

## APPARATUS FOR ADMINISTERING PENTOTHAL SODIUM \*

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MANY different types of equipment have been devised for the intravenous administration of anesthetic agents. These have varied from the most simple—a syringe and needle—to extremely complicated and ingenious automatic devices, such as the Kirschner apparatus for the intravenous administration of tribromoethanol. The objectives aimed at in the evolution of such equipment have been to centralize the administration in the hands of one person in order to permit the simultaneous administration of oxygen and other inhalation agents; to permit the administration of fluids, blood, stimulants and analeptics; to maintain a reserve supply of the anesthetic solution so that it may be aspirated into the syringe when its contents have been exhausted, and to release the anesthetist from holding the needle in the vein throughout a long operative procedure.

All the devices now available for administering pentothal sodium function satisfactorily and the preference of an anesthetist for one or another no doubt depends on the particular conditions in the hospital in which he works, that is, the anesthetic personnel and the number and type of operations to be performed during a given time. In recent years, many anesthetists have begun to favor the infusion of a dilute solution of pentothal sodium in preference to injection with a syringe. Some prefer to use a double infusion apparatus so that physiologic salt solution can be infused in order to keep the lumen of the needle open when the solution of pentothal sodium is not being infused. This seems to be unnecessary unless the patient requires physiologic salt solution. The occasional injection of 0.25 cc. of a 2.5 per cent solution of pentothal sodium is effective in keeping the lumen of the needle patent.

Where the anesthetic personnel is minimal and when an intravenous anesthetic must be administered simultaneously in a number of cases or in rapid succession, the simplest possible equipment commensurate with the needs of the individual patient is the most desirable. In addition, many of the operations for which intravenous anesthesia is used are of short duration, which renders the use of a complicated apparatus superfluous.

A reserve supply of the anesthetic solution may have advantages in certain cases, but after using various types of equipment, including those which I have devised, it seems to me that there is nothing more

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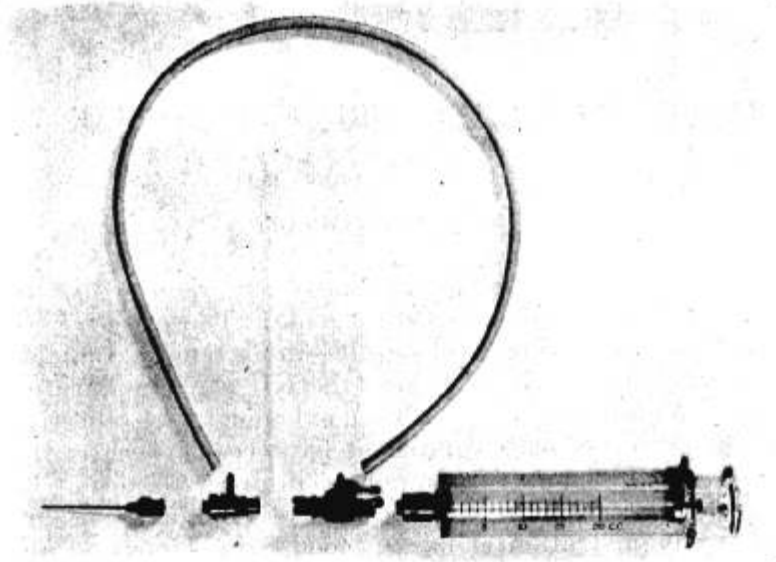


FIG. 1. Apparatus with parts disconnected.

simple than disconnecting the empty syringe from the end of the tubing and substituting a full one. A reserve supply of the solution can be kept in sterile syringes covered with Luer caps.

The objective most anesthetists have in mind is to reduce the equipment to the absolute minimum that will permit successful veni-

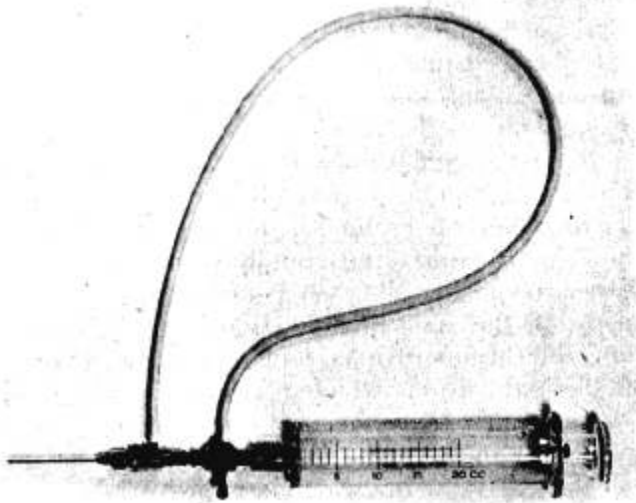


FIG. 2. Apparatus assembled for use.

puncture and easy maintenance of anesthesia. The apparatus should have as few parts as possible. It is now obvious that some type of extension tubing to permit administration of the solution at the head

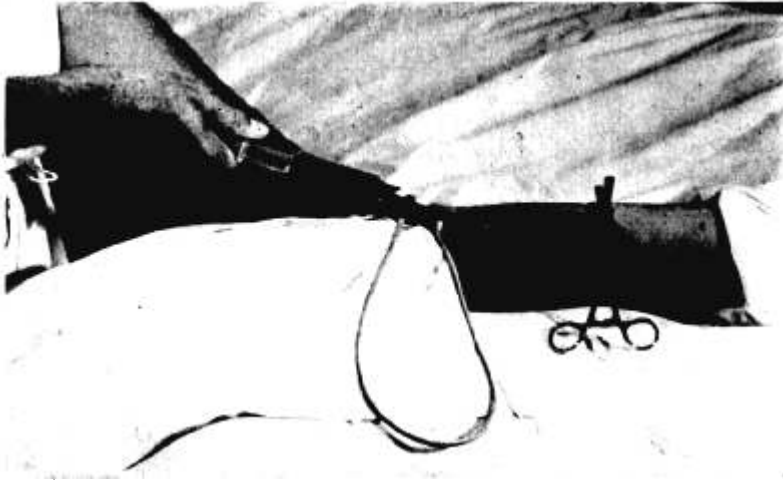


FIG. 3. Venipuncture with apparatus assembled.

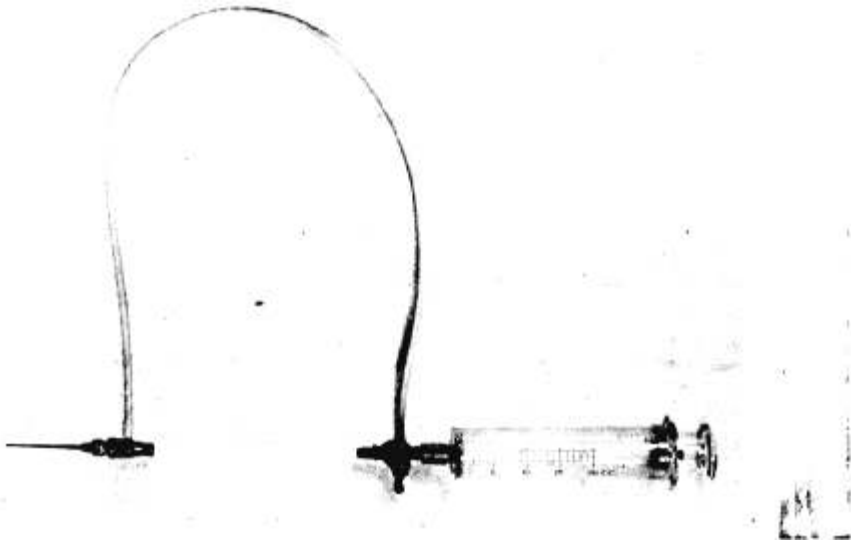


FIG. 4. Syringe disconnected from needle.

of the operating table, with the needle strapped in the vein, has decided advantages even for short operations. At the Mayo Clinic, we now use this type of equipment almost routinely. This type of equipment may be of various forms. The most satisfactory tubing is the small

bore, thick-walled tubing used for continuous spinal anesthesia. A Luer fitting is placed on the distal end of the tubing to accommodate the needle. The proximal end, to which the syringe is attached, is equipped with a one-way Luer stopcock or an automatic one-way Luer valve to prevent backflow of blood into the syringe and to prevent the

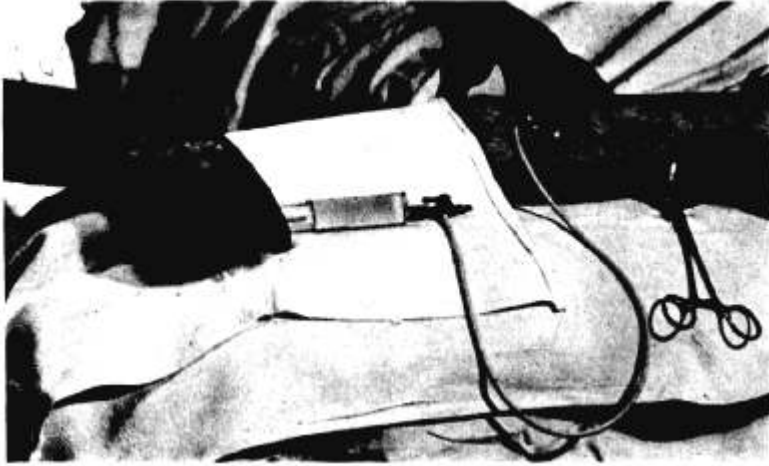


FIG. 5. Needle in vein with syringe disconnected from needle.

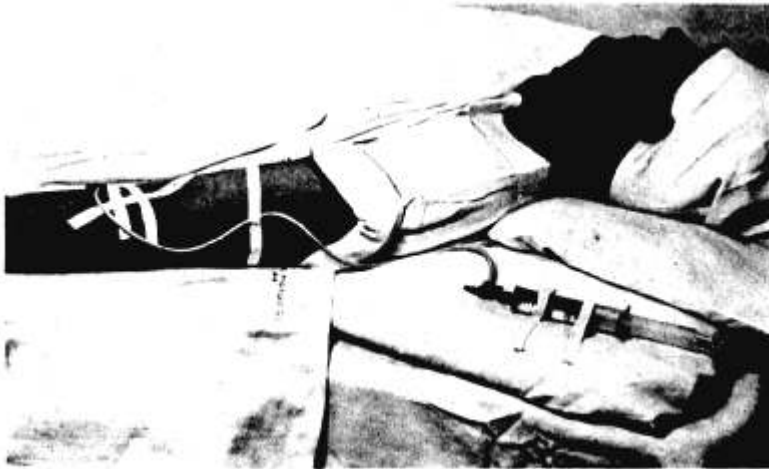


FIG. 6. Needle strapped in vein and syringe strapped at head of operating table.

lumen of the needle from becoming plugged. While this equipment is simple, it has one main disadvantage, namely, it is necessary to fill the tubing with the 2.5 per cent solution of pentothal sodium, after which the needle must be connected to the syringe to make the venipuncture and again disconnected after the needle is in the vein, in order to con-

nect the tubing. Since most workers prefer to perform venipuncture with the syringe attached to the needle, these maneuvers take time, favor contamination and also increase the possibility of dislodging the needle from the vein during the change. The apparatus to be described has been modified to permit venipuncture with the syringe attached to the tubing. At the same time, it is possible to maintain a closed system. The needle may be disconnected from the syringe after venipuncture and the syringe may be placed anywhere.

This apparatus \* consists of the following parts: (1) a 20 cc. Luer syringe with offset outlet; (2) a 20 gage Luer intravenous needle  $1\frac{1}{2}$  inches (3.8 cm.) long; (3) at least 2 feet (61 cm.) of small bore, thick-walled rubber tubing; (4) a modified Luer one-way stopcock and (5) a modified Luer double fitting.

These parts are shown disconnected in figure 1. The one-way Luer stopcock has been fitted with a side outlet to accommodate one end of the rubber tubing, and the normal outlet is closed. The double Luer fitting (No. 5) also has a side outlet, and the Luer fitting on its proximal end also is closed. These two closed fittings are connected prior to venipuncture, integrating the five components of the set (figs. 2 and 3). After venipuncture has been accomplished, the two closed portions are separated (figs. 4 and 5), the needle is strapped in place and the syringe may be carried to the head of the table or any other site (fig. 6).

The two Luer fittings with the attached tubing may be autoclaved and kept in sterile packs ready for use. Before venipuncture is made, they are assembled (figs. 2 and 3) and the tubing is filled with the solution of pentothal sodium. During the insertion of the needle, back pressure may be exerted on the plunger as an aid to successful venipuncture.

#### SUMMARY

The purpose of this apparatus has been to attempt to provide the simplest possible closed system of administering pentothal sodium while permitting its single-handed administration from any place.

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