

## IMRT QUESTIONNAIRE

<b>Institution:</b> _____	<b>Date:</b> ____/____/____
<b>Address:</b> _____	
_____	
_____	
<b>Physicist:</b> _____ <b>e-mail:</b> _____	
<b>Telephone:</b> _____	<b>Fax:</b> _____
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<b>Dosimetrist:</b> _____ <b>email:</b> _____	
<b>Telephone:</b> _____	<b>Fax:</b> _____
<b>Responsible Radiation Oncologist(s)</b> _____	
<b>Telephone:</b> _____	<b>e-mail:</b> _____

This questionnaire and benchmark have been accepted by all of the NCI funded cooperative groups and Quality Assurance Offices as a minimum standard for an institution to be credentialed for use of IMRT in clinical trials. The benchmark is not site specific, i.e. it applies to IMRT treatment of all disease sites. The benchmark should be submitted to the appropriate Quality Assurance office, i.e. Quality Assurance Review Center ([www.QARC.org](http://www.QARC.org)), Radiation Therapy Oncology Group ([www.RTOG.org](http://www.RTOG.org)), or Radiological Physics Center (<http://rpc.mdanderson.org/rpc>).

Some cooperative groups may require that a specially designed phantom be planned and irradiated using IMRT as a part of the IMRT credentialing requirement for some or all of their IMRT protocols. For such cases the RPC has developed anthropomorphic (or geometric) phantoms to meet the specific requirements of the protocol. Institutions that have satisfactorily completed IMRT credentialing with an RPC phantom will not be required to complete this benchmark. Information concerning the RPC phantoms may be obtained from the RPC.

1. a. What treatment machine(s) do you use for IMRT treatments? \_\_\_\_\_

b. Photon energy(s)? \_\_\_\_\_

2 a. What form of IMRT do you use?

SMLC (step and shoot)

Serial tomotherapy (MIMiC)

DMLC (sliding window)

other \_\_\_\_\_

b. MLC/device used to deliver IMRT: vendor \_\_\_\_\_

\_\_\_\_\_ (#) leaves with \_\_\_\_\_ cm leaf width at isocenter

\_\_\_\_\_ Nomos MIMiC in \_\_\_\_\_ 1cm mode \_\_\_\_\_ 2cm mode

Other : \_\_\_\_\_

3. What is your IMRT planning system? \_\_\_\_\_ Version No. \_\_\_\_\_

4. Is your treatment planning system capable of transferring a patient's beams to a QA phantom for verification purposes?  yes  no

If no, how do you verify the dose distribution \_\_\_\_\_

5. What sites do you treat with IMRT?

head and neck

prostate

other (please specify) \_\_\_\_\_

6. If you treat head and neck (H&N) patients with IMRT:

a. The total number of H&N patients treated with IMRT at your institution is \_\_\_\_\_

b. Number of H&N patients treated with IMRT in the past 12 months at your institution \_\_\_\_\_

c. The usual fraction size is \_\_\_\_\_ cGy and the usual number of fractions is \_\_\_\_\_

d. The usual beam energy is \_\_\_\_\_ MV

e. How are your H&N patients immobilized for IMRT?

head-cup and mask

talon

foam-immobilization mold and mask

other \_\_\_\_\_

A bite block is routinely used  yes  no

f. What PTV margins do you usually use for H&N IMRT patients? \_\_\_\_\_ mm

- g. To what isodose line are IMRT treatments for H&N patients commonly prescribed (relative to maximum dose)?
- 95%       90%       85%       80%       other \_\_\_\_\_
- h. How do you verify field positioning relative to the patient's anatomy?
- orthogonal films
- beam films using a jaw setting that encloses all segments
- other (please be specific) \_\_\_\_\_
- \_\_\_\_\_
- i. How frequently is position verification performed for H&N patients?
- first treatment only       weekly       other \_\_\_\_\_
- j. How do you verify that the field intensity patterns are delivered as planned?

7. If you treat prostate patients with IMRT:

- a. The total number of prostate patients treated with IMRT at your institution is \_\_\_\_\_
- b. Number of prostate patients treated with IMRT at your institution in past 12 months is \_\_\_\_\_
- c. The usual fraction size is \_\_\_\_\_ cGy and the usual number of fractions is \_\_\_\_\_
- d. The usual beam energy is \_\_\_\_\_ MV
- e. How are your prostate patients immobilized for IMRT?
- knee sponge only       thermoplastic cast
- knee sponge and foot holder       foam-immobilization mold
- other \_\_\_\_\_
- f. What PTV margins do you usually use for prostate patients? \_\_\_\_\_mm
- g. To what isodose line are IMRT treatments for prostate patients commonly prescribed (relative to maximum dose)?
- 95%       90%       85%       80%       other \_\_\_\_\_
- h. How do you verify field positioning relative to the patient's anatomy?
- orthogonal films
- beam films using a jaw setting that encloses all segments
- other (please be specific) \_\_\_\_\_
- \_\_\_\_\_

i. How frequently is position verification performed for prostate patients?  
 first treatment only       weekly       other \_\_\_\_\_

j. How do you verify that the field intensity patterns are delivered as planned?

8. Other than prostate or H&N, what site do you most commonly treat with IMRT? \_\_\_\_\_  
 \_\_\_\_\_

a. The total number of patients treated to this site with IMRT at your institution is \_\_\_\_\_

b. The number of these patients treated with IMRT at your institution in past 12 months is \_\_\_\_\_

c. The usual fraction size is \_\_\_\_\_ cGy and the usual number of fractions is \_\_\_\_\_

d. The usual beam energy is \_\_\_\_\_MV

e. How are patients immobilized for these treatments? \_\_\_\_\_  
 \_\_\_\_\_

f. What PTV margins do you usually use for this site? \_\_\_\_\_mm

g. To what isodose line are IMRT treatments for these patients commonly prescribed (relative to maximum dose)?

95%       90%       85%       80%       other \_\_\_\_\_

h. How do you verify field positioning relative to the patient's anatomy?

orthogonal films

beam films using a jaw setting that encloses all segments

other (please be specific) \_\_\_\_\_  
 \_\_\_\_\_

i. How frequently is position verification performed for these patients?

first treatment only       weekly       other \_\_\_\_\_

j. How do you verify that the field intensity patterns are delivered as planned?

9. How do you verify that the treatment unit delivers the planned dose for individual patients?

**a. Absolute dose**

point(s) measurement with

ion chamber (chamber size \_\_\_\_ cc )       diode       TLD

XV film       EDR2 film       radiochromic film

Other: \_\_\_\_\_

These absolute dose measurements are routinely performed for

- every field for every patient  
 cumulative fields (i.e. total treatment) for every patient  
 monthly as part of routine Quality Assurance  
 only on special occasions

specify: \_\_\_\_\_

**b. Relative dose**

isodose distribution with

XV film       EDR2 film       radiochromic film       Gel dosimetry

other \_\_\_\_\_

Relative dose is routinely measured in \_\_\_\_ (#) axial planes

& in \_\_\_\_ (#) sagittal planes

& in \_\_\_\_ (#) coronal planes

These relative dose measurements are routinely performed for

- every field for every patient  
 cumulative fields (i.e. total treatment) for every patient  
 monthly as part of routine Quality Assurance  
 only on special occasions

specify: \_\_\_\_\_

c. Type of QA phantom:

- anthropomorphic phantom Vendor: \_\_\_\_\_
- geometric phantom: \_\_\_\_\_(material)  
 shape: square     cylinder     other \_\_\_\_  
 size of phantom \_\_\_\_cm X \_\_\_\_cm X \_\_\_\_cm

d. For this measurement

- the patient's beams are transferred to the QA phantom by the planning system.
- the patient's beams are not transferred to the QA phantom in software, but an anthropomorphic phantom is used to simulate approximate patient geometry for dose measurements.

e. The fields are delivered to the QA phantom and measured

- for individual fields delivered in the geometry of the treatment
- for cumulative fields (i.e. total treatment) delivered in the geometry of the treatment
- for individual fields delivered from one gantry angle (e.g. 0 or 180 degrees)
- for cumulative fields (i.e. total treatment) delivered from  
 one gantry angle (e.g. 0 or 180 degrees)

f. What agreement between planned and measured doses for individual patients is considered acceptable at your institution?

- For absolute dose in target volume (high dose) region \_\_\_\_\_
- For absolute dose in critical normal tissue region \_\_\_\_\_
- For absolute dose in low dose region \_\_\_\_\_
- For relative dose in high dose gradient region \_\_\_\_\_
- For relative dose in low dose gradient region  
 in high dose region (target) \_\_\_\_\_  
 in low dose region \_\_\_\_\_

g, Are your monitor unit calculations checked by an independent program?

- no                       yes Vendor: \_\_\_\_\_

10. Are your IMRT treatments monitored by a record and verify system?

no                       yes    What system? \_\_\_\_\_

11. Treatment Machine Calibration

a. Calibration Protocol:     TG-21                       TG-51                      Other: \_\_\_\_\_

Frequency of calibration checks: \_\_\_\_\_  
 \_\_\_\_\_

b. RTOG institutions and institutions choosing to satisfy the benchmark requirement with an RPC phantom should submit the following items for all treatment machines/photon energies used for IMRT:

1. A description of the procedures followed to verify the calibration of the treatment machine.
2. Calibration report worksheet (TG-21/TG-51 or equivalent).
3. Central axis depth dose information: table of TPR's, TMR's, TAR's, or percentage depth dose and output data used for clinical meter set calculations.