NOTES FROM ABROAD

Nuclear Medicine in Europe.
Considerations of Present Status and Future Trends

D. P. Pretschner, Hannover, Germany


The author reviews past developments and identifies present trends in European nuclear medicine. The influence of economic factors, medical attitudes, acceptance of innovation, and political considerations, as they affect the growth of this medical specialty, is stressed.

Twelve European countries have established separate departments of nuclear medicine within existing university systems. In seven countries nuclear medicine is practiced within the university by radiologists and in three others by internists. In Sweden and Denmark nuclear medicine procedures are performed in the departments of clinical physiology, reflecting the fact that nuclear medicine measures and images organ function. Nine nations have nuclear medicine departments in all university medical schools, and there are a total of 149 departments of nuclear medicine in European universities. Nuclear medicine is recognized as a separate medical specialty in 18 nations, however, educational requirements differ greatly, so that five countries require 4 yr of training, seven countries, 3 yr, and six countries, only 6 mo for certification.

The structural divergence of European nuclear medicine is also mirrored in the available professional societies. In 22 countries organizations exist for those engaged in nuclear medicine—11 nations have their own national society of nuclear medicine, whereas the other 11 have nuclear medicine sections within societies of radiology. Natural scientists are excluded from membership in eight of the 22 nuclear medicine organizations, whereas six countries have societies that accept only natural scientists.

Although western Europe has a total of 1,400 gamma cameras and 750 computer systems, growth depends heavily on national finances. It is estimated that the greatest number of Anger-type scintillation cameras has been installed in the Federal Republic of Germany (West) (498), followed by England/Ireland (206), France (134), and the Netherlands (104). When the number of gamma cameras installed in each nation is compared with the national populations, it is apparent that both West Germany and Sweden have the highest density of gamma cameras, followed by the Netherlands and Switzerland, respectively. Yugoslavia, Hungary, and Bulgaria had the most rapid growth rates in 1977, the last year for which data are reported (Table 1). The acquisition and distribution of computers has shown a development parallel to that of gamma cameras, with about 60% of the cameras being equipped with electronic data processing systems.

Considerable interest exists in Europe in single-photon emission tomography. It is hoped that this technology will increase the confidence of a final diagnosis when used in conjunction with standard projections obtained by conventional gamma cameras. Great interest has also developed in imaging with short-lived positron emitters. Thus, there appears to be a growing market for cyclotrons and for positron cameras. Indeed, there are presently 12 cyclotrons in West Germany alone, four of which regularly produce radionuclides for nuclear medicine use. Four positron cameras have been installed in western Europe, and ten additional installations are foreseen within the next few years in the Federal Republic of Germany alone. It is expected that increased investment in this specific area will have a great impact on studies of pathophysiology and pharmacology.

The importance of nuclear medicine in Europe may be judged from the size of the West German radioisotope market. It is assumed that 5,000 Ci were purchased in 1979 for diagnostic purposes. During 1979 Germany imported 30,000 Ci (included are Au-198 seeds); 16.5% was used for diagnostic applications, 61% for therapy, and 0.5% for scientific applications. The remaining 22%
The European market has attracted continental and numerous non-European suppliers of nuclear medicine equipment (Tables 2 and 3). Acceptable maintenance service, such as speedy repairs and immediately available replacement parts, depends on the existence of cooperative endeavors with national manufacturers and on local
TABLE 3. VENDORS OF NUCLEAR IMAGING EQUIPMENT II

<table>
<thead>
<tr>
<th>General purpose data processing and display systems</th>
<th>Positron cameras</th>
<th>Cyclotrons</th>
<th>Single photon emission tomographs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digital Equipment Corp.</td>
<td>Scanditronix</td>
<td>Scanditronix</td>
<td>Searle</td>
</tr>
<tr>
<td>ADAC Laboratories</td>
<td>Cyclotron Corporation</td>
<td>Nucletronix</td>
<td>General Electric</td>
</tr>
<tr>
<td>Informatik</td>
<td>FG &amp; G Ortec</td>
<td>Cyclotron Corp.</td>
<td>Union Carbide</td>
</tr>
<tr>
<td>Artronix</td>
<td></td>
<td></td>
<td>CMS 7-pinhole technique</td>
</tr>
<tr>
<td>Philips</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Varian</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Krupp Atlas-Elektronik</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elscint</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Distributors. Service contracts, particularly those for computers, appear to be too expensive for the European market. There may be a development towards leasing, or 5-yr service contracts, with continuous updating included in the price of the equipment. Although after-sales service and maintenance of nuclear medicine equipment are considered to be important, in-house quality control appears to receive less attention. Routine testing on a weekly or monthly basis is seldom performed.

Computers in nuclear medicine are used primarily with gamma cameras for data acquisition, processing, and image and kinetic display. The more automated systems are preferred by smaller hospitals and private practitioners of nuclear medicine. General purpose systems appear to gain increasing acceptance, especially for cardiovascular procedures.

Five journals of nuclear medicine are published in Europe; the European Journal of Nuclear Medicine, Nuclear Medicine, The Journal of Nuclear Medicine and Allied Sciences, NUC-Compact, and Der Nuklearmediziner. Numerous medical specialty and scientific journals publish papers related to nuclear medicine, particularly journals of radiology, medical physics, and computer science.

The most important scientific meetings of the European nuclear medicine community are the International Annual Meeting of the Society of Nuclear Medicine, the Congress of the European Nuclear Medicine Society, and the Radioaktive Isotope in Klinik und Forschung, in Bad Gastein, Austria.

JOHN CLORIUS
Heidelberg, Germany

---

**NATIONAL SYMPOSIUM-WORKSHOP ON QUALITY ASSURANCE IN NUCLEAR MEDICINE**

April 27-29, 1981  
Pan American Health Organization Building  
Washington, D.C.

The Federated Council of Nuclear Medicine Organizations and the Bureau of Radiological Health are sponsoring the National Symposium-Workshop on Quality Assurance in Nuclear Medicine on April 27-29 in Washington, D.C.

The goals of determining the "state of the art" and arriving at a consensus that will facilitate development of an optimum quality assurance program will be accomplished by lectures by experts in quality assurance and control, with relevant viewpoints being presented; work/discussion groups; and a plenary session presenting conclusions. Proceedings of the meeting will be published.

Seventeen (17) hours of CME credit will be available through The Society of Nuclear Medicine.

For further information contact:

Mr. Ronald Hanchar  
Assistant Director of Survey Programs  
College of American Pathologists  
7400 N. Skokie Blvd.  
Skokie, IL 60077

---

THE JOURNAL OF NUCLEAR MEDICINE