Brookhaven National Laboratory
Upton, New York

H.L. Atkins

BNL 19485

CONF-741143--1

71061

CLINICAL USE OF IODINE-123

The effective clinical use of iodine-123 requires careful consideration of its decay scheme and of the degree of contamination with impurities such as other radioiodines. Biological and chemical considerations are also important. The advantages of iodine-123 rest on the lower radiation dose allowing administration of higher levels of activity and the more effective collimation and detection in comparison with iodine-131 labeled substances. An additional advantage for some radiopharmaceuticals would be a higher specific activity.

MASTER

Physical considerations

One of the principal problems with iodine-123 is the presence of other isotopes of iodine in the commercially available product. These consist primarily of iodine-124 and iodine-130. As much as 3 or 4% contamination may be present (Table 1). The effects of such contaminents on the images obtained on a gamma camera will be twofold; 1) septal penetration of the collimator and Compton scatter will degrade the image and 2) the presence of a high ratio of counts outside the window to those inside the window will reduce count rate capability at high count rates.

An examination of the spectra obtained with various collimators as performed by McKeighan, Muehllehner and Moyer is instructive (1). This study was performed with commercially available iodine-123 and illustrates the large proportion of Compton events seen with the high resolution collimator. With the 4000 hole low energy collimator the Compton background is 40% that seen with the high resolution collimator. The septal thicknesses are: hi-resolution 0.01",

NOTICE
This report was prepared as an account of work sponsored by the United States Government. Neither the United States nor the United States Atomic Energy Commission, nor any of their employees, nor any of their contractors, subcontractors, or their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness or usefulness of any information, apparatus, product or process disclosed, or represents that its use would not infringe privately owned rights.