

## PROTON THERAPY COOPERATIVE GROUP

### I. MISSION

The objectives of the PTCOG should be reassessed in light of the commitment that has been made by several institutions to establish proton radiation therapy services. I feel that the group should attempt to have some NIH affiliation. Possibly this could be arranged through one of the cancer committee sections, the FDA, or the NRC. The group should have supervisory, advisory, coordinating or "licensing" function.

The set-up and administration of the group would not have to compete or interfere with institutions establishing proton therapy units. However, in recognition of our obligation to improve and maintain the quality of therapy for the cancer patient, we, as potential users should assure ourselves that the development and utilization of protons is uniform, high-quality and cooperative.

Possible functions:

1. Establish a clearing house for information.
2. Establish advisory groups for identification and definition of cancer-containing target volumes.
3. Treatment planning committee.
4. Results committee.
5. Beam delivery/new technology committee.
6. The facility committee and accelerator committee.
7. Radiobiology committee.

- II. The treatment results groups and treatment planning group should be structured along the lines of RTOG. I feel that controlled clinical trials are totally necessary to accelerate the incorporation of protons into general use. We have a collected experience with utilization of fast neutrons, neutron capture therapy, pion therapy, as well as the RTOG, to help us establish an efficient, effective, non-adversary program.

### III. NEW AREAS FOR EMPHASIS

- A. There are several areas that are not being addressed collectively"
- B. Target volume identification.
- C. Beam control.
- D. Beam range confirmation or identification.
- E. Treatment plan evaluation/optimization: guidelines: parameters.

I know that the LBL and the MGH (HCL) Groups are also concerned about these problems and are doing something about it. However, this is a somewhat closed circuit approach: the potential new facilities have no access to developing this information. I understand that the MGH program is overburdened and there is little time available for testing and evaluation: a similar situation exists at LBL. On the other hand, the Brookhaven Proton Facility has never been utilized and stands idle.

### IV. RADIOBIOLOGY

I do not feel that the Radiobiology has been thoroughly evaluated, and new studies should be established by individual grant or contract to evaluate and determine" 1) dose-volume relationship. 2) what I will call the time-schedule-volume relationship, 3) dose-tolerance of tissues using histologic parameters. I do not feel that these have to be commented on in detail. Certainly the dose-volume relationship is recognized. There are data that suggest that the dose-volume relationship reflects the vascular distribution of irradiated tissues. Dose-volume histograms will be utilized to evaluate and compare different treatment plans. However, there are few data available indicating dose-tolerance limits of normal tissues. Gross parameters are limited and do not always reflect change in one tissue. When organ function is the parameter, a dose-volume relationship can be demonstrated. Whether there is a dose-volume relationship using cell density or other population parameters is not clear. Some of the clinical work suggests that for small volume irradiation, the tissues will tolerate, not only a larger dose, but larger dose fractions.

## V. CLINICAL UTILIZATION

The effort to utilize protons has been well-modulated and effective. The data accumulated are sound and support the expansion of the program. There is no equivocation about the results, as there were from initial results of fast neutron therapy and other efforts. Again, with our experience in establishing the use of fast neutrons, pions, high-energy particle therapy, as well as establishing new and effective time-dose schedules through the RTOG, I feel that we have precedents to use to set up a system which will offer the most efficient exploitation of protons. However, with the insistence of a controlled application of protons for selected diseases, I anticipate that some will have an urge to go off on their own. I feel this should be avoided. The simple fact that protons will be readily available, indicates that they will be tested and evaluated for cancers that are routinely being treated with x-rays. Therefore I should prefer that we broaden our efforts by our evaluation, since, with the appropriate utilization of protons, the integral dose delivered to the patient will be reduced.

Along these same lines, the justification for the utilization of protons has been to improve the incidence of control for cancers that are not well treated using x-rays. Is it possible that we could utilize other criteria such as increased cost-effectiveness, decreased morbidity and increased efficiency as justification? These are probable criteria if the radiobiologic considerations of time-schedule-volume relationships are documents, or as new technology for dose delivery/beam delivery become available.

## VI. WORKSHOPS

In light of the above, it seems appropriate to increase the group's efforts. One of the important considerations is to make the accumulated data and experience immediately available. One approach would be to initiate workshops either at LBL, Harvard (possibly Brookhaven) or at PTCOG meetings, or national meetings, e.g. ASTRO.