Sir,

We are pleased to note that Eke and Thompson (in The National Survey of Local Anaesthesia for Ocular Surgery)[1,2] agree with our reservations on the methodology of the survey expressed earlier,[3] particularly the lack of any standardised definition of method of local anaesthesia (LA) and flawed planning of the two phases of the survey. This has led to significant underreporting of the more serious adverse events. Although they have attempted to determine the extent to which the 1993 Safety Guidelines[4] have been followed, little attempt has been made to analyse the impact of adherence or otherwise to various guidelines on the incidence and outcomes of adverse events due to LA. The survey shows that the 'severe events' had not been predicted in individual cases. This strongly supports our view that 'routine' pre-operative investigations before LA are unnecessary, invoking cost and inconvenience without producing any demonstrable patient benefit. Logically, the College Guidelines ought to be altered to reflect this.

Their classification of the various types of local anaesthesia projects the impression that 'intracameral' and 'topical alone' techniques are by far more dangerous than the 'peribulbar' and 'retrobulbar' methods. This is contrary to popular belief and available evidence[5,6] and is not supported by close examination of the data. The estimated rates of incidence of 'severe' systemic adverse events for the 'intracameral' and 'topical alone' groups (217 and 5.4 per 10 000 respectively) are based on single reports each, among the small numbers of patients estimated to have received these methods of anaesthesia. On closer inspection it appears that the only serious adverse event of brief apnoea in the 'intracameral' group was almost certainly due to intravenous fentanyl/midazolam sedation in an ASA grade 4 patient rather than the intracameral agent. Similarly the isolated cardiovascular adverse event in the 'topical alone' group could have been due to the muscarinic agonist action of carbachol which the patient received 23 minutes after the procedure started. Though we agree that the design of the survey does not allow comparison between the safety of various LA techniques, this issue has not been adequately discussed.

We would like to return to our earlier point[3] which Eke and Thompson have failed to address. Assuming the adverse event data from the first week are accurate, then LA for ocular surgery as currently practised in the UK is an unsafe procedure. In the first week 3.6% of patients had either an 'orbital' (2.7%) or a 'systemic' (0.9%) adverse effect. This 3.6% risk makes LA the single highest risk in cataract surgery to the patient's health or sight, comparable to the risk of vitreous loss and higher than that of endophthalmitis.[7] It is our view that the National Survey of Local Anaesthesia for Ocular Surgery will be recognised as a landmark paper and will influence the practice of cataract surgery in this country for some time to come. In an era of clinical governance it is imperative that the results of this survey are understood by all involved. Given the results of the survey we fail to see how LA for cataract surgery can be beneficial to the patient or its continued use justified unless individual units can demonstrate from audit that their own figures of adverse events can better the Survey's results. For retrobulbar or peribulbar techniques to continue in ocular surgery, it will need to be shown that the risk to the patient's health or sight from adverse events is no higher than the risk posed by general anaesthesia or the other LA techniques. A further properly designed National Audit is needed and we look to the Royal College of Ophthalmologists to address this point.

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Sir,

It is difficult to respond to the points made by Kamath, Prasad and Clearkin because of their use of so many rhetorical asides. To suggest that we agree that the Survey design was 'flawed' is either ridiculous or outrageous, depending on one's point of view. It is an elementary truth of clinical research that all designs have limitations. If an intelligent discussion of those limitations is to be characterised as an admission that the design is flawed, then such discussion will cease. The question is not whether the design has limitations, as every clinical study ever undertaken has its problems. Rather, the questions are: could the design have been improved upon, and does the study provide useful information? We are strongly of the opinion that the National Survey of Local Anaesthesia for Ocular Surgery used the best practicable design, and that it provides very useful data.

Ideally, we would have wished for full details of every local anaesthetic given in the whole country for 6–12 months, but it would have been totally unacceptable and even counterproductive for us to request this amount of data. The Survey design[1] was thus a compromise between what we wanted, and what we felt would be acceptable to our colleagues in eye theatres.

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In designing the Survey, we did consider the issues of pre-operative testing and the safety of adhering/not adhering to the guidelines. However, we do not feel that these questions can be adequately addressed by an audit such as ours, particularly if the anonymity of respondents is to be preserved. Thus, the Survey was not designed to assess the safety or otherwise of pre-operative testing. The Survey did show that a small number of adverse events were reported, and that in many cases the patients had pre-operative testing.[2] However, we do not know what the results of these tests were, nor what action was taken when test results were abnormal. This is true of those patients who had uneventful surgery, and applies equally to those who suffered adverse events. Hence, we cannot agree with Kamath *et al.*'s assertion that '[the Survey] strongly supports our view that "routine" pre-operative investigations before LA are unnecessary'. As we have already pointed out,[3] we do not feel that the Survey results *per se* can be used to argue for or against pre-operative testing.

Kamath *et al.* highlight the dangers of misinterpretation of our data, and make the point that the papers should be read in full. They claim that the 3.6% total incidence of reported adverse events means that LA is 'unsafe'. In our second paper, the tables clearly show that the majority of these adverse events were minor (e.g. inadequate block or mild periocular haemorrhage). We concluded that 'serious adverse events associated with LA are rare'.[2] Regarding the aetiology of reported adverse events, we agree with Kamath's speculation as to likely causes, with the caveat that correlation does not imply causation.

Kamath *et al.* point out that we do not know which LA technique is safest, or how LA compares with general anaesthesia. This question cannot be addressed by an observational study such as ours, but would require a randomised trial so large that it could probably never take place. If Kamath or others can suggest ways in which our design could have been improved, we would be pleased to hear from them.

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Sir,

I would like to clarify recent reports that the plastic multifocal lens used to replace cataracts during eye surgery originated with pieces of plastic from the canopy of Spitfires that splintered in the eyes of pilots during crash-landings in World War II. These wounds, while unpleasant, never caused any eye reaction. Harold Ridley, a medical professor attending such cases, decided to make lenses out of the same material (Perspex) to improve the eyesight, which of course has benefited many millions of people since. Not surprisingly, the Perspex 'bubble' hood of the Spitfire was so clear it offered unrestricted visibility and, if accidently scratched, the scratch could be removed by a rubbing compound, the predecessor of 'Glass Wax' and others.

As a former Spitfire pilot (who survived five crashes) and a recent survivor of a cataract operation I should like to comment on this legend which, as legends do, needs some clarification. The Perspex hood was above the pilot's head, and front where it joined the top of the bulletproof windscreen being well above eye-level, though the sides extended down to about shoulder height.

During take-off – and landings – the pilot always wore his goggles over his eyes, though once airborne he pushed them up over the forehead; it was impossible to sight accurately or watch for enemy aircraft when wearing them. If he knew he was going to crash (as I so often did) one of his first automatic emergency procedures was to pull the goggles down to avoid eye injury (mostly from fire). The next was to shove the canopy back (it locked automatically) so he would not be trapped in the cockpit. Even if the pilot did not pull his goggles down due to lack of time, injury, unconsciousness, panic or negligence, or failed to push back the hood, the chance of an eye injury from shattered Perspex would be negligible.

More likely the chance of such an injury might occur in combat, in which the pilot's eyes, with his goggles back, would be exposed to splinters caused by enemy fire. Even that is a very remote possibility. Dead ahead the pilot was protected by a bullet-proof windscreen. The enemy angle of fire would have to come from either quarter from behind and if it was accurate enough it would pierce the Perspex, not shatter it, in which case eye injury would be the least of the pilot's worries. More likely it would blow his head off.

While none of these possibilities can ever be ruled out – war has a way of breaking the rules – I am dubious that the Spitfire was the catalyst to the 'miracle' multi-focal lens. Queen Elizabeth Hospital, East Grinstead in the south of England, known as the 'Gash House', which attended to Commonwealth aircrew wounded, was famous for performing burn surgery but also cared for other wounds such as eye injuries. Patients there included pilots, observers, navigators, flight engineers, bomb-aimers and air-gunners rescued from Lancaster and Halifax bombers, Beaufighter and Mosquito night-fighters, Liberator and Sutherland coastal command flying boats and many others whose construction and configurations had much more 'glass-work' than the tiny Spitfire. This made their crews highly vulnerable to eye injury from pieces of Perspex.

Because the Spitfire enjoys the reputation of being the most famous combat aircraft of all time it is often credited, with the best intentions, with being the answer to many a solution to many a worthwhile problem. In this case, however, it hardly seems justified. For those of us who flew her and cherish her memory, my case rests.

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Sir,

The interesting note by Mok *et al.*[1] invites comment on several counts. They reported an impressive linear relation between the ocular pressure measured in the centre of the cornea, P_c, and peripherally, P_p, respectively. They state that 'no clinically significant difference was observed between the IOP readings of central and mid-peripheral cornea measured by the Tono-Pen'. However, the data do not bear this out altogether. In the first place, they quote the relation between the two quantities as

$$P_c = 1.5\ P_p + 0.87$$

This suggests that central readings are almost 50% greater than peripheral ones, and the expression is therefore likely to be in error. Secondly, the regression does not pass through zero – a point that does not seem to have been commented on. While the authors have paid some