IROC™
IMAGING AND
RADIATION ONCOLOGY CORE
Global Leaders in Clinical Trial Quality Assurance

TOTAL-BODY IRRADIATION
QUESTIONNAIRE & BENCHMARK

Date: _____/_____/_____ Institution _____

Treatment Planner: _____ E-mail: _____

Telephone: _____ Fax: _____

Signature: _____

1. Machine to be used for TBI: _____ Photon Energy: _____MV
2. Complete either 2a or 2b:

   2a. For standard calibration of this accelerator, 1 MU = _____ cGy
   ❑ to water or ❑ ICRU muscle,
   At _____ cm distance from the nominal source (distance = SSD + depth),
   At _____ cm depth in water,
   With _____ cm x _____ cm field, defined at _____ cm distance from the nominal source.

   2b. For standard calibration of this Co-60 unit, the dose rate was _____ cGy/ min on _____ (date)
   ❑ to water or ❑ ICRU muscle,
   At _____ cm distance from the nominal source (distance = SSD + depth),
   At _____ cm depth in water,
   With _____ cm x _____ cm field, defined at _____ cm distance from the nominal source.

3. Patient position for treatment:
   ❑ Supine ❑ Decubitus
   ❑ Standing ❑ Sitting
   ❑ Other; please describe: _____
4. Field Arrangement for TBI:
   ❑ Opposed Lateral Fields
   ❑ Anterior / Posterior Fields
   ❑ Combination of lateral & AP fields % dose to prescription point from AP _____
   ❑ Other; please describe: _____
5. TBI treatments are at an extended distance of _____ cm.
6. The dose rate at the prescription point is _____ cGy/min.
7. The TBI output factor at extended distance is _____ cGy/MU.
8. How do you know the exact output at the extended distance used for TBI?
   ❑ By a special calibration
   ❑ By other means; please describe:_____
   _____
9. Do you account for dose variations due to body thickness differences? ❑ Yes ❑ No
   If yes, are these dose differences ❑ calculated or ❑ measured
   and is compensation done by ❑ addition of material next to patient
   ❑ attaching compensators to the treatment apparatus

10. Mid-plane doses are calculated using
    - ❑ TPRs
    - ❑ TMRs
    - ❑ PDDs
    - ❑ Other; please describe: _____

11. Adequate skin (surface) dose is obtained by
    - ❑ Bolus on patient
      Material: _____
      Thickness: _____cm
    - ❑ Beam spoiler
      Material: _____
      Thickness: _____cm
    - ❑ Other; please describe: _____

12. Correct positioning of lung blocks is verified by :_____

13. Correct positioning of lung blocks is verified
    - ❑ Before each fraction
    - ❑ Before first treatment only
    - ❑ Other; please describe: _____

14. Measurement of doses for individual patients is routinely performed: ☐ yes ☐ no
    If yes, for which sites:
    - ❑ Prescription point
    - ❑ Lung
    - ❑ Neck
    - ❑ Other (list) _____

    If yes, the dosimeter used is:
    - ❑ Diode
    - ❑ TLD
    - ❑ OSLD
    - ❑ Ion chamber
    - ❑ Other please describe: _____

15. Calculate and submit a sample treatment case. Choose the machine and technique that represents how you will treat protocol patients. You may satisfy this requirement in one of two ways:

    15a. If you do conventional planning for TBI patients with APPA or lateral treatments, you should calculate and submit the sample treatment case described on page 4. Be sure to include all calculation forms, with symbols and quantities clearly described.

    15b. If you do CT based planning for TBI patients and you have a humanoid phantom, you should submit a digital plan following the prescription guidelines on page 4. If you do not have a humanoid phantom, you may submit a digital plan for an actual patient following the prescription guidelines on page 4. Please anonymize the digital plan prior to submission. Refer to the IROC Rhode Island website, www.irocri.qarc.org for instructions on submission of digital data.

<u>On separate sheets:</u>

16. Briefly describe the total-body treatment technique used in your department.

17. Describe how your TBI output factor was determined and the conditions to which it applies (measurement vs. calculation, location of reference point, size of phantom, field size, beamspoiler included or not, etc.)

18. Give the formula you use to calculate the monitor setting for your accelerator (time for Co-60 unit) to give the prescribed dose per fraction to the prescription point. Explain the symbols and quantities!

19. Describe your method to determine the dose to the lungs. Describe how you design the thickness and shape of lung attenuators and verify their placement.

20. Briefly describe phantom measurements that have been performed to confirm your dosimetry. Include a description of any phantom measurements you have done to confirm dose in lung.

Please return: a) Completed questionnaire
b) Sample case (page 4) with all forms completed and calculations included
c) Description of your TBI treatment technique (see item16)
d) Description of how your TBI output factor was determined (item 17)
e) Formula used (with all symbols explained) for calculating the monitor units (see item 18)
f) Description of dose calculation off-axis (see items 18 & 19)
g) Description of your method to account for lung density (see item 19)
h) Description of phantom measurements you have performed (see item 20)

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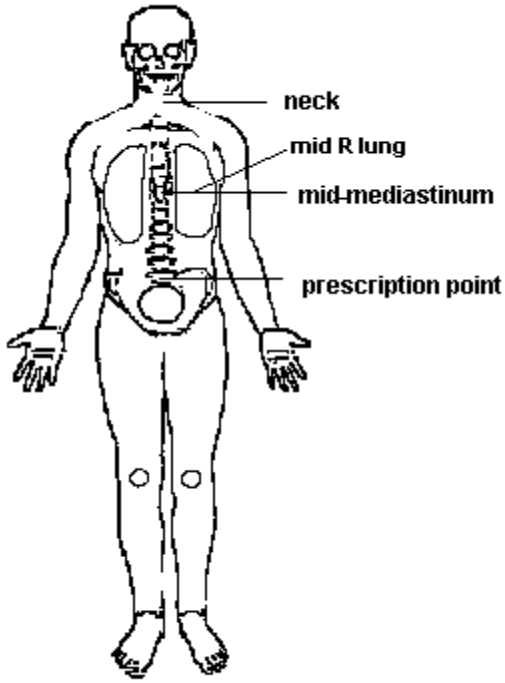
TOTAL-BODY IRRADIATION BENCHMARK

1. Calculate the monitor units (or irradiation time, for Co-60) needed to deliver 150 cGy to the prescription point (mid-thickness at the umbilicus) for the following case of Total-Body Irradiation, using your department's methods and forms.

2. Calculate the dose per fraction to the mid-mediastinum, the right mid-lung (for APPA treatments), and the mid-neck. Lung density must be taken into account in the calculation of lung dose. For a total TBI dose of 1200 cGy (8 fractions), the lung dose should be limited to 800 cGy. The dose to the mid-mediastinum reference point will represent lung dose for patients treated laterally.

Separations	AP-PA	LATERAL
Prescription point (Umbilicus)	16 cm	25 cm
Mid-Mediastinum	18 cm	30 cm
R Mid-Lung (Density=0.25)	18 cm (12 of 18cm is lung tissue)	30 cm (24 of 30cm is lung tissue)
Neck	8 cm	10 cm



Monitor units (time for Co-60): Field1: _____ **Field 2:** _____

Doses:

A. Umbilicus (mid); _____ cGy

B. Neck (mid): _____ cGy

C. Mediastinum (mid): _____ cGy

D. Right Lung (mid): _____ cGy