Anaesthesia, 1993, Volume 48, pages 1122–1123

Errata

Anaesthesia, 1993, Volume 48, pages 820–821

The following letter is being reproduced as originally submitted; when first printed it contained a publisher's modification.

Information processing under anaesthesia

Dr Russell rightly notes in his recent letter (*Anaesthesia* 1993; **48:** 275) that N_2O/O_2 opioid/relaxant techniques may, in general, not make all patients insensible to incoming auditory stimuli. In fact, without the use of the sometimes questioned isolated forearm technique (IFT), we demonstrated the validity of this very statement by making use of indirect measures of memory [1], in which earlier reports from our group—with the same [2], or a different anaesthetic technique [3]—were corroborated. Explicit recall, however, was absent in all studies, and it is precisely the dissociation between explicit and implicit measures of memory which is important; information processing may take place even without any clinical signs revealing its occurrence.

The technique used in our study, however, is still widely used, especially in cases of outpatient anaesthesia [4–6]. The issue at stake here is not so much the adequacy of the technique as the question of whether or not our patients were truly 'unconscious' all the time. In fact, one can never be 100% sure that a patient is unconscious in the sense that no consciousness is present of incoming stimuli. Even if one uses the IFT and does not receive an appropriate reaction to commands given, there can still be some sense of consciousness, similar to that seen in a hypnotic trance when subjects experience a subsidence of their planning function and just do not feel like responding when a command is given. [7].

The reverse is true when a more or less appropriate response is given by the patient, without him or her realising it. It has been shown that awake subjects can respond in highly sophisticated ways to stimuli, without being aware (or conscious?) of the link between stimulus and response, or even of the response itself [8,9], and that verbal commands presented during rapid-eye-movement sleep, for instance, allowed subjects to respond without any conscious awareness [10].

This discussion may eventually lead to a philosophical debate where the concepts of 'being conscious of something' and 'consciousness' are dissected into their own chracteristic properties. The purpose of this letter is not to promote such a debate, but to show how difficult it is to be sure when someone is or is not 'conscious', even if one gets correct responses to commands while using the IFT. Furthermore, we would hesitate to support the implicit advice contained in Russell's letter that only those anaesthetic techniques that totally abolished all intra-operative responsiveness were to be used. Techniques such as the IFT have helped us in realising that auditory information processing may (perhaps more often than is generally believed) take place in one way or another, without us normally noticing this, and without any necessity to use a different, or even 'deeper', anaesthesia.

We thank Dr Russell for his stimulating contribution to our understanding of information processing under anaesthesia.

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Anaesthesia, 1993, Volume 48, pages 704–711

Beyond the lung: oxygen delivery and tissue oxygenation

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At the bottom of the first page under the heading **Lactate** the last sentence should read:

> Aerobic metabolism occurs in most tissues which utilise oxygen for the production of energy in the form of adenosine triphosphate (ATP). Failure of the oxygen supply has three main consequences.

At the bottom of page 705 it should read:

> This has been termed 'pathological supply dependency' [22] and implies that delivery was still inadequate in these patients.

On page 706, in the last paragraph before the heading in the first column, the second sentence should read:

> In critically ill patients with lower than necessary oxygen consumption, lower than necessary delivery and with evidence of anaerobic metabolism, the uptake of oxygen is inadequate for normal aerobic cellular function.

In the last column the last sentence should read:

> In patients in whom a rise in demand was associated with no change in delivery but an increase in extraction ratio from 0.03–0.7, the mortality was lower than in those in whom increased delivery led to increased consumption [23].