amount of miles that a person drives.[6 8] When modern methods were used to examine the visual field of 10 000 drivers, severe binocular field loss was associated with a 100% increase in crash rates.[9] Unfortunately, these authors did not define "severe binocular field loss." This association between peripheral field loss and increased crash frequency has been confirmed by some investigators[5] but not others.[6 7]

It is difficult to establish the relation between visual impairment and crash rates because visually impaired drivers tend to restrict their driving habits and change their behaviour to compensate for their visual loss.[8 10 11] Crashes are fortunately rare events with multiple causes, and the effects of a driver's visual impairment are dwarfed by other factors such as the annual mileage driven, the driver's age, inattention, intoxication, and speeding. Furthermore, it is unsurprising that it is difficult to predict crash rates from measures of static visual acuity and the peripheral visual field since these indices do not reflect the visual, perceptual, and cognitive complexity of the driving task. There is some evidence that relicensing policies based on measurements of static acuity and visual field reduce accidents on the road.[12] However, many drivers who fail these requirements are at no greater risk of being involved in a crash than a road user who is not visually impaired. Although the relationship between reduced acuity, visual field loss, and crash rates is weak, relaxing the requirements further cannot be justified because it would lead to a small increase in crash frequency. As the population ages so the incidence of visual impairment will increase, and with it the number of drivers who are unfairly debarred.[4–7]

The solution to this problem lies in the use of cognitive and perceptual tests that are better predictors of crash involvement. These may take the form of more sophisticated tests of vision,[5 7] driving simulator assessments,[12] driving tests on the road,[13] or other objective measures of performance.[14] In a retrospective study of an older population a test of central processing time, divided attention, and peripheral discrimination abilities within the central part of the visual field correlated highly with crash frequency over the preceding five years.[5] A further prospective study shows that over a three year follow up a poor performance in this test was associated with a doubling in the relative risk of crash involvement.[7] No association was found between visual acuity or field measurements and crash rates for the same population.

In the short term the low cost, widespread acceptance, and availability of static visual acuity and perimetric measures justifies their use. But other tests should be developed to help determine the driving ability of people who do not meet the current standards and, when appropriate, allow them to retain their licences.

Meanwhile the Driver and Vehicle Licensing Authority in the United Kingdom should monitor and audit the results of the current visual requirements. It should collect data to confirm that there is at least some benefit for society from the devastating effect that removal of a driving licence can have upon a visually impaired individual.

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Headaches after diagnostic dural punctures

Smaller, atraumatic needles and protocols for early treatment should reduce morbidity

Paper p 986

In a dural puncture a needle is passed through the dura mater into the cerebrospinal fluid within the spinal canal. It is commonly performed and is indicated for diagnostic lumbar puncture, spinal anaesthesia, myelography, and intrathecal chemotherapy. The most common adverse event after the procedure is a headache. This occurs in about a third of patients after diagnostic lumbar puncture in an ambulatory setting with a 20 or 22 gauge standard Quincke bevel spinal needle.[1]

The aetiology of the headache from the dural puncture is most likely related to the hole left in the dura after the needle has been withdrawn. This allows the cerebrospinal fluid to leak out of the subarachnoid space, which depletes the "cushion" of fluid supporting the brain and its sensitive meningovascular covering, resulting in gravitational traction and the classic headache, which is made worse when the patient is upright and relieved on lying down.[2] The headache, the onset of which is often delayed for 24 to 48 hours, usually lasts for one or two days and is frequently severe enough to immobilise the patient.[3] Rarely, it can persist for a year or more and if untreated can predispose to subdural haematomas.[4 5] In one survey of 14 people

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with subdural haematomas after dural punctures four patients died.[6] The risk of developing a headache from a dural puncture is greater in patients who are younger, female, and pregnant.[3]

The leakage of cerebrospinal fluid from the subarachnoid space, and consequent incidence and severity of headache, can be reduced by decreasing the size of the hole in the dura.[7] This can be done by using smaller needle gauges, an atraumatic design of needle tip as opposed to the standard version, orienting the bevel of the needle parallel to the longitudinal axis of the spinal cord, approaching the dura tangentially (paramedial versus midline approach), making fewer attempts at dural puncture, and withdrawing atraumatic needles with the stylet in situ.[2 7-10]

Atraumatic needle tips leave a smaller hole in the dura than Quincke tips—it is thought they cause temporary separation rather than cutting of the elastic fibres, which then recoil after removal of the needle.[8] The term "atraumatic" may be misleading as a recent study shows that the dural defect after puncture by these needles was actually more traumatic, with tearing and severe disruption of the collagen fibres, than that found with Quincke tips.[11] The authors hypothesised that the inflammatory reaction set up by this trauma could act as a plug, limiting the leakage of cerebrospinal fluid and so reducing the incidence of headache.

In this week's issue of the *BMJ* Thomas and colleagues (p 986) show a decrease from 54% to 29% in the incidence of moderate to severe headache after dural puncture at one week after diagnostic lumbar puncture when using 20 gauge atraumatic needles rather than Quincke spinal needles.[12] This reduction is admirable, but there is a world of difference between this and spinal anaesthesia, where the incidence has been reduced to 7% and 1% with 22 gauge and 25 gauge atraumatic needles respectively.[13] Follow up routines after spinal anaesthesia, particularly for obstetric and ambulatory surgery, are well established, and an incidence of greater than 1% would lead to major debate about restricting the procedure. Anaesthetists frequently perform lumbar punctures, and trainees quickly become competent at using the smaller gauge needles. Epidural blood patching (the placement of 15-20 ml of autologous blood into the epidural space near the dural puncture site) to treat severe headaches after dural punctures is also widely practised by anaesthetists. Physicians in training could easily be taught these procedures and perhaps would benefit from some exposure to the practice of spinal anaesthesia.

It is claimed that diagnostic dural puncture cannot be performed with a needle smaller than 22 gauge because of the need to collect adequate volumes of cerebrospinal fluid and accurately measure intrathecal pressure.[14] However, the needle gauge, and consequent incidence of headache, could be reduced if two fundamental changes in practice were considered. Firstly, a sample of fluid can be obtained easily by gentle aseptic aspiration using a syringe, in which 2 ml can be collected in less than a minute via a 24 gauge needle.[15] Secondly, accurate and reliable pressure measurements can be made with 25 gauge spinal needles using an aseptic transducer system.[15 16] These changes require the input of a clinician competent in performing lumbar punctures.

Prevention is always better than cure, and using the smallest gauge of atraumatic needle possible for a procedure would bring about the biggest reduction in the incidence of headache after dural puncture. This is well established in the anaesthetic literature and is now also emerging for diagnostic dural puncture. A systematic review from the Cochrane Collaboration on what needle types and techniques reduce the incidence of these headaches is in progress, and we look forward to its conclusions. In addition, it is important that any headache after a dural puncture is diagnosed and treated early to minimise any morbidity or mortality. This can be done by advising patients about early symptoms and signs and incorporating local protocols for early treatment.[17]

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Correction

The management of anal warts

Two errors occurred in this editorial by Raymond Maw and Geo von Krogh (14 October, pp 910-1). The title should have been "The management of anogenital warts." Additionally, Dr Maw's statement of competing interest was inadvertently omitted. It should have read: RM has received fees for speaking from 3M, which manufactures Aldara (imiquimod). 3M and Perstorp have funded clinical trials in his department. Perstorp manufactures pdophyllotoxin. RM does not believe that this remuneration has influenced his input into the editorial.