NMT Gadgetry

A New Method for Technetium Microsphere Agitation

Linda Grasso

Charles S. Wilson Memorial Hospital, Johnson City, New York

This paper describes a technique of concern to radiation-safety-conscious technologists. This method for technetium microsphere agitation can be adapted easily in the nuclear medicine laboratory of any community hospital.

One of the most commonly used radiopharmaceuticals for lung imaging is technetium-labeled microspheres that are produced by the 3M Co. These microspheres are widely used due to their fine quality and easy preparation. The relatively uniform microsphere size (ranging from 15 to 30 microns in diameter) and the even distribution throughout the pulmonary capillary bed are two of the advantages over the MAA particles. The disadvantage of the microspheres is the radiation exposure to the hands during the prescribed manual agitation time in the tagging preparation of the kit. It is the purpose of this paper to describe an inexpensive method of eliminating this excessive exposure by using an automatic agitation device that is relatively simple to construct.

Materials and Methods

Many nuclear medicine laboratories have at one time or another purchased some sort of agitation device for performing various in vitro studies, i.e., T_3 and T_4 tests. One such device is a vortex mixer that we have found to work quite well in the construction of the agitation device we have developed. A lead block or wooden platform may be used to elevate the vortex. A lightweight aluminum rod about 6 in. in length and a small piece of pliable wire about 10 in. in length are also used. Water-resistant adhesive tape is used to fasten the parts together. A hot plate and water container with proper shielding are also needed for the construction of this device (Fig. 1).

The automatic agitation device is assembled quite easily. The vortex agitator is placed on the lead block or wooden platform and fastened by tape or any other suitable means so that the agitator and the stand become one immobile unit. Next the 6-in. aluminum rod is placed on the rubber cup at a 90-deg angle to the vortex unit. Tape is then placed around the end of the rod and the rubber cup (Fig. 2, left). The tape should be lightweight and tightly pulled around this union to insure the mobility of the rubber agitation cup. At the other end of the rod the 10-in. wire is placed and secured with tape. A slipknot that suspends a labeling vial in place during agitation is fastened at the end of the wire. A hot plate with a suitable glass or metal water container (Fig. 2, right) is then placed under the arm of the agitation device, and

For reprints contact: Linda Grasso, Charles S. Wilson Memorial Hospital, Johnson City, N.Y. 13790.

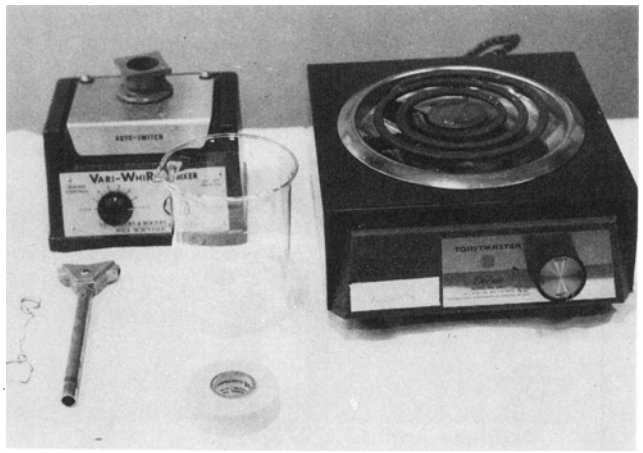

FIG. 1. Items necessary to construct microsphere agitation device.

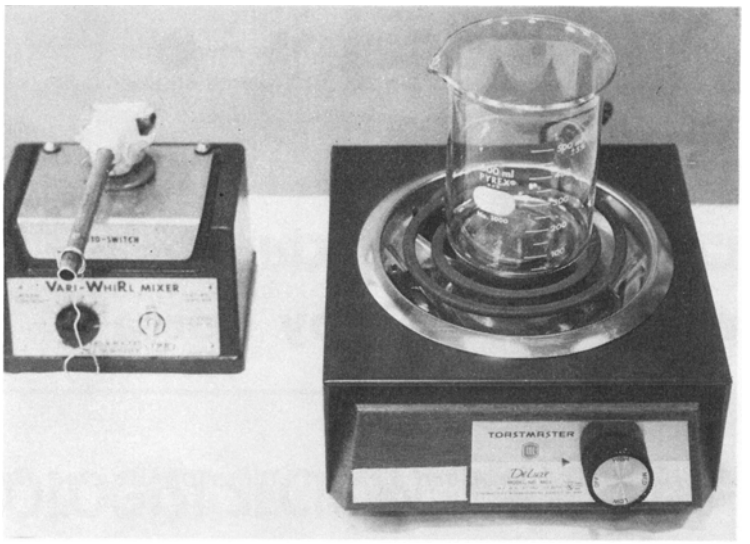

FIG. 2 (Left) Ten-inch aluminum rod secured to rubber cup with the wire slipknot for suspending labeling vial. (Right) Hot plate with glass container for water bath.

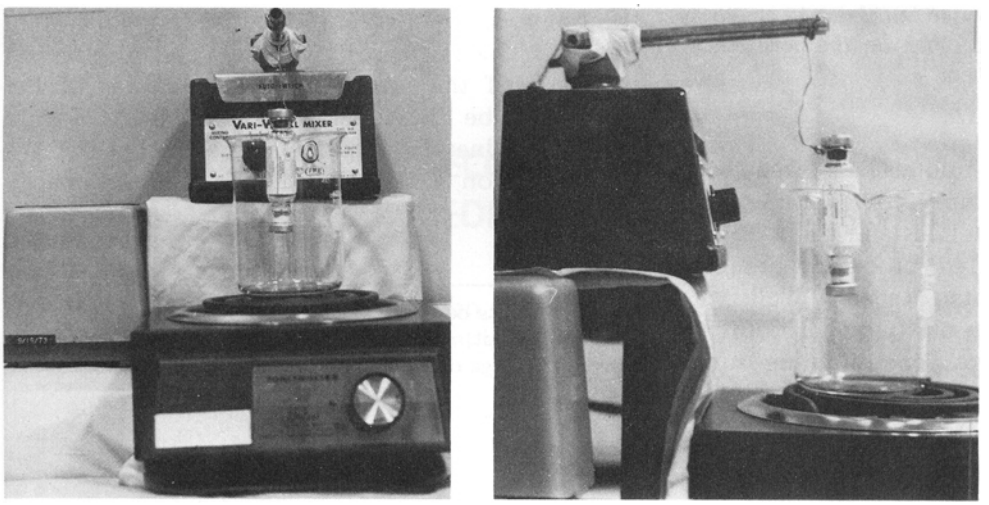

FIG. 3. (Left) Front view of device with ultrasonic bath in place on left of picture. (Right) Lateral view of agitation device.

suitable lead shielding is placed around the entire unit. The automatic agitation device is now ready to be used for microsphere labeling (Fig. 3A and B).

Labeling Efficiency

Although this method of automatic agitation does not enhance labeling, the microsphere-labeling process is not impaired. Of all the kits prepared using the agitation device, we consistently obtained 85 – 95% yield in labeling.

Summary

With the use of the agitation device, hand exposure is reduced and labeling efficiency is not altered.

Acknowledgment

The technical assistance of Donald M. Carley is gratefully acknowledged.

Reference

1. Albumin microspheres (human) for lung imaging. 3M Kit Circular Issue, Jan 6, 1972