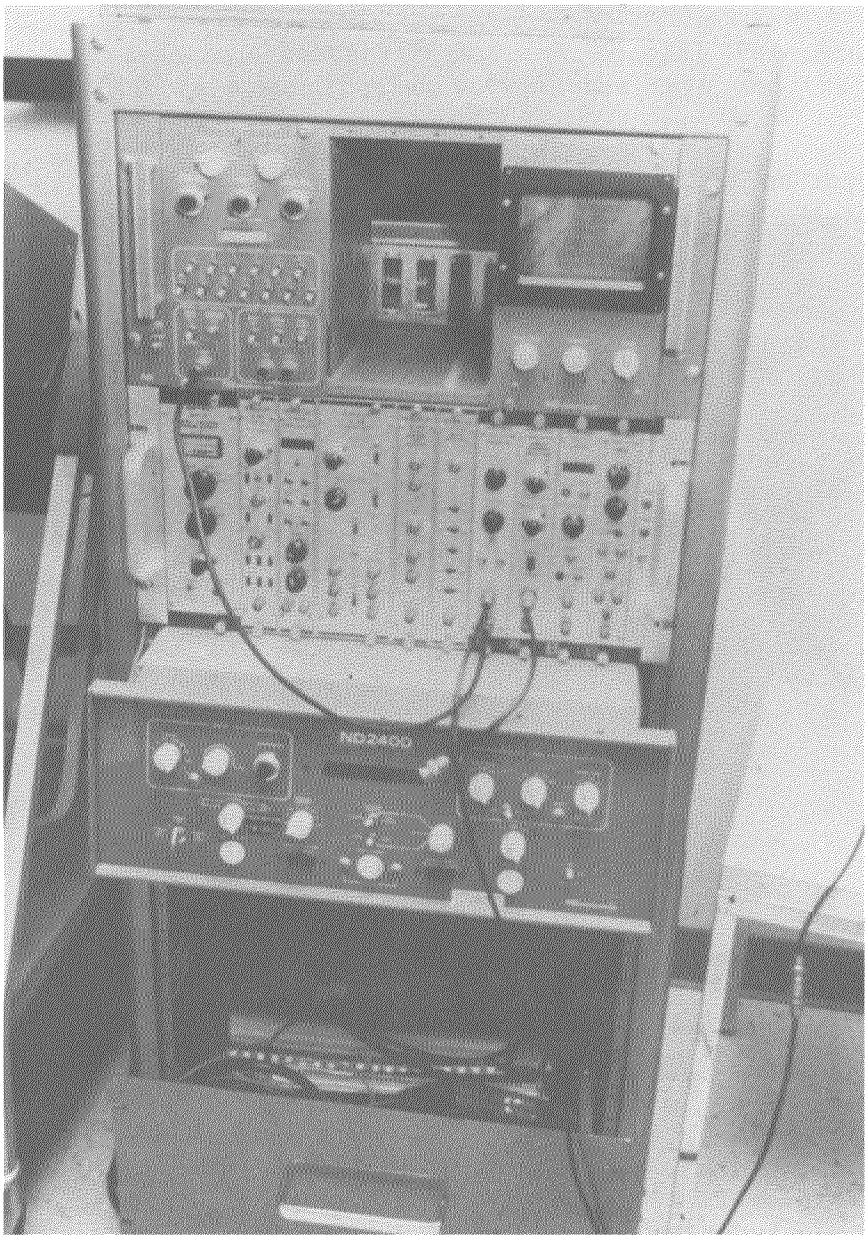

Figure 2. Multichannel energy analyzer for identification and quantification of radioactivity. This unit is kept in the Nuclear Medicine service where it is in use daily.

should be cleansed and treated as soon as possible. More specialized decontamination techniques may be required.

Early Treatment and Hospitalization: If the patient is seriously contaminated or if radiation effects are expected, he or she should be admitted to the hospital. Depending on the contaminant, early treatment with pharmacologic agents may be useful, for example, potassium perchlorate to wash radioiodide from the thyroid or saline for sodium diuresis.

Hospital and Unit Modification: A special area in the hospital should be provided to receive the patient. In the UAB Hospitals, a nine-bed unit was modified and designated for reverse isolation and for treating those injured by high doses of radiation.

Practice Runs: These are necessary to assure that the system will work. We found many weak points in the first dry run and needed to restructure the system. The APC initiated test situations complete with victims and unidentified sources of radioactivity. Practices were carried out with and without prior notification. After we ascertained that all systems were functioning properly, such tests continue to be scheduled at approximately six-month intervals.

Procedure Manual: We developed a detailed procedure for general instruction of all persons involved, as well as an abbreviated step-by-step protocol that is also prominently displayed.

DISCUSSION

Although this system has never been employed for the purposes intended, the results of frequent, realistic practice runs lead us to believe it would work efficiently. We have located sources of weakness and have taken steps to eliminate them. One important weakness is the inevitable turnover of key personnel. Newcomers on the staff who would participate must be identified and must read and understand the procedure manual.

Failure to check all equipment and supplies regularly could result in serious problems in moments of crisis. Therefore, all equipment is assigned some routine, if infrequent, use. Our treatment bays are used frequently for wound decontamination. When filled with ice, the decontamination tubs are ideal for treating persons with heat exhaustion. The radioactivity monitors are checked routinely by the Radiation Safety Department. The equipment used for monitoring, such as urine counters and test tube counters, are used daily in the Nuclear Medicine Department in monitoring and quantifying radioactivity in human tissues and body fluids.

Perhaps the greatest weakness is the fact that our system has only two treatment rooms for emergency care. Several patients can be accommodated only if each patient is handled quickly. If 30 minutes are required for decontamination and first aid for each patient, then

four can be treated per hour. The relatively small number of patients that can be handled per hour is largely due to the necessity of minimizing contamination of the ER by unknown radioactive materials.

In a reactor meltdown situation, such as at Chernobyl, where tens to hundreds of persons were involved, a much broader solution must be sought. As indicated by a Soviet hematologist who assisted in the care of the Chernobyl victims, "The handling of the problem ultimately required the resources of the entire nation with considerable help from abroad. What would happen in a nuclear explosion is unthinkable." Certainly it could not be handled in any 'conventional' way.