

LETTERS TO THE EDITOR

The question of removing a ventilation bag before defibrillation

EDITOR,—Following an incident in January 1995 in which a patient at Northwick Park Hospital received severe burns resulting from bedding catching fire during defibrillation,¹ some London programmes began teaching trainees to remove the ventilation bag before defibrillation. We believe this intervention delays the Advanced Cardiac Life Support protocol and risks dislodgement of the endotracheal tube. Although there is no formal recommendation from the Resuscitation Council (UK), local hospital resuscitation committee policies have dictated this change in training.

Increasing the oxygen level in air, even by a few per cent, increases the risk of fire.² Does oxygen concentration significantly rise in the atmosphere during resuscitation? A test was carried out to monitor the oxygen in ambient air. Oxygen content was measured with a Tele-dyne Oxygen Analyzer around a Laerdal manikin, with a Laerdal ventilation bag connected to an endotracheal tube.

To simulate resuscitation conditions the manikin was placed on a patient trolley in a ventilated room. Oxygen supply to the ventilation bag was set at 10 liters per minute, connected to the manikin via an endotracheal tube, and measured. The ventilation bag was not manually ventilated and therefore gas flow escaped through the reservoir valve, resting behind the manikin's head. The oxygen level above the manikin, on the chest, and at the mouth remained at 21%. The oxygen level beside the manikin on the trolley surface did rise from 22% at the axilla to 28% directly below the reservoir valve.

There may be an increase in the risk of fire by keeping the ventilation bag connected during defibrillation, but we believe this is outweighed by the delay in defibrillation if removed, and also by the risk of endotracheal tube dislodgement.

We suggest local hospital resuscitation committees re-examine their policies recommending removal of the ventilation bag before defibrillation. A Medline search from 1967 revealed only one other report of fire during defibrillation.³ After 30 years of defibrillating patients with so few incidents of fire reported, would it be wrong to repeat the cliché "if it ain't broke, don't fix it?"

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Dr Michael E Ward, Immediate Past Chairman of the Resuscitation Council (UK) replies

There was concern on the part of the Resuscitation Council (UK) regarding the advice from the Medical Devices Agency (MDA SN 95/03),¹ and the Safety Action Notice (SANSC95/3) issued by Scottish Healthcare Supplies, that the recommendation to stop oxygen flow during defibrillation would lead to hypoxia. The Council responded by a letter to the journal *Resuscitation* (1996;31:173) with the following advice: "that the breathing system be retained in the hands of the ventilating attendant, but disconnected from and distanced from the patient, ready to be re-attached as soon as defibrillation is completed".

It seems to us that if there have now been two reported cases,^{1,3} that this would suggest that the incidence of fire is a real one albeit very low. There is no doubt that 10 litres of oxygen flowing adjacent to the patient will increase its concentration and indeed the findings from Cantello and colleagues support this. After all, 28% concentration of oxygen at the axilla is an increase of one third over ambient, and one of the defibrillator paddles will be situated close to the axilla! Any spark resulting from poor contact will therefore have a good chance of producing a propagating flame if in the presence of combustible material. It is likely that the new edition of the Advanced Life Support Course from the Resuscitation Council (UK) will include the above recommendation. As always, awareness of the problem is likely to reduce the incidence. We do, however, agree that there is a risk of dislodgement of the endotracheal tube, or other ventilating device, and repeat that continuing awareness of this problem through training, etc, is likely to play a significant part in prevention.

1 Lefever J, Smith A. Risk of fire when using defibrillation in an oxygen enriched atmosphere. Medical Devices Agency, 1995 (Feb). (MDA SN 95/03.)

2 BOC Gases. *Safe under pressure*. 1997 (Jan).

3 Hummel RS, Ornato JP, Weinberg SW, et al. Spark-generating properties of electrode gels used during defibrillation. A potential fire hazard. *JAMA* 1988;260:3021-4.

Pre-hospital emergency rapid sequence induction of anaesthesia

EDITOR,—Graham and Meyer claim that pre-hospital emergency rapid sequence induction of anaesthesia can be safely performed by suitably trained accident and emergency (A&E) staff.¹ Unfortunately, the retrospective study they base this on has serious flaws. The first is their definition of rapid sequence induction of anaesthesia. This is widely understood to mean the induction of anaesthesia with a suitable agent after preoxygenation, the use of a rapidly acting muscle relaxant to facilitate intubation (usually suxamethonium), and the application of cricoid pressure to prevent pulmonary aspiration of gastric contents.² There is no mention of cricoid pressure in this paper. Cricoid pressure is considered an essential component of a rapid sequence induction, especially in the emergency situation where a full stomach is possible.

The second problem is that out of 26 patients described as having had a rapid sequence induction, only 64% were actually given a muscle relaxant for intubation. Some

were not even given drugs that could be described as induction agents. Only 16 patients therefore should have been included in this study.

Three months' anaesthetic training cannot be considered adequate for the safe administration of such drugs to critically ill patients. The incidence of difficult intubation in the normal population is one in 2500 with nearly nine times as many in obstetric cases.³ Indeed, in this study one of the 16 patients given suxamethonium proved impossible to intubate, was then difficult to ventilate, and required an emergency cricothyrotomy to secure the airway. The authors curiously describe this as a "lack of complications".

Suitably trained doctors working in A&E departments may be able to safely perform rapid sequence inductions in the pre-hospital setting, but this paper did not have sufficient evidence to support this conclusion.

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The authors reply

The comments made by Speirs and Webster merit further comment. We clearly stated what "rapid sequence induction" meant for the purposes of our study, and therefore for the purposes of the study, their "widely understood" definition is irrelevant. Given this fact, all 26 patients were entered into the study appropriately according to the criteria we established.

We do, however, agree that cricoid pressure is an essential component of any emergency intubation drill and should be provided wherever possible. This can be difficult to perform in the pre-hospital situation, however, where skilled assistance may be limited.

It is interesting to see anaesthetists stating that three months' anaesthetic training is not adequate for undertaking this type of work in critically ill patients. This is despite the fact that in many hospitals, newly appointed anaesthetic trainees are first on call for emergencies in A&E, the intensive therapy unit, and theatres after only three months' training. Surely what is adequate for anaesthetists is adequate for A&E doctors?

Difficult intubation is a problem encountered frequently in A&E, certainly more frequently than the one to 2500 patients quoted. The patient who was impossible to intubate underwent cricothyrotomy appropriately, immediately after the failed intubation attempt. This was the appropriate next step in the failed intubation drill in the circumstances, and rapidly resulted in achievement of the desired goal, namely a secure definitive airway.

We reiterate the fact that no patient acutely deteriorated as result of these drug assisted acute pre-hospital airway interventions. As such, we feel strongly that pre-hospital rapid sequence induction can be done safely by suitably trained A&E doctors.

1 Graham CA, Meyer ADMcR. Prehospital emergency rapid sequence induction of anaesthesia. *J Accid Emerg Med* 1997;14:219-21.

2 Sellick BA. Cricoid pressure to control regurgitation of stomach contents during induction of anaesthesia. *Lancet* 1961;ii:404-6.

3 Samsom GLT, Young JRB. Difficult intubation: a retrospective study. *Anaesthesia* 1997;42:487.