In Reply: — We agree completely with Dr. Wochlick that the small amount of carbon monoxide formation observed after Baralyme rehydration was probably a result of incomplete mixing of the added water with the absorbent granules. In the technical range of pouring, dribbling, sprinkling, and misting, we dribbled the water. Presumably sprinkling or misting, with better mixing, would have more completely rehydrated the absorbent. Similarly, use of excess water would likely provide greater rehydration.

Before “taking the plunge,” however, we suggest evaluating the effect of such measures on the scavenging characteristics of carbon dioxide absorbents.

Inhaled Nitric Oxide Delivery Systems

To the Editor: — Imanaka et al.1 informed us about the inaccuracies of nitric oxide (NO) delivery systems during adult mechanical ventilation. Although we found the study informative, we have some concerns regarding the methodology and the manner in which the authors interpret their results.

Although the authors argue for the analysis of only “a single breath . . .,” we have major concerns about such results. In the cited conditions, no statistical analysis is possible, hence no inference can be made. Moreover, explanations of the changes (table 2) in fractions of inspired NO (NO concentration) observed by varying tidal volume (VT) or inspiratory time (T1) would have been appreciated. The authors claim that during pressure support ventilation into inspiratory phase, injection into inspiratory limb (fig. 5, panel ii) is not acceptable. However, no obvious difference is observed between this and NO concentration—premixing systems with synchronized intermittent mandatory ventilation, and it is unclear how the authors explain the sudden appearance of a high peak of NO concentration in the ii mode with a mandatory breath?

Continuous and premixed administrations of NO were used at the very early stages of inhaled NO therapy. Continuous injection is simple, but it results in high peak NO concentration,2,3 often not recorded by slow-response analysers,4 high production of nitrogen dioxide (NO2), and reduction in FNO2. It is characterized by a bolus effect2 and would require an appropriate mixing chamber or continuous bypass flow to avoid it. This method is currently not recommended, except with continuous-flow time-cycled pressure-limited or high-frequency mechanical ventilators.

Premixing NO with nitrogen (N2) or air (supplemental diluting cylinder) also presents major drawbacks. Blenders, valves, and other ventilator components were not specifically designed to withstand NO. Even if this method has been used over a period of 20 months without apparent corrosive effects,4 long-term safety has not been verified.7 Most blenders also have a bleed flow delivered in the room, and the NO concentration changes when the FNO2 setting on the ventilator is changed. The validity of the used nomograms to adjust NO dilution is suspect, and we observed difficulty achieving a precise NO concentration. At high FNO2, high levels of NO2 can be produced.8

Using their cyclic NO delivery system, the authors have shown a high variability in NO concentrations. This was particularly evident in the pressure-controlled (PCV) mode where peak inspiratory flow rate is high and decelerating. This may be a problem of the efficacy of their system, and the authors should be prudent before ruling out cyclic NO injection in the inspiratory limb. It appears that this method also is the choice of many companies developing NO delivery systems (Servo 3000® with NO option, Dräger Nodomo®, Messer-Griesheim Pulmonox®, L’Air Liquide Opti-NO®, Ohmeda I-NOvent®). No study has evaluated whether physiologically significant effects occur if NO concentration fluctuates around a mean therapeutic value during inspiration. We think that the latter method can be used to deliver inhaled NO