QARC
QUALITY ASSURANCE REVIEW CENTER

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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 QARC (Quality Assurance Review Center), and will also be shared with the RPC (Radiological Physics Center) to assess the accuracy of your dose calculation. It will cover all protocols requiring CSI; you will not be expected to complete separate benchmarks for different CSI protocols.

The CT image set may be downloaded from the QARC website (www.QARC.org).

Institutions are strongly encouraged to submit this Craniospinal Irradiation Benchmark in digital format. Treatment planning data may be submitted in either RTOG Data Exchange Format or Dicom RT. Digital data shall include planning CT, structures, dose, plan, and dose-volume histograms. The data may be submitted on a CD or sent electronically via ftp to QARC. Instructions for digital submissions may be found on the QARC website - www.QARC.org, under Digital Data, RT Treatment Planning. If submitted by hardcopy, two (2) full sets of data should be sent to the address below.

Section 1. Description of Craniospinal Irradiation (CSI) Benchmark

Purpose:
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. This benchmark will be used by both QARC (Quality Assurance Review Center) and the RPC (Radiological Physics Center) to assess your treatment planning and your dose calculation algorithm. It will cover all protocols requiring CSI; you will not be expected to complete separate benchmarks for different CSI protocols.

1. Method:

A CT scan set in DICOM format is to be loaded into the treatment planning system that is used for planning protocol patients.

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, that is either CT-based or not.

A) CT based: Plan the opposed lateral brain fields and the spinal irradiation as you normally do. Pay particular attention to the junction of the brain and spine fields.

B) 2D, non-CT based: Design the brain fields using digitally reconstructed radiographs (DRRs) from the CT scan. Perform the dose calculation as you normally would. Determine the size of the spinal irradiation field from the CT. Determine any couch or collimator rotation as you normally do in your clinic. If you routinely calculate a "gap" between the brain fields and spinal field, do so. Perform the dose calculation as you normally would.

Section 2. Data to be Submitted

Institutions are strongly encouraged to submit this CSI Benchmark in digital format if the treatment plan is CT based.

I. For digital data submission, an institution's treatment planning system must have the capability of exporting data in one of two formats:

- RTOG Data Exchange Format, Version 3.20 or later (specifications at http://itc.wustl.edu/exchange_files/tapeexch400.htm); or
- DICOM 3.0 in compliance with the Advanced Technology Consortium's (ATC) DICOM 3.0 Conformance Statement

A list of commercial systems that are known to have this capability are listed on the ATC website (http://atc.wustl.edu/credentialing/atc_compliant_tps.html).

Two copies of additional hard copy data (or screen capture images) to accompany digital submissions shall include:

1. DRR in the Beam's Eye View (BEV) for each field, showing the aperture.
2. 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).
3. Complete and submit the CSI questionnaire below.

II. For non-digital submission, two (2) full sets of the following shall be submitted as original hardcopy and in color. Please make sure that isodose contours are readily identifiable.

For CT-based plans:

1. Axial CT with isodose contours through the isocenter of the brain fields.
2. Sagittal section through the spinal cord with isodose contours.
3. DRR in the Beam's Eye View (BEV) for each field, showing the aperture.
4. A printout of beam specifications including at a minimum the beam energy, gantry, couch, and collimator positions, field sizes, apertures, wedge specifications, depth of isocenter (or SSD) and monitor unit calculations.
5. A description of your method of abutting the cranial and spinal fields. Include all forms and calculations you employ. If you usually use a "gap", include the complete gap calculation as performed in your clinic.
6. Complete and submit the CSI questionnaire below.

For non- CT-based (2D) plans:

1. Printout of the shape of each of the treatment fields.
2. A printout of beam specifications including at a minimum the beam energy, gantry, couch, and collimator positions, field sizes, aperture names, wedge specifications, depth of isocenter (or SSD) and monitor unit calculations.
3. A description of your method of abutting the cranial and spinal fields. Include all forms and calculations you employ. If you usually use a "gap", include the complete gap calculation as performed in your clinic.
4. Complete and submit the CSI questionnaire below.

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Craniospinal Irradiation Benchmark Questionnaire

Institution: _____ **City** _____**State**_____

Treatment Planner: _____ **Telephone:** _____

E-mail: _____ **Fax:** _____

Brain Fields:

Beam energy: _____ MV

Collimator rotation (if any): _____^{o}

Couch Rotation (if any): _____^{o}

Gantry Rotation (if any): _____^{o}

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): _____^{o}

Couch Rotation (if any): _____^{o}

Gantry Rotation (if any): _____^{o}

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 QARC via sFTP.

Or

Click to Submit