

CHAPTER 1

INTRODUCTION

The world is entering the 21st century and our lives and health are being transformed more and more by modern technology. Many of us have access to things that our parents could only dream about, and our grandparents couldn't even imagine. This technology is changing the way eye surgery is performed and all the time this change is happening faster and faster.

Let us take a brief look backwards into history. The first clear description of eye surgery was in the code of Hammurabi, a king of ancient Babylon about 4,000 years ago. This was a set of laws which laid down the fees for eye operations and the penalties for unsuccessful ones. These could be rather severe. A surgeon could have his hand amputated for a failed operation. One wonders how any eye surgeon continued to practise.

Medical science and especially eye surgery did not advance very fast from Hammurabi's time for thousands of years. Eye surgery 200 years ago was probably not very different from 4,000 years ago. Even then changes only occurred very slowly. One hundred years ago there might be a significant advance in eye surgery about every 20 years. Now there are significant advances every year and almost anything is becoming possible in advanced modern eye surgery.

Unfortunately some aspects of medical care have not changed in the last 4,000 years. In Hammurabi's code it described how the fees for the treatment of a free man (ten silver pieces) differed from that for the treatment of a slave (two silver pieces). Today there is no slavery but it is still true for much of the world that the treatment, if available, depends mainly upon the patient's ability to pay.

Modern medical treatment is unfortunately very costly. It is therefore not available nor affordable for poor people living in poor countries whose governments cannot fund a comprehensive system of health care.

A study of world blindness shows some very disturbing facts. There are over 40 million blind people in the world although the exact number depends upon the definition of blindness. The accepted definition by the World Health Organisation is that a blind person is unable to count fingers at 3 metres distance with both eyes open.

By far the most common cause of this blindness is cataract, for which surgery is the only treatment. Trachoma and glaucoma are also very important causes of blindness, and surgery has a big part to play in preventing blindness from both these diseases. Perhaps the most disturbing fact of all is that the numbers of avoidably blind people in the world who need surgery still seems to be increasing. This is happening despite all the advances in medical care and technology and the increasing numbers of doctors and medical schools throughout the world. Nearly

all these blind people live in the rural areas of the poor countries of the world – the so-called “developing” countries. The reason for their blindness appears to be that the doctors and medical care are found mostly in the rich developed countries or crowded into the major cities in developing countries. In this way the rural poor remain untreated.

At present in most developing countries there is much debate and discussion about the relative importance of treating or preventing disease. Most medical workers are involved in treatment rather than prevention. However, the World Health Organisation and other expert international health agencies consider the prevention of disease should have priority over treatment. It is seen as a more effective and cheaper way of promoting health in the community, and has more chance of helping the poor.

As far as eye disease is concerned the debate is slightly different. All authorities agree that the basic aim in providing eye care is to prevent unnecessary blindness. This may require public health measures or medical or surgical treatment. The World Health Organisation (WHO) has identified four major causes of blindness and visual handicap world-wide which should be easily preventable. It has also identified three other important causes which are preventable but not so easily.

These are:

<i>Easily preventable major causes of blindness</i>	Cataract
	Trachoma
	Xerophthalmia
	Onchocerciasis
<i>Other preventable major causes of blindness</i>	Glaucoma
	Diabetic retinopathy
	Refractive errors

At present surgery is the only treatment for cataract and it is often the most appropriate treatment for glaucoma. It plays an important part in the prevention of blindness from trachoma. Therefore any plan to prevent unnecessary blindness must make basic low-cost surgical treatment available to all those who need it.

This book is written to describe appropriate surgical treatment to tackle this huge problem of avoidable blindness. It is about surgery in particular, and is written as a companion to “Eye Disease in Hot Climates” which is about eye disease in general. In this opening chapter some of the basic problems in trying to provide surgical services will be discussed. The rest of the book is about surgical principles and techniques.

Why is there so much surgically treatable blindness in the poor hot countries of the world?

The first and obvious reason for this is the lack of medical facilities and personnel. The second reason is that many blinding diseases are much more common in these countries quite apart from any lack of treatment. Some examples of this are:

Cataract There is now plenty of evidence that cataract occurs at a younger age and is more common in hot climates and where hygiene is poor. The exact cause of this is not known for sure and there may be several causes. However episodes of severe dehydration in earlier life from previous gastro-enteritis, heat-stroke or fevers may increase the risk of cataract formation in later life. Life-time exposure to bright sunlight or high temperatures may also be factors. It therefore seems that poor people are more likely to go blind from cataract than rich people, and yet paradoxically the rich have a much better chance of getting treatment.

Trachoma occurs most severely in hot, unhygienic surroundings where flies, poor living standards and lack of water allow the passage of infection from person to person.

Glaucoma does not appear to be influenced by the environment, however certain ethnic groups have an increased risk of certain types of glaucoma. Open angle glaucoma is more prevalent and serious in blacks, and angle closure glaucoma is much more prevalent in mongoloid races.

Pterygium is probably caused by excessive exposure to ultra violet rays from the sun. It is a very common disease in hot climates but is of little significance elsewhere. It is more prevalent in rural areas where people live and work outdoors.

Corneal scarring is a much more significant cause of blindness in poor countries and hot climates where the cornea is more exposed to trauma, infections and solar radiation. Malnutrition, especially vitamin A deficiency, also increases the risk of corneal scarring.

Consanguinity (marrying a close relative) may be common in certain communities, and may cause an increase of some surgically treatable conditions such as congenital cataract.

Infectious diseases can lead to blindness. Rubella in pregnancy can cause cataracts, and measles in childhood can lead to corneal ulceration and scarring. Both rubella and measles are easily prevented by immunisation, but some developing countries still have very poor immunisation rates.

How can appropriate surgical treatment be provided for those who need it?

This is a much more complex question and obviously no two countries are the same. In some countries there may be a desperate shortage of hospitals and specialist care, while in others the shortage of care may be only in rural areas. Often isolation or difficulty in travel may prevent people having access to medical treatment.

By far the biggest challenge for eye surgery is to make cataract surgery available throughout the world. The initials of the word “**cataract**” make eight convenient headings to describe eight principles for providing basic surgical treatment for all those who need it.

C	Commitment
A	Appropriate
T	Teamwork
A	Affordable
R	Rural outreach
A	Accountable by audit
C	Community-centred
T	Training

1. Commitment. In spite of all the advances in modern medical care, the number of blind people requiring surgical treatment is still increasing. What technically should be an easy problem to solve is in fact very difficult. Commitment and dedication is needed and major difficulties and problems must be identified.

Many of these difficulties are in the community. Most of the cataract blindness in the world is found in areas of poverty. There is not just a shortage of money but poverty of education, and community development as well.

However some of the difficulties come from the attitudes and limitations of those in authority. Governments, especially military governments, may not give a large share of the budget to health and education, and even then a health ministry may give cataract surgery a low priority when there are so many other health problems. Even those of us who are eye surgeons often find it hard to respond to the challenge of making basic surgical treatment available to all members of the community.

Most experts in world blindness prevention consider that it should be possible to solve the problem of treatable and preventable blindness even with the resources which are available. To this end the WHO and the International Agency for the Prevention of Blindness (IAPB) have launched the plan called “**Vision 2020 the right to sight**”. 20/20 represents normal visual acuity recorded by the Snellen’s method and measured in feet. (In fact it is usually measured in metres and recorded as 6/6). The hope is that by the year 2020 most of the avoidable blindness in the world should be eradicated, so that everyone in the world except those with untreatable and unavoidable disease should have a visual acuity of 20/20 by the year 2020. The surgical treatment of cataract blindness is one of the main aims of Vision 20/20.

A commitment to this plan and this ideal is obviously the first and most essential step in achieving it. Any commitment has two basic parts. Firstly, *awareness* of the problem and secondly, *action* to try to solve it. Most people involved in eye care are aware of the problem but unfortunately it is much harder to solve.

The need for commitment is shown by some statistics from India. In 1981 there were about half a million cataract operations performed in India. By 1999 this number had increased by about six times to 3 million. This obviously demonstrates a very great commitment to eye care and the community. In spite of such a

dramatic increase in surgery the numbers of blind people with cataract in India has apparently not yet fallen. The reasons for this are uncertain. One probable reason is that cataract is a disease of old age, and with people living longer the prevalence of cataract in the community is increasing. Another possible reason is that much of the increased cataract surgery is due to increased demand. Because the results of surgery are now so much better, many patients with early cataracts or with cataracts in only one eye are wanting treatment to improve their quality of life even though they have not gone blind.

It is hoped that some of the ideas in the rest of this chapter may encourage people to take appropriate action.

2. *Appropriate.* The treatment given and the technology used must be appropriate for the needs and resources of the community.

The equipment used in medical care and especially in ophthalmology is becoming increasingly sophisticated. Phakoemulsification is now the standard treatment for cataract in the developed world and there are many different lasers and vitrectomy machines which can do much in the treatment of eye disease. Nearly all this technology has been developed by research in rich countries. It is expensive and the equipment needs servicing and maintenance.

Many different groups of people want to make this advanced technology available in developing countries as well :-

1. All good doctors like to be up-to-date with the most modern techniques. It gives them professional satisfaction and benefits their patients as well.
2. The influential middle classes and the rich like to have every possible treatment available in their own country, so they don't have to travel abroad for it.
3. Governments feel a sense of pride if their country has the most modern facilities for medical treatment.
4. The organisations that manufacture and market high technology medical equipment are very anxious to sell it, and provide incentives and pressures to do so.
5. In private medical practice there is competition and commercial pressure to have the most modern equipment.

It is difficult for any conscientious and enthusiastic doctor working in a poor country to maintain a balanced view about expensive modern technology. It is difficult to balance enthusiasm for scientific excellence with a concern to provide effective treatment for as many patients as possible. The priority for high technology is to get an excellent result regardless of the cost, however small the number of patients treated or the longer time taken. The priority in treating the poor and needy is to be cost-effective and have a surgical department which can deal with large numbers of patients. Somebody has to pay for the treatment whether it is the government, a charity or the patients themselves or their relatives. The patients themselves usually cannot afford much, nor can governments, and charitable organisations are very concerned about cost-effectiveness with their donors in mind.

Nowadays, even rich countries are discovering that modern medical care is very costly, and there has to be a cash limit as to how much a country can afford to pay for its health care. If this is true for rich countries it is even more true for poorer ones. If a poor country invests in expensive sophisticated medical technology it means that resources have to be taken from possibly more important health needs in order to pay for it. Unfortunately, many hospitals in developing countries contain pieces of sophisticated, expensive equipment which are not being used. The usual reason is that they have broken down and cannot be repaired, or sometimes one small part is defective or missing.

There is an old saying, "*The best is the enemy of the good.*" This is very true about providing medical care in poorer countries. If a poor country decides to make the best treatment available for a few it may at the same time prevent many others from receiving good treatment. Obviously everyone would like the best treatment for their own disease. However, people who have no access to medical care at all will accept any treatment as long as it is safe and effective, and it does not have to be the best.

The use of intraocular lenses in cataract surgery is a good example of the question "*What is appropriate technology?*". Intraocular lenses to restore the focus of the eye after cataract surgery instead of spectacles have now been used routinely in the western world for over 20 years. They provide better and much more natural restoration of the vision than spectacles, and if used correctly they don't cause any damage to the eye. The long-term results are good. They are obviously even more appropriate for cataract surgery in poor countries, because patients there have even more problems in looking after or replacing their spectacles. Until recently intraocular lenses (IOLs) were very expensive. The first edition of this book written ten years ago did not promote the use of IOLs because of the problem of expense. At that time the cost of a good IOL was about 100 U.S.\$ which meant it was not a technique which most poor people could afford. The price of IOLs has fallen dramatically since then. A good quality lens now costs 5 U.S.\$ or less, and IOLs will become even cheaper in the future. This dramatic fall in price has come about because good quality IOLs are now manufactured in developing countries themselves. There is now no financial reason why IOLs cannot be recommended for all patients, although there are other reasons why their uses may not always be possible.

The development of low cost IOLs creates other subtle problems. The use of IOLs has meant that the indications for cataract surgery have changed. People are having surgical treatment at a much earlier stage in their disease. For instance a patient with a partial cataract in one eye and good vision in the other would not benefit much from the old-fashioned routine cataract extraction and giving spectacles. However he would benefit from an IOL. This may have the unfortunate effect of diverting medical resources away from more needy people towards the more privileged.

The problem of appropriate technology and health care should be considered quite carefully by doctors from developing countries who go to the western world for postgraduate medical training. Much of their training in advanced technology and expensive sophisticated medical care may not be what their fellow citizens most need or can afford.

The problem also concerns volunteers who go from the developed world to work or teach in poorer countries. Cheap and rapid air travel has now meant that these activities are becoming more frequent. What is needed in developing countries is a sustainable system of treatment which doesn't depend on visits from outside experts, but will continue to function and provide a service to the community on its own. If a specialist from overseas visits a developing country and carries out a few operations that is in itself is a very valuable service. However it is a very much more valuable service if a visitor from overseas can help to start a programme using available technology which can continue and grow of its own accord after he or she has left.

3. Teamwork. Teamwork is an essential feature of a good surgical programme. With a team of people working together much more work can be done making the result more *effective* in terms of numbers of patients treated, and also more *efficient* because it means that everyone is working together and so the cost of the treatment is less.

Also teamwork brings about mutual *enthusiasm* and *encouragement*. Most people work much better and enjoy it much more when they are working in a team with others. One of the difficulties of medical care in poor countries is that so much activity is carried out by people working single-handed in small health centres or private eye clinics. It is an interesting thought that most people are happiest when they feel part of a group, and solitary confinement is one of society's worst punishments.

Teamwork is especially important in surgery. Surgical work is not carried out by just one individual, the surgeon, but by a team. This is especially true when there are large numbers of patients. *Everybody in the team is equally important although some may be more highly trained and skilled than others.* For example if an eye is not properly prepared for surgery or a local anaesthetic is not given correctly or the patient is not properly looked after post-operatively, the resulting complication may be just as serious as a major mistake by the surgeon during the operation.

Another important aspect of teamwork is the formation of local blindness prevention committees. These should involve a wide range of people in the community – eye surgeons, government health officials, local community leaders etc. as well as voluntary organisations like the red cross, the red crescent, rotary and lions clubs. In this way programmes to prevent blindness and provide surgical treatment can be started and maintained.

4. Affordable. How is it possible to provide surgical treatment that poor people and poor countries can afford? The size of this challenge is shown by comparing the amount that is spent on health care in rich countries with that spent in poor countries. Rich industrialised western countries spend at least 1,000 U.S. \$ per person per year on health care and in some countries much more than this. In poor countries the total expenditure both by government and by private individuals on health care is usually less than 10 U.S. \$ per person per year. In such circumstances it is unrealistic to seek to give everybody the best and most modern medical treatment. However, there are ways in which the cost of medical care can be reduced without necessarily reducing its quality. The cost of intraocular lenses is a

very good example of this. Increased efficiency and cost saving by manufacturing in developing countries has drastically reduced the price of IOLs, without any loss of quality. Great savings can be made by treating large numbers of patients where the overhead costs remain the same but are shared by the much larger numbers of patients treated.

In general there are three sources of funding for medical treatment: firstly the government, secondly what the patients themselves pay, and thirdly from charitable donations.

In poor countries the government finds it difficult to fund the entire cost of surgical treatment but it can provide incentives, support and encouragement, and may often pay the salaries of the staff.

Patients may have to be responsible themselves for paying for most or some of the treatment, a process which is called “*cost recovery*”. Some ways of trying to reduce the cost of surgery have already been described. There is also the principle of “Robin Hood”. (Robin Hood was a legendary bandit of long ago who stole from the rich in order to provide money for the poor). There are some treatment programmes in which the higher fees paid by richer patients subsidise those who are poorer.

One result of successful treatment for blindness is that the financial burden to the community of looking after a blind person is removed. If a person is blind or will become blind without treatment, then that treatment enables him or her to be self-supporting, to work and often to look after others. A blind person is not only unable to earn, but is also a great drain on the resources of the family and the community. Apart from all the other human and personal benefits of helping blind people to see, it makes good economic sense. It has been calculated that the total cost of looking after a blind person for one year is ten times the cost of a basic cataract operation.

Much medical treatment in poor countries is supported by local or international charities, or donations from rich people locally. Charitable donors are anxious that their donation should be really used to good effect. In this way well managed hospitals and programmes receive charitable support and so become even better and more effective, whereas badly managed programmes find it hard to get donors to support them.

5. Rural outreach. In all poor countries most of the treatable and preventable blindness is found in rural areas. It is difficult and costly for people living in country villages to travel to big towns and cities for treatment. When they finally arrive, no cheap and effective system for treating them appropriately may be available. They may have to wait some time to be seen and for a hospital bed, even though they do not have the resources. So mobile teams or “eye camps” have developed as a response to this problem.

It may be much easier for a small surgical team and their equipment to travel to them, than for large numbers of elderly blind patients and their relatives to go to hospital. In countries where there is an effective cheap transport system the mobile team may only need to identify the patients who need surgical treatment, and can then refer them to a permanent base hospital. If transport is not cheap and easy then surgical treatment has to be provided locally. It is possible to carry out safe

and effective eye surgery in any clean, well-ventilated building. All the necessary instruments and equipment for basic eye surgery can be transported easily, whereas equipment for high technology surgery cannot be moved and is not appropriate for this kind of work.

A programme of rural outreach is much more effective when there are also community based eye services (see below).

6. Accountability by audit. Every doctor should know the effectiveness of the treatment that they give. In particular, a surgeon should know the results of his or her operations, how successful they were and what complications developed. The idea of “audit” is to give us a reasonably accurate assessment of the results of our surgery. This is often not easy to obtain, especially for people working in developing countries. Ideally all patients should be followed-up after eye operations, but many patients may not be able to come back for routine follow-up, or feel that such a visit is worthwhile. After successful surgery, patients may be content to stay at home. Patients who have had complications may not trust the surgeon and so may go to see a different person for follow-up. Therefore if a patient doesn’t return for follow-up, there is no way of knowing whether the operation was successful or not. If we audit our work and keep up-to-date records of our successes and failures, this will help to identify the faults in our treatment and methods. In this way we can think creatively about how and what to change, in order to provide a better service and improve our techniques. Here are some examples of the importance of audit and accountability from both cataract surgery and other types of surgery:

- A community survey some years ago about cataract and cataract surgery mostly after “eye camps” showed that many people who had cataract surgery were still effectively blind. This was either because of the complications of surgery, or because the cataract glasses they had been given were either lost or broken. This survey demonstrated firstly, the need for a reasonable quality of surgery to be carried out in “eye camps” and secondly, the need for low cost intraocular lenses as an alternative to spectacles.
- A community survey of patients after eye-lid surgery for entropion following trachoma showed that many patients had little benefit from the surgery, and also that certain operations were much more successful than others. Some surveys have also shown that the results of surgery by trained staff who are not fully medically qualified can be just as good as surgery by ophthalmic surgeons.
- Glaucoma is a major cause of blindness and it is obvious that most people in poor countries cannot afford long-term medical treatment with drops for life. Glaucoma surgery unfortunately sometimes has complications and there is an urgent need of a good audit to assess the effectiveness of glaucoma surgery in preventing further loss of vision.

Accountability demands that the quality of our equipment, the quality of our surgical skill and the quality of our sterilisation and freedom from infection all achieve a certain basic standard.

7. Community centred. Most medical staff, especially surgeons, see their work as being based in a hospital. However, programmes which are providing effective

care in the rural areas also have primary health care workers who are based in the community. Community eye care is essential in preventing disorders like trachoma and xerophthalmia. It is also important in identifying patients with cataract or glaucoma who need surgery to prevent or cure blindness, and then continuing to look after them post-operatively. Many patients especially from villages need a lot of motivation and encouragement to come for treatment and community eye workers provide this. *Surgical treatment, especially in remote areas, is both more efficient and more effective if there is a permanent infrastructure of primary health care in the community.* Community based health workers can not only identify and encourage those who need treatment to come for it. They can also provide a vital follow-up service.

Some local communities do not always use the hospital services which are available for them. One of the problems seems to be that the community may feel alienated from the hospital service, they may feel it doesn't "belong" to them. "Ownership" is the word used to describe the way in which the community feels it has some responsibility in planning and delivering health care. Sometimes the people turn to traditional or unorthodox healers rather than trained and skilled doctors for the same reasons.

8. Training. Training is one of the most important activities in trying to make basic surgical facilities available for all. It is also one of the main aims of the Vision 20/20 programme.

In some countries there are considerable problems in obtaining a good and comprehensive surgical training. Any surgical training programme must have three essential components:

1. *Knowledge and Information.* This can usually be obtained from text books and libraries, or nowadays electronically, although lectures and seminars are often more helpful for the student.
2. *Clinical Skills.* This requires more person-to-person contact between the trainer (teacher) and the trainee (student).
3. *Surgical Skills.* These can only be acquired by an apprenticeship training.

(There are of course other important skills to learn in a postgraduate training programme, such as communication skills, teaching skills and management skills, as well as having a professional and caring attitude.)

Apprenticeship training is the most difficult and time consuming part of a surgical training programme. Trainees can usually acquire knowledge and information relatively easily and clinical skills without too much difficulty. However it is often very hard to find the trainers who have the time available and the expertise to teach surgical skills. There are four stages in a surgical apprenticeship:

1. The student must acquire the necessary background knowledge to perform surgery. This means a detailed knowledge of relevant basic medical science: anatomy, physiology, pathology, medicine etc. as well as a knowledge of surgical technique.
2. The student should then assist the teacher while he explains each step of the operation and how to do it.

3. The student then performs the operation with the teacher assisting. This is usually done in stages, the student performing the easier parts of the operation first and then progressing to the more complex parts.
4. Finally the student performs the operation alone but the teacher is available in case problems or difficulties arise.

Once the student has acquired both theoretical knowledge and practical ability, he or she can work without supervision. Sometimes post-graduate training in surgery can consist of a great deal of theory and a considerable amount of observation but very little practical experience. Theory can be learned from a book but the practical experience cannot. This does not mean that surgical textbooks have no value. They do have a value in explaining principles and techniques and discussing likely problems that may arise and how to deal with them. However a textbook cannot replace practical instruction and an apprenticeship training. There is general agreement about the way that surgeons should be trained. There is however great controversy about who should be selected for training.

Much time and money is invested in training doctors and especially postgraduate specialists. Apart from general education there are usually six years at medical school and about six years of postgraduate training after medical school. After such a costly and lengthy training a specialist needs to support and repay a wide circle of family and dependants. There are therefore strong economic reasons why he or she may have to work in major cities and concentrate on private medical practice. It is very hard to see how a health care system which is mostly dependent on this type of specialist will be able to provide effective surgical treatment for the poor, especially in the rural areas of less developed countries.

It is now well recognised that appropriate people who are not graduate doctors can be taught to carry out basic eye care, and to diagnose and treat eye disease. Those with the right motivation and skill can be given further training and taught to operate. The whole question: "What is the place of non-doctors in delivering health care?" is unfortunately very controversial. In some developing countries there are very comprehensive training programmes for such staff who are called Ophthalmic Clinical Officers or Ophthalmic Assistants, but in other countries there are strong objections to anyone other than doctors being taught to give treatment. Provided such trainees are given appropriate support and encouragement, they are much more likely to remain in the rural areas. It is obvious that in any training programme of this nature the people being trained must be properly selected, trained, accredited and supervised.

Proper *training* will ensure that he (or she) is able to be of real help to the community.

Proper *accreditation* will ensure that the government and medical authorities recognise and approve of the work, and that there is a career structure.

Proper *supervision* will keep up the morale and support of someone who may be working in isolated and difficult situations.

Most international organisations concerned with preventing blindness recognise the need for training Ophthalmic Clinical Officers or Ophthalmic Assistants. Sometimes the established medical profession or government is opposed to this type of training, especially if it is specific training in surgery. However for countries

with a serious problem of avoidable blindness and a shortage of specialist skills there is really no other way forward. There is an ever increasing problem of cataract blindness especially in the rural areas, and few specialists who are able or willing to leave the big cities. Usually graduate doctors who are not specialists have received very little training in ophthalmic diagnosis and treatment, *so eye care is often better when given by a "specialist" who is not a doctor than by a doctor who is not a "specialist"*. Unfortunately in many developing countries there is great enthusiasm and competition for training as a doctor but often little interest in giving training at a more practical level.

This textbook is not meant to be comprehensive. It is meant to focus on basic surgical techniques for common and important causes of blindness or disabling eye conditions. Therefore most of the book concerns cataract, glaucoma and trachoma surgery. In particular there are some aspects of eye surgery which are deliberately omitted. Squint surgery, which is mainly cosmetic, is not described at all nor is retinal detachment surgery. Retinal detachments can cause blindness and can be treated surgically, but because of the more complex nature of the operations which need both extra equipment and skills they are definitely techniques for the fully qualified specialist. Corneal diseases and corneal scarring are both very important, and in many cases corneal grafting could improve or restore the sight. Some aspects of corneal surgery are included, but corneal grafting is also a treatment which requires special training and of course some donor corneal tissue.

Modern ophthalmic surgery, even when carried out in fairly basic conditions should be effective with very few serious complications. If serious complications do occur they are usually from a failure to observe basic surgical principles and not from any lack of sophisticated or advanced technology. The five most common causes of serious complications from intraocular surgery are:

1. ***A bad local anaesthetic block.***
2. ***Intraocular infections.***
3. ***Damage to the corneal endothelium or other intraocular structures during surgery.***
4. ***Failure to suture the wound securely and accurately.***
5. ***Poor post-operative care.***

All these complications should be avoidable simply by keeping to basic surgical principles.

Throughout the book there is an emphasis on trying to provide practical help for someone working in difficult circumstances and without the aid of expensive modern technology.