

## **Craniospinal Irradiation Benchmark**

This benchmark is a sample case used to evaluate the treatment planning process for CSI irradiation at your institution, i.e., data acquisition, treatment planning, dose calculation and monitor unit calculations. The aim is to demonstrate your capability to participate fully in protocol studies requiring CSI. Your benchmark will be evaluated by IROC to assess your planning process and the accuracy of your dose calculation. It will cover all protocols requiring CSI; you will not be required to complete separate benchmarks for different CSI protocols.

The CT image set to be used for this benchmark will be provided and may be downloaded from the IROC website ([www.IROCRI.QARC.org](http://www.IROCRI.QARC.org))

**Institutions are required to submit this Craniospinal Irradiation Benchmark in digital format as DICOM RT.** Digital data shall include planning CT, along with the structure, dose and plan files. The data may be submitted on a CD or sent electronically via sftp to IROC Rhode Island (QARC). Instructions for digital submissions may be found on the IROC Rhode Island website - <http://www.irocqi.qarc.org/>, under Digital Data, RT Treatment Planning.

## **Section 1. Description of Craniospinal Irradiation (CSI) Benchmark**

### 1. Method:

The CT image set to be used for this benchmark may be downloaded from the IROC website ([www.IROCRI.QARC.org](http://www.IROCRI.QARC.org)).

The image set, which is provided in DICOM format as well as Pinnacle format for Pinnacle users, is to be imported into the treatment planning system that is used to plan treatments for protocol patients.

A treatment plan is to be developed following the instructions below and submitted as DICOM RT, along with any required supporting data.

### 2. Treatment Prescription:

The prescription dose for each treatment site (brain and spinal cord) is 24 Gy in 1.5 Gy fractions.

You should plan this treatment as is the normal practice at your institution. This benchmark applies to the use of conventional linear accelerators as well as to newer treatment modalities such as Tomotherapy. The image set that is provided is that of a patient who is prone. If CSI treatments at your institution are always delivered with patients in the supine position, you may substitute an image set of a supine patient for this benchmark.

For conventional CSI treatments you should plan the opposed lateral brain fields and the spinal irradiation as you normally would, paying particular attention to the junction of the brain and spine fields. Determine any couch or collimator rotation according to your departmental practice. If you routinely calculate a “gap” between the brain fields and spinal field, do so. Perform the dose calculation as you normally would in your clinic.

## **Section 2. Data to be Submitted**

**Institutions are required to submit this CSI Benchmark in digital format.**

**The institution's treatment planning system must have the capability of exporting data as DICOM RT.**

Submissions shall include:

1. The digital RT plan in DICOM RT format consisting of the CT data set along with structure, dose and plan files.
2. Digitally reconstructed radiographs (DRR) in the Beam's Eye View (BEV) for each field, showing the aperture.
3. A printout of beam specifications, including at a minimum the beam energy, gantry, couch, and collimator positions, field sizes, aperture names, wedge specifications, and depth of isocenter (or SSD).
4. Completion of the Questionnaire below.

**Note: Items that are not part of the digital submission should be submitted as screen captures or other electronic format whenever possible.**

## Craniospinal Irradiation Benchmark Questionnaire

**Institution:** \_\_\_\_\_ **City** \_\_\_\_\_ **State** \_\_\_\_\_

**Treatment Planner:** \_\_\_\_\_ **Telephone:** \_\_\_\_\_

**E-mail:** \_\_\_\_\_ **Fax:** \_\_\_\_\_

### Brain Fields:

Beam energy: \_\_\_\_\_ MV

Collimator rotation (if any): \_\_\_\_\_ °

Couch Rotation (if any): \_\_\_\_\_ °

Gantry Rotation (if any): \_\_\_\_\_ °

Monitor Units: Field 1: \_\_\_\_\_ MU

Field 2: \_\_\_\_\_ MU

### Spine Field:

Beam energy/modality: \_\_\_\_\_ MV or \_\_\_\_\_ MeV (electrons)

SSD  or SAD  Setup

Collimator rotation (if any): \_\_\_\_\_ °

Couch Rotation (if any): \_\_\_\_\_ °

Gantry Rotation (if any): \_\_\_\_\_ °

Monitor Units: \_\_\_\_\_ MU

### Abutment of the Cranial and Spinal Fields:

- Abut light fields at posterior neck skin
- Calculate “gap”
- Always use \_\_\_ cm “gap”
- Other (describe) \_\_\_\_\_

Is the matchline shifted (feathered) routinely? Yes  No

If yes, at what interval (e.g. every 5 fractions): \_\_\_\_\_

and by how much (e.g. 1 cm): \_\_\_\_\_

**Please save and submit with supporting documents to IROC RI QA Center via sFTP.**

**Or**