FOREWORD

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25 Years of Progress

One of the most important events that occurred during my presidency of the Society of Nuclear Medicine in 1971 was the creation of the Technologist Section of the Society. At that time, most medical societies limited membership to those with medical degrees. The enormous accomplishments made over the past quarter century by the leaders and members of the Technologist Section are evidence that this alliance has been essential in advancing nuclear medicine to its present level. Nothing has contributed more to the care of our patients.

Nuclear medicine technology demands more skills from its practitioners than any other allied health profession. The modern technologist is not only responsible for the technical excellence of the studies, but also: serves as the staff manager; is involved in the funding, budget, billing and cash flow; and establishes and maintains good working relationships with nuclear medicine physicians and, equally important, with the physicians who refer patients for nuclear medicine studies. Communication has never been more important. In some cases, the technologist knows more about the interpretation of the studies than a part-time physician assigned that responsibility. The technologist must constantly educate the referring physicians and patients about the nature of the study, its purpose and the amount of radiation to which the patient will be exposed. Staff education, safety programs, compliance with regulatory agencies and the conduct of safety inspections all fall within the technologist's responsibilities.

As the field of nuclear medicine has changed enormously over the past 25 years, the technologist's role has expanded. Although anatomy and histopathology remain the principal bases for making a diagnosis, these two approaches suffer from being descriptive, subjective, not quantifiable and, in the case of biopsies, based on the study of dead tissue. The era of histopathology as the dominant concept in medical practice is coming to an end, being supplanted by a molecular as well as cellular approach to disease. Our procedures go far beyond anatomy into the domains of physiology and in vivo biochemistry.

For example, in cancer patients a single biopsy will at times not reveal the true nature of the disease, such as the degree of malignancy. Far greater accuracy in the staging of disease and in the planning of treatment is possible through nuclear medicine procedures, such as measurement of ^{18}F-fluorodeoxyglucose accumulation. Basic scientific advances in genetics, molecular biology, oncology, metabolic diseases and infectious diseases are being extended to clinical practice by nuclear medicine.

Nuclear medicine does not just provide new tests for old diseases, but new ways of defining and detecting disease. Chemical changes, that can almost always be detected before clinical signs of disease, make possible more specific characterization of the disease. For example, if a metastatic breast tumor contains estrogen receptors it can be treated with the estrogen receptor antagonist, tamoxifen. Both the planning of treatment and the response to treatment can be based on regional biochemistry.

The cyclotron has returned to the development of radiotracers based on the production of ^{11}C and ^{18}F, the workhorses of positron emission tomography (PET). Cyclotron advances are being extended via ^{123}I and ^{99m}Tc tracers to single-photon emission computed tomography (SPECT).

The next generation of nuclear medicine technologists has a rendezvous with destiny. The increasing role of primary physicians and the decrease in the number of specialists will affect the profession. As the technology and scope of nuclear medicine expands, technologists will become even more expert, knowledgeable and sophisticated. Technologists increasingly will participate in answering the four questions that characterize the practice of medicine: What is wrong? How did it happen? What is going to happen? What can be done about it?

Nuclear medicine is helping to decrease the amount of unnecessary or inappropriate care, helping to prevent future complications of disease by making early diagnosis possible, helping in the effective selection of procedures, and helping ensure that all studies are of high quality and interpreted with maximum accuracy. Nothing can help nuclear medicine more than outcomes research. Used properly, nuclear medicine not only improves patient care but saves money. We can make sure that our patients get the right procedure, the right care, in the right setting and in the right amount.