A panel summary

Monitoring of oxygen

Participants

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(Measurement of Oxygen by Mass Spectrometry)

Arthur M. Lam MD FRCP

Department of Anaesthesia, University of Western Ontario, London, Ontario
(Chairman: Continuous Arterial PO₂ Monitoring)

Kenneth W. Turnbull MD FRCP

Department of Anaesthesia, University of British Columbia, Vancouver, B.C.
(Mixed Venous Oxygen Saturation)

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(Monitoring with Transcutaneous PO₂ and Pulse Oximetry Devices)

Anaesthetic mortality has not changed appreciably during the last decade.¹ Perhaps, as Keats has suggested,² it has declined to the extent that no further reduction is possible. We must not, however, forget that anaesthetic mortality is only the tip of the iceberg and represents the unfortunate outcome of a possibly continuous spectrum of anaesthetic-related morbidity. Cooper, in two important studies of anaesthetic mishaps, pointed out that many "near-misses" do result in substantive negative outcomes and that the majority of these are caused by human errors.^{3,4} Of all anaesthetic-related morbidity, none is more frightening and costly than a period of sustained anoxia regardless of the primary aetiology of the initiating event. A recent article entitled "Death During General Anesthesia" published in a health technology journal suggested means of decreasing the occurrence of such catastrophic events, including using more intensive monitoring.⁵

This panel was organized with the aim of reviewing the current technology available for monitoring of oxygena-

tion during anaesthesia to prevent such mishaps. While the importance of observation of clinical signs cannot be overemphasized, they are not always reliable or indeed present during the occurrence of hypoxaemia.⁶ To this end, the panel was dedicated to the discussion of implementation of modern technology to improve the margin of safety. Both invasive and non-invasive methods were discussed. Dr. Neil discussed the use of mass spectrometry. Dr. Turnbull discussed the merits of monitoring mixed venous oxygen saturation. Dr. Lam discussed the advantages and pitfalls of continuous monitoring of arterial oxygen tension using an intravascular electrode while Dr. Tremper discussed the applications of oximetry and transcutaneous PO₂ monitoring.

References

- 1 Davies JM, Strunin L. Anesthesia in 1984: How safe is it? *Can Med Assoc J* 1984; 131: 437-41.
- 2 Keats AS. What do we know about anesthetic mortality? *Anesthesiology* 1979; 50: 387-92.
- 3 Cooper JB, Newbower RS, Long CD, McPeck JB. Preventable anesthesia mishaps - a study of human factors. *Anesthesiology* 1978; 49: 399-406.
- 4 Cooper JB, Newbower RS, Kitz RJ. An analysis of major errors and equipment failures in anesthesia management: considerations for prevention and detection. *Anesthesiology* 1984; 60: 34-42.
- 5 Deaths during general anesthesia: technology-related, due to human error, or unavoidable? An ECRI Technology Assessment. *J Health Care Technology* 1985; 1: 155-75.
- 6 Knill RL. Evaluation of arterial oxygenation during anaesthesia. *Can Anaesth Soc J* 1985; 32: S16-9.

Measurement of oxygen by mass spectrometry

Mass spectrometry is an accurate method of measuring oxygen and other respiratory gases and with recent technological improvements we now have an extremely useful noninvasive means of monitoring the patient's gas

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