

Letters to the Editor

Manpower Requirements for Clinical PET

TO THE EDITOR: The November 1988 issue of the Journal's Newline featured an article (1) on "Clinical PET." The timely article is a stimulus to individuals now considering introduction of cyclotron/PET technology at the community hospital level. The article pointed out that radiochemists and radiopharmaceutical scientists with relevant experience are in popular demand. The newline article (1) quoted Dr. M. A. Wilson of the University of Wisconsin at Madison: PET "this is the most complicated imaging technology that there is. You have to have someone who understands the problems and a staff willing to do it, plus enough money to get the thing going." This voice of experience is good advice! Therefore, it follows that it is better for a new facility to find the "Right Person, i.e., the Bridge Scientist" at the stage when the start-up money is being committed.

Unfortunately, the "Bridge Scientist" to direct the cyclotron clinical PET Program is sometimes not on board at the time the purchase order is made. A facility considering a cyclotron and/or PET based upon its technical determination of performance by an outside professional, should also require that individual or firm to be bonded and liable for acceptance signature in the event of future problems, such as, the equipment not meeting performance specifications. In short, this reduces the difficulty that the person being hired to assure a successful program will not have to live with avoidable oversights not identified during performance testings by a third party. On the other hand, the formation of an Acceptance Committee consisting of local staff, outside experts and company representatives is a fair way to share the responsibilities for the large investment.

The Newline article included discussion on manpower requirements to operate a cyclotron/PET Center. Facilities like the National Laboratories and major universities have a resource of support services that are not characteristically found at the community hospital level. A modest beginning program requires at least one PHD radiochemist or radiopharmaceutical scientist, and at least one PhD physicist to look after the PET and a modern compact cyclotron. A physical chemist may double-up on the radiochemistry and physics aspects of a program. Given vacation schedules, etc., a third PhD specialist on the cyclotron/PET Team is a practical consideration. In order to assure progress during the first 2 years of start-up, the program should include a minimum of three bachelor's or master's degree level specialists to provide technical support in the form of radiopharmaceutical synthesis, nuclear medicine technology, software development, and quality control. If a medium-energy cyclotron is involved, one or more cyclotron technicians will be necessary.

A more ambitious program requires more manpower. The radiopharmaceutical program at this institution is typically comprised of 34 members. The manpower provides for research efforts in radiopharmaceutical chemistry (9); kinetic modeling (1); drug development research (2); routine clinical radiopharmaceutical production and distribution (6); quality

control (3); and the necessary support services including an engineering physicist, a cyclotron engineer and cyclotron operators (4) in order to operate the CS-30 cyclotron 70 hr per week. Current efforts focus on therapeutic radionuclides, radiopharmaceuticals, and the laboratory automations in preparation for a clinical research PET program. We do not presently have a research-oriented nuclear medicine physician on the team, but projects with physicians in oncology, obstetrics and gynecology, surgery, and the neurosciences are underway. External collaborations to develop radiopharmaceuticals have begun with University Hospitals, Cleveland, and the Memorial Sloan-Kettering Hospital, New York. We feel that an interinstitutional, multi-disciplinary approach to the rapidly expanding developments in clinical PET is an advantage.

The MRC cyclotron unit at Hammersmith Hospital has an even more ambitious effort with 65 scientific, clinical and technical support personnel involved to efforts in the various aspects of their 112-hr per wk cyclotron/PET Program (Watson IA: personal communication).

The question of salary support is always a sensitive issue. Hospital administrators should justify and expect to pay the key scientific and clinical staff at parity with the clinical PET team. An experienced Bridge Scientist necessary for the effective utilization of a multidisciplinary cyclotron PET Program is a commodity in very high demand. Scientists and physicians must work as members of an interdisciplinary team to assure the success of a PET program. Indeed, the cyclotron and PET are expensive technology that require knowledgeable individuals whose specialty and advanced training is comparable in value to the expertise required to practice clinical medicine with PET. To spend 4-6 million dollars on a technology, and then to minimize on manpower can result in having less competent personnel responsible for the major investment. In addition, if proper incentives are available, recent graduates will be encouraged to enter the field.

Two examples of leading cyclotron/PET Centers in the United States under the program direction of a PhD, and of an MD are UCLA and Johns Hopkins University, respectively. The exemplary success of interinstitutional collaboration in clinical PET research is noted by the Brookhaven National Laboratory and New York University PET Program. Therefore, these three different examples illustrate that knowledge and experience and ability to lead an interdisciplinary team is the important factor in a successful cyclotron/PET Program as opposed to any single approach.

Reference

1. Harby K. Clinical PET: Is it time to take the plunge? *J Nucl Med* 1988; 29:1751-1757.

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