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TO: M.M. Kligerman
Carl von Essen
FROM: Ken Hogstrom, Al Smith *HRS*
SUBJECT: RANGE SHIFTER FUNCTION DEVELOPMENT

November 18, 1977

Range shifter functions for Cycle 18 will be designed as prescribed by the radiotherapist in conference with the physics section. Design criteria based on clinical observation, preliminary experiments, and microdosimetry is:

(1) The basic criteria for range shifted beam design is that the high LET dose across the range shifted-peak should be equal to or greater than 12 rads for each 100 rads of total peak pion dose. The physical dose is to be made as flat as possible under this constraint. For spread peaks of 6 cm or less the physical dose can be made flat while keeping the required amount of high LET dose. For peaks spread from 6-10 cm (10 cm is the largest spread obtainable with the present range shifter) the basic criteria will be relaxed to a approximately 10 rads of high LET dose in order to design range shifter functions for which the slope is not too steep/i.e., it is highly desirable to keep the physical dose slope less than 100-85%.

(2) The dimensions of the spread peak are defined as follows: The proximal edge of the spread peak will be the maximum dose (100%) point. The distal edge of the peak will be the point of maximum dose for the unspread peak (range shifter static at minimum thickness).

(3) For range shifted peaks, whether single port or multiport, the prescribed dose will be the maximum tumor dose.

(4) All new rangeshifted peaks and results of overlapping opposed peaks should be reviewed by the radiotherapist before patient use.

KH/odm

cc: S. Wilson
J. Somers
C. Richman
S. Simon

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