5th INTERNATIONAL SYMPOSIUM, LOS ANGELES, USA
25–29 OCTOBER 1976
The meeting was attended by 276 participants and 80 observers from 27 Member States.

Medical Radionuclide Imaging

Patients entering hospitals in the USA are reported to have about one chance in three of having a radioactive tracer play a role in the diagnosis of their medical problem. One important diagnostic technique is radionuclide imaging – the use of radioactive isotopes to obtain images of body organs and processes. The IAEA, from its very beginning, has paid close attention to this particular field. In 1959 the second large scientific meeting ever to be organized by the IAEA was devoted to this topic and at intervals of about four years the Agency has organized symposia on medical radionuclide imaging.

The symposium held in Los Angeles reflected the recent expansion of this field. During eleven scientific sessions a total of 74 papers were presented, 14 of these constituting invited reviews of important developments in instrumentation, methodology and clinical applications.

During the first session, various programmes for quality assurance in imaging were presented and the importance of the recommended procedures was well documented. It was evident that the minor efforts required for establishing such programmes would greatly improve medical care.

The new "large field of view" type of gamma-camera (with improved resolution and sensitivity) as well as several other novel and improved imaging devices were reviewed. Three papers dealt with semiconductor detectors and two papers focussed on the performance of collimators.

The various elaborate, multidetector systems for emission tomography that have recently been developed were described. Part of the intensive discussion was concerned with the relative importance of temporal versus spatial resolution and their relative advantages and limitations. Most of the radionuclides used for tomography are produced in cyclotrons and are positron emitters. The production techniques were reported in an extensive review on medical cyclotrons.

A session devoted to image evaluation included reviews of quantitative evaluation of medical imaging and of display systems in scintigraphy. Work carried out under the IAEA Co-ordinated Research Programme on the Intercomparison of Computer-assisted Scintigraphic Techniques was reported at this session.

One review paper covered applications of ^{123}I, and another paper reviewed radiopharmaceuticals for bone and bone marrow imaging. Several new and improved radiopharmaceuticals were described. For radionuclide angiography, one group of researchers suggested the use of generator-produced $^{191}Ir^{m}$ (with a half-life of only 4.9 sec.), which would considerably reduce the absorbed radiation dose to the patient. For the same purpose, another group suggested the use of small magnetic particles labelled with radionuclides. The particles, after having been injected intravenously, could be collected in an artery by an external

magnetic field and subsequently released when no longer needed. While it remains to be seen if these techniques will be used in clinical practice, both papers illustrate the fascinating current explorations.

The clinical applications of imaging have greatly increased in number during the past four years and now include almost all major organs of the human body. Three reviews were presented on imaging of the lungs, the kidneys and the heart. The progress in applications in cardiology has been particularly rapid. Eight papers were presented during the session devoted to cardiac studies and several other papers presented under other sessions emphasized technical aspects such as the ECG-gated cardiac studies.

$^{99}Tc^{m}$-pyrophosphate and ^{201}Tl in ionic form are excellent radiopharmaceuticals that provide the physicians in coronary care units with simple, safe and sensitive methods of diagnosing patients with acute myocardial infarction in whom contrast angiography would be associated with a significant risk.

The symposium provided physicians and specialists in various related disciplines with opportunities for an exchange of information on the advances during the last four years. Two well-attended evening sessions were devoted to the social impact of nuclear medicine (including cost-benefit studies) and to a comparison of the potential of medical radionuclide imaging in relation to complementary techniques, notably computerized axial tomography and ultrasonography. Although radionuclide techniques do not provide the great morphological detail that the alternative techniques do, the important complementary role of assessing functional status of an organ (i.e., the observation of physiological processes *in vivo*) that can be achieved by radionuclide imaging was emphasized.

The proceedings will be published in two volumes. An annex on dosimetry for frequently used radiopharmaceuticals, giving the absorbed radiation doses to various organs, is included at the end of Volume II.