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Aids for Fiberoptically Guided Intubation in Children

To the Editor—The technique of combining an oropharyngeal airway and an anesthesia mask with diaphragm to aid fiberoptic intubation in adult patients has been well described, but apparently the limitations of this technique in pediatric patients have not been addressed. Oral fiberoptic intubation in children, as in adults, is greatly facilitated by maintaining the fiberscope in a midline position. In adults, a variety of oral airways exist to aid in this endeavor. Currently, no such oral airways are available for pediatric use. Such an airway may be produced, however, by cutting a strip from the convex surface of a Guedel-style airway and removing that piece of the airway, as shown in figure 1. In order to allow adequate visualization of the base of the tongue and epiglottis, it is easiest to use an airway slightly smaller than if the airway were being used solely for airway management. Unlike the adult airways manufactured to aid oral fiberoptic endoscopy, the airway produced by this technique will not act as an effective bite block and therefore must be used with care in a nonanesthetized patient.

When the fiberscope is used to intubate the trachea of a pediatric patient because of anticipated difficulty in intubation or for teaching purposes, it may be several minutes before intubation is achieved and the airway secured. In an adult, it is possible to continue oxygenating, ventilating, and delivering inhalational anesthetic to the lungs by the use of a specially adapted face mask, such as the Patil-Syracuse mask. Although the Patil-Syracuse mask is available in sizes as small as number 2, it is not always possible to achieve a good seal with this mask, and the mask is not well suited to infants and small children. By attaching a swivel bronchoscopy endotracheal tube adapter to a pediatric face mask, it is possible to produce a system that allows continued ventilation of the patient's lungs and fiberoptic intubation to take place simultaneously. By choosing a mask of appropriate size or manipulating the position of the mask, the nasal or oral route may be used.

The use of a clear pediatric face mask allows direct observation of the child's lips, mouth, and nose and facilitates the initial placement of the fiberscope into the oral or nasal cavity. A swivel adapter that fits directly into an anesthesia mask is available (Instrumentation Industries, Bethel Park, PA). If such an adapter is not available, a swivel adapter designed for attachment to an endotracheal tube adapter (e.g., the Portex bronchoscope adapter) may be connected to the face mask with a 15–22-mm adapter. Occasionally the height of this arrangement causes difficulty in manipulating the endoscope into the nasal or oral cavity. In this situation the height can be reduced by taping the swivel adapter designed for use with an endotracheal tube directly to the face mask (fig. 2).

The combination of an oropharyngeal airway and an anesthesia mask greatly facilitates resident education since the patient can be safely paralyzed and the lungs ventilated while the resident intubates the trachea.

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FIG. 1. Guedel-style airway (left) modified to hold fiberscope in midline position (right).

FIG. 2. Comparison of the height of the Portex bronchoscope adapter taped directly to the face mask (left) and the Instrumentation Industries endotracheal tube adapter (right).
Induction Dose of Propofol in Infants and Children

To the Editor:—We read with interest the recent report by Westrin1 assessing the required dose of propofol for satisfactory induction of anesthesia in infants and children. However, we believe that the study may have been biased by its methodology used and by the occurrence of spontaneous movements, a side effect commonly observed during induction with propofol in children. Indeed, the dose required for satisfactory induction in 50% of patients was assessed by the "up and down method" and judged adequate or inadequate if children moved in response to the anesthesia mask 30 s after injection.

As we recently demonstrated,2 however, spontaneous movements in children given a bolus of propofol 3 mg·kg⁻¹ occurred between 25 and 30 s and lasted until 60–80 s after the induction dose. EEG recordings obtained during this period showed that these spontaneous movements were related to the phase of δ-wave appearance. Although the nonprocessed EEG does not permit accurate quantification of the depth of anesthesia, the appearance of δ waves showed that the excitement stage had been passed.4 Since 41% of the children moved in response to the anesthesia mask (after loss of the lid reflex) at a time coincident with the appearance of spontaneous movements—a phenomenon not related to inadequate anesthesia—the results obtained by Westrin should be interpreted with caution since the methodology used in this trial does not permit differentiation between inadequate anesthesia or spontaneous movements. EEG and/or analysis of evoked patients seem to be more suitable methods to answer these questions.

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In Reply: I thank Dr. Borgeat, Dr. Wilder-Smith, and Dr. Tassonyi for their interest. Their point is well taken. However, I believe that analysis of movements in response to the anesthesia mask was indeed a valid way of assessing the adequacy of anesthesia, and I am uncertain whether the alternative suggested by Borgeat and colleagues would really be more suitable.

I tested the response 30 s after the injection and required major movements of the arms, legs, head, or trunk in order to classify the patient as not asleep.1 Spontaneous movements occurring after propofol, and apparently not associated with inadequate sleep, have been described as minor.2,3 They have been stated to appear a few seconds after completion of the injection and to last no longer than 25 s,4 the most recent report by Borgeat et al. excluded.4 The incidence of spontaneous movements reported by Borgeat et al. is high (75–100%) in comparison to that found by others. Purcell-Jones et al.5 reported an incidence of 33%, and Mirakhar,6 who compared the induction characteristics of propofol to those of thiopental, reported spontaneous movements in 22 and 25% of patients, respectively. Apart from these

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