research. Technology foresight seems to have had far reaching effects in Japan and Germany, and such a system in Britain might provide a mechanism for moving research and development up a gear.

The white paper contains little new on science education in schools and undergraduate science, but it does propose encouraging graduates who are thinking of embarking on a career in science to begin with a masters degree rather than a PhD. This seems a good if limited idea, but there are few new ideas on developing the career structure for scientists or on increasing the importance of science in British society.

Maybe British science will develop despite, rather than because of, this new strategy, but it's ominous that the first general review of science in 20 years could produce nothing better.

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NSAIDs and postoperative pain

Sooner is better than later

Non-steroidal anti-inflammatory drugs (NSAIDs) have traditionally been used to relieve pain after minor surgery or have been prescribed two or three days after major surgery when the more powerful analgesic drugs have been withdrawn. Recent clinical studies have shown that in the setting of major surgery starting these drugs earlier is preferable, not instead of opioids but in addition to them. Moreover, the quality of analgesia from these combinations is better than that achieved by opioids alone.

Surgery or other trauma disrupts cellular integrity, and cell contents are released into the surrounding tissues. Some cellular components—such as serotonin, histamine, and bradykinin—directly stimulate nociceptors, causing afferent neuronal transmission that is interpreted in the brain as pain. Other compounds—such as the prostaglandins E_2 and I_2—do not cause pain directly but cause hyperalgesia by increasing the sensitivity of the nerve endings to the effects of pain producing substances. Increased sensitivity to painful stimuli extends to areas not directly involved in the initial trauma, probably by antidromic axo-axonal stimulation and by dorsal horn cell sensitisation.[1,2] Preventing or inhibiting this sensitisation of peripheral nerve endings would therefore limit the transmission of noxious stimuli to the spinal cord and thus reduce the need for centrally acting analgesics.

Damage to cell membranes activates the synthesis of prostaglandin from arachidonic acid. Non-steroidal anti-inflammatory drugs act mainly by inhibiting this pathway; by preventing the synthesis of prostaglandin they reduce the sensitivity of the nerve endings to painful stimuli and thus relieve pain.

Studies in patients after major abdominal or thoracic surgery have consistently shown that non-steroidal anti-inflammatory drugs given soon after operation reduce the requirements for opioids by about a third in the first or second postoperative day. This occurred for ketorolac[3] and diclofenac[4] given intramuscularly and indomethacin[5] and ibuprofen[6] given as rectal suppositories. Surprisingly, starting these drugs preoperatively is no better than starting them postoperatively, although this has been the subject of only one published study.[7]

Where intravenous opioids were titrated according to pain patients receiving non-steroidal anti-inflammatory drugs tended to experience less pain.[3-5] This indicates that this combination provides better pain control than opioid alone. For severe pain, the efficacy of non-steroidal anti-inflammatory drugs is limited, but these studies clearly suggest that opioids, when used alone, may also be inadequate and, like the anti-inflammatory drugs should be viewed as having a "ceiling" effect.

Some questions about the use of non-steroidal anti-inflammatory drugs preoperatively remain unanswered. What is the risk of damage to the upper gastrointestinal tract? Peptic ulceration may undoubtedly follow chronic ingestion of these drugs, but no information is available regarding acute short term use. Should these patients receive prophylactic H_2-receptor antagonists at the same time? Extrapolating the results of studies evaluating prophylaxis in chronic users of non-steroidal anti-inflammatory drugs does not support such a proposal.[8]

Are these drugs safe in patients with renal impairment, cardiac failure, or asthma? As with drug prescribing in general, the answer comes down to balancing the risks against the benefits for each patient. In most cases, the benefits of reducing an elderly patient's opioid requirement by a third will outweigh any short term reduction in renal function. At worst, these adverse effects rapidly reverse on stopping the drug.

Platelet dysfunction resulting from non-steroidal anti-inflammatory drugs given preoperatively increases the risk of preoperative bleeding, but this does not seem clinically important.[4,9] Any increase in blood loss may assume importance in some circumstances, however—such as after neurosurgery—and delaying administration of non-steroidal anti-inflammatory drugs until the postoperative period may be judicious.

Some orthopaedic surgeons have been concerned about delayed fracture healing in animals caused by non-steroidal anti-inflammatory drugs.[10] Determining the relevance of these animal studies to the acute short term use of these drugs in humans requires further research.

Many compounds influence the sensitivity of the peripheral nociceptor apart from the prostaglandins, so non-steroidal anti-inflammatory drugs alone should not be expected to eliminate pain. The goal of postoperative pain management should be to prevent peripheral nociceptor stimulation and dorsal horn sensitisation. Reducing the sensitivity of the primary afferent nerve terminal to painful stimuli by using non-steroidal anti-inflammatory drugs is one useful early step.

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Providing citizens' advice in general practice

Would meet much unmet need

Recent changes to community care have further complicated the entitlement to benefits of patients needing residential care. Over the past year many patients will have taken the lengthy claim form for disability living allowance for their doctor to sign. Many of these will still be awaiting a definite decision on their claim. With these the latest changes to the benefits maze, it remains true that "many doctors and others feel themselves ill equipped to understand the financial position their patients are in, let alone advise or help them find their way through the system."[1]

The study by Paris and Player in this week's journal on providing citizens' advice in general practice is timely (p 1518).[2] It accepts that most doctors do not understand the benefits system well enough to advise patients but exploits the unique opportunities offered to the primary health care team to advise patients on the many aspects of the benefits system relevant to ill health and disability.

Placing skilled advisers in general practice, who accepted referrals from doctors and other members of the practice team, produced results that are either startling or predictable, depending on your familiarity with the extent of unclaimed benefits. About one quarter of the study group were not claiming their full entitlements; after advice some £58 000 was claimed on behalf of only 39 patients.

In addition, patients received advice on many other problems. The study was successful and popular with patients—clearly they benefited considerably, both financially and by having other worries eased, which must have improved their wellbeing. Is this a model for how general practice should develop?

The pilot scheme's success relied on several key factors: the commitment of the practices to the scheme and their willingness to include the adviser as a full member of the practice team; the existence of adequate facilities in the practice premises to run an advice service; the availability of funding for the project; and the support and back up provided by the Citizens Advice Bureaus. Arguably all these elements were crucial for the scheme's success.

Would developing such schemes merely reduce the demand for advice services elsewhere? More than one third of the sample had previously sought advice on the same problem from another agency, including the local council or the Benefits Agency, although none had previously consulted a Citizens Advice Bureau. This shows the extremely variable quality of advice offered on benefits and related matters by many agencies, including the legal profession and those responsible for administering the benefits. But no one with any experience of the scale of unmet need for good advice will be surprised by the view of the manager of a local Citizens Advice Bureau that this project had no visible effect on the numbers seeking advice at the local bureaus.

Birmingham Family Health Services Authority has recognised advice provided by Citizens Advice Bureaus as health promotion and has funded 15 practices in Birmingham to offer this service. It must be hoped that new regulations on health promotion in general practice will not put such schemes at risk. Certainly local authorities—traditionally the funders of Citizens Advice Bureaus and other independent advice agencies—are unlikely to be a ready source of finance in the current financial climate.

Perhaps the solution lies in the community care reforms, whereby the provision of services to sick, disabled, and elderly people is meant to be integrated, crossing agency boundaries. Funding projects to provide advice within primary health care is logical and efficient if the end result is an improvement in people's physical and mental wellbeing. Social workers and community care managers are spending increasing amounts of time checking clients' entitlement to benefit, both to maximise clients' incomes and to minimise the costs to social services by enabling clients to contribute a greater proportion of the costs of their care.

Providing advice on benefits within general practice is a far more effective and proactive way of meeting at least some people's needs. Joint funding by health authorities and social services of advice services based in general practice would be an intelligent and far sighted response to community care needs.

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