

TITLE: PREOXYGENATION IN THE ELDERLY: HOW LONG A PERIOD?
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Although reported in adults¹, preoxygenation has not been well investigated in the elderly. We have assessed oxygen saturation during a modified rapid sequence induction, in ASA I or II elderly patients using several preoxygenation techniques.

Sixty patients over 65 years of age, were randomly allocated to five groups of twelve each, with their informed consent and Ethical Committee approval. Premedication consisted of 10 mg of diazepam, 90 minutes preoperatively. All patients had ECG, non-invasive blood pressure and oxygen saturation (SpO₂) monitored throughout. The pulse oximeter used was a Nellcor N-100 averaging over 3 seconds, with an accuracy of ± 2%. The standard anesthetic technique consisted of vecuronium 0.1 mg/kg, followed 30 seconds later by thiopental 3-5 mg/kg and fentanyl 0.1 mg/kg, injected over 10 seconds. Intubation was attempted 90 seconds after administration of vecuronium.

The preoxygenation technique for group A consisted of 4 deep breaths of 100% oxygen, over 30 seconds from a non-rebreathing system, at a fresh gas flow of 10 l/min. Patients in groups B, C, D and E were preoxygenated for 1, 2, 3 and 4 minutes respectively. No ventilatory assistance was given, before or after intubation, until the SpO₂ reached 93%. During this period, the patient's endotracheal tube was left open to the atmosphere. The period of acceptable apnea was defined as the time from the injection of thiopental to the study end-point. Results were analysed using the one way analysis of

variance, the Kruskal-Wallis test, and the Chisquare test.

For technical reasons, two patients were excluded from group B leaving fifty-eight patients in the study. The oxygen saturation data is given in Table 1. There was no significant difference between the groups in SpO₂ at rest, after preoxygenation and at intubation. The duration of apnea varied between 4.2 and 5.2 minutes in the five groups.

Our results indicate that prolonging preoxygenation beyond four deep breaths does not produce a statistically significant improvement in the duration of apnea. Nevertheless, clinically a period of at least 2 minutes is optimum as it gives a mean extra 42 seconds period of apnea prior to intubation.

References:

1. Br J Anesth 63: 241P-242P, 1989.

Table 1: Oxygen Saturation Data.

	A	B	C	D	E
<u>Resting SpO₂ (%)</u>					
Mean	97	97	97	98	97
Range	94-100	94-98	94-99	95-99	94-99
<u>SpO₂ After Pre-oxygenation</u>					
Mean	99	99	100	100	99
Range	98-100	99-100	99-100	99-100	98-100
<u>SpO₂ at Intubation</u>					
Mean	99	99	100	100	99
Range	98-100	99-100	99-100	99-100	99-100
<u>Time to SpO₂ of 93% (min±SD)</u>					
	4.3±1.8	4.2±1.0	5.0±1.4	5.2±1.6	5.0±1.8

Title: ROLE OF EQUIPMENT FAILURE AND MISUSE IN ANESTHETIC-RELATED MALPRACTICE CLAIMS
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The ASA Committee on Professional Liability is engaged in an ongoing nationwide study of closed malpractice claims against anesthesiologists. 1,541 anesthetic-related closed malpractice claims from 20 professional liability insurance companies were examined by anesthesiologist-reviewers as previously described.¹ We examined the role of equipment as a cause of damaging events and adverse outcomes.

Results: There were 67 claims (4% of 1,541) in which equipment was implicated as causing negative outcomes which ranged from temporary injuries necessitating a prolonged hospital stay to permanent injuries such as brain damage or death. Of the 67 claims, damaging events were identified as misuse in 32 claims, failure in 21 claims and unknown etiology in the remaining 14 claims (Table 1). Catheters, ventilators, and anesthesia machines were the most frequently misused. Breathing system disconnects were the single most commonly identified adverse event. Other equipment

implicated in claims included warming blankets, electrocautery units, EKG's, and cardiopulmonary bypass machines. Permanent brain damage or death occurred in 14 (67%) of claims for equipment failure and 14 (44%) of the claims for misuse. There was no difference between claims for failure or misuse in incidence of payment or median amount of payment. The median payment for equipment failure claims was \$100,000 and for equipment misuse was \$75,000. Payments ranged from \$430 to \$3,500,000 with 70% of all equipment-related claims resulting in payments.

Conclusions: Anesthesia equipment failure and misuse represent a small fraction (4%) of the national database of anesthesia-related malpractice claims. Misuse was more common than equipment failure.

Table 1. MOST COMMON EQUIPMENT INVOLVED IN DAMAGING EVENTS

	Misuse	Failure
Catheter (Epidural & CVP)	9	0
Ventilator	6	1
Anesthesia Machine	5	4
Hot IV/Water Bottle	5	0
Anes. Machine & Vent.	3	0
Other Equipment	4	16
	32	21

1. Cheney FW et al.: JAMA 1989;261:1599-1603.