frequently digital machines that can produce DICOM files, although, this is a changing paradigm. If your institution's x-ray machines can produce DICOM images, you can send those to us those either by CD or Dicomunicator as explained above. Good quality digital pictures of x-rays taken with a digital camera or a saved screen shot from a digitized film may be adequate for the review. However, if accurate measurements are required a picture will not substitute for a DICOM file or a film.

### Radiation Therapy Data

Much of the RT data required by protocol can be submitted electronically to QARC. Most radiation therapy planning today is done with treatment planning computers. The patient's diagnostic CT or MRI is sent to the planning system. The planning system uses the data from the diagnostic study to present a digital reconstruction of the patient on which the physician identifies tumor and tissue at risk as well as critical structures. Using the planning system the physician and dosimetrist plan how the patient will be treated to deliver the prescription dose to the treatment volume while preventing the dose to critical structures from exceeding normal tissue tolerance criteria in the protocol. Documentation of the treatment plan is displayed in various formats including Digital Reconstructed Radiographs (DRR), Beam's Eye Views (BEV), Dose Volume Histograms (DVH) and isodoses. These types of data can be saved as screen captures (.jpg or .bmp) and sent to QARC on CD or as attachments to an e-mail. Screen captures from the treatment planning system should be distinguished from DICOM RT files. At this time, we **do not** want DICOM RT files submitted to QARC. One final note about treatment planning, a treatment planning CT is different than a diagnostic CT. When studies require the diagnostic CT, a treatment planning CT cannot be substituted.

Many Radiation Oncology Departments no longer produce verification films from the treatment machines (linear accelerators). Real-time portal imaging has replaced verification films. These systems display an image of the beam portal on a monitor for the time that the patient is receiving treatment. A "screen-shot" of the portal imaging can be taken and saved as a digital picture (.jpg or .bmp). This can be submitted to QARC on CD or by e-mail.

All e-mails can be sent to [tborchardt@QARC.org](mailto:tborchardt@QARC.org). If you have any questions, please contact Tracy Borchardt; or any of us at QARC: <http://www.qarc.org/qarcstaff.htm>