Proton Beam Cooperative Group – Steering Committee

Charge to Committee on Medical Applications of Proton Beam Radiation

1. The general charge is to assess the comparative dose distribution advantage for photon beam radiation therapy versus standard medical center quality photon therapy. This should be performed for tumors at diverse anatomic sites. The selection of anatomic sites should be directed towards but not limited to major cancer sites. For some of the sites it will be necessary to make comparative treatment plans for lesions of early and for lesions of more advanced stage.

2. The comparison will be based on the defined target volume, which will be the same for all treatment plans on a particular anatomic site and stage of disease. The comparison of conventional photon therapy vis a vis proton therapy would, of course, allow that the technique for photon therapy be either external beam, interstitial, or intracavitary.

3. The process for comparison of treatment plans should be based as a minimum on:

   1. The dose volume histogram of the treatment volume outside the target volume. These histograms can be performed for individual structures of anatomic regions; and
   2. Integral dose.

4. The impact of a reduced treatment volume should be assessed by estimates of the increase in dose, which could be administered to the target and the expected increment in tumor control probability secondary to the higher radiation dose. For each of these assessments of the gain, consideration should be given to the limit in radiation dose increase which, of course, the tolerance of the target tissue were there a perfect conformation of treatment volume to target volume.

Time course of Study:

For the late October meeting there should be available a listing of anatomic sites and the stages for which comparative treatment plans could be generated. By the January-February meeting there hopefully will be clear definition of the process, the technical means for performing the study and the different individuals who would participate in study of the various anatomic sites.

Charge to Facilities Committee of the Proton Therapy Cooperative Group

The general charge to the committee is to assess the criteria for a facility, which would serve as a low LET charged particle therapy center. The criteria for such a facility to be considered would include but not be limited to the following items.

1. Site: assess the merit in having the unit in a hospital
   Evaluate the advantage of having photon therapy in the same facility. Such capability would be advantageous for patients who had more than one area being treated and one anatomic region was appropriate for proton therapy but the second area might be preferentially treated by photons. Thus, the patient would need to be treated with protons and photons each treatment session. Clearly, there may be some advantage in haging that capability in the single facility. Would there be an advantage in having the photon capability in the same facility in order to facilitate conduct of clinical trials comparing proton therapy versus photon therapy.

2. Size: a general statement regarding the facility size as dependent upon the number of treatment bays, the amount of back-up capability in the larger overall facility, the latter would include some general work areas, perhaps conference rooms, appropriate library space, etc., etc. The size would also be influenced by the

number of bays, which would be equipped with a movable gantry. Also, a consideration would be whether or not follow-up examinations would be performed in this facility.

3. Patient support assembly: Items to be considered here would be the degrees of freedom of motion requirement for the minimal motion which could be made along any one of the axes of the support assembly, i.e., should the table top be able to be moved. .1, .5, 1.0 mm along each of the axes in order to make minimum adjustments.
Read-out of support assembly in each axes:
Capability for accommodating the patient in the supine, prone, decubitus?, sitting?, standing?
Capacity for motion of support assembly during treatment;

4. Gantry: range of motion, 45^{o}, 90^{o}, 135^{o}, 180^{o}, 270^{o}, or 360^{o}.
dosimetry system built into the treatment head of the gantry

5. Field Size Range: ease of facility for changing field size
attachment of field defining devices, boli
interlock system for assuring that field defining device and boli are attached in the one and correct position

6. Real Time on Line CE Digital Radiographic Monitoring:

7. Imaging Systems: should this include CT scanning? If there is gantry mounted unit, would there be a necessity for the CT u nit to have the capacity to scan patients in the seated or standing positions

8. General support function: Patient exam rooms, waiting area, offices, treatment planning areas, control room (switch yard, etc., etc.)