


ESSENTIAL MONITORING

Sir,—Professor Sykes, in his article on Essential Monitoring [1] drew attention to the need for expired volume and airway pressure monitoring as a check on ventilator function. Recently, we discovered a potential hazard of expired volume monitoring that, to our knowledge, has not been described before.

During clinical evaluation of a prototype airway pressure failure alarm, trial disconnections were made at various places in a circuit comprising a Blease Manley 4 ventilator, operating as a minute volume divider and a Medishield Wright's respirometer at the expiratory port. A Medishield AGS scavenging system was connected to the ventilator. Following a complete disconnection at the tracheal tube (which was detected by the pressure failure alarm) it was noticed that the respirometer was still recording 500-ml "breaths" during the expiratory phase of the ventilator.

It was found that the scavenging system was aspirating room air through the Wright's respirometer via the open expiratory limb of the circuit. As this occurred only when the ventilator expiratory valve was open, the respirometer behaved exactly as if measuring the patient's expired gas.

The message is that end-tidal carbon dioxide monitoring may be more expensive than simple ventilator alarms, but will detect failure of ventilation in every case.

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REFERENCES


Sir,—Thank you for allowing me to comment on the interesting letter from Dr Jordan. The whole thrust of my article was to try and indicate how conventional monitoring systems could fail to detect malfunction if they were not integrated completely into a comprehensive system. I pointed out that it was necessary to use both end-tidal carbon dioxide monitoring and expired volume monitoring to detect re-breathing during both spontaneous and controlled ventilation, and I am delighted that Dr Jordan has identified a further problem with expired volume monitoring.

Your readers might be interested to know of another source of error which I encountered some years ago. In the early models of the Manley Pulumovent, there was an excessively large gap between the expiratory valve and its seating, so that approximately equal volumes of gas passed through the valve during inspiration and expiration. The interruption of flow between these two phases of respiration was inadequate to reset an electronic Wright's Respirometer, so that the tidal volume displayed appeared to be appropriate for the ventilatory rate and the minute volume set on the flowmeters. However, the patient's chest movement was less than would have been expected. Replacement of the electronic respirometer by the standard mechanical model clearly demonstrated that gas was flowing through the expiratory valve during both inspiration and expiration, thus revealing the true cause of the malfunction.

I hope your readers will continue to record their experiences in this field, so that other anaesthetists may be made aware of possible deficiencies in monitoring systems.

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MORTALITY AND MORBIDITY AFTER HIP FRAC TURE

Sir,—I wish to take issue with Davis and colleagues [1] over a point in their otherwise interesting and useful paper on mortality and morbidity after hip fracture. They devote utterly disproportionate space in their summary to the statement "A delay to surgery of more than 24 h from admission was also associated with an increased 28-day mortality."

The only support for this statement is in their table VI, where surgical delay is listed as an association with long-term mortality. This appears to have been identified by univariate analysis, and there is no discussion of considerations such as that patients in whom surgery was delayed may have been in such poor condition as to justify the delay. It may then be argued that the delay was not long enough to permit adequate resuscitation.

The matter is mentioned briefly in the discussion, and the work of Aldrete, Hamilton and Hingson [2] is quoted in support. This is a misrepresentation. Aldrete demonstrated a possible adverse effect only when a delay of more than 48 h was compared with one of 13–48 h; patients who had a delay of less than 12 h did worst of all. The only support for an adverse effect of delay is on morbidity, from the work of Villar, Allen and Barnes [3]. These authors noted a poorer psycho-social recovery in patients whose surgery had been delayed, but their study was limited to the 145 preoperatively healthy patients of their original group of 205. Other major papers show either no difference with delay [4,5] or a difference only after a delay of over 48 h [3,6,7].

Statements made in summaries are likely to be the most influential. In this case the effect could be extremely harmful to those patients who need time for adequate assessment and resuscitation before surgery; there remains no evidence for anything but harm if the operation is performed within 12 h of injury.

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REFERENCES

1. Davis FM, Woolner DF, Frampton C, Wilkinson A, Grant A, Harrison RT, Roberts MTS, Thadaka R. Prospective multi-centre trial of mortality following general or spinal anaesthesia for hip fracture surgery in the


**CORRESPONDENCE**

Sir,—Thank you for the opportunity of replying to the letter from Dr Dodds. My comments in reply are as follows.

Dr Dodds' letter correctly raises the very important issue of adequate preparation for anaesthesia and surgery in elderly patients with hip fracture. A delay of longer than 1 day from injury to surgery was associated with increased mortality generally in our study and should have appeared in both columns of table VI. This association, however, does not imply a cause and effect relationship. The assumption that it is the patients in poorer shape in whom surgery tends to be delayed may or may not be true, however, as many other factors come into play, such as lack of theatre time or staff, and the generally low priority of these unfortunate people in the “pecking order” for hospital facilities. In many hospitals there is a somewhat fatalistic approach to their surgical care which is often placed into the hands of inexperienced and unsupervised junior doctors, to be done as soon as possible as “an acute”.

Conversely, unnecessary delays to surgery sometimes result from an over cautious approach to anaesthetic assessment.

The limitations of space prevented discussion of issues peripheral to the central theme of the anaesthetic contribution to mortality. Nevertheless, we totally agree with Dr Dodds that appropriate time for adequate assessment and resuscitation must be allowed before surgery. Surgery for fractured hip in the elderly is an urgent, but not an emergency procedure.

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**REFERENCES**


