INSTITUTE OF PHYSICS AND ENGINEERING IN MEDICINE

Nuclear Medicine Software Working Party

Quality Assurance of SPECT Reconstruction Software

RESULT FORM (Please use a separate form for each operator)

Name of Site: **Operator Identifier (e.g. 1,2, etc):**

Computer System

Manufacturer: **Make and Model of computer:**

Name and version of SPECT reconstruction software:

Details of analysis (Please tick appropriate box in each case)

Software used:

Commercial	☐	**User written programme**	☐
Filtered Back Projection	☐	**Iterative Reconstruction**	☐

SPECT reconstruction: Please briefly describe method and enclose a hardcopy of the results obtained

Please specify the filter name used:-

Does the reconstruction provide a Quantitative/Contrast switch Yes/No
If Yes specify conditions used:-

p.s There is no attenuation or scatter present in the data.

Operator experience (Please tick appropriate box in each case)

How long have you been routinely processing SPECT data ?

< 6 months	☐	**6 months - 1 year**	☐	**> 1 year**	☐

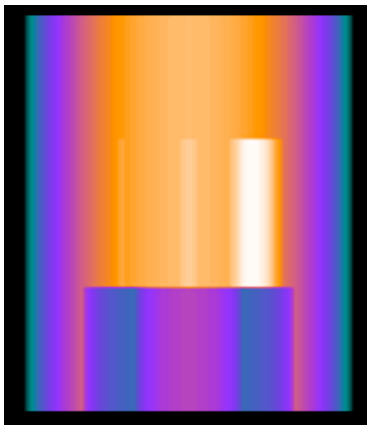
How many SPECT scans do you process per month ?

1-10	☐	**11-30**	☐	**>30**	☐

P.T.O

SPECT Audit Result Form contd

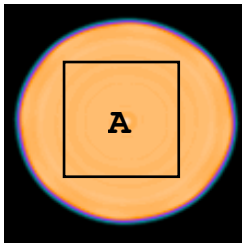
If the projection images have been transferred correctly they should be in the conventional orientation as shown below: The matrix size is 128*128 with 128 projections. The data is simulated as if from a rectangular FOV gamma camera. (Some reconstruction programs have a circular/rectangular head switch).



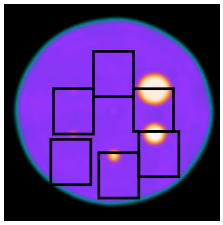
The peak pixel count in each projection dataset is as tabulated below:

Dataset	Peak Count
SPECT1	674
SPECT2	130
SPECT3	171
SPECT4	352
SPECT5	541
SPECT6	1158
SPECTLN	149

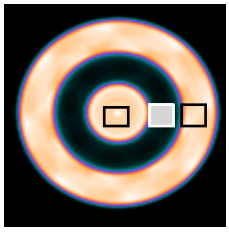
For SPECT 1-6, after reconstruction three distinct areas can be reconstructed as shown below:-



Uniform Cylinder



Hot Rods



Concentric Rings

Data should be reconstructed as single pixel width slices for SPECT 1-6

Regions should be drawn as shown. Region A should be 64*64 pixels centred on the reconstruction matrix. Regions B-F should allow the measurement of the peak pixel in each hot rod. Region G should be approximately 10*10 pixels and provide a mean and SD for the background to the rods placed at approximately the same radius as the rods. Regions H-J should all be 10*10 pixels and provide the mean counts in each of the three locations. Each region is centred on the ring being measured.

For SPECTLN the data should be reconstructed with 3 pixel wide slices (The data is 128*128 resolution and should be reconstructed at 128*128 resolution). After reconstruction a single slice should be analysed by placing a horizontal profile, (3 pixels wide) through the reconstructed point (Care should be taken to ensure that this is centred on the reconstructed line source). Data for peak pixel count and FWHM of the point spread function should be returned. For the FWHM measurement the results should be returned in units of pixel and mm if possible.

Please tabulate results from regions shown as follows:-

Phantom	A (64*64) Mean	A(64*64) S.D.	B Max	C Max	D Max	E Max	F Max	G (10*10) Mean	H (10*10) Mean	I(10*10) Mean	J(10*10) Mean
SPECT1											
SPECT2											
SPECT3											
SPECT4											
SPECT5											
SPECT6											

Phantom	Peak Profile Count	Full Width Half Maximum					
		pixels	mm				
SPECTLN							