

OFFICE MEMORANDUM

TO : M. M. Kligerman, M.D.

DATE: 7 May 1973 712697

FROM : L. Rosen

SUBJECT : NEGATIVE PIONS FOR RADIOTHERAPY

SYMBOL : MP-DO

MES-200

Now that it appears reasonably certain that LAMPF will eventually operate according to design, and that personnel and funds will be available to complete the biomedical channel within the next six months or so, and maybe even to provide pions for experiments on the average of 48 hours per week during most of FY-74, I again am permitting myself the luxury of thinking about various directions one might explore in addition to those previously considered and laid out in your proposal to NCI and in our 189's to DBM, and the few proposals received thus far from various experimenters.

This memorandum is strictly a physicist's view of how and why pions might be used in conjunction with surgery, a combination which, for strictly biological and medical reasons, may have no utility whatsoever. However, I think we have to discuss it; and how pions might be used with extreme specificity.

The greatest advantage, to my mind, of pions is the capability they present for local deposition of high-LET energy. The greatest worry in their use has to do with the possible sterilization of all normal as well as all tumor cells in the volume of interest. The worry, as I understand the situation, with using radiation as a precursor to surgery whereby one hopes to prevent metastasis as a result of the surgery, emanates from the inhibition of the healing process resulting from radiation-induced damage in the healthy cells outside the volume to be excised.

Now it would seem to a lowly physicist that the properties of negative pions (both the advantages and disadvantages) are such as to greatly mitigate the main disadvantage of using radiation as a presurgical "antiseptic." I wonder whether some animal experiments would be in order at an early date.

The second point I wish to raise today has to do with precision plumbing, and here I do claim some competence. It would seem to me that the state of miniaturization in solid state detectors is such that they should be seriously considered as radiation monitors when treating tumors in the walls, or immediately adjacent to the walls, of body cavities. For example, in attempting to localize the stopping region of a pion beam when treating a growth in the esophagus, stomach, bowel, uterus, nose, ear or rectum, one ought to consider positioning detectors in such a way that they will reveal precisely whether the energy is being deposited according to plan.

REPOSITORY LANL/RC
COLLECTION Div CFF Files
BOX No. B-11, D-88
FOLDER MES200 173-6/73

FILE BARCODE



00133210

COPIED FOR
HSPT

00133210.001

1085120

To: M. M. Kligerman

-2-

7 May 1973

The third point I wish to raise has again to do with plumbing. I am quite certain that procedures can be devised for using hollow tubes, aligned with the pion beam and through which one can greatly facilitate access to body cavities under precisely controlled conditions. These tubes would serve two purposes. They would render more accessible for treatment a volume inside the cavity, and they could serve as an absorber for part of the beam which would otherwise be stopped in healthy tissue.

I hope the above thoughts will be catalytic, if they are worthy of consideration.



Louis Rosen

LR/mr

cc: Sterling Edwards, M.D. ✓
George Voelz, M.D.
Ed Knapp, Ph.D.

1 Cy-HVR

COPIED FOR
HSPT

1085121

00133210.002