

Hand Written Method

- Decrease percentage with poor outcome due to surgery or need for spectacles.

What if the Results are Not Good?

Action to improve results is advisable if:

IOLs

- The percentage of cases receiving an IOL is less than 95%.

Take action to improve the availability and affordability of IOLs.

Surgical complications

- The posterior capsule rupture rate is more than 5%

- The vitreous loss rate is more than 5%
- The discharge uncorrected visual acuity is poor (<6/60) in more than 10% of cases.

Take action to improve the surgical technique by asking for advice from a good, experienced cataract surgeon.

Visual outcome

- The week 8 visual acuity with available correction is more than 5% poor outcome (<6/60)
- The week 8 visual acuity with available correction is less than 85% good outcome (6/6-6/18).

Analyse whether the major cause of poor

vision is surgical problems or correction of refractive errors.

Take action to improve the surgery as above.

Take action to provide at least best spherical correction spectacles at an affordable price.

Trends over time

- The trend over time is static outside the recommended limits
- The trend over time is worsening.

Carefully analyse the reasons for lack of improvement and take action to deal with the identified problems. □

Review Article

Monitoring Cataract Surgical Outcomes: Computerised Systems

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Introduction: Why Monitor?

It is well known that the world is facing a cataract crisis. The number of people blind from cataract increases annually, and, as the Earth's population ages, this increasing growth in cataract blindness is accelerating.¹ It is estimated that the elimination of cataract blindness will require over 30 million cataract operations to be carried out

every year by 2020 – a threefold increase in less than 20 years.

However, the cataract crisis is not solely a crisis due to low surgical output. In addition, there is evidence of a disturbingly high rate of poor surgical outcomes. In India, 15–25% of eyes see less than 6/60 with available correction.^{2,3} In China, nearly 40% of eyes had a poor outcome.⁴ The situation in Africa is unlikely to be any better.

Poor outcomes may be due to any of the following:

- Selection
- Surgery
- Spectacles and uncorrected refractive error

Outcomes can be improved by any measures that will:

- Improve case selection, and avoid surgery in patients who will not benefit



Computerised systems

Photo: Murray McGavin

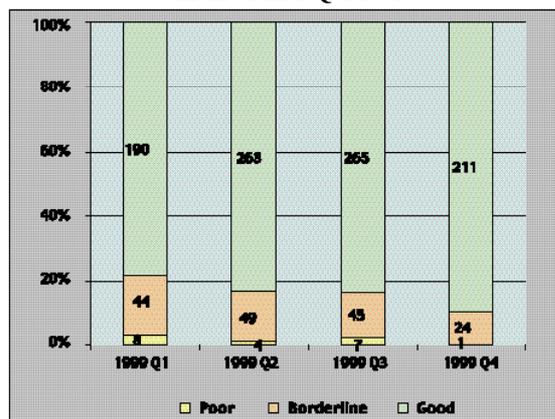
- Improve the quality of surgery, and avoid surgical complications
- Improve post-operative correction of refractive error, and minimise surgically induced ametropia.

A good cataract outcome monitoring system will contribute to all the above.

Table 1: An Example of an Automated Report of Surgical Complications

Total Operative Complications 01 January 2002 to 30 June 2002		
Surgical Complication		
• Nil	470	90.7%
• Capsulorhexis extended	14	2.7%
• Capsule rupture and vitreous loss	10	1.9%
• Unintended damage to iris	6	1.2%
• Zonular dehiscence, no vitreous loss	6	1.2%
• Capsule rupture, no vitreous loss	5	1.0%
• Zonular dehiscence and vitreous loss	3	0.6%
• Others	2	0.4%
• Small pupil, stretched	1	0.2%
• Supra-choroidal	1	0.2%
• haemorrhage	1	0.2%
Total	518	

Table 2: Quarterly Outcomes, Showing an Increase in the Proportion of Good Outcomes from 79% in the First Quarter to 89% in the Final Quarter



How to Monitor

Obviously the more data included in any monitoring system, the more information can be retrieved. However, collecting detailed data on outcomes can be time consuming. Eventually this leads to 'audit fatigue', and the information is no longer recorded. As a bare minimum, data should be collected on pre- and post-operative visual acuity, and on intra-operative complications. In a manual monitoring system, this may be as much data as can be analysed routinely. With a computerised system, analysis can be automated, so it is reasonable to collect more

data – but remember that even if analysis is automatic, data entry will still be a tedious manual task. It is important to achieve a balance between collecting all the information that may be useful, and collecting information from every patient. For monitoring purposes it is better to collect minimum data from everyone than a lot of data from a few patients.

Any cataract monitoring system should minimise the extra work required. If possible, the routine recording of clinical data should be integrated with outcome evaluation. This can be done by using a standard form for all cataract operations. This ensures that the necessary details are recorded, and makes it simple for a clerical worker to transfer them to a computer. The form is placed in the patient's file, and becomes the clinical record of the cataract surgery and post-operative care.

Data should be collected on all patients, even those in whom a good outcome is impossible owing to pre-existing co-morbidity – e.g., previous glaucoma surgery. Although this means that a higher proportion of eyes will have a poor outcome, it permits a more reliable estimate of trends within the clinic.

A defect of many outcome evaluations is that the data are collected, and analysed, but are not readily available to the surgeons and so fail to influence their practice. If surgeons do not see the results, they are not going to be motivated to collect the data. A vital part of any evaluation of outcomes is to provide regular reports to the surgeons, and to develop ways of including the findings into practice. One way of doing this is to have a quarterly meeting, at which all patients with a poor outcome are discussed, and the cause of the poor outcome is identified. Where possible, a change of practice is planned to avoid poor outcomes in the future. For example, at Kikuyu Eye Unit, Kenya, we identified vitreous loss at surgery as being associated with a ten-fold greater risk of poor outcome. This led to changes in our management of vitreous loss, and a significant reduction in the proportion of eyes suffering a poor outcome following complicated surgery.

Some surgeons may feel threatened by discussing poor outcomes in front of their colleagues. The purpose of monitoring surgical results is not to identify incompetent surgeons, but to enable every surgeon to improve their own outcomes. The World Health Organization has set targets of a minimum of 90% of eyes seeing 6/18, and a maximum of 5% seeing less than 6/60, with correction, by two months after surgery. Although it is important to aim for these targets, no one would suggest that,

once they have been achieved, there is no room for further improvement. Monitoring should not be used to check outcomes against other clinics, surgeons, or targets, but to demonstrate trends. Since different surgeons and clinics have different case loads, equipment, and patients, comparisons should be made only against historical data from the same clinic, as this is the only way to show if standards of care at any unit are improving or not.

Computerised Monitoring of Outcomes

Advantages

The major advantage of using a computerised system to monitor outcomes is that reporting can be automatic. Commercially available databases (such as Microsoft Access) have a reporting function. This allows reports to be designed, and then automatically updated. These reports may be text (Table 1), or they can be graphical (Table 2). Surgeons can obtain an immediate report of outcomes at any time, providing they know how to turn on the computer and to open the database!

Computers are good at handling numbers, so the reports can include calculations, such as the mean post-operative refractive error. In clinics that carry out pre-operative biometry, patients whose final spherical error differs from the planned refraction can be identified. Surgically induced astigmatism can be measured, and different surgical techniques compared. If pre-operative visual acuity is recorded for both eyes, it is easy to calculate the number of blind patients who have their sight restored by surgery. Outcomes for specific groups of patients – e.g., diabetics – can be evaluated separately. Although it is possible to do all this from a paper register of outcomes, it is very time-consuming, and it would be difficult to provide regular updates. Once a computerised system is in place, data analysis is easy.

Disadvantages

The major disadvantage of using a computerised system is the cost and complexity of getting it established. Although minimal computing skills are required to use the database, and to obtain reports, the design of the database and the reports do need input from someone with the necessary expertise. The necessary hardware and software should not cost more than \$1,500 - \$2,000. Many clinics will already have a computer that can be used for outcome monitoring, in which case the costs are minimal.

The second disadvantage of computerised systems is the possibility of data

loss. Irregular electricity supplies, theft, or computer viruses can all lead to corruption of vital data. The easy way to avoid this is to have an automated back-up system that copies the database on to a removable disk. This can then be stored in a safe place. If this is done regularly, then data is more secure on a computer than it is in a book, as it is impractical to copy a cataract register at frequent intervals.

Experience of Evaluating Outcomes

At Kikuyu Eye Unit, we found using a computerised system to be a valuable tool. As Table 2 shows, there was a statistically significant improvement in the results of surgery over the first year of using the system. It is hard to identify any single factor that led to this improvement. Management of the complications of surgery improved, and the number of patients with known pre-existing co-morbidity declined. I believe the most important factor was a change in attitudes. The ready availability of the outcome data meant that surgeons were immediately aware of their own results. This led to a move away from just concentrating on the numbers of operations to a culture in which quality is as important as quantity.

References

- 1 Brian G, Taylor H. Cataract blindness—challenges for the 21st century. *Bull WHO* 2001; **79**: 249–256.
- 2 Limburg H, Foster A, Vaidyanathan K, Murthy GV. Monitoring visual outcome of cataract surgery in India. *Bull WHO* 1999; **77**: 455–460.
- 3 Dandona L, Dandona R, Naduvilath TJ, McCarthy CA, Mandal P, Srinivas M et al. Population-based assessment of the outcome of cataract surgery in an urban population in southern India. *Am J Ophthalmol* 1999; **127**: 650–658.
- 4 Zhao J, Sui R, Jia L, Fletcher AE, Ellwein LB. Visual acuity and quality of life outcomes in patients with cataract in Shunyi County, China. *Am J Ophthalmol* 1998; **126**: 515–523. □

Letter

Dear Editor

I read Professor M Daud Khan's article 'Training of a Cataract Surgeon' in the Journal (*J Comm Eye Health* 2002; **15**: 21–22) with keen interest. I would like to suggest that the trainee should also receive 25–30 sutures (10–0 monofilament nylon) in addition to the other equipment and materials given to them. This would complete the kit.

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