blockade. Spinal anaesthesia remains an excellent form of anaesthesia for non-urgent and elective Caesarean deliveries as well. Hopefully, it will regain its proper role as an important technique in the hands of the obstetrical anaesthetist.

Simon J. Lucy MD FRCPC
Mary Anne K. Naugler, RN
Department of Anaesthesia
St. Boniface General Hospital
409 Tache Avenue
Winnipeg, Manitoba R2H 2A6

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A practical, "hands-free" method for mask anaesthesia

To the Editor:

Mask anaesthesia with spontaneous ventilation is an enduring technique, although not without disadvantages. The necessity that one and sometimes both hands hold the mask has been addressed with bulky, tight-fitting straps and suspension systems.^{1,2} A second problem, that of pressure injury, may occur even when straps are not used.^{3–8} We have devised a technique which gives the anaesthetist two free hands and offers many other advantages.

Following induction of sufficiently deep general anaesthesia, a Williams Airway Intubator™ is inserted into the patient's mouth. A 15 × 20 cm sheet of transparent adhesive dressing (TAD) (e.g., Opsite™, Tegaderm™) is then applied to the face, covering both nostrils. Next, an endotracheal tube, which has been cut short (approx. 12 cm), so that the tip rests no more than a centimeter past the end of the Airway Intubator™, is inserted. The breathing circuit is then attached to the 15 mm connector of the cut tube (Figure).

Using this method in more than 1200 patients over the past five years, few major problems have been encountered. Partial airway obstruction occurs in some patients,

FIGURE Set-up.

particularly the edentulous. This can usually be overcome by manoeuvres aimed at improving the "sniffing position" and prognathic trust.¹¹ Regurgitation of gastric contents is no more likely than with conventional mask techniques. Should regurgitation occur, it is detected easily and possibly earlier than when an opaque mask is used. The TAD can be removed quickly to allow oropharyngeal suctioning. Prolonged controlled ventilation results in undermining of the TAD with gas, and loss of the seal, therefore this technique is best suited to the spontaneously breathing patient. Short periods of controlled or assisted ventilation may be used when necessary. The small leak which sometimes occurs at the circular junction of the tube and TAD is easily sealed with tape. Skin irritation has not occurred provided that care is taken when removing the TAD.

The equipment is suited to a wide variety of patients and procedures. It is simple, light-weight, and transparent. There is minimal leakage, a small deadspace, and no external pressure. An end-tidal CO₂ probe may be used with the system and will produce the typical waveform. Finally, a modification of this technique facilitates fiberoptic tracheal intubation of the anaesthetized patient.^{9–10}

Although the anaesthetist's hands are free to perform other tasks once the circuit is complete, vigilance remains essential. We do not recommend the abandonment of

close monitoring of the patient's airway and breathing, nor have we discarded conventional mask techniques altogether. Rather, we suggest our method as a useful addition to the armamentarium of the anaesthetist.

Joanne Todesco MD FRCPC
Rock Loken MD FRCPC
Department of Anaesthesia
Foothills Hospital at the University of Calgary
Calgary, Alberta

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Hypocarbica during anaesthesia in children with Moyamoya disease

To the Editor:
We wish to report three children with moyamoya disease

(MMD) who underwent five surgical procedures in which anaesthetic management of ventilation deviated from that currently recommended.

Moyamoya disease is a rare progressive cerebrovascular disorder characterized by stenoses of the distal portions of the internal carotid arteries and filmy networks of arteries emanating from the base of the brain. The latter represent temporary intracranial perforating arteries (moyamoya vessels) formed in response to ischaemia.¹ Because moyamoya vessels may overreact to hypocapnia, transient ischaemic attacks can be precipitated in children during hyperventilation. Self-induced hyperventilation in cooperative children produces diagnostic EEG changes,² and artificial hyperventilation in undiagnosed children can cause puzzling neurological signs.³ Several palliative surgical procedures are currently available in which anastomoses between the extracranial and dural systems are created - theoretically hastening the development of collateral vessels before permanent ischaemic damage occurs. In 1983, neurological deficits were described following anastomotic surgery during neuroleptanaesthesia with modest hypocarbia.⁴ Since then, reports concerning the anaesthetic management for MMD have emphasized the maintenance of normocarbia or mild hypercarbia.³⁻⁷

We examined the anaesthetic techniques and outcomes for all anastomotic procedures performed at our institution for MMD. Two occurred before 1983 and three afterwards. In all five procedures, hyperventilation was deemed necessary by the surgeon to enable dural closure. In four patients, the lowest PaCO₂ were 25-30 mmHg. In the fifth, a cerebral function monitor was closely observed while PETCO₂ was lowered cautiously to 23 mmHg for 30 min. No ischaemic changes were noted. A potent inhalational agent (enflurane, halothane or isoflurane) was used in all for primary maintenance, and normotension was uniformly preserved. No patient exhibited additional neurological deterioration upon awakening.

The development of postanaesthetic neurological deficits secondary to hypocarbic ischaemia may depend upon the anaesthetic technique employed. Critical PaCO₂ levels for adequate cerebral blood flow in children with MMD are lower during halothane anaesthesia than during neuroleptanaesthesia.⁵ As cerebral vasodilators, potent inhalational agents may offer more protection from hypocarbic vasoconstriction by maintaining cerebral perfusion (supply) while effectively decreasing cerebral metabolic rate (demand). Isoflurane may be the agent of choice.⁶

In conclusion, it would appear that short periods of modest hypocarbia may not be as harmful as previously suggested in children with MMD anaesthetized with a