To the Editor:

We would like to express our appreciation to Drs. Hauswald, Brown, and Hall for sharing their experience on the prehospital use of the pharyngeo-tracheal lumen (PTL) airway (*Prehospital and Disaster Medicine* ,Volume 7, Number 2, pp 185, 188–189, **Forum**). Their data appear to support our findings, but go further regarding the amount of cervical spine movement during PTL placement in cadavers. Their observations are of great clinical importance, since the role of the PTL in managing trauma patients still is unresolved.

Dr. Johnson's thoughtful letter brings up several points which require further clarification. First, we regret the unfortunate typographical errors in the final, published version of the paper. In response to Dr. Johnson's concerns, some additional background information on the status of the emergency medical services (EMS) system at the time of the study may be helpful. During the study period, the Richmond, Virginia, EMS system (from which the majority of data were obtained) was undergoing a major transition, and was upgraded from a two-tier ambulance system to an all-advanced life support (ALS) ambulance response with automated-defibrillator equipped firefighters on engine companies providing first response.

During the transition period, a large number of providers were receiving training to upgrade their skills from the basic life support (BLS) to the ALS (mostly Cardiac Technician) level. Cardiac Technicians (CTs) in Virginia take a 130-hour course after they complete basic emergency medical technician (EMT) training. The CT training includes ACLS and advanced trauma management. A minority of ALS providers practiced at the more highly trained National Registry Paramedic level during the study (although, at present, the majority of our ALS providers have attained, or soon will attain, paramedic certification).

Only 26 of the 119 ALS cases (22%) in the study were managed by paramedics. The introduction of PTLs into our region was timely, since new ALS providers were not "cleared" to intubate in the field unless they were supervised repeatedly. They also were given the option to intubate under direct laryngoscopy using the PTL; if tracheal position was confirmed by a physician, this successful "intubation" would count toward "clearance." The PTL provided less experienced ALS providers with the ability to intubate during the transition period, but theoretically provided some protection for the patient since recognized esophageal placement still would permit ventilation after the first insertion of the device.

Of course, it is true that ALS providers are more highly trained than BLS providers, and may be more critical of airway performance. However, most of our ALS providers had been practicing at that level for less than two years at the time of the study. In addition, most ALS providers were CTs, not paramedics. Thus, the gap in experience and training was less than it may have seemed.

The actual success rates of ALS versus BLS providers for insertion of the PTL were as follows:

Prehospital care	Provider	Success/Attempt	Percentage
BLS	EMT	31/33	94
ALS	CT	51/63	81
	Paramedic	5/8	62
	Overall	56/71	78

Surprisingly, the paramedic PTL "failures" were due to provider error in two of three cases. In one, there was unrecognized esophageal placement, which was discovered by the emergency department physician. In another case, a paramedic arrived on scene after the PTL was placed by basic providers. Because of leakage of gastric secretions, the paramedic removed the PTL. The paramedic then placed an ETT that, upon arrival at the emergency department, was found to be in the esophagus. In the third case, the PTL could not be inserted because the patient was trapped and there was no access to the airway (the patient was intubated following extrication).

The CT "failures" included: three cases in which the patient had a gag reflex or breathing was stimulated by attempted airway placement; two trauma patients in which the airway could not be passed requiring cricothyroidotomy for ventilation in one of the cases; one trauma patient who had profuse bleeding from the nose and mouth with each ventilation; one case in which the PTL was very cold and inflexible and could not be passed; three cases in which ventilation was felt to be inadequate with the PTL, requiring ETT placement; one patient who had broken teeth which were felt to pose a hazard for balloon breakage; and two cases in which the PTL was removed and either an oral airway or no adjunct was substituted.

Because of the large number of cases in which ALS providers used the PTL (over twice as many cases as BLS providers), and the skewed proportion of failure in the paramedic subpopulation, we did not feel that the major difference in ability to assess appropriate ventilation between provider groups was a major problem. We believe that the number of ALS cases in the study makes it doubtful that the PTL was used by ALS providers only when the airway was inherently more difficult to manage. The exception to this rule may be in the trauma cases, since our local protocols did not permit laryngoscopy of patients with trauma above the clavicles, so the only adjunct available in this population was the PTL, or use of intubation with manual, in-line traction under direct medical control orders.

Physician corroboration of tube placement, effectiveness of ventilation, and input on any other airway problems was part of the original study design, as were arterial blood gas (ABG) determinations. Regrettably, even after additional in-service training at the many participating area hospitals, completion of the data collection form by hospital physicians was sporadic at best during an early pilot phase of the study. Therefore, this element of data collection was eliminated and results could not be incorporated into the study except in anecdotal form. We note that these problems were confirmed by Drs. Hauswald, Brown, and Hall, who were unable to obtain useful ABG data on even the small patient group they studied (all of whom were treated at a single hospital).

The patient population of this study encompassed a wide range of etiologies of airway compromise, including traumatic and non-traumatic conditions. Although not studied specifically, the mortality rate was extremely high, and few patients survived the events that led to their being included in the study, with many being pronounced dead within a short time of their arrival in the emergency department. Of those patients in which outcome was noted (n=38), only 6 (16%) survived to hospital admission (two with status epilepticus, one respiratory arrest due to a drug overdose, two in cardiac arrest, one with upper airway obstruction). Even if the data had been available, it would be difficult to draw any useful conclusions regarding airway efficacy in view of the number and diversity of patients.

In our article, Table 5 was printed incorrectly. The incidence of unrecognized misplacement of the PTL was 1%, not 17% as printed. The correct version is:

	PTL	ET	*p*-value
n	107	60	n/a
Difficult insertion	16 (15%)	3 (5%)	.06
Inadequate seal	17 (16%)	1 (3%)	.02
Unrecognized misplacement	1 (1%)	1 (2%)	.75
Tube slippage or movement	3 (3%)	1 (2%)	.60
Vomiting during insertion	3 (3%)	1 (2%)	.60

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As stated in our paper, we believe that further study of the PTL is needed to determine its efficacy in trauma patients, and to provide objective ABG data. However, we feel that subjective study of the PTL by its users—the prehospital care providers—still is an important step in the evaluation of this field airway adjunct.

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Errata

To the Editor:

We were deeply concerned to see that our paper (Gas Powered Resuscitators and Portable Ventilators: An Evaluation of Six Models), published recently in *Prehospital and Disaster Medicine*, (1992;7:25–34) failed to include any of the extensive corrections we had made to the proofs.

Although your revision of our original paper produced many welcome improvements, there were a number of errors, particularly in the interpretation of our Results.

Now that the paper has been published it is difficult to see how this unfortunate situation can be rectified. Perhaps a letter indicating some of the important corrections could be published in the next edition of the journal. This would be much appreciated

Peter JF Baskett, FCAnaes
Jerry P Nolan, FCAnaes
Bristol, UK

The editors regret that the article was published without inclusion of final corrections of the galleys sent by the authors. We apologize for the error and take responsibility for any misunderstandings that may have arisen as a result of this omission. To prevent any false conclusions regarding the article, and as requested by the authors, the appropriate corrections for the article follow:

1. Title (page 25)

The correct title should read:

Gas Powered Resuscitators and Portable Ventilators: An Evaluation of Six Models.

2. Abstract (page 25)

Replace the Conclusions statement with:

"under conditions of low pulmonary compliance and high airway resistance each resuscitator tested fails to deliver the pre-set volumes, and this must be considered during their use."

3. Results (pages 26–27)

Delete the whole of the first part, as far as "At the first load setting." Replace with:

"Results from the bench tests performed on each of the ventilators are in Tables 4 and 5 and Figures 1 through 3. In all cases, tidal volumes and minute ventilation declined progressively as resistance was increased and compliance was decreased. Some of the reduction in measured tidal volume would be due to the internal compliance of the ventilator tubing and test equipment, but there also was significant loss of volume through inspiratory pressure relief valves.

"For three of the ventilators (TransPAC, Oxylog, and Ambu Matic), the frequency and minute ventilation can be selected from the control panel. In addition, each of these three ventilators has the capability of air-mixing with the oxygen, thereby allowing the delivery of different levels of FiO_2. The minute ventilation obtained for each of these machines at three different settings for each of the three combinations of resistance and compliance are in Table 4 and the relative changes are in Figures 1 and 2. In every instance, the minute ventilation delivered was less in the air-mix mode. Of the three ventilators, the TransPAC demonstrated the greatest relative reduction in minute ventilation on switching from the non-air-mix to the air-mix mode.

"The delivered levels of minute ventilation were as low as 40–50% of the selected levels at the lowest compliance-highest resistance tests. At this ventilatory load and at the highest selected levels of minute ventilation, most of the volume loss was due to leakage from the inspiratory pressure relief valve (see Table 4 and Figures 1 and 2).

At the first load setting (C=50; R=5)...."

Page 30—*Delete the sentence starting "Only three pre-established levels of ventilation can be selected...," replace with:*

"The three remaining machines (ERA 2000, MARS, and Uni-Vent) do not have independent controls for frequency and level of minute ventilation. Therefore, we tested these at settings that would correspond to adult, small adult, and child."

4. References (page 34)

Reference 9 was in the wrong place in the original text.

Other references had been omitted from the text.

Legends for Figures

Page 27—Figure 1—Levels of minute ventilation attained, in no air-mix mode, for the TransPAC, Oxylog, and Ambu Matic, as a percentage of that selected

Page 27—Figure 2—Levels of minute ventilation attained, in air-mix mode, for the TransPAC, Oxylog, and Ambu Matic, as a percentage of that selected.

Page 29—Figure 3—Levels of minute ventilation attained for the ERA 2000, MARS, and Uni-Vent

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The affiliations for the authors of the article The Prehospital Use of Albuterol Inhalation Treatments *were listed incorrectly. We regret the error. Space constraints in earlier issues delayed the timely posting of this correction. The correct affiliations of the authors should read as follows:*

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