## IROC Houston Proton Beam Alignment Spine Phantom

Guidelines for ***Planning and Treating*** the IROC Houston Proton Spine Phantom.

Revised July 1, 2013

The study groups are requesting that each institution keep the phantom for no more than 2 weeks. During this two-week period, the institution is expected to image, plan, and treat the phantom and return it to the IROC Houston QA Center. Thank you for your cooperation.

This phantom has been designed and constructed by the IROC Houston. IROC Houston phantom contains TLDs at 2 locations and perpendicular sheets of film in order to evaluate the field matching at the field junction.

If you have any questions, please contact the appropriate person.

IROC Houston Nadia Hernandez (713) 745-8989 nhernand@mdanderson.org

IROC Houston Paige Summers (713) 745-8989  pasummers@mdanderson.org

IROC Houston Andrea Molineu (713) 745-8989 amolineu@mdanderson.org

**DOSIMETRY INFORMATION TO BE SUBMITTED:**

The following information is to be submitted to the IROC Houston (include in the phantom shipping box):

* A completed **IROC Houston Proton Spine Phantom Institution Information form.**
* Original hard copy of the plans and isodose distributions in the sagittal and coronal planes through the target center.

The following information is to be submitted to the IROC Houston (results will not be analyzed until the digital treatment plan is received:

Please follow the login URL: <https://mdandersonorg.sharefile.com>

Login information:

**Username:** trangnguyen@mdanderson.org

 **Password:**Phantom8989

* Click on folder named **IROC Houston Spine proton phantom,**  select the **Add Folder** tab on the top right hand side of the screen. In the **folder name** box, enter your institution name, city and state, then click **Create Folder.**
* Select the folder that you have created, then select **Upload Files** tab on the right hand side. In the Details box please type in **phantom type, irradiation date, and physicist name**. Follow the instruction and upload your files. **Select Send email notification box when done.** Lastly Click Upload Files.

The files to export to the IROC Houston are the digital data for your spine proton phantom irradiation in DICOM format, and include all CT slices, 3D composite dose file, structure file and plan file.

Please log out once you finish and inform the IROC Houston by email, Nhernand@mdanderson.org.

**Spine Phantom:**

The white shipping case labeled “H&N 18” contains a solid phantom with an embedded spine to test accurate matching of adjacent fields. The phantom is already loaded with Gafchromic® EBT2 film. The phantom is secured with 4 acrylic T-bars in the left-right directions and 4 screws in the A-P direction. **Do not open the phantom.**

The phantom consists of three parts:

1. **Top** that contains the posterior portion (including spinous processes) of the spine,
2. **Rt** which is the patient’s right (that contains patient’s Rt transverse process), and
3. **Lt** which is patient’s left

The phantom simulates a prone patient when placed on the table with the **Top** section on top. The superior end of the phantom is marked on the **Top** section.

**CT Scanning Instructions:**

1. Treat the phantom as you would a patient. The phantom is fragile as it contains a real human spine - please treat it gently. Please do not remove any tape with markings on it. If you are going to mark on the phantom, please use your own tape and mark on it and if you think we need your mark for dosimetry analysis at the IROC Houston, leave the tape on.
2. Scan the phantom with a CT scanner as you would for a spinal or cranio-spinal patient treatment.
3. Scan the entire phantom using the regular slice thickness you use for spine patients.

**Planning Instructions:**

1. Call the IROC Houston with the date that you will irradiate the phantom. Ask for Nadia Hernandez or leave a message. Phone number: (713) 745-8989
2. For this test case two fields shall be used. Each field should be approximately 25 cm long and 5 cm wide. Match the fields in the middle of the phantom, at approximately the middle of the 5th vertebral body from the superior edge
3. This procedure requires the use of fields whose half-length (distance from central axis to inferior or superior border) is about 12.5 cm. The purpose is to simulate the beam divergence that would occur if you were to treat a 50 cm spine. This may require special handling in your planning system, as the phantom is only about 30 cm long.
4. Deliver a biologically weighted dose of 6.00 Gy(RBE) at each isocenter.

**Treatment Instructions:**

1. Perform your customary QA of the proton plan prior to irradiating the phantom.
2. Treat the phantom with the developed plan as you would a protocol patient. You may want to place a towel under the phantom so it doesn’t slide on the treatment couch.
3. Put the phantom back into the box.
4. Include all the dosimetry data discussed above. Be sure to include the magnification factor used on the images coming from your TPS.
5. Return the complete package to the IROC Houston.

###### IROC Houston Proton Spine Phantom Institution Information

**Please e-mail the IROC Houston, at** **IROCHouston@mdanderson.org** **to let us know when you are going to irradiate the phantom.** We will irradiate TLD standards to meet your schedule. **Please include on the subject line: irradiation of proton spine phantom.**

Institution:

Address:

Person performing irradiation:

Physicist to receive report:

Oncologist to receive report:

Person to call in case of questions:

Phone Number: Fax Number:

Email address: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

## Treatment Unit:

Manufacturer: Model:

In-house specification:

Proton beam line used: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Please enclose original copies of your treatment plans. Include the coronal and sagittal planes through the target center. Include scaling factors for each plane. FTP the digital treatment plan.**

**Treatment Planning System:**

Manufacturer: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Model: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Software:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Algorithm:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Version/#:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Treatment of Phantom:**

Date of Irradiation:

Indicate dose delivered to these specific points as determined by your treatment planning computer

| Point | Dose (GyRBE) |
| --- | --- |
| Right Superior TLD position\* |  |
| Left Inferior TLD position\* |  |

\*Please see Appendix for screenshots of the TLD locations if you are having difficulty locating them

Results of QA:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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Did you change the M.U. based on your QA? No Yes

Attach copies of the treatment plans including slices in the sagittal and coronal film planes. Please include labels for the treatment plan

Comments:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| For Office Use Only | TLD Batch | Film Batch | Phantom ID # | Code | Date Sent | Date Rec'd |
|  |  |  |  |  |  |  |  |  |

**Appendix**

See screen captures below for location of TLD if you are having difficulty locating them.

