

# Design Concepts of a Nuclear Medicine Department

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**The architectural design of an efficient, functional nuclear medicine department is described and its advantages discussed.**

**J Nucl Med 20: 1093-1094, 1979**

In designing a new nuclear medicine department in our hospital, we employed several design concepts that have proved useful during the initial 2 yr of operation. One of the first considerations is that the complex technology of nuclear medicine can be a frightening experience for the patient. To decrease patient anxiety, we minimize patient contact with the technology by limiting their movements to the area with the striped pattern in Fig. 1, plus one of the examining [4,5] and one of the imaging rooms [6-16]. Patients never enter the staff corridors [B (Fig. 1)], and no equipment, other than wheelchairs or stretchers, is allowed in patient corridors [A]. Staff activities are limited primarily to the staff corridor and those areas indicated by the dot pattern.

The patient flow to and from the department is controlled from the reception area [1 (Fig. 1)]. A magnetic board with color-coded cards shows the daily patient schedule of the department, the names and location of the patients within the department, and the stage of all studies at any time. Only those functions that involve calling for, receiving, and returning patients to their hospital rooms are carried out in this area. Other administrative functions, including scheduling, are performed in the general administrative area at the back of the department away from the patient areas [20 (Fig. 1)]. When patients arrive in the reception area they are directed to either the in-patient [3] or out-patient [2] waiting area, both of which are visible from the receptionist's desk.

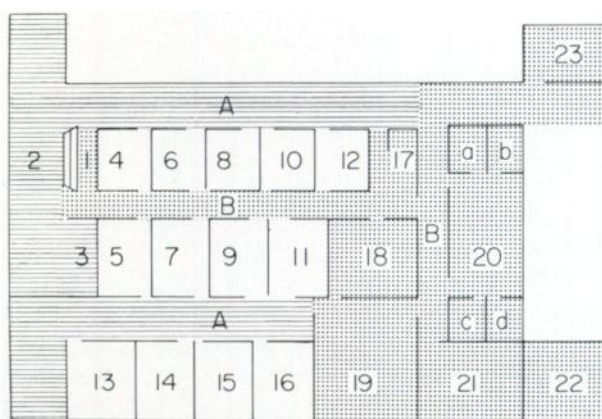
Immediately behind the reception area are two examining rooms [4 and 5 (Fig. 1)] where patients are seen by a nuclear physician. The examining rooms are necessary since nuclear medicine requires patient consultation as contrasted to the discipline of a laboratory service. In these rooms the nuclear physician defines the patient's problems, examines the relevant clinical data, and when indicated, examines the patient before he plans the nuclear studies. It is often necessary to deviate from routine protocols and "tailor-make" a study to solve a particular clinical problem.

After the physician completes the initial examination, the patient is taken to one of the imaging rooms [6-16 (Fig. 1)] through one of the two patient corridors [A]. Since most nuclear medicine procedures are performed with the patient supine, an indirect lighting system is used throughout the imaging area, so that the

patient doesn't have to stare directly at ceiling lights. A call button is given to the patient so that if necessary he or she can summon help when the technologist must be out of the room. Oxygen and suction equipment are built into every room, and four rooms, where lung ventilation studies are performed, have a built-in exhaust system for venting radioactive gases safely.

After the technologist completes the procedure, the patient is returned to the reception area until the study is reviewed by the nuclear physician responsible for the examination. A checking area [17 (Fig. 1)] is located at the end of the staff corridor, adjacent to the computer room [18].

Computers now play a major role in nearly all nuclear medicine procedures, and consequently, a data-processing room [18] is located between the checking area [17] and a consultation room [19] (Fig. 2). Glass walls between these rooms facilitate communication and minimize noise from the computers. Easily removable elevated



**FIG. 1.** Floor plan of Department of Nuclear Medicine at The Johns Hopkins Hospital. Patient areas indicated by stripes and staff working areas by dots. The rooms where staff and patients interface are white. A—Patient corridors; B—staff corridors; 1, 2, 3—reception and waiting areas; 4, 5—examining rooms; 6-16—imaging rooms; 17—film checking; 18—data processing; 19—consultation room; 20—administration and patient records; 21—in vitro and future cyclotron chemistry; 22—proposed cyclotron; and 23—radio-pharmaceutical laboratory.

Received Feb. 6, 1979; revision accepted May 11, 1979.

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**FIG. 2.** Consultation room is viewed from data processing room. Glass walls permit good visual communication and prevent computer noise from reaching other areas.

floor panels facilitate interfacing the computer with the imaging instruments in the department.

Since communication between the nuclear physician and the physicians with primary responsibility for the patients is essential, a consultation room [19 (Fig. 1)], equipped with television monitors connected to the computers, radiologic view boxes, and a 35-mm projector, is adjacent to the computer room (Fig. 2). Here

the physicians and others review and discuss the findings, interpret, and report the results of the studies. All rooms are connected by an intercom system. Our patient studies are filed in the administrative area [20 (Fig. 1)] (1) and the immediate availability of previous studies adjacent to the consultation area aids in the interpretation of current studies.

Those concerned with the immediate supervision of the studies (the chief technologist, chief resident, and head of the in vitro studies) have offices in the administration area [20a,b,c,d (Fig. 1)]. The director's and associate director's offices, the teaching classrooms, the conference rooms, and a staff lounge are nearby (but are not shown in the figure).

The in vitro laboratory [21 (Fig. 1)] is an integral part of the nuclear medicine department, an arrangement that is very helpful in the correlation of in vitro and in vivo studies. Future plans include provision for a medical cyclotron in room 22, and the in vitro laboratory will become the radiopharmaceutical preparation laboratory. At present, radiopharmaceuticals are prepared in room 23.

In summary, the concepts followed in the design of this nuclear medicine department have resulted in a pleasant and attractive area for patients, an efficient working area for the staff, and a means for facilitating communication with referring physicians.

#### REFERENCE

1. LANGAN JK, WAGNER HN JR: A system to record, view, store, and distribute nuclear medicine images and records. *J Nucl Med* 14: 588-590, 1973

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