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Irregular Fields (Mantle) Benchmark

This benchmark is a sample case used to evaluate the treatment planning process at your institution for Hodgkin's disease treated with opposed "mantle" fields. The goal of this benchmark is to demonstrate your capability for data acquisition, treatment planning, dose calculation and monitor unit calculations. Your benchmark will be evaluated by QARC (Quality Assurance Review Center), and the materials you submit will be shared with the RPC (Radiological Physics Center) to assess the accuracy of your dose calculation.

The CT image set may be downloaded from the QARC website (www.QARC.org). Appendix 1 shows a DRR with the blocking to be used for the anterior field.

Institutions are strongly encouraged to submit this 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, dose and plan and any delineated structures. 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.



Irregular Fields (Mantle) Benchmark

Section 1: Description of Irregular Fields Benchmark

This benchmark is a sample case used to evaluate the treatment planning process at your institution for Hodgkin's disease treated with opposed "mantle" fields. The goal of this benchmark is to demonstrate your capability for data acquisition, treatment planning, dose calculation and monitor unit calculations. 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.

1. Method:

A CT scan of a Hodgkin's disease patient shall be loaded into the treatment planning system that will be used for protocol patient treatment planning at your institution.

A treatment plan to deliver 180 cGy per fraction with "mantle" fields shall be developed.

The point to be used as isocenter is embedded in the CT scan on slice 91 ($z = 1.5$ cm).

The blocks for the anterior mantle field are shown in Appendix 1. This blocking shall be approximated to the best of your ability on your planning system. For most systems, this can be accomplished by creating an anterior field DRR and drawing the blocks with respect to the anatomy.

For this benchmark, the blocking for the posterior field shall mirror the anterior field

Dose calculation shall include the effects of tissue heterogeneities.

The prescription dose is 180 cGy per fraction.

In addition to isodose distributions, dose shall be reported at the off-axis points embedded in the CT scan. One is in the left supraclavicular region on slice 78 ($z = 4.75$ cm), the other in the lower mediastinum on CT slice 150 ($z = -13.25$ cm).

Section 2: Data to be Submitted

Institutions are strongly encouraged to submit this Irregular Field Benchmark in Digital Format.

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 ATC's 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 both fields, showing the blocking.
2. A printout of beam specifications, including at a minimum the beam energy, gantry, couch, and collimator positions, field sizes, aperture/block names, wedge specifications, and depth of isocenter (or SSD).
3. Report of the dose calculated at the three embedded points (isocenter, supraclavicular region, and lower mediastinum).
4. Completion of the Questionnaire in Section 3 below.

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.

1. Axial CT slice with isodose contours through the isocenter.
2. Axial CT slice with isodose contours through the neck.
3. Axial CT slice with isodose contours through the region of maximum dose.
4. Axial CT slice with isodose contours through the region of minimum dose.
5. Sagittal view through the spinal cord with isodose contours.
6. Coronal view through midplane with isodose contours.
7. DRR in the Beam's Eye View (BEV) for both fields, showing the blocking.
8. A printout of beam specifications, including at a minimum the beam energy, gantry, couch, and collimator positions, field sizes, apertures/block/compensator names, wedge specifications, and depth of isocenter (or SSD).
9. Report of the dose calculated at the three embedded points (isocenter, supraclav, and lower mediastinum).
10. Completion of the Questionnaire in Section 3 below.



Section 3: Irregular Field Benchmark Questionnaire

Institution: _____

City: _____ **State/Province:** _____ **Country:** _____

Treatment Planner: _____

Telephone: _____ **FAX:** _____ **e-mail:** _____

1. Treatment machine _____ & photon energy (MV) _____ used.
2. Treatment Planning System (*manufacturer, version*): _____
3. Calculated dose at required dose points:
 - a) Isocenter _____ Gy
 - b) Left supraclav _____ Gy
 - c) Lower mediastinum _____ Gy

Please save and submit with supporting documents to QARC via sFTP.

Or

Appendix 1: AP DRR with blocks

