management practice if the manufacturers of preformed tubes were to agree a standard length in the design of their preformed tubes.

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CPAP facilitates sedation of patients with obstructive sleep apnoea

The incidence of obesity, with associated obstructive sleep apnoea, has been steadily increasing in the UK over recent years [1, 2]. Regional techniques are often preferred in order to avoid general anaesthesia and its associated morbidity and mortality in this patient population [3]. During long procedures under regional anaesthesia it is our experience that patients often become uncomfortable and intolerant without sedation. The morbidly obese population, however, is often denied sedation for fear of airway obstruction, leading to hypoxia. We propose that patients who are treated with CPAP for obstructive sleep apnoea use their device during procedures requiring sedation.

At the University of Michigan (in one of America's 'fattest' states) [4], patients who have obstructive sleep apnoea are routinely asked to bring their CPAP machines to hospital when they attend for elective procedures, to prevent nocturnal hypoxia in the postoperative period. We have found that sedation can be used safely in this population by asking the patient to apply their own CPAP device at the start of the case. Our technique has been to sedate cautiously using midazolam (1–2 mg) or propofol (10–30 $\mu g.kg^{-1}.min^{-1}$). Supplemental oxygen is applied either directly via the CPAP circuit (when the design allows) or via nasal cannulae under the mask. This latter approach is well tolerated and does not seem to interfere with the performance of the CPAP system. Similar patients in the UK should be encouraged to bring their CPAP machines with them for both intra- and postoperative use.

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Failure of a flow sensor of a Datex Ohmeda S/5 Aespire

I would like to relate my experience of an unusual machine failure during an 8 h anaesthetic. The anaesthetic machine was a Datex-Ohmeda S/5 Aespire machine (Datex-Ohmeda, Helsinki, Finland) with 7100 ventilator. This was probably the first case of this length of time using this machine as it had been in service for only 1 week. The ventilator was set to 'volume control', a tidal volume of 550 ml, at a rate of 12 breaths per minute. After more than 6 h at a fresh gas flow rate of 0.5–0.6 $l.min^{-1}$, the ventilator began to deliver inadequate tidal volumes. The bellows were not moving through their usual range during the inspiratory phase and the measured expiratory tidal volumes appeared to be a correct measurement of the reduced tidal volume. Shortly thereafter the low minute volume alarm sounded. Interestingly, during this period the end-tidal carbon dioxide did not alter to any noticeable extent, probably due to the rapidity of the event. On switching off the ventilator and hand-ventilating the patient, there were no obvious lung compliance problems. The ventilator mode was changed to pressure-controlled ventilation, and no problems were noted.

The most likely cause was a fault with the inspiratory flow/volume sensor. A heat-moisture-exchange-filter was in use at the patient end of the circuit. Despite this, the breathing circuit had become very moist during the prolonged case; probably as a result of water production from the soda lime. It is conceivable that the flow sensors had failed due to moisture deposit. It would seem a fault of the design that they were inadequately heated, or not heated at all. Furthermore, is it sensible to have an inspiratory flow/volume sensor within the circle system where it may be prone to such problems? Clearly the expiratory flow sensor would have to be within the circuit; but the consequences of failure of this device would not be as great as for the inspiratory flow/volume sensor. An added margin of safety could be achieved by having a further flow/volume sensor outside of the circle system to measure the driving volume of the bellows.

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A reply

GE Healthcare appreciates the opportunity to respond to the letter regarding the S/5 Aespire flow sensor. It is well known that long duration anaesthetics, particularly when the fresh gas flow is similar to the patient's tidal volume, produce significant amounts of moisture within the breathing system. The development of the moisture is a by-product of the normal carbon dioxide absorption process and, if it migrates into the pressure sensing tubes, is known to present difficulties to the flow sensors used in the Aespire. This issue is, as described in the letter, usually seen during volume control ventilation

