In reply—We realize that many factors must be taken into consideration when ventilating the pediatric airway during a bronchoscopy procedure and agree that dilution of inspired gases is one more variable of which anesthesiologists should be aware.

We agree with the authors warning their fellow practitioners; however, to use such a strong word as “hazard” is very alarming. We also would like to suggest a simple solution such as regulating the air flow with a valve or clamp on the antifog line.

The authors used a Collins spirometer and a Wright respirometer to measure the air flow. These are designed to measure the volume of a patient’s lungs and they do not provide any resistance to the air flow.

The Karl Storz Automatic Xenon Flash Generator (catalog #610C) has a built-in air pump, the output of which is inversely proportional to the resistance (pressure). The maximum output is 2.5 l/min with no restriction. With a minimal resistance (30 mmHg) such as in an antifog sheath with the telescope in place, the output is 1 l/min; therefore, the precise outflow pressure and volume of the pump depend on the application in which it is used.

When the air pump is used for antifog during a bronchoscopic procedure, the amount of restriction depends on the size of the telescope used and the corresponding antifog sheath. The authors did not indicate which size was used or if the telescope was in place during their measurements. They also did not indicate by what means the patient was ventilated after the bronchoscope was inserted and with what mixture of gases. Presumably, the tracheostomy tube was removed and the patient was ventilated via the bronchoscope tube.

When a small 3.5 bronchoscope tube is used, the telescope and antifog sheath almost completely fill the lumen of the tube. Usually, the telescope and antifog tube can be left in for only 10–20 s and then must be removed to allow adequate ventilation of the patient. Is this limited amount of time sufficient for substantial dilution of the anesthesia?

We at Karl Storz believe that the authors’ tests and results are interesting, and we look forward to the more conclusive results that will be provided by their further prospective study.

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A Cost-saving Method of Modifying the Nellcor® Pulse Oximeter Finger Probe

To the Editor.—The pulse oximeter has become a valuable and commonly used instrument for monitoring anesthetized patients.1 The disposable finger probes (Item D-20, D-25, Nellcor Inc., Hayward, CA) are designed for single use and have a limited life expectancy if reused. Each time the probe is removed from the finger the adhesive tape included with the probe tends to delaminate the probe and break the wires, making the unit inoperable. Our institution presently uses 1,200 probes yearly at a total patient cost of $31,200. With increased use in the recovery room and the intensive care unit, these numbers are escalating.

We have devised a simple means of extending the life expectancy of these probes as well as making them more easily and more quickly applied, especially in pediatric patients.

First, the adhesive wings of the probes are folded backward and opposed to each other, creating a sticky surface on the back side of the probe for easy gluing. Second, scavenge the Velcro® from the neck ties of the disposable operating room scrub gowns (Convertors®, American Hospital Supply, Evanston, IL). Third, glue the smaller “hooked” Velcro® piece to one arm of the probe and glue in place (Superglue Corp., Hollis, NY). Fourth, apply the “looped,” long portion of Velcro® to one-half of the “velcroed” probe, wrap around the finger, and attach to the uncovered portion of the hooked piece of Velcro® (fig. 1).
A New Method for Maintaining Body Temperature in Children

To the Editor:—We read with interest the letter from Drs. Rosen and Broadman\(^1\) describing an ingenious method of warming intravenous solutions prior to their administration to small children.

At the Royal Manchester Children’s Hospital we attempt to minimize heat loss in infants by maintaining operating room temperature at 24\(^\circ\) C, using a heated water mattress at 39\(^\circ\) C, and avoiding hyperventilation with cold gases. We always use a condenser/humidifier attached to the endotracheal tube. Intravenous fluids would normally be heated to 37\(^\circ\) C for major procedures.

It is possible to reduce the incidence of hypothermia still further by increasing ambient temperature,\(^2\) but operating conditions become uncomfortable for the surgeon. However, we have found that the same effect can be achieved by creating a microclimate of warm air around the infant using the Howorth Climator\(^\circledast\).\(^\circledast\)

The apparatus is shown in use in figure 1. It consists of a thermostatically controlled fan heater and a length of wide-bore flexible hose. A special air mattress is also supplied, which we have found useful in operations on older children. The high-capacity heater is virtually silent in operation and can be placed unobtrusively beneath the operating table. Ambient air is drawn in through a 5\(\mu\) filter and heated. The air is then directed to the patient via the flexible hose, at the end of which is a remote sensor to monitor the air temperature that is displayed digitally. By covering the head area with a Steri Drape\(\circledast\), the patient can be kept constantly in view while providing a closed microclimate. For operations about the head and neck warm air is directed over the legs and abdomen. The air temperature is set initially at 40\(^\circ\) C, which is comfortable to the skin and will not produce a burn.

In order to demonstrate the effectiveness of the device, its use in five infants weighing less than 10 kg is described. Patient details are presented in table 1. Despite the usual methods of heat conservation described earlier, rectal temperature decreased in all five patients during induction of anaesthesia and early surgery. Figure 2 shows the effect of the Climator\(\circledast\) in reversing these changes. As can be seen a rise in temperature of 0.05–0.18\(^\circ\) C/min occurred when the Climator\(\circledast\) was set to deliver air at 40\(^\circ\) C. Indeed,

\(\circledast\) Howorth Air Engineering Limited, Surgicair Division, Lorne Street, Farnworth, Bolton, BL4 7LZ, England. (0204) 71131—Telex 635242 Howair G.

**Table 1. Patient Characteristics**

<table>
<thead>
<tr>
<th>Subject</th>
<th>Age</th>
<th>Weight (kg)</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>C.B.</td>
<td>2 months</td>
<td>3.2</td>
<td>Pulmonary artery lancing</td>
</tr>
<tr>
<td>K.N.</td>
<td>3 months</td>
<td>5.4</td>
<td>Resection of aortic</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>coarctation</td>
</tr>
<tr>
<td>C.E.</td>
<td>15 months</td>
<td>9.0</td>
<td>Posterior fossa exploration</td>
</tr>
<tr>
<td>C.S.</td>
<td>2 weeks</td>
<td>3.4</td>
<td>Emergency inguinal hernia</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>repair</td>
</tr>
<tr>
<td>C.W.</td>
<td>8 months</td>
<td>7.9</td>
<td>Insertion of ventriculo-</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>peritoneal shunt</td>
</tr>
</tbody>
</table>

\(\circledast\) First patent J. 931,396.