



**FIG. 4.** Posterior views of infant xenon ventilation study (Case 2) with initial view at left and 100-sec view at right. There is spotty filling initially and diffuse bilateral trapping of radioactivity at 100 sec.

and plastic bag are filled partially with 100% oxygen to avoid oxygen lack from the dead space of the closed breathing system. The infant is positioned supine on the upper surface of an inverted gamma-camera detector, and the face mask is placed on the infant. The room-air vent is closed and the Xe-133 cartridge\* is cracked. The gamma camera is immediately started and 10-sec exposures are recorded on film over a 40-sec period. The room-air vent is opened and 10-sec washout views are then taken until no more activity is visible on the persistence scope.

The second method is for infants dependent on a ventilator. The infant is placed supine on an inverted gamma-camera detector. An endotracheal tube is connected to an adaptor and xenon-cartridge assembly, then to an ambu bag previously filled with oxygen. An exhaust tube leads from the endotracheal tube to a plastic bag in a lead-lined container. This exhaust tube is initially clamped. The xenon-133 cartridge is cracked. The gamma camera tape is immediately started and 10-sec film exposures are taken over a period of 40 sec. The baby is ventilated with the ambu bag. With the adapter, room air is allowed into the breathing system for washout, and the exhaust-tube clamp is removed. Views are continued at 10-sec exposures until the persistence scope shows completion of washout.

The xenon ventilation study aided us in separating surgically correctable congenital lobar emphysema from a condition with diffuse ventilation abnormalities of a nonsurgical nature.

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#### FOOTNOTE

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#### The Multi-Organizational "Umbrella"

Our need to re-examine organizational interrelationships and to seek opportunities for amplifying effectiveness and benefits through cooperation, led Henry Wagner to write his provocative Letter to the Editor "Time for FASORS?" (1). He pointed out the effectiveness that that type of umbrella organization has

demonstrated in arranging joint meetings or meetings in sequence at the same location.

He did not mention a different model already well launched: the Federated Council of Nuclear Medicine Organizations (FCNMO). This federation consists of the Society of Nuclear Medicine (SNM), the American Colleges of Nuclear Medicine (ACNM), of Nuclear Physicians (ACNP), of Radiology (ACR), the College of American Pathologists (CAP), and the American Board of Nuclear Medicine (ABNM). Its purpose has been envisioned as a means to discover common policies and problems, and to coordinate effectively their actions for common goals. A common manpower survey for the field of nuclear medicine has been proposed as an example of an opportunity to achieve greater effectiveness with diminished cost to each member organization. It is also recognized that government-relations activities for each organization could be significantly enhanced through FCNMO by a variety of means. One such would be for two or more organizations to share the cost of staff for their government-relations activities. Another might be for FCNMO organizations to enrich their government-relations activities by having their individual staffs cooperate, share, and coordinate their information-gathering, contacts, and presentation of points of view. FCNMO is an organization where each member retains all prerogatives, and consequently it is limited to effective action only in those circumstances where there is unanimity.

A third model for an "umbrella" organization is illustrated by the highly successful and prestigious American Institute of Physics. This organization was established, by a group of specialized scientific societies covering the broad spectrum of physics, to provide selected services to its individual member organizations. Each has representation on the Institute's Board of Directors, and thus establishes its policies and staff. Its function is providing those individual services contracted for by member organizations. Each member organization employs only sufficient staff to handle those services it retains "in-house," and such staff as needed to interface with the Institute for those services provided by its contract. The Institute has developed a strong core of professional staff with greater capability than any of its member organizations could begin to afford alone. The Institute's accomplishments as publisher of much of the physics literature in this country is typical. Its success in expeditious publication of its quality scientific journals, for lowest cost, has provided as essential a part of recent U.S. successes in modern physics as the multimillion dollar investments in government facilities. It also took the lead in the struggle with the Internal Revenue Service to preserve allocation of journal advertising revenues to meet the costs of scientific publication, etc. It publishes the magazine *Physics Today*, oriented to inform the general populace, accurately and in simple terms, about advances in physics. In this way it communicates very effectively with the general public for its member organizations. This is mentioned to illustrate how such an organization can be extraordinarily effective, as well as efficient, for its group of sponsoring organizations. The "institute" model of an umbrella organization serves a very different function from that of the recently developed Federated Councils.

Would the "institute" model have any applicability in our fields of interest? Several possibilities exist, but only one will be sketched to illustrate the potential. The essential core is a group of organizations with some commonality, which would establish a common service organization that they could collectively control and administer. It need not be called an institute, but the title does not present an immediate problem.

The Radiological Society of North America, the Society of Nuclear Medicine, the Radiation Research Society, and the Health Physics Society could represent a beginning core of sponsors for a service group tentatively identified as the American Institute of Radiation Biology or by some other appropriate name.

Service could range from publications, through membership records and accounting, to arrangements for meetings, etc., as each organization might choose to contract. Each sponsoring organization would determine its own goals, needs, policies, and services.

I think such an "institute" might be able to develop a parallel to the *Physics Today* magazine, which our culture sorely needs. The role of radiation in our lives will almost certainly increase rather than decrease. Our chosen fields, as well as the general public, need a magazine widely available in school and public libraries, as well as in waiting rooms, that tells accurately and in simple terms the stories of "RADIATION in LIFE, TODAY." The concept of risk/benefit ratios has to become commonplace and readily understood, in terms of the full spectrum of everyday risks and benefits, including those relating to radiation.

Could these advantages accrue to a group of societies in a less formalized "consortium-for-services?" As the aggregate magnitude of costs, monies, and services grows, the need for safeguards through formalized organization also grows. Personnel recruited for providing services would be more readily secured and retained in a well-structured organization. Some projects—including a common general publication like "RADIATION in LIFE, TODAY"—would be practical only if approached with care by an organization analogous to the "institute" model.

Inflation is causing officers and members of many organizations to re-examine how desired services can best be provided. The merging of selected service functions of several organizations can be as cost-effective for scientific activities as it is for commerce and industry. Such changes need neither alter nor impair the individual organization's effectiveness, goals, or identity. With strong and dynamic leadership, an organization should enhance its capabilities and accomplishments through participation in such a cooperative venture.

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### What Do We Want from a Bone-Scanning Agent?

Table 1 presents our initial results from repeated 24-hr whole-body retention studies, using both hydroxyethylidene diphosphate (HEDP) and methylene diphosphate (MDP), on four volunteer subjects and one patient with Paget's disease. These values reflect skeletal uptake of tracer (1) and show that in the normal subject MDP has the higher uptake, which presumably explains the faster plasma clearance of tracer and higher ratios of bone to soft tissue that have been found with this agent (2,3). While we have studied only one patient with Paget's disease, the skeletal uptake in the abnormal situation shows less striking difference between the two agents.

For the imaging of patients with metabolic bone disease—where abnormality on the bone scan is generally assessed by an awareness of diffusely increased tracer uptake throughout the skeleton—HEDP may be the radiopharmaceutical of choice. Furthermore, if there is high uptake of tracer in normal bone, focal skeletal abnormality may be less striking against such a background, and we have indeed shown that tumour-to-bone ratios are higher using HEDP than with MDP (4).

Just because one agent produces "pretty pictures" in the normal situation, it does not necessarily follow that such an agent is su-

**TABLE 1. REPEAT WHOLE-BODY RETENTION MEASUREMENTS USING HYDROXYETHYLIDENE DIPHOSPHONATE (HEDP) AND METHYLENE DIPHOSPHONATE (MDP)**

Subject	Age	Sex	24-hr WBR HEDP (%)	24-hr WBR MDP (%)
1	33	M	15.46	25.1
2	62	F	14.48	27.48
3	59	F	21.82	36.32
4	62	M	19.18	30.94
5 (Paget's disease)	76	F	72.21	79.63

prior in the detection of abnormality. What matters more than high bone-to-background ratios is a high ratio of abnormal to normal tracer uptake in bone. In clinical practice, both HEDP and MDP are excellent bone-scanning agents, but in the search for metastatic disease, HEDP may prove to be the more sensitive.

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### Re: Thyroid Carcinoma in an Autonomously Functioning Nodule

The recent case of functioning thyroid cancer reported by Drs. Abdel-Razzak and Christie is interesting (1). This patient and the one reported by Hopwood et al. (2) would seem to be the only ones with cancer that suppressed function in normal thyroid tissue without aid from functioning metastases. The size of this cancer and the modest suppression of extranodular tissue indicate that the functional activity was of a low order, perhaps making the benign nature of the nodule moderately suspect. With thyro-pathologists, Robert C. Horn, Jr., M.D., and William Meissner, M.D., we have reviewed the histology of a half dozen published (or to be published) similar cases. The diagnosis of cancer in two instances from the probable thousand nodules of this type removed surgically in the United States makes this test for thyroid cancer of great specificity. Doubts should be resolved by needle biopsy (3) rather than by wholesale surgical removal of such nodules.