One case showed toxic effects by growing an excess of hair on the face.

Infections which are easily masked by cortisone should be carefully watched for.

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Medical Memorandum

Use of Methyl *N*-Propyl Ether as an Anaesthetic for Children

The use of methyl *n*-propyl ether in anaesthesia dates from its inclusion in a series of ethers investigated by Krantz *et al.* (1946). The physical and chemical properties are not dissimilar to those of diethyl ether, of which it is an isomer, and similar precautions against explosion risk must be observed. Its safety margin is close to that of diethyl ether, the arbitrary standard (Krantz *et al.*, 1947), and it is excreted from the body without having undergone metabolism. The chemical formulae of the two substances are:

In the present series of 378 cases in which methyl *n*-propyl ether was used as a maintenance agent all the patients were subjected to plastic surgical procedures, and the group selected for study includes ages from birth to the fifth birthday, distributed as follows: 1st year, 108; 2nd year, 87; 3rd year, 71; 4th year, 50; 5th year, 62.

By the age of 3 most of the surgery for hare-lip and cleft-palate has been completed, and the liability to burns and trauma causes the increase in surgery in the fifth year and subsequently. The duration of administration of anaesthesia varied from 10 minutes to 180 minutes, the average being 76 minutes. With the exception of eight cases, administration was carried out by means of an intratracheal tube, using the method described by Picken (1950), the vaporizing agent being oxygen or a 2:2/3 oxygen and nitrous oxide mixture at a flow rate of 4 to 5 litres a minute.

In this series 209 patients were operated upon for repair of hare-lip and/or cleft-palate, among them an Abbé repair of primary hare-lip at 5 months, in which the administration lasted 145 minutes; 80 underwent excision and/or grafting of burns; and the remaining 89 were submitted to a large variety of procedures, including a repair of spina bifida lasting 105 minutes, eleven hours after birth, and a colostomy at 26 hours.

Premedication.—Atropine alone, 1/200 to 1/100 gr. (0.3 to 0.6 mg.), was used in the smallest children. Pentobarbitone sodium ("nembutal") at the rate of 0.7 gr. per stone (7 mg per kg.) body weight, with atropine, was given orally to some; morphine sulphate, 1/40 gr. per stone (0.25 mg. per kg.), with atropine was given to others; while a few of the older children received papaveretum and scopolamine. All these drugs, with the exception of pentobarbitone, were given by the intramuscular route.

Induction.—Cyclopropane and oxygen 50:50 was used as the inducing agent in 200 cases, and ethyl chloride followed by methyl *n*-propyl ether on the open mask in most of the other 178. In a very few cases induction and maintenance were carried out with methyl *n*-propyl ether alone. Cyclopropane is preferred by one of us (H. G. M.) because it gives a very rapid induction, free from coughing or excitement. Its vapour density (21) is greater than that of air (14.3), and most of the children were anaesthetized without

the use of a mask by "pouring" the gas from a tube concealed within the hand. Intubation was carried out, using either the Magill or the Macintosh laryngoscope, as soon as the jaw was relaxed. Induction with ethyl chloride and methyl *n*-propyl ether appeared to be more rapid than induction under similar circumstances with ethyl chloride and diethyl ether. The relatively non-irritating vapour of methyl *n*-propyl ether causes less coughing and breath-holding and allows induction to proceed more smoothly.

Course.—After intubation anaesthesia was maintained with either pure oxygen or a mixture of nitrous oxide and oxygen as a vaporizing agent for the methyl *n*-propyl ether. The vapour is carried by pressure tubing to a Cardiff connector attached to the end of the intratracheal tube so that there is no resistance to breathing in the circuit. Because this ether is relatively non-irritating we have found that anaesthesia may be deepened very rapidly when required, and therefore a very light plane may be maintained when relaxation is not needed. The respiratory rate is not apparently increased to the same extent by methyl *n*-propyl ether as by diethyl ether, nor is there any apparent increase in capillary oozing in the presence of an unimpaired airway. We have observed no cardiac irregularities in the series. The response of the pupil to methyl *n*-propyl ether shows a time lag when compared with the sequence for diethyl ether (Guedel, 1937), and consciousness may be reached during withdrawal of anaesthesia from depth before the pupil contracts (Shane, 1947). Recovery from anaesthesia is rapid, and the cough reflex is quickly restored. Excitement and struggling are very uncommon. It has been found possible to begin feeds in all cases very soon after withdrawal of anaesthesia, thus minimizing nutritional loss. In the concentrations used there have been no complaints of headaches or disagreeable feelings in the surgical teams (Fisher and Whitacre, 1947).

Sequelae.—We have found no significant alteration in the incidence of post-operative nausea and vomiting when compared with diethyl ether. No vomiting persisted beyond the first post-operative 24 hours. The type of surgery undertaken in this series has necessitated the acceptance for operation of a higher than normal proportion of patients with chest infections. It is our impression that complications are few, since coughing is restored rapidly and co-operation in physiotherapy soon follows. There were no deaths immediately or remotely attributable to the anaesthesia.

We are indebted to Mr. Emlyn Lewis, consultant plastic surgeon to the United Cardiff Hospitals and the Welsh Regional Hospital Board, under whose care these patients were admitted, for his co-operation.

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The United States Food and Drug Administration has directed that drug products containing more than 5% of oil of wintergreen must bear on their labels a warning that they should be kept out of reach of children, and that use contrary to directions may be dangerous. The methyl salicylate in the oil of wintergreen attracts young children by its smell, and a considerable number of deaths have occurred in the U.S.A., as in Britain, from young children drinking such preparations as liniments containing oil of wintergreen. Parents are not often aware of how dangerous these preparations are to children.