the whole length of the outer wall and ending within the bronchoscope 1 cm from the tip. This channel was designed for smoke extraction. Operation of the laser bronchoscope ventilator converts this channel into a conduit for ventilation as well as smoke extraction.

In Sanders' original publication on jet ventilation, he mentions the availability of bronchoscopes with channels or ducts built into the side of the instrument for the purpose of gas delivery, 10 years before its publication. Sir, neither Professor Vourc'h nor we are describing anything original in relation to bronchoscopes.

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I. D. Conacher  
Newcastle-upon-Tyne

REFERENCES


THE GRASS FT 03 TRANSDUCER SHOULD NOT BE USED FOR HUMAN EXPERIMENTS

Sir,—In their recent report on priming with alcuronium, Black and colleagues (1986) described the use of Grass FT 03 transducer for measurement of the force of the adductor pollicis in response to ulnar nerve stimulation in adults. The FT 03 transducer is rated a 2-kg maximum (Grass Instruments, Quincy, MA, U.S.A.). Freund and Merati (1973) have noted that this transducer may be a "source of errors in assessing neuromuscular blockade" since it is designed for small animal experiments. Instead, they note, the model FT 10, rated at 10 kg should be used.

Some of the measurements showing no fractional twitch depression in the study of Black and colleagues (1986) may be the result of an overloaded transducer. Thus use of the FT 10 transducer may show lower latency times.

M. Sosis  
Philadelphia

REFERENCES


Sir,—Dr Sosis has made a valid point, but I do not think transducer overload was responsible for failure to show twitch depression with our priming doses or for artificially long latencies. The FT 03 was always able to register forces considerably greater than the unparalysed single twitch, if we applied a tetanus or if we applied graded extra pressure on top of the patient's thumb. It is important to check that any transducer is being used within its limitations rather than abandon it altogether—especially if it is all you have. We think now we have a very good reason for abandoning our FT 03—namely, a Datex Relaxograph! Although it has its own set of very different problems, our observations with it have been quite consistent with those we reported in respect of the effects of priming doses and latencies of onset.

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QUANTIFICATION OF SYMPATHETIC BLOCKADE BY THERMOGRAPHY

Sir,—In their paper McCollum and colleagues (1985) discussed the use of thermography in the assessment of the efficacy of sympathetic blockade and in the prediction of the need to perform sympathetic blocks in certain patients (diabetics). This use of thermography in the qualitative assessment of sympathetic blockade is not new (Diaz, 1976). One of the major problems in the assessment is, however, that many other factors (smoking, drugs, eating and ambient temperature) have a large influence on skin blood flow when measured by skin temperature.

In this department I have been evaluating aspects of sympathetic blockade using contact thermography ("Nova Therm", Novamedix Ltd). Early in this study I was concerned by the "corruption" of images by other factors and looked for a method of improving the accuracy of the technique.

Using a plethysmographic system, Glynn and colleagues (1982) had shown that skin blood flow and, in particular, the response of blood flow to the proximal application of ice, was the most specific measure of sympathetic activity. On the base of these observations I started to quantify sympathetic tone and sympathetic blockade by a thermographic ice response test. Thermography is performed after the application of ice to either the proximal limb or the trunk. The response is reproducible and sympathetic blockade is evident from a failure of vasoconstriction with ice. This has been of value in clinical work as well as a research tool.

In a study of sympathetic tone and blockade, it is important to quantify the response to stimulation. Thermography on its own does not satisfy this criterion because the image is corrupted by extraneous factors. The "thermography ice