

family history of blood dyscrasias may be very important.

At present there are no accurate figures to estimate the precise risk of marrow aplasia after the ocular administration of chloramphenicol. We do, however, know that the overall risk of developing aplastic anaemia after oral administration of chloramphenicol is 1 in 30 000 to 1 in 50 000,⁶ which is 13 times greater than the risk of idiopathic aplastic anaemia in the population as a whole. Since topical administration achieves systemic effects by absorption through the conjunctival membrane¹⁰ or through drainage down the lacrimal duct with eventual absorption from the gastrointestinal tract, we can postulate that the risk may be similar to that after oral administration of the antibiotic.

Although the numbers of documented cases of aplastic anaemia associated with topical chloramphenicol are few, the tragic consequences in previously healthy patients cannot be ignored.¹¹ From our review of published reports we find it difficult to justify subjecting patients to this potential risk—except when the ocular infection is resistant to all other available antibiotics. The prescribing habits of doctors on the other side of the Atlantic support this approach. In the United States the *Physician Desk Reference* emphasises with repeated boxed warnings the importance of not using ocular chloramphenicol unless there is no alternative. Framycetin and fusidic acid are but two of many safer and equally effective

preparations in the treatment of most superficial eye infections. All doctors should follow the example of their American colleagues in restricting their use of ocular chloramphenicol.

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Neuromuscular blockers during general anaesthesia

Less may be better

The recall of events occurring during surgery, including the suffering of pain, remains a problem experienced by at least one in 3000 patients.¹ In about half of these cases the problem is due to failure of equipment or an error in anaesthetic technique. In many cases, however, no cause other than individual "resistance" to anaesthetics can be found. Being "awake" during general anaesthesia without the knowledge of the anaesthetist was almost unheard of until the middle of this century, and its possibility is a direct consequence of modern techniques of anaesthesia. It may be time to re-examine these techniques.

In 1942, in Montreal, Griffith and Johnson introduced the use of small amounts of curare to enhance abdominal muscle relaxation during laparotomy, still relying on the diaphragm to ventilate the lungs.² Patients were made merely weak and not paralysed while receiving a full inhalation anaesthetic. A few years later, in Liverpool, Gray and others introduced a technique whereby much less anaesthetic and much more curare were used, effectively paralysing all skeletal muscles, including the diaphragm.³ Intubation of the trachea and mechanical ventilation of the lungs were therefore essential. This led to a reduction in mortality due to anaesthesia. Previously mortality had been mostly due to the severe cardiac depressant effects of general anaesthetics, a side effect absent from curare. The enormous advantages of this new technique gave it considerable popularity, which has lasted to the present day. But it also led to the possibility of carrying out surgery on paralysed, unanaesthetised patients, unable to communicate with the outside world.

Before curare was used the depth of anaesthesia was reliably judged by close observation of the patient, mostly of movement of skeletal muscle, including the breathing pattern and the reflex response to surgery. With total paralysis of skeletal muscle there is no reliable method of assessing depth of

anaesthesia and therefore guaranteeing unconsciousness during surgery. Great efforts have recently been made to develop methods of measuring depth of anaesthesia in paralysed patients. So far, these methods are still experimental, and the goal may well prove to be elusive.¹ The potency of anaesthetics continues to be defined in terms of a motor response to a standard stimulus. It is noteworthy that recent reviews of cases of awareness during surgery show that neuromuscular blockers were used in all the reported cases; after awareness of sounds, the sensation of paralysis with inability to communicate was the most common recollection (85%) suffered by patients complaining of awareness.⁴

A close examination of the indications for muscle relaxation during surgery leaves only a small minority of procedures for which a short period of paralysis is absolutely necessary. Modern anaesthetics and analgesics allow good operating conditions to be maintained without paralysis for most major surgery, including cardiac operations. Why then is the use of paralysing agents so widespread in anaesthesia? If neuromuscular blockers were used only when there was a clear indication for them the incidence of awareness during surgery might be drastically reduced. But are our trainee anaesthetists being taught the right techniques?

Finding a clearly stated policy for the administration of neuromuscular blockers in standard textbooks is hard, although much emphasis is placed on the pharmacology of these drugs. In one popular British textbook indications for paralysis include: "to abolish skeletal muscle contractions which occur as reflex responses to painful stimuli or to tracheal intubation."⁵ In an equally popular North American textbook, however, the author states: "two philosophies govern the use of muscle relaxants. One end of the scale has been popularized by Gray and co-workers in Liverpool, England. In this approach nitrous oxide, oxygen, and large

doses of muscle relaxants constitute the sole anesthetic... Muscle relaxants should be viewed as adjuncts—not as substitutes for anesthesia.”⁶ This difference in emphasis in standard textbooks reflects an old Atlantic divide well recognised by Feldman: “Even if a dose of relaxant adequate to ablate the response of the adductor muscles of the hand to indirect stimulation is used, it seldom produces abdominal relaxation that would satisfy a European surgeon.”⁷

It is time to examine the practice of routinely using neuromuscular blockers during surgery. Their use as sedatives in intensive care was just as widespread in 1980, when up to 96% of patients were given neuromuscular blockers to aid mechanical ventilation; by 1986 their use had fallen to 16% of ventilated patients.⁸ This drastic reduction followed the publication of accounts of patients who survived after treatment in intensive care and who suffered the ordeal of muscle paralysis while conscious.⁹ The simultaneous publication of

similar accounts of paralysis and wakefulness during surgery¹⁰ led to an increase in the dose of intravenous and volatile anaesthetics in general anaesthesia. Regrettably, it did not lead to a widespread reappraisal of the place of muscle paralysis in modern anaesthesia.

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Matching the needs with skills in epilepsy care

Specialist nurses could offer better support in primary care

Like most common chronic conditions epilepsy is managed at the interface between primary and secondary care. In 1990 the cost to the health service for each person with epilepsy was £600 in the year in which the diagnosis was made, this figure falling to less than £200 in subsequent years, when seizures are well controlled.¹ The cost of social services was five to 10 times higher, depending on the frequency of seizures. Better care and fewer seizures might therefore lead to a net gain for both patients and society. Most of that improvement needs to be made in the social aspects of care.

People who experience one or more seizures take different pathways through the medical care system. Most initially see their general practitioner, who will, if epilepsy seems probable, refer them to a specialist. For their first appointment patients will probably be allocated three quarters of an hour. The specialist may confirm the diagnosis at the end of this or at a follow up appointment, which is likely to last for no more than 15 minutes. Treatment may be started, which today usually means that the patient is given a note to take to his or her general practitioner, who will actually prescribe the treatment. After this about a quarter or a third of patients who have refractory epilepsy will continue to visit specialists, either periodically or as needed, the remainder being managed by their general practitioner. A group practice with 10 000 registered patients will have about 50 people taking anti-epileptic drugs²; within the catchment area of a single neurologist (about 300 000 people³) there will be about 1500 people taking anticonvulsant drugs.

Within this pattern of medical care patients may receive advice and counselling about the consequences and social implications of epilepsy. But there is no generally accepted way in which specialists or generalists take responsibility for, and allocate time to, the provision of this advice and counselling. Patients have said that they would like to receive explanations about the causes of epilepsy and its prognosis; the side effects of drugs and when and how to stop them; and the implications of having epilepsy and taking drugs when it comes to contraception, pregnancy, and inheritance.⁴⁻⁶ Some patients continue to drive when it is risky and illegal to do so,⁴ while others may continue to refrain from driving when changes in the law make this no longer necessary. A few patients work in risky situations, and many others do not

work in jobs that are appropriate for them. Lack of timely counselling may leave patients with unnecessary uncertainty about whether to participate in leisure pursuits or even to marry and have children. For some, epilepsy is associated with loss of self esteem, depression, and fear of sudden death.⁶ Some of this information and advice should be offered when or soon after the diagnosis is made, but some of it needs to be available again at stages in the person's life. In exploring the needs of patients with epilepsy Freeman and Richards found that patients valued a person with skills and, presumably, the time for good communication.⁶

The need of patients with epilepsy for information and advice on self management is similar to that of patients with other chronic conditions such as diabetes, so emulating services for diabetes might help. Nurse specialists at district level and practice nurses in primary care have linked the diabetes service together. In Doncaster Taylor *et al* have provided a model whereby a general practitioner with an interest in neurology, working in tandem with nurse specialists and a visiting neurologist, provides more comprehensive epilepsy care.⁷ The National Society of Epilepsy has supported the idea of epilepsy nurse specialists⁸ and has set up courses to train them. The society's document leaves open the question of who the nurse specialist should work with most closely. Different sorts of doctors—such as general practitioners, neurologists, and psychiatrists—take an interest in epilepsy, and nurses with enhanced skills will seek them out and be sought out by them.

If general practitioners have continuing support from a specialist nurse and a doctor with a special interest in epilepsy they may be willing to set up a system for monitoring and giving advice, as they have done for patients with diabetes. Primary care teams could develop registers of patients receiving antiepileptic drugs, and patients could be reviewed annually by the practice nurse. The patient or nurse could identify the times when additional advice is needed—for example, on family planning or, after four or more years' remission, about the possibility of reducing drug treatment.⁹ The nurse could act as an agent, initiating demands for advice. This change in roles will also require training, and protocols will be important to ensure that team members know what is expected of them. New arrangements such as this