THE PHYSICS OF TOTAL BODY IRRADIATION WITH PHOTONS

Wendell R. Lutz, Ph.D.
Radiation Oncology, University of Arizona

This refresher course will discuss primarily TBI treatment methods and dosimetry. Treatment methods are generally dictated by the constraints of existing equipment. Factors such as photon beam energy, field flatness, room geometry and available field sizes influence whether patients are to be treated AP-PA or laterally and with horizontal or vertical beams. These factors, along with the desired dose homogeneity, also determine whether compensation, bolus, and/or lung shielding are necessary. Several representative treatment approaches will be used to illustrate the interplay of these factors. Several dedicated TBI facilities exist and will be discussed briefly. Some thoughts will be presented on how an “inexpensive”, dedicated facility could be built.

Once a treatment technique has been determined, dosimetry data must be measured with a geometry closely approximating the treatment geometry. This generally involves measuring percent depth doses or tissue maximum ratios in a water tank of suitable size located at the treatment position. These measurements can then be related in an absolute way to a calibration procedure preferably at the treatment position but without the necessity of the water tank. In addition, such water tank measurements need to be related to realistic patient contours and sizes. If compensators, bolus or lung shields are used, careful measurements of their effects on the dose distribution are needed. In the end, a given treatment technique should be capable of delivering a reasonably accurate dose to some specific reference point in a patient and with known dose heterogeneities at other parts of the body. Current recommendations on absolute accuracy and maximum dose heterogeneity throughout the body will be discussed. Lastly, various approaches to in vivo measurements will be discussed.

THE TREATMENT OF PITUITARY TUMORS

Glenn E. Sheline
Department of Radiation Oncology, University of California, San Francisco.

The presentation will include a review of the parasellar anatomy, the more common types of pituitary adenomas, the results (control and complications) of various treatment modalities and radiotherapy techniques.

STATISTICAL ANALYSIS OF CLINICAL TRIALS IN BREAST CANCER

Roger A. Potish, M.D., and Seymour H. Levitt, M.D.
Department of Therapeutic Radiology, University of Minnesota

Clinical trials in breast cancer have been misinterpreted for a number of reasons. Both radiotherapeutic and chemotherapeutic trials have suffered from unclear and incorrect statistical analyses. The present course will examine several classic trials so that clinicians may draw proper references in treating women with breast cancer.

CARCINOMA OF THE HYPOPHARYNX

James E. Marks, M.D.
Loyola University Medical Center; Maywood, Illinois

The goals of this course will be to review for carcinomas of the pyriform sinus, pharyngeal wall and posterior region: (1) presentation and diagnostic workup, (2) normal anatomy and patterns of local and regional spread, (3) host and tumor factors that have prognostic significance, (4) radiation technique and dose response information for tumor and normal tissues, (5) an overview of management by surgery and radiation including an analysis of primary tumor and nodal control, patterns of failure, voice preservation, and post treatment complications. Considerable attention will be devoted to examining the major problems in the management of these tumors and balancing risk and benefit of various combinations of radiation and surgery to achieve maximum control of tumor with preservation of voice and swallowing.