### Improving surgical outcomes

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Outcomes of cataract surgery are worse than we would like them to be. Community-based studies show that up to 40% of eyes have a postoperative presenting vision of <6/60.1 Eyes with intraocular lenses (IOLs) do better; however, it has been shown that even in prosperous middle-income countries, such as Venezuela, in 20% of pseudophakic eyes presenting vision was <6/60 and in 15% best corrected vision was worse than 6/60.

Poor outcomes matter. Patients deserve improved vision whenever possible and poor outcomes deter prospective patients from coming for surgery and probably reduce their willingness to pay for their treatment – particularly if they have to pay in advance!

In this article, we offer some suggestions for improving the quality of cataract surgery. We admit that there is little evidence base for most of these suggestions and that some of them are controversial. However, we hope to stimulate debate.

#### 1 Selection and training of ophthalmologists

Selection processes usually emphasise academic credentials rather than clinical or surgical skills. It is difficult to test surgical aptitude during a selection process; however, generic tests of hand-eye coordination do exist and are used routinely in the selection and training of pilots. Should we consider using similar tools to select ophthalmologists? At the very least, we should ensures that trainees have stereoscopic vision.

Selection is not always based on quality. Some postgraduate programmes do not even identify candidates who are interested in ophthalmology, because the country desperately needs ophthalmologists. The training of ophthalmic assistants in many countries in Africa offers another example. Originally, this training consisted of one year of clinical ophthalmology for everyone, after which suitable candidates were selected for another year of training in cataract surgery. However, to answer needs in personnel, training programmes now last eighteen months to two years and all students on the course are trained in cataract surgery, regardless of inclination or aptitude. The trainees’ cataract surgical skills vary greatly and it is unlikely that this change has improved cataract outcomes.

Postgraduate training of eye surgeons should also have explicit targets for trainees, such as:

- number of operations that must be performed before trainees can qualify as ophthalmologists (e.g. in the UK, this number is 300, but most trainees perform more than 500 in practice)
- level of supervision: initially the trainee will be closely supervised by the trainer, but, by the conclusion of training, trainees should be able to operate on almost any cataract without supervision
- acceptable outcomes: e.g. simply performing the required number of operations would be insufficient if the trainee had a 25% vitreous loss rate.

#### 2 Continuing medical education (CME)

In all medical disciplines, CME is vital. When ministries of health have so many claims on their small budgets, educating doctors is rarely a priority: after all, they have already received an expensive training. However, unless there is support for CME, the quality of care offered by specialists will deteriorate and this will reduce the value of the investment in their initial training.

CME is not just for doctors, but also for ophthalmic assistants and nurses. In the UK and the USA, qualified ophthalmologists must obtain a certain number of ‘CME points’ every year. Points can be obtained from private study. The process is administered by the Royal College of Ophthalmologists and the American Academy, respectively.

This model, with its points system, may be one way in which ophthalmology institutions in affluent countries can assist low- and middle-income countries.

#### 3 Innovation

At various stages in our careers, most of us have probably acquired a tip from another surgeon that enabled us to operate with greater confidence.

Eye surgery is not static and keeps improving. To improve our own surgery, we need to observe other surgeons and, occasionally, copy their techniques. This is easy in a large centre with multiple surgeons, but it is much more difficult if you are a surgeon working alone in a remote area. Those who work in larger centres should ensure that they can welcome other surgeons to observe and learn new techniques. This is also true for new materials and protocols, e.g. the use of cefuroxime in the prevention of endophthalmitis.2

#### 4 Discipline

When we are under pressure to increase the numbers of cataract operations to 32 million per year by 2020, it is easy to focus on the quantity and lose sight of the quality.

Surgeons, and all eye workers, have to work in a systematic, disciplined way, so that all patients are fully assessed preoperatively and only those who are likely to benefit proceed to cataract surgery.

Because cataract surgery is performed so frequently, it can become routine, and we become careless. Doctors, nurses, and health managers need to sit together to develop robust processes and systems to ensure that every patient receives the best care and to minimize the risk of error. This may be as simple as ensuring that no patient is taken to theatre unless the eye for surgery is marked, or it may be as complex as a ten-page booklet that includes all preoperative and postoperative instructions.

#### 5 Biometry

Many centres still use standard-power IOLs because they cannot perform biometry. Biometry equipment has become more portable and less expensive. Most surgeons should use it as a routine, even in outlying clinics. We are not aware of any randomised trials proving that preoperative biometry improves unaided postoperative vision. However, given that biometry is safe and inexpensive, it is difficult to justify withholding it from any patient. The prevalence of axial ametropia varies widely, and biometry is of greatest value in communities with the highest prevalence, e.g. in Asia. It will have a lesser impact where axial ametropia is less common, e.g. in sub-Saharan Africa.

#### 6 Equipment

It is difficult to obtain good results with inadequate equipment. If the operating microscope is broken, it is safer to cancel the operation than to proceed. This is frustrating for both surgeon and patient. However, the inconvenience of a cancelled operation is minor compared to the problems caused by complicated surgery. Ultimately, only surgeons can judge whether the equipment is adequate for their needs.

What is acceptable to one may be unsuitable for another. For example, some eye instruments are designed for use by a right-handed surgeon. However, one of the authors is left-handed!

As ophthalmic surgery becomes more complex, regular maintenance of equipment is essential. Fortunately, this has been
first step), but to determine how to improve
staff. The goal is not to find out what went
surgeons, nurses, managers, and technical
vindictive or punitive. A single individual is
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discuss results and causes of poor outcomes.
9 Morbidity/mortality meetings
Although there are few cases of mortality in
ophthalmology (we hope!), it is helpful to
organise regular departmental meetings to
discuss results and causes of poor outcomes.
It is essential that these meetings are not
vindictive or punitive. A single individual is
rarely wholly responsible for a poor outcome.
There is usually a sequence of errors, some of
which are due to systemic failures in the
institution. If these are to be corrected, the
review must involve everyone, including
surgeons, nurses, managers, and technical
staff. The goal is not to find out what went
wrong (although this may be a necessary
first step), but to determine how to improve
the standard of care in the future. If the end
result is merely to identify a culpable individual,
the exercise is worthless.
10 Standard evaluation systems
If everyone has different standards of evaluation,
this obscures the bigger picture. The World
Health Organization has set standards for best
corrected vision at two months after surgery:
• 6/18 or better for 90% of eyes
• <6/60 for less than 5% of eyes
There are two problems associated with these
guidelines. Firstly, few patients return for
follow-up at two months, so the assessment
of outcomes represents only a small
fraction of operations. Secondly, although
vision may be tested with best correction in
the clinic, the patient may not buy the
glasses, or the spectacles may be lost or
broken within a month. Now that IOLs are
almost universal and biometry is widely
used, we could set standards for uncor-
rected vision at an earlier date – such as
one week. This would allow more consistent
reporting of outcomes, which would make it
easier to identify best practice.
11 Refraction and spectacles
Even with biometry, some patients will have
significant postoperative refractive error. One
of the best ways to improve outcomes is to
perform refraction for all patients and to give
them spectacles. If there is significant astig-
matism, the spectacles may be more expensive
than the surgery, as astigmatic lenses are
costly to prescribe and fit. Since most surgeons
are aiming for good uncorrected vision, we
should give spectacles either free of charge
or for a minimal fee, to any patient who requires
spectacles to achieve 6/18 or better.
12 Understanding our limitations
We have emphasised cataract surgery, as
this is the most common procedure under-
taken by ophthalmologists. However, the
proposals are applicable to any simple or
complex eye operation. In high-income
countries, ophthalmologists often
specialise, for example for vitreoretinal
surgery. General ophthalmologists perform
most common procedures, but they refer
complex problems, such as paediatric
(cataract, to a sub-specialist colleague.
In developing countries, it can be difficult to
establish such a referral network: travel is
costly and difficult for patients, and people
prefer to deal with the doctor they know and
trust rather than visit an unknown surgeon
in a distant place. However, the outcomes of
surgery for these complex conditions always
improve when patients are referred to
specialists who have the necessary
equipment, training, and personnel to
obtain the best results.
13 Leadership
This is perhaps the most important point.
If the quality of outcomes is seen purely as
the job of the ophthalmologist, then it is
unlikely that the results will ever improve.
Every eye worker has to be involved, because
every stage of the patient’s journey, from
diagnosis to discharge, can affect the
outcome. This includes not only doctors
and nurses, but also non-clinical staff,
such as administrators and technicians.
The surgeon’s role is to provide leadership
and to involve all the other personnel in
ensuring that every patient gets the best
treatment. A change in attitudes will be
accomplished by involving all health workers
and allied personnel in partnership, not
by giving lectures or orders from above.
On the back page of this journal, you will
find the CBM logo with the motto: “Together
we can do more.” This is the best advice you
can ever follow, if you want to improve the
quality of your surgical outcomes.
References
1 Limburg H, Foster A, Vaidyanathan K, Murthy GV.
Monitoring visual outcome of cataract surgery in India.
Br J Ophthalmol 2002;86(5): 543–7.
2 Yorston D. Using intracameral cefuroxime as a prophyl-
axis for endophthalmitis. Community Eye Health J 2008;21(65): 11.
3 Limburg H, Foster A, Gilbert C, Johnson GI, Kyndt M,
Myatt M. Routine monitoring of visual outcome of
cataract surgery. Part 2: Results from eight study
centres. Br J Ophthalmol 2005;89(1): 50–2.
4 Yorston D, Gharch S, Wood M, Foster A. Does prospective
monitoring improve cataract surgery outcomes in
Africa? Br J Ophthalmol 2002;86(5): 543–7.
Resources for improving outcomes
1 The free software package ‘Monitoring Cataract Surgical
Outcomes’ (MCSO) can be downloaded from:
www.iceh.org.uk/display/LIB/Software+++Monitoring++Cataract
+Surgical+Outcomes
For a physical copy, you can order the
‘Community Eye Health Updates 2007’
CD from TALC, PO Box 49, St Albans,
Hertfordshire, AL1 5TX, UK. Email:
info@talculk.org Website: talculk.org
2 Instrument maintenance training is
available at low cost at Aravind Eye
Hospitals in India – see www.aravind.org

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