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URINARY EXCRETION OF CYCLIC AMP, CYCLIC GMP AND SOME ELECTROLYTES IN HEALTHY HUMANS OF DIFFERENT AGES. T. Satoh. Research Laboratory, Yamasa Shoyu Co., Ltd., Choshi.

Urinary excretion of cyclic AMP, cyclic GMP, inorganic phosphorus, calcium, sodium, potassium and creatinine was measured in 138 healthy male and 104 healthy female humans from 2 to 68 years old. Yamasa cyclic AMP and cyclic GMP assay kits were used for measurement of the nucleotides. The range of cyclic nucleotide excretion was as follows: cyclic AMP ( $\mu\text{mol/day}$ ), 1.01-10.89; cyclic GMP ( $\mu\text{mol/day}$ ), 0.13-2.00; cyclic AMP ( $\mu\text{mol/g creatinine}$ ), 1.52-8.93; cyclic GMP ( $\mu\text{mol/g creatinine}$ ), 0.11-1.87. The 242 volunteers were grouped into 7 classes according to age: A, 2-9 years old; B, 10-19; C, 20-29; D, 30-39; E, 40-49; F, 50-59; and G, 60-68. Average excretion ( $\mu\text{mol/day}$ ) of cyclic AMP in class A ( $2.62 \pm 0.29$  for males and  $2.30 \pm 0.18$  for females) was significantly smaller than that in other classes ( $4.59 \pm 0.12$  for males and  $3.90 \pm 0.13$  for females) ( $P < 0.01$ ). Such significant difference was not observed in cyclic GMP excretion. A significantly positive correlation between cyclic AMP ( $\mu\text{mol/day}$ ) and inorganic phosphorus ( $\text{g/day}$ ) was found ( $r = 0.50$  for males and  $0.56$  for females) ( $P < 0.01$ ). This correlation suggests that urinary cyclic AMP might reflect the activity of parathyroid in normal humans. There was no significant correlation between cyclic GMP and electrolytes. The present study is considered to provide basic data for clinical evaluation of disorders.

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DEVELOPMENT OF THE HIGH RESOLUTION LARGE-FIELD-OF-VIEW SCINTILLATION CAMERA. M.Tanaka, S. Nakaoka, Y.Hirose, M.Toda, S.Nakanishi, H.Hattori. R/D Engineering Medical Systems Division, Shimadzu Corporation, Kyoto.

The development of a high resolution scintillation camera with a large field of view has been accomplished. Some improvements and new ideas were added to the camera reported in JSNM'78. The results are as follows. This camera has 3.47mm FWHM intrinsic resolution for Tc-99m, uniformity within  $\pm 10\%$  and 33cm $\phi$  field of view. The intrinsic resolution of a camera is determined by the optical system which consists of a crystal, a light guide and photomultiplier tubes, and by characteristics of the electronic circuits employed. This time the optical system was mainly improved. The crystal is 6mm thick NaI(Tl). The light guide is 10mm thick pyrex glass. Adopted are 61 photomultiplier tubes of 2" diameter. The thickness of the light guide was determined by computer simulations and experiments. The optical mask on the light guide is designed and evaluated to obtain enough uniformity. Because of reduction of crystal thickness, the sensitivity of the camera for Tc-99m decreases by approximately 12% compared with that of 9mm thick crystal camera. The maximum count-rate reaches to 150kcps at 30% window and 200kcps at 95% window. This camera is under clinical evaluation.

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MICRO PROCESSOR CONTROLLED HI-PERFORMANCE IMAGING SYSTEM, LFOV STANDARD. M.Toda, S.Nakanishi and H. Hattori. Shimadzu Corporation. Kyoto.

This system combines the basic scintillation camera system and the microprocessor controlled imaging system. By combining both data acquisition and image processing into one unit, it becomes compact and easy to operate.

**Ease of operation**

Unambiguous English-language keyboard offers unprecedented operational simplicity. No computer programming prerequisites are needed: no computer codes, complex computer mathematics, or unfamiliar mnemonics are utilized.

**Dynamic function capability**

This system provides an add-on library of new dynamic function study procedures via floppy disc. These procedures can be continually updated as new developments and changing needs in nuclear medicine occur.

**Features**

This system features a 256 x 256 image storage with a display monitor. A Micro Dot Imager is available to produce a great variety of image sizes and formats. The Floppy Diskette and Cartridge Disc provide an increase in storage, processing and permanent record capabilities. The system provides pushbutton control of gray scale, back ground, window-controlled contrast enhancement, regions of interest and pre-programmed study protocols.

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DESIGN CONCEPT OF NUCLEAR MEDICINE COMPUTERS M.Kiri. K.Kume. S.Takahashi. M.Hosoba. R.Ban. K.Ohmura. S.Wakabayashi. H.Hattori. Systems Dept. and Medical Systems Div., Shimadzu Corp., Kyoto.

Latest configuration of Shimadzu' nuclear medicine computer system "SCINTIPAC-1200", including a mini-computer with 128k-words main memory and 24M-words disk, gives high performances such as parallel data acquisition from two scinti-cameras and FG/BG simultaneous operation. Extended main memory allows multi-gated RI angiocardiology consisted of 31-frames by 4k-w, or high resolution image measurement of 256 x 256 piccells and higher data processing speed. The display devices are a graphic CRT of 64 gray levels, a micro dot imager and hard copies. Also, a specially designed color CRT display is used for the moving imaging study, the image can be fed to a ordinary cassette VTR. The system is written in the BICOMS (dedicated real time BASIC) and FORTRAN.

Another work in progress is developing a dedicated processor for this purpose consisted of image-oriented large size MOS memory of 1-Mw, 16-bits microcomputer, hard wired image processor, dynamic color CRT display and floppy disks. The software can be modified or expanded in BASIC language.

The best system for the nuclear medical study must be a combination of above two computers, the latter for the routine analysis and as a rapid image memory to the former computer used for research purposes or high order data processing.