Correspondence

Bain circuit delivery tube obstructions

To the Editor:

Bain circuits which we presently use are designed with a coloured delivery tube so that kinks or obstructions to the tube will be easily seen. We received a new Bain circuit which appeared intact, but when it was placed on the anaesthetic machine, it provided no gas flow at the patient end. On examining the circuit, the delivery tube was obstructed and kinked at the proximal end. The obstruction was not visible, as it was inside the opaque connecter at the proximal end of the circuit. This is clearly seen in the radiograph (Figure).

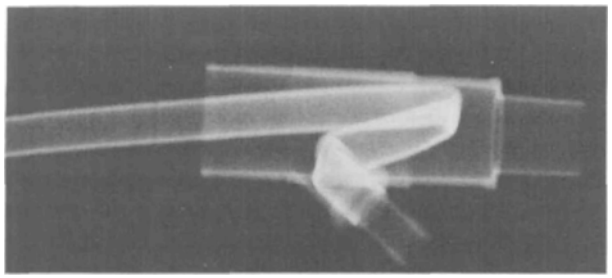

FIGURE Inflow obstruction of a Bain circuit fresh gas flow delivery tube.

This matter is drawn to your attention firstly to caution anaesthetists to use appropriate tests to ensure the integrity of the Bain Circuit prior to commencing an anaesthetic and, secondly, in the hope that manufacturers of coaxial circuits would take this report as a challenge to provide circuits which allow complete visibility of the gas delivery tube over the entire length of the circuit from the common gas outlet to the patient end.

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Continuous subcutaneous injection of ketamine for cancer pain

Subanaesthetic doses of ketamine have been administered as an analgesic to injured, postoperative, and cancer patients by intravenous,[1] intramuscular,[2] epidural,[3] and intrathecal[4] routes. We report the effectiveness of ketamine administered via another route, continuous subcutaneous injection of ketamine which was effective to relieve cancer pain in 13 out of 18 patients. The advantages of the method of continuous subcutaneous injection have been previously described.[5,6]

All patients were in the terminal stage of cancer and had intractable pain. Analgesics, such as morphine and pentazocine, had became ineffective for pain control. Ten mg (0.2 ml) of ketamine hydrochloride was injected initially, which was followed by a continuous subcutaneous injection, at a rate of 10 $mg \cdot hr^{-1}$, using a battery-driven infusion pump (Nipro SP-10, Nipro, Osaka). The rate of administration was titrated by increments of 2.5 mg daily up to 15 $mg \cdot hr^{-1}$ to meet the patients' requirements. The maximum rate was arbitrarily fixed at 15 $mg \cdot hr^{-1}$ based on the reports of Idval *et al.*[7] and Nimmo *et al.*,[8] since the distribution volume per body weight might be decreased in terminal patients and body weight might not be helpful in calculating doses. Pain was subjectively graded by patients into four stages: 0 (none); 1 (slight); 2 (obvious but tolerable); 3 (intolerable). Patients were requested to assess the maximum pain at three assessment periods of 0–8, 8–16, 16–24 hours. Three consecutive scores of 0 and 1 were considered to be effective.

Very low doses of ketamine (2.5–15 $mg \cdot hr^{-1}$) produced analgesia in the region of both the spinal and the cranial nerves with alert consciousness. It was not effective in three patients and was of questionable benefit in two. Ketamine was given as the sole analgesic in four patients for 10–48 d. Side-effects consisted of injection site inflammation (six), salivation (two), and insomnia (two). In two patients with long-term administration (202 and 147 days), ketamine's analgesic potency seemed to decrease. An acute tolerance to ketamine analgesia has been postulated,[9] however, the time courses of the present cases did not support this. The decrease in effect was probably due to exaggeration of pain rather than the development of tolerance.

In conclusion, low-dose ketamine given subcutaneously provided effective analgesia in most of the cancer patients (13/18). The dose of ketamine which relieved pain in regions of the spinal nerves also exerted an analgesic effect on regions of trigeminal and glossopharyngeal nerves. This supports the laboratory findings of Tomemori *et al.*[10] which suggested that ketamine does not act on the spinal cord directly.

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Anaesthetic data logging using a Psion pocket computer

To the Editor:

The acquisition of data from anaesthetic monitoring equipment is useful as a trend monitor, for teaching, and research purposes. Many monitors have built-in trending with analogue (waveform) or digital display (printer). Output of data from these machines is most often achieved by the use of industry standard interfaces, e.g., serial RS232.

Infra-red analysers are routinely used for the monitoring of anaesthetic gases including oxygen, carbon dioxide, nitrous oxide and volatile agents, e.g., Datex® 254 airway gas monitor, which has a serial RS 232 output interface for data streaming. Chart recorders (analogue) require to be calibrated (zero and peak) and errors may occur due to pen movement and, later, transcribing data from them. A previous program used an analogue to digital converter to obtain data suitable for computer processing.[1] However, this required a two-stage calibration to be performed each time it was used. Digital data is transmitted "as is" and, provided that the monitoring equipment is correctly calibrated, then the recorder will be accurate. Thus, calibration is a one-step procedure, and due to the good zero-stability of infra-red analysers, this is only required on a weekly basis. We have recorded data from the analyser during calibration and have shown that the recorded data corresponds to zero and peak levels of CO_2 and anaesthetic agent. Furthermore, to obviate the need to take a IBM computer (or similar) into the operating-room with problems of expense, electrical isolation and size we used a commercially available pocket computer (Psion Organiser XP). The communications link supplied, as an option, with the Psion XP pocket computer has a D-25 female connection, as does the Datex 254, therefore a gender-changer has to be constructed. "Pin-outs" were found for the two pieces of equipment and a cable with D-25 male connectors was appropriately fashioned. A further connection was used to permit the analogue display of the capnograph on the Datex 251.

The Datex 254 transmits a data-stream every ten seconds consisting of time (hours and minutes), end–tidal and inspired fractions of CO_2, O_2, N_2O, anaesthetic agent, agent name (ISO, ENF, HAL), and respiratory rate. The communications procedure on the Psion was set up with a Baud rate of 1200 and the other default values supplied. Data can be directly down-loaded from the Psion to an IBM spreadsheet (Microsoft Works® in this case), and then displayed graphically and/or printed.