Conclusions:.We propose a new method for calculating the complex geometric figures formed by band- and notch-filters when using the non-standard decomposition giving the opportunity to compress and filter multi-dimensional images also with those wavelet-techniques. This leads to faster wavelet-algorithms to compress and filter multi-dimensional medical images.

AT0200371

12.4

A Quality Control Atlas for Scintillation Camera Systems

E. Busemann Sokole[1], L.S. Graham[2], A. Todd-Pokropek[3], A. Wegst[4], C.C. Robilotta[5]

[1]Dept. Nuclear Medicine, Academic Medical Centre, Amsterdam, the Netherlands; [2]UCLA School of Medicine, Los Angeles, USA; [3]Dept. of Medical Physics and Bioengineering, University College London, UK; [4]Diagnostic Technology Consultants, Kansas City, USA; Heart Institute, University of São Paulo Medical School, Brazil

Aim: The accurate interpretation of quality control and clinical nuclear medicine image data is coupled to an understanding of image patterns and quantitative results. Understanding is gained by learning from different examples, and knowledge of underlying principles of image production. An Atlas of examples has been created to assist with interpreting quality control tests and recognizing artefacts in clinical examples. The project was initiated and supported by the International Atomic Energy Agency (IAEA).

Methods: The Atlas was developed and written by the first author of this abstract from image examples submitted from nuclear medicine users from around the world. The descriptive text was written in a consistent format to accompany each image or image set. Each example in the Atlas finally consisted of the images; a brief description of the data acquisition, radionuclide/radiopharmaceutical, specific circumstances under which the image was produced; results describing the images and subsequent conclusions; comments, where appropriate, giving guidelines for follow-up strategies and trouble shooting; and occasional literature references. Hardcopy images required digitizing into JPEG format for inclusion into a digital document. Where possible, an example was contained on one page. The Atlas was reviewed by an international group of experts.

Results: A total of about 250 examples were compiled into 6 sections: planar, SPECT, whole body, camera/computer interface, environment/radioactivity, and display/hardcopy. Subtle loss of image quality may be difficult to detect. SPECT examples, therefore, include simulations demonstrating effects of deterioration in camera performance (e.g. centre-of-rotation offset, non-uniformity) or suboptimal clinical performance. The Atlas includes normal results, results from poor adjustment of the camera system, poor results obtained at acceptance testing, artefacts due to system malfunction, and artefacts due to environmental situations. Some image patterns are generic to any scintillation camera system, others may be specific and depend on system design and corrections applied in image formation. Examples from both new and old generation systems have been included.

Conclusions: This Atlas is intended to be a guide. It covers a wide range of different situations and variants that may be encountered. The IAEA intends to produce a hardcopy of this Quality Control Atlas, and eventually make it available on CD-ROM and possibly via Internet.

The author and editor (EBS) is indebted to all those who contributed to the examples and to the review process.