TECHNICAL METHOD

DEVICE FOR SAMPLING BLOOD BOTTLES

BY

B. A. THOMPSON

From Group 9 Laboratory, Watford

(RECEIVED FOR PUBLICATION MAY 17, 1952)

In constructing the device described below we have used the following criteria: (1) the blood to be cross-matched is the actual blood from the inside of the bottle; (2) the device does not lead to bacterial contamination of the blood in the bottle, in spite of repeated use, thus allowing the contents of the bottle to be cross-matched more than once.

As will be seen from Fig. 1, the device is made mainly from standard parts. It consists of a blood transfusion needle (No. 17, B.W.G.), F, joined to a transfusion adaptor, D, by a piece of rubber tubing 3.75 mm. long, E. Interposed in the centre and interior of the rubber tube is a $\frac{1}{4}$ -in. stainless steel

ball bearing, G. The tubing has an external diameter of 8 mm. and an internal diameter of 4 mm.; the rubber tubing needs to be firm enough to grip the ball bearing and, at the same time, not too rigid to prevent the tubing being pinched by the fingers away from the ball bearing. A dust cap, C, is fitted to the adaptor, consisting of an old record needle mount soldered over at the tip. The device is autoclaved in a plugged test-tube, and is then ready for use (Fig. 2).

FIG. 1.—Exploded view of the device.

ball bearing, G. The tubing has an external diameter of 8 mm. and an internal diameter of 4 mm.; the rubber tubing needs to be firm enough to grip the ball bearing and, at the same time, not too rigid to prevent the tubing being pinched by the fingers away from the ball bearing. A dust cap, C, is fitted to the adaptor, consisting of an old record needle mount soldered over at the tip. The device is autoclaved in a plugged test-tube, and is then ready for use (Fig. 2).

To use the device the viscap covering is removed from the top of the blood bottle and the metal cap

FIG. 2.—Device assembled and mounted in sterile tube.

is wiped with alcohol. The needle is then pushed through one of the perforations in the metal cap, and then through the rubber bung up to the shoulder of the needle. The blood bottle is gently inverted, the dust cap, C, removed, the adaptor end, D, flamed, and by pinching the rubber tubing at the site of the ball bearing, thus making a channel between the ball and the inside of the tubing, one or two drops of

blood are allowed to run out into a saline tube for cross-matching. The tubing is then released, thereby allowing the tubing to grip the ball bearing again, and the dust cover is replaced before the bottle is righted again. Before the blood is issued for a case the device is withdrawn from the bottle top; or, if the blood is subsequently not required, the device is left *in situ* and the bottle can again be sampled for a further case.

Tests for Sterility

Test 1.—Two bottles containing nutrient broth were fitted with the devices with the dust caps removed. The bottles were inverted, the valves were momentarily opened by pinching the tubing from the ball bearing to moisten the inside of the devices with media: the bottles were then left during the day on the laboratory floor. At night one was incubated at 37° C. and one at room temperature. The contents of the bottle were tested for sterility twice a week for three months, at which time they were still sterile.

Test 2.—The device was interposed between two bottles, one, A, containing glucose indicator broth and the other, B, a culture of *P. vulgaris* in nutrient broth. The dust cap in this case was replaced by a record needle which was passed through the cap of the bottle containing the proteus culture. Before joining the two systems together the valve was momentarily opened by pinching the tubing over the ball bearing and media from A was allowed to flood past the valve; similarly the needle of the culture broth was allowed to fill with infected broth. The two systems were now joined together and set up at an angle to get a slight gravity-feed effect from B to A. This system was incubated at 37° C., and the contents of bottle A were tested weekly for sterility, and the contents of bottle B for viability, the milking process being repeated each time before the two systems were joined. After six weeks the contents of A were still sterile and the proteus organism was still viable.

Test 3.—The device was mounted in a bottle of fresh blood which was kept at 4° C. Thrice weekly for six weeks, by operating the device, cultures of the blood were made under aerobic (air containing 5% CO₂) and under anaerobic conditions; all cultures were sterile.

Summary

A device for removing blood aseptically from transfusion bottles for cross-matching without opening the bottle is described.