A No. 1 Macintosh blade and a 3.5-mm red rubber endotracheal tube with stylet are used. Intubation of the cat is frequently more difficult than intubation of a child since the cat has large, sharp teeth, a large tongue, copious salivation, a small anterior larynx and dome-shaped arytenoid cartilages.

Intubation of the cat is a dynamic demonstration which simulates future experiences and gives students a sense of accomplishment. Besides the obvious advantage of not exposing humans to a completely inexperienced endoscopist, the use of the cat model engenders a feeling of confidence in the student and markedly increases his technical skill. This technique has been published in detail elsewhere (Calderwood and Ravin, 1972).

MARK B. RAVIN
Gainesville, Florida

REFERENCE

Editorial note. United Kingdom readers are reminded that this type of procedure in the United Kingdom is governed by the Cruelty to Animals Act, 1876. Accordingly, anyone wishing to pursue this procedure is advised to communicate with the appropriate department of the Home Office.

CEREBRAL METABOLIC EFFECTS OF HYPERVENTILATION AND DELIBERATE HYPOTENSION

Sir,—I read with interest the excellent article by Drs Harp and Wollman (Brit. J. Anaesth., 1973, 45, 256). They have addressed themselves well to the prevention of cerebral hypoxia if one or both techniques are to be used. However, there are a few comments I would like to make relevant to cerebral oxygenation during deliberate arterial hypotension.

With the reduction in cerebral perfusion pressure during deliberate hypotension, compensatory mechanisms come into play to maintain cerebral oxygenation. Cerebral vasodilatation occurs and the rate of oxygen extraction increases. Consequently, jugular venous oxygen tension tends to fall. As the authors indicated, monitoring of the jugular venous oxygen tension could provide adequate warning and a border limit of 30 mm Hg was suggested.

Since the case against induced hypotension rests mainly on the danger of inadequate cerebral oxygenation, every effort made to prevent its occurrence should enhance the safety of the technique. Efforts have been directed toward reduction of the cerebral metabolic rate, and to prevention of excessive fall in cerebral blood flow.

Reduction of the cerebral metabolic rate can be accomplished by anaesthetics or by hypothermia. The effect of anaesthetics, except perhaps enflurane, is rather limited. Hypothermia, though complementary to induced hypotension, is not practicable since it would detract from the simplicity of the technique.

Excessive reduction of cerebral blood flow may be prevented by: avoiding hypocarbia; aiming at a level of pressure consistent with the patient’s condition; limiting the duration of hypotension; and detecting early any warning signs indicative of cerebral hypoxia.

One additional precaution which should be mentioned is the administration of 100% oxygen during deliberate hypotension, instead of the usual 30–50%. The effect of 100% oxygen versus 40% oxygen and nitrous oxide, on the jugular-bulb oxygen tension during profound hypotension has been studied (Salem, Kim and Shaker, 1970). An increase in Pjv02 occurred in each patient when 100% oxygen was given, to an average of 34.3 mm Hg from a previous level of 27.8 mm Hg.

This effect is probably brought about by two different mechanisms: first, the increase in cerebral arterial oxygen content following the administration of 100% oxygen, and secondly, the concomitant reduction of cerebral oxygen consumption as a result of eliminating nitrous oxide. A stimulating effect of nitrous oxide on the cerebral oxygen consumption during light halothane anaesthesia has been demonstrated previously in dogs (Theye and Michenfelder, 1968).

Although the increase in Pjv02 with the administration of 100% oxygen is not of great magnitude under normal circumstances, it may be of critical importance during deliberate hypotension. The increase in jugular-bulb oxygen saturation would be proportionately greater than the increase in Pjv02, since most of the values would be at the lower part of the oxygen dissociation curve.

Other observations indicate the usefulness of administering 100% oxygen during hypotension. Robinson (1967) showed that the lactate-pyruvate ratio increases in the blood during profound hypotension unless the Pao2 is kept above 300 mm Hg. In another study (Nilsson and Siesjo, 1971) it was observed that lactate levels in the brain were lower when 98% oxygen was used, compared to lower oxygen concentration.

Together with other precautionary measures, the use of 100% oxygen may contribute to the safety of induced hypotension. It is very unlikely that this high oxygen concentration will have any deleterious effects on the lungs, since its use is usually limited to a few hours.

M. RAMEZ SALEM
Chicago

REFERENCES