

## CURRENT COMMENT AND CASE REPORTS

CURRENT COMMENT is a section in ANESTHESIOLOGY in which will appear invited and unsolicited professional and scientific correspondence, abbreviated reports of interesting cases, material of interest to anesthesiologists reprinted from varied sources, brief descriptions of apparatus and appliances, technical suggestions, and short citations of experiences with drugs and methods in anesthesiology. Contributions are urgently solicited. Editorial discretion is reserved in selecting and preparing those published. The author's name or initials will appear with all items included.

### A PROPOSED NEW DEVICE FOR THE ADMINISTRATION OF OXYGEN

In recent years the medical profession has developed an increasing appreciation of the many benefits of oxygen therapy. This trend is reflected by the increasing use of oxygen not only for the critically ill, but also for those patients whose recovery may be hastened by its use as a supportive measure. With the increasing use of oxygen have come improvements in the methods by which it is administered.

The device herein proposed was designed to overcome the major disadvantages (irritation, constriction, inefficiency and expense) of the currently popular devices for administering oxygen and to deliver oxygen to the patient efficiently and with comfort. In repeated trials over the past two years, it has undergone several modifications until it has reached its present state of design.

This device (figs. 1 and 2) is composed of a light weight plastic base which is narrow (0.8 cm.), flared at the ends and curved to fit the face and to rest against the upper lip. The upper edge of the base rests against the upper lip. The upper edge of the base rests against the septum mobile nasi. To this base plate is secured a plastic tube (0.7 cm. in diameter), which is sealed at one end, the upper surface of which has two short plastic tube outlets (0.5 cm. in diameter). These serve as bases for two 1.5 cm. lengths of soft 12 French rubber tubes which are attached to them, and which, when the device is worn by the patient, will enter the nasal ostia to a depth of about 1 cm. These tubes can be set at slight angles to meet anatomic variations without coming into contact with

the nasal mucosa. Measurements of over 100 adults have indicated that these short outlet tubes should be placed 1 cm. apart.

The entire device is secured at its base by two loops of  $\frac{1}{4}$  inch Penrose rubber drain tubing which encircle the ears, each of which is equipped with a simple sliding buckle to permit individual adjustments for tension.

The device has been well accepted almost without exception by the patient upon whom it has been tried, and particularly by those who have had previous experience with other devices. The rubber ear loops, being free of sharp edges, can be worn with comfort for prolonged periods without irritation. The small diameter of the narrow soft rubber nasal tubes permits the patient to exhale through his nose without appreciable obstruction to the ostia. The single openings of the tubes direct streams of oxygen upward and backward into the nasal chambers. The light weight of the device insures its security on the face and its small size and positioning do not interfere with the wearing of spectacles or with eating and drinking.

To test the operating efficiency of this device, a comparative study was made to determine the concentration of oxygen present in the posterior pharynx of an individual using the nasal catheter, the metal Y tube device and the plastic device described. With each of these in satisfactory operation and with a continuous flow of oxygen at 5 liters per minute, gas samples were taken slowly from the posterior pharynx of a normal adult under

basal conditions. The gas samples necessarily were composed of both expired and inspired air but were taken slowly in order to obtain representative gas concentrations under equal conditions for each device. Only the concentration of oxygen was determined.

These trials indicated that with the use of the nasal catheter an oxygen concentration of 54 per cent was obtained from the gas removed from the pharynx, while with both the Y tube and the plastic device, the oxygen concentration was 45 per cent. Thus it would seem that the rubber nasal catheter is slightly more efficient than the other two and that the metal Y tube and the plastic device herein presented are of equal efficiency. This would appear to indicate that it is not necessary to occlude the nasal ostia in order to deliver a high concentration of oxygen to the nasal chambers.

Because of the light plastic material of which this device is made, it is obvious that it cannot stand the heat of autoclave sterilization and its proper cleansing, therefore, must be chemical in nature. Because of its simplicity and structure, how-

ever, it could conceivably be manufactured in quantity and at a low cost and therefore become a disposable item. Such disposable individual items are becoming increasingly popular with those responsible for hospital administration and maintenance.

#### SUMMARY AND CONCLUSIONS

The plastic device proposed herewith for the administration of oxygen seems to offer the following advantages:

The light weight and face-fitting shape render this apparatus extremely comfortable, and experience has indicated that the patient loses awareness of its presence after a short time.

The device does not tend to become loosened or detached when the patient sleeps or turns on his pillow or when he is irrational or agitated.

The ear loops are adjustable to anatomic facial variations with ease. Because they are thin soft rubber tubes, there are no sharp edges or projections to irritate the ears.

The soft rubber tubes do not irritate the nasal mucosa by continuous contact and

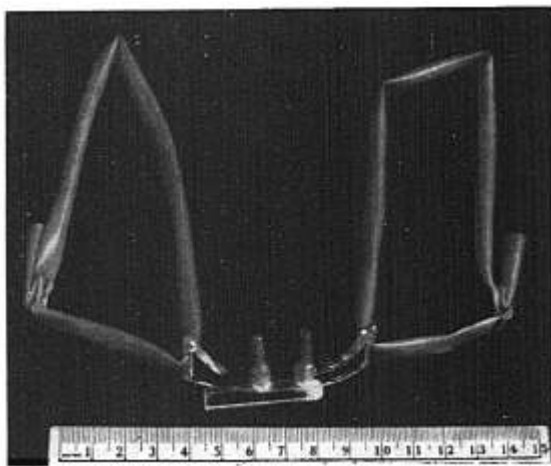


FIG. 1. Complete unit. This model was made of clear Plexiglass.



FIG. 2. The oxygen device in use.

their single openings direct a stream of oxygen upward and backward into the nasal chambers. By reason of their small diameter, these tubes do not occlude the nasal ostia and therefore do not interfere with normal expiration in those patients who breathe through their noses. This arrangement does not, however, interfere with the proper delivery of oxygen as is evidenced by the analysis of gas from the posterior pharynx.

The device permits the free use of spectacles by the patients, and does not interfere with normal eating and drinking or with the patient's ability to speak.

The light plastic material of which this device is made is unsuited to heat sterilization. This disadvantage could be offset by the manufacture of such a device in quantity in order to reduce the unit cost and make the device a disposable item.

#### REFERENCE

1. Beckman, H.: *Treatment in General Practice*, ed. 5, Philadelphia and London, W. B. Saunders Company, 1946.

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### THE "OPERISCOPE" AS AN AID DURING ANESTHESIA

Modern surgery requires intimate coordination of the activities of the anesthetist with those of the other members of the operating team. At frequent intervals the anesthetist should appraise the surgeon's requirements in terms of relaxation, the patient's position, the lighting of the operative field, and other factors which may be partially or completely within his

control. Accurate evaluation of replacement therapy in all operations of major significance, and periodic inflation of the collapsed lung during thoracic surgery are best done if the operative field is clearly visible to the anesthetist.

Although it is desirable to allow the anesthetist full view of the operative site, it is often necessary to obscure his view with