lence. Until such time as these problems are solved, the use of the tubes should be limited to such cases as resections in which excessive secretions or intrabronchial hemorrhages are anticipated.

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AN INEXPENSIVE "HOMEMADE" VALVE FOR NONREBREATHING TECHNIQUE OF PEDIATRIC ANESTHESIA

With the advent and increased use of endotracheal anesthesia the nonrebreathing technique in pediatric anesthesia has come into extensive use. The Leigh (1) valve and the Stephen-Slater (2, 3) valves have answered the need for the vital part of this apparatus. However, both of these valves are difficult to obtain at times and are relatively expensive. For these reasons I have designed a valve which can be made with little difficulty and at very little expense. For the person with little mechanical ability, the metal part of the valve can be made quickly by any competent machinist or plumber.

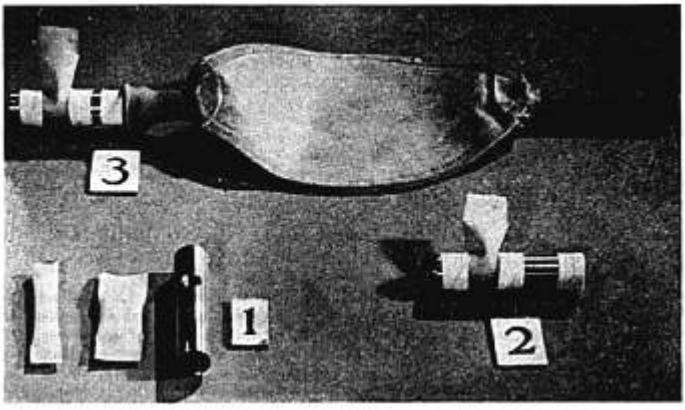
The original models were made of stainless steel, by far the most satisfactory material because of its toughness, resistance to wear and corrosion, and its relatively light weight. However, the tube portion of the valve may be made of almost any metal or plastic. The tube is cut to a length of 3 inches with an inside diameter of 19/32 inch. One end may be reamed slightly to 39/64 inch on the inside to take the standard Magill curved slip joint endotracheal catheter connection. One inch from this end a hole 3/8 inch in diameter is drilled into the tube. This piece of tubing constitutes the permanent part of the valve.

A piece of 3/8 inch rubber Penrose tubing 2 1/2 inches long for the inspiratory valve and a piece of 5/8 inch rubber Penrose 2 1/2 inches long for the expiratory valve constitute the remainder of the valve. One end of the 3/8 inch rubber tubing is cut along each folded edge about 5/8 inch and the proximal 1/8 inch of the cut ends are cemented together to produce a close approximation of the ends. One end of the 5/8 inch rubber tubing is cut along each folded edge about 1/2 inch and preferably with a 1/8 inch bevel. The proximal 1/8 inch of the cut ends are cemented together on each side like the 3/8 inch tubing. The opposite end of the 5/8 inch rubber tubing is cut along the folded edges about 1 1/4 inch. The valve is then assembled as shown in the illustration.

The 5/8 inch rubber tubing is secured around the metal tube with rubber cement or tape, or both, care being taken to place the valve directly over the hole in the metal tubing. The 3/8 inch tubing is inserted into the opposite end of the metal tube and a cuff 1/2 inch long is folded over the metal tube as illustrated. If the tubing is inserted too far into the metal tube it will occlude the expiratory hole. The rubber portions of the valve are easily and quickly replaced as necessary.

The valve works on somewhat the same principle as the Leigh and Stephen-Slater valves. There is negligible accumulation of carbon dioxide and respiratory resistance is minimal. Gases flow from the reservoir bag into the metal tube by inspiratory effort unless gas flow and bag content are excessive. In either event exhaled gases do not pass back into the reservoir bag. From the metal tube gases pass by way of the endotracheal catheter to the patient. Resistance is minimal at high flow, depending on how carefully the rubber parts are made. With a slower rate of gas flow as for smaller children the resistance to expiration is less. The dead space in the valve is 9 to 10 cc, that of the mouth and pharynx being reduced by the endotracheal catheter.

As recommended by Stephen and Slater



1. Unassembled valve.
2. Valve assembled and secured with adhesive tape.
3. Valve attached to gas reservoir bag and ready for attachment to the standard Magill curved slip joint endotracheal catheter connection.

the reservoir bag should be kept moderately full but not distended. The valve has the additional advantage of being able to operate in any position. Controlled or assisted respiration is accomplished by compressing the visible flaps with two fingers or pressing the flaps over the hole in the metal tube.

After each use the valve should be washed, dried and powdered. Before use gauze should be passed through the valve to avoid sticking of the rubber flaps. The valve is cleansed very easily, and if necessary, the rubber parts can be replaced in a few minutes.

This type of valve has very satisfactorily filled our need for an inexpensive and easily made valve for the nonrebreathing technique. The valve was not made to replace the original types of nonrebreathing valves, but can be used when the other valves are not available. It may, incidentally, be used with trichloroethylene in the nonrebreathing technique.

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To the Editor:

In a recent publication, Keats and Beecher [Anesthesiology 14: 140–142 (March) 1953] reported a study on the effect of the addition of 0.1 per cent sodium bisulfite, a commonly used antioxidant, to morphine sulfate solution in order to investigate whether or not this