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Editorials

Cataract surgery—quantity and quality

In this issue, we present the initial results from the second national survey of cataract surgery, which was a collaborative endeavour supported by the Department of Health, the Royal College of Ophthalmologists, the College of Optometrists, and the Royal College of Nursing. Great credit is due to the authors for what was clearly an enormous task, but they rightly credit all the participating centres for the vital contribution of their own data. Together with the previous 1991 survey,^{1–3} we now have a detailed picture of what we are achieving in terms of the baseline characteristics of our patients and of the outcome, which is presented by Desai and colleagues in this issue of the *BJO* (p 893). A further paper will appear giving a fascinating modelling exercise on the national burden of visual impairment due to cataract and the levels of activity required to tackle it.⁴

Thus, epidemiologists have provided the evidence for an informed debate about what if anything should be done to meet the needs of the population and deal with the ever lengthening waiting lists. This is both a national and global issue. This year, in February, “Vision 2020, the right to sight”—the World Health Organisation’s global initiative for the elimination of avoidable blindness—was launched by the new director general with a commitment of high priority among the WHO’s numerous campaigns.⁵ Tackling cataract blindness is the first of four priority areas identified for the campaign. The issues from a global perspective were elegantly summarised by Allen Foster at last year’s Cambridge symposium.⁶ Armed with these insights, we are now in a position to debate our response to these challenges.

We are fortunate as ophthalmologists to own an intervention that is of undoubted effectiveness⁷ and which can achieve quality of life gains of an almost unequalled scale for a single surgical procedure.⁸ But it is clear that the extent of the gain is proportional to the severity of visual impairment which preceded the intervention. The rapid evolution of technology, first intraocular lenses and now phacoemulsification (5% in 1991 to 77% in 1997) which together offer rapid rehabilitation and precise aphakic correction, has encouraged us to intervene earlier. In 1997, just under a third of eyes operated on could still see 6/12 or better. While the indication for surgery in these cases could surely be justified in terms of an individual’s symptoms, there is an opportunity cost. This concern was well expressed in a recent leader in the *BMJ*.⁹ Those who demand more will tend to be operated on at the expense of

those whose need may be greater. The authors of that leader implicitly accept that the volume of surgery nationally is fixed. It seems clear from the epidemiological evidence that volumes will have to increase if we are to avoid a rapidly growing backlog of visual impairment from cataract and an increasing number of our elderly dying visually impaired by a condition for which we have excellent treatment.

Foster’s model for the global scenario is quite clear about the required action when demand is high (as manifested by growing waiting lists). Output must be increased while costs are reduced and quality maintained or improved. Economy of scale should allow us to increase volume and decrease unit cost but this will still require an increased government investment. That quality can improve with increased output has also been shown to be the case although there is a threshold beyond which the pressures of quantity start to reduce quality.

Many ophthalmologists will be naturally concerned that cataract surgery is not devalued; it is after all our bread and butter. But we should be aware that we hold a monopoly and that if we wish to keep it, we should deal with it responsibly. One thing is certain, there is never going to be a shortage of work—even in the lifetime of our most junior trainees. Compared with almost all other industrialised nations, except perhaps New Zealand, there is comparative underservicing of our community. This is an enviable position because we have the opportunity to expand and develop to reach an optimal target of service provision. It is much harder to face reductions and constraints in our activity. The irony is that many of us do face such constraints owing to the shortage of resources in the NHS or perhaps the way they are distributed. But if we want to do more and attract more contracts, we will have to find ways of reducing the unit cost. It is much better that we find ways of doing this ourselves than have it thrust upon us.

Desai and colleagues flag three important questions relevant to this debate which their paper generates. These are the first; there are more to follow.

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Wellcome Trust support for vision research

Strengthening the support for vision research

The importance of fundamental clinical research in the vision sciences has been recognised by the Wellcome Trust since the early 1970s, but the low level of activity was always a cause for concern. Consequently, in 1977 vision research was “selected for special development” by the trustees (equivalent to the governors of the present day), and in the following years training fellowships and fellowships in ophthalmic medicine and surgery were established. In 1984 the trust's activities were expanded further by the establishment of the Vision Research Working Party (VRWP), followed by the introduction of other training fellowship schemes to enable young clinicians to establish an academic career, while maintaining their clinical links. By 1986 the trust's research support in this area had topped £1m per annum, and in 1990 the VRWP became a grants committee, linked to the Neuroscience Panel, with its remit being extended to cover auditory research.

Reviewing the impact of the Wellcome Trust's activities

The Wellcome Trust routinely reviews the impact and the mechanisms of its special initiatives, to ensure that funding policies and programmes remain both effective and appropriate, and in 1997 a review of the trust's contribution to vision research in the United Kingdom was carried out by its policy research unit, PRISM. Briefly, the review found that given the substantial health burden of visual diseases and disorders, Wellcome Trust resources made a real and vital contribution to important research in the field.

Three important conclusions could be drawn from the information gathered during this review. The first was that the burden of human suffering associated with visual diseases and disorders, both in the United Kingdom and worldwide, is considerable and is set to increase if current demographic trends continue. The cost of treating these diseases and the economic impact of vision impairment is also very large. Using the World Health Organisation's now widely recognised measure of disease burden, the DALY (disability adjusted life year), PRISM's analysis showed that the four most prevalent diseases alone account for millions of years of lost quality of life. Trachoma is a major cause of blindness in the developing world, has a global prevalence of 28 per 100 000, and is responsible for the loss of two million DALYs per year. Glaucoma affects both rich and poor countries alike, accounts for nearly six million DALYs per year, and has a worldwide prevalence of almost 100 cases per 100 000. The most common cause of blindness is cataract with nearly 16 million sufferers at any one time, resulting in 26 million DALYs being lost each year. A complication of diabetes mellitus, diabetic retinopathy, is the most important cause of visual impairment in the established market economies and is about three times as common as in developing countries. It accounts for 18 million DALYs per year and its prevalence can be as high as 250 cases per 100 000 population. Even

so, these four diseases account for less than half the total disease burden throughout the world.

Within the UK it is possible to estimate the economic cost of eye disorders using “Burdens of Disease” published by the NHS Executive. This analysis reveals that although about £830m are spent on clinical patient care every year an additional £500m will be spent on community health care and social services, bringing the total cost to the NHS to over £1.3bn, nearly 3% of its total budget. In addition to the cost of patient care the economic burden to the community of people who cannot work or can do only limited work because of visual impairment has been estimated at a further £360m per annum. This brings the total annual cost to the UK economy from vision related disease to nearly £1.7bn.

The second part of this review concerned an analysis of the funding available to scientists working in this field. The largest single supporter of vision research is the National Institutes of Health in the United States, through the National Eye Institute. In 1997 its budget was £216m, approximately £1 per US citizen, compared with 25 pence per citizen from both private and government sources in the UK. Within the UK the largest single supporter of research in this area is the Medical Research Council with a budget of £5.26m for the financial year 1995–6. During a similar period the Wellcome Trust allocated £3m for research in the vision sciences; further important sources of UK research funds are numerous other charitable organisations, which contributed an additional £3m in that period. The trust concluded therefore that although vision research receives considerable support in the UK, support given through the VRWP and other trust schemes plays a major part and it is necessary to continue to support research in this area. This is especially true for research in basic science, as most other charities tended to concentrate their support on more clinically oriented projects.

The final analysis concerned the trust's vision research training fellowships. These were originally designed to encourage clinical ophthalmologists to move into academic research and provide them with laboratory support and dedicated research training time. The PRISM analysis has shown that these fellowships have achieved their purpose with all recipients remaining actively involved in vision research, several have already achieved consultant/professorial status and many publish more papers in basic science journals than their peers.

How competitive is UK vision research?

The PRISM analyses also attempted to estimate the quality of vision research carried out within the UK and comparing it with similar activities both overseas and within the UK.

Ophthalmology and vision science is a relatively small field with only about 6000 research publications per year and is growing slower than most other fields in biomedicine. The United States is dominant in this field, but the UK is the second most productive country and is expanding its relative presence in terms of the numbers of papers

published. The impact of these publications (as measured by citation analysis) compares favourably with those produced by all other countries, except the USA. However, there was a higher proportion of clinical research papers published in the UK primarily because 73% of all UK clinical papers are published in two highly rated specialist journals, the *British Journal of Ophthalmology* and *Eye*.

Vision research comes of age

During the past 10 years research in the vision sciences has undergone dramatic development. It has been transformed from a quiet backwater involving a small cadre of clinicians and a few basic scientists into a global field occupied by many high quality innovative and imaginative researchers. A wide range of techniques is now employed, including molecular biology, genetics, biochemistry, and immunology, as well as sophisticated mathematical modelling. An encouraging feature of this maturity is the establishment of closer collaborations between practising clinicians and laboratory based scientists. In addition, several new academic departments have been established and many existing ones strengthened.

Holders of Wellcome Trust research fellowships are competitive with their peers in other disciplines and award rates for programme grant and project grant applications are similar to those seen for the trust's core funding panels. Consequently, the governors of the trust have concluded that vision research is now in a very healthy position and no longer needs to be treated as a subject "selected for special development". To enable the wide range of disciplines now employed in vision research to be adequately peer reviewed the Wellcome Trust has decided to disband the VRWP and to handle all applications for support in this area through its general funding mechanisms.

How will the Wellcome Trust support vision research in the future?

From the start of the 1998–9 academic year, several new procedures have come into force and these are outlined below.

- All applications for project grants, programme grants, university awards, research career development awards, and research leave fellowships are now handled by the appropriate panel, mainly the Neuroscience Panel.
- Research training fellowships for ophthalmic pathologists are similar to university awards, and will be handled as such by the Neuroscience Panel.

- Research training fellowship applications from clinicians interested in vision research will be considered in the general scheme of research training fellowships for medical and dental graduates, handled by the trust's Clinical Interest Group (CIG). In the past, other specialised training schemes have been successfully subsumed into the general scheme in this way, once they have served their purpose—for example, fellowships in surgery and dermatology. The CIG is familiar with issues such as the need to balance serious scientific research training with the requirements of higher clinical training. The CIG leads for the trust in its interactions with relevant external bodies, such as the Committee of Postgraduate Deans, the royal colleges, and so on. These issues have become more prominent since the "Calman" reforms of higher clinical training, and there is a growing need to monitor these processes, and proactively to promote the interests of academic medicine.

How will these new arrangements benefit the research community

Since its inception the VRWP has awarded programme grants valued at nearly £10m, project grants worth nearly £14m, and 69 vision research training fellowships at a cost of over £4m. When awards administered through other schemes are taken into account the trust has given nearly £32m of support to the vision sciences during the lifetime of the VRWP. The budget previously allocated to the VRWP has now been allocated to the trust's core panels and the CIG. These new arrangements will ensure that competitive research proposals will continue to enjoy the level of support that they have had in the past.

The membership of the Neuroscience Panel has been increased to include expertise in areas specific to the visual and auditory sciences. In recent years the breadth of scientific activity in vision research has widened considerably, resulting in the trust experiencing difficulties in maintaining a high quality of peer review. Now the expertise of all the trust's core panels will be available to applicants, ensuring that funding requests receive the most appropriate assessment.

Further details of all the trust's schemes can be found on its website (www.wellcome.ac.uk).

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