IGRT Credentialing for NCI Sponsored Clinical Trials

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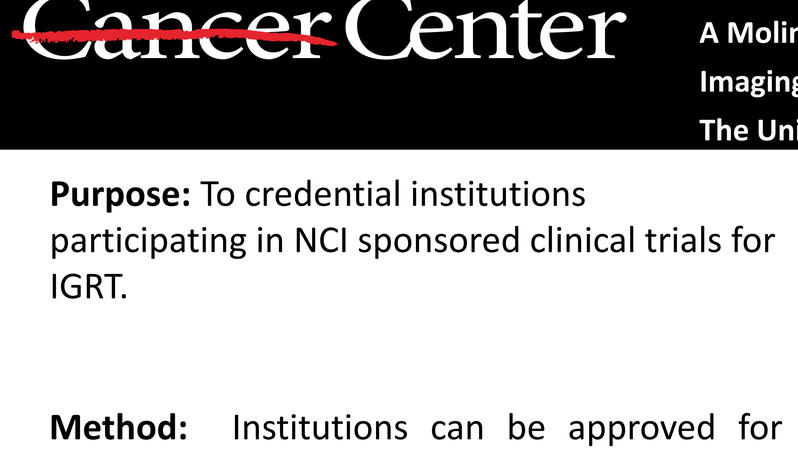
Purpose: To credential institutions participating in NCI sponsored clinical trials for IGRT.

Method: Institutions can be approved for either boney anatomy or soft tissue anatomy IGRT. They are asked to submit IGRT datasets for two fractions from either a HN or brain case (for boney anatomy) and a lung, liver or pancreas case (for soft tissue anatomy.) All sites must also submit data for a pelvis case. The data is submitted through TRIAD in DICOM format and should include the planning CT, RT structure set, RT plan file, RT dose file, localization images used (CBCT, kVCT, etc), and the spatial registration file if available. (Figure 1) The sites also submit a questionnaire where they are asked to describe their IGRT procedures and QA. (Figure 2) Once the submission is complete, the items are reviewed in MIM Maestro®.



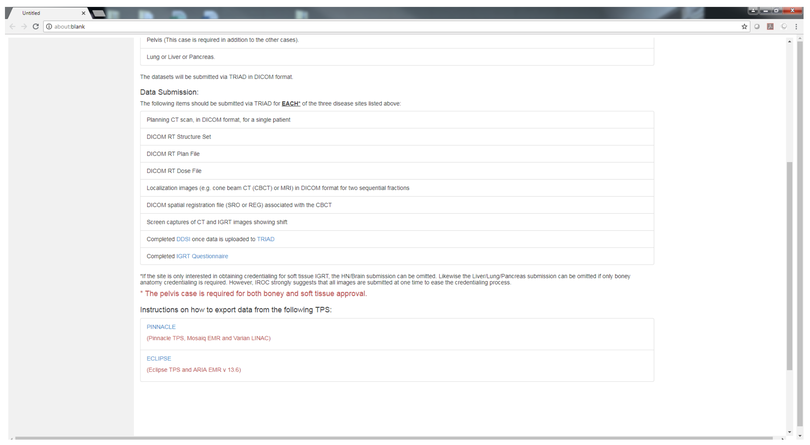


Figure 1 Website description of IGRT credentialing requirements.

IGRT Questionnaire

Contact Information:

Institution Name:_____RTF:_____ CTEP Number:_____

Address:_____

Physicist name:_____Physicist email:_____

Radiation Oncologist name:_____Radiation Oncologist email:_____

Data manager/CRA name:_____ Data manager/CRA email:_____

Other contact name:_____ Other contact email:_____

Phone number:_____

IGRT Types Used (check all applicable)**:**

2D: ☐ MV ☐kV ☐ kV fluoroscopy

CBCT: ☐MV ☐kV ☐4D

CT: ☐MV ☐kV

MRI: ☐

Other: _____

Please list Model and Manufacturer of each system used: _____

Registration Method(check all applicable)**:**

☐Manual Registration ☐Automated registration ☐Automated&manual registration ☐Other

If other, describe _____

What type of alignment does your site perform? ☐Bony ☐ Soft Tissue ☐Fiducial ☐tumor

Please include a detailed description of your IGRT methods including registration algorithm, patient alignment and approval procedure_____

Motion Management (check techniques used in the clinic):

Simulation: ☐Free Breathing ☐ 4DCT ☐breath hold

Treatment: ☐Free Breathing ☐breath hold

Imaging QA:

Each site is expected to follow the recommendations issued by the AAPM's TG-179 report.

Do you perform daily tests either of isocenter coincidence or of phantom localization/repositioning?

☐Yes ☐No

Do you perform monthly laser alignment QA? ☐Yes ☐No

Do you perform monthly couch shift QA? ☐Yes ☐No

Do you perform monthly Image quality QA? ☐Yes ☐No

Do you perform annual imaging dose QA? ☐Yes ☐No

If you answered no to any of the above, please explain. _____

Frequency/Tolerance:

What is your IGRT frequency (daily, weekly, etc)? _____ Please describe for all relevant disease sites. _____

What is your tolerance level for patient repositioning? Please describe for all relevant disease sites. _____

Do you reimage after shifting the patient? ☐Yes ☐No If so describe the circumstances when you do? _____

In what situations do you reimage the patient during the treatment?_____

What is your rotational tolerance _____and is your treatment couch able to rotate? ☐Yes ☐No

Are fiducial markers used? ☐Yes ☐No

Figure 2 IGRT credentialing Questionnaire

Results: 221 submissions have been received, of which 24 are incomplete. 189 approvals have been issued: 122 for boney and soft tissue anatomy, 52 for soft tissue only, and 15 for boney only. 164 approvals are for c-arm type machines. The rest are for CyberKnife (14), proton (6) and TomoTherapy (5). One site did not receive approval due to lacking a comprehensive IGRT procedure. Several sites have clarified or improved their procedures based on feedback from the review. Common questions for the site include asking about bladder fill for pelvic irradiations, asking for clarification on procedures for re-imaging after applying shifts, and asking for clarification about scan-range procedures.

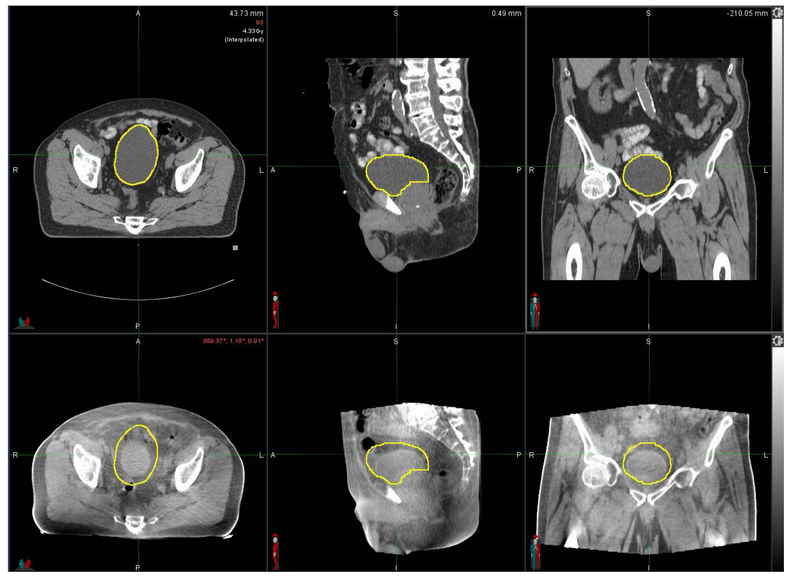


Figure 3 Example of a submission where bladder filling is markedly different between

Conclusions: IGRT credentialing ensures that institutions participating in NCI sponsored clinical trials have an IGRT QA program and can capture and register images that exhibit an appropriate field of view and quality.

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