These guidelines have been withdrawn

MOH clinical practice guidelines are considered withdrawn five years after publication unless otherwise specified in individual guidelines. Users should keep in mind that evidence-based guidelines are only as current as the evidence that supports them and new evidence can supersede recommendations made in the guidelines.

CLINICAL PRACTICE GUIDELINES

Cataract Surgery

Ministry of Health

NMRC National Medical Research Council

National Committee On Ophthalmology

July 1999

MOH Clinical Practice Guidelines 1/99

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Statement of Intent

This guideline is not intended to serve as a standard of medical care. Standards of medical care are determined on the basis of all clinical data available for an individual case and are subject to change as scientific knowledge advances and patterns of care evolve.

The contents of this publication are guidelines to clinical practice, based on the best available evidence at the time of development. Adherence to these guidelines may not ensure a successful outcome in every case, nor should they be construed as including all proper methods of care or excluding other acceptable methods of care. Each physician is ultimately responsible for the management of his/her unique patient in the light of the clinical data presented by the patient and the diagnostic and treatment options available.

Foreword

Cataract is a major cause of avoidable blindness and worldwide, an estimated 20 million people are blind from this condition. In the absence of any preventive measure that can be applied in a public health setting, the only recourse is surgery. Cataract surgery is a highly cost-effective intervention and generally, sight is restored to near normal vision after a relatively low-cost operation with an enhancement of the quality of life.

With ageing of the population, there will be more people suffering from cataract. The condition is generally not amenable to prevention, but surgery is effective. In Singapore where cataract surgery is readily available and affordable, we need to ensure that quality eye care is provided based on the latest scientific evidence.

These guidelines on cataract surgery, based on current medical evidence and expert opinion, were developed by the National Committee on Ophthalmology. We hope that they will play a part in ensuring high success rates in terms of restored vision and quality of life outcomes for patients who have cataract surgery.

DR CHEN AI JU
DIRECTOR OF MEDICAL SERVICES

Contents

1 Introduction

1.1 Epidemiology

Cataract surgery is the most common operation performed at the Singapore National Eye Centre. Data from the Ministry of Health Medisave claims show a rising national incidence of cataract surgery from 2.25 per 1000 population in 1986 to 4.02 per 1000 population in 1995. This is commensurate with the ageing population in Singapore.[1] Cataract surgery is a highly successful and cost-effective procedure which leads to better vision and function in patients. The incidence of cataract increases with age and is thought to be higher in the poorer communities. Cataract can affect different aspects of vision and some people with visual impairment can have quite good visual acuity. Visual acuity should therefore not be the only measure of visual disability.

Between a fifth and a third of people aged 65 to 74 years will develop lens opacities over a five-year period. The prevalence of decreased visual acuity (less than 6/9) due to cataract in the US National Health and Nutrition Survey for people aged 45 to 74 years was 14.7%.[2] There is a poor correlation between visual acuity and visual function. There is a need to move away from exclusive reliance on visual acuity and to measure visual function, taking into consideration social function, quality of life and the clinical examination.

1.2 Guidelines development and target group

These guidelines look into the current practice of cataract surgery and aim to ensure that the most appropriate and cost-effective care is given to all patients. They were developed by an expert workgroup appointed by the National Committee on Ophthalmology. This workgroup conducted a systematic review of current medical literature and prepared draft guidelines which were presented to other ophthalmologists for discussion and refinement. These guidelines are for ophthalmologists performing cataract operations in the public and private sectors.

2 Levels of evidence and grades of recommendation

Levels of evidence

Level	Type of Evidence
Ia	Evidence obtained from meta-analysis of randomised controlled trials.
Ib	Evidence obtained from at least one randomised controlled trial.
IIa	Evidence obtained from at least one well-designed controlled study without randomisation
IIb	Evidence obtained from at least one other type of well-designed quasi-experimental study.
III	Evidence obtained from well-designed non-experimental descriptive studies, such as comparative studies, correlation studies and case studies.
IV	Evidence obtained from expert committee reports or opinions and/or clinical experiences of respected authorities.

Grades of recommendation

Grade	Recommendation
A (evidence levels Ia, Ib)	Requires at least one randomised controlled trial as part of the body of literature of overall good quality and consistency addressing the specific recommendation.
B (evidence levels IIa, IIb, III)	Requires availability of well conducted clinical studies but no randomised clinical trials on the topic of recommendation.
C (evidence level IV)	Requires evidence obtained from expert committee reports or opinions and/or clinical experiences of respected authorities. Indicates absence of directly applicable clinical studies of good quality.
GPP (good practice points)	Recommended best practice based on the clinical experience of the guideline development group.

3 Executive summary of recommendations

1 **C** The assessment of the severity of the cataract should include the Snellen Visual Acuity test. Occasionally, other tests of visual function may be needed e.g. glare testing, contrast sensitivity testing etc.[3]

This is a C recommendation based on level IV evidence.

2 **GPP** Cataract surgery should be performed if the patient will benefit from it.

This is a GPP recommendation.

3 **C** Bilateral simultaneous cataract surgery is generally not recommended as cataract surgery carries a small risk of serious eye infection and total blindness can occur.[5]

This is a C recommendation based on level IV evidence.

4 **B** The current techniques available include Extracapsular Cataract Extraction (ECCE) with intraocular lens (IOL) implant and phacoemulsification with intraocular lens implant. Either technique may be used. Where appropriate, patients may be informed of the two techniques available and advised which would be more suitable.[6-9]

This is a grade B recommendation based on level III evidence.

5 **B** At least 90% of patients undergoing cataract surgery should achieve a best corrected visual acuity of 6/12 or better in the absence of any other ocular pathology.[10,11]

This is a grade B recommendation based on level III evidence.

4 Assessment

4.1 Assessment of cataract severity

C The assessment of the severity of the cataract should include the Snellen Visual Acuity test. Occasionally, other tests of visual function may be needed, e.g. glare testing, contrast sensitivity testing etc.[3] This is a C recommendation based on level IV evidence.

The decision by the specialist to recommend cataract surgery to the patient should not be based only on the visual acuity but on an overall assessment of visual function. Any coexisting eye disease should also be documented. The different types of cataracts, depending on the site of the lens affected, should be identified. The Snellen Visual Acuity is the most common assessment used to measure the degree of cataract. This test could be supplemented with glare and contrast sensitivity testing in patients who complain of reduced visual function but who still have acceptable visual acuity. Ideally, impairment of visual function should be measured. Questionnaires such as the VF-14 address functional impairment. Impairment of vision can be due to other co-existing eye problems and these should be looked for as they will reduce the degree of visual improvement after surgery.

5 Cataract surgery

5.1 Timing of and indications for cataract surgery

GPP Cataract surgery should be performed if the patient will benefit from it. This is a GPP recommendation.

While there may be differences in opinion between doctors regarding the optimal timing of cataract surgery, in general the need and timing of surgery should be dictated by the individual requirements of the patient, e.g. a retired individual aged 80 years may be perfectly comfortable with a visual acuity of 6/36 whereas a visual acuity of 6/18 may be unacceptable to a person aged 30 years. Cataract surgery should therefore be done when the patient needs it and when the benefits of surgery outweigh the potential surgical risks. This is where the ophthalmologist needs to exercise his clinical judgement.

There should be good reason for the removal of cataracts when the corrected acuity is still good at 6/12 or better and it should be documented clearly in the notes, e.g. anisometropia or posterior subcapsular cataract which is visually disabling under certain lighting conditions.

In general, cataracts should not be operated on if the patient has no perception of light. The only exceptions are when the cataract becomes intumescent or for cosmetic reasons. The impossibility of visual recovery has to be made known to the patient.

In certain situations, there is justification for carrying out cataract surgery in the presence of pre-existing retinal or optic nerve disease which may limit the ultimate post-operative visual function. In these patients, the visual field may be improved but the acuity may not. This must be clearly explained to the patient, preferably in writing, so that there is no misunderstanding.

5.2 Contraindications to cataract surgery

The surgery should not be performed if:

i) The patient does not desire surgery.

ii) The patient does not need it.

iii) Spectacles or other aids provide satisfactory visual function.

iv) The patient's lifestyle is not affected by the cataract.

v) The patient's medical condition is such that the risk of surgery outweighs the potential benefits.

vi) Surgery is unlikely to improve visual function.

5.3 Cataract surgery in a one-eyed patient

The indications will be the same as for a two-eyed patient. However, the risk of total blindness must be explained in case complications occur.

5.4 Second eye surgery

The majority of people with cataract in one eye will develop cataract in the second eye. A few studies have shown that patients derive significant benefits having both cataracts removed. A study by Javitt et al compared the outcomes of 426 patients who had surgery in one eye with 164 patients who had cataract surgery in both eyes. Whereas both groups showed significant improvements, the group with both eyes operated showed greater improvements in all three outcomes measured: 61% showed improvement in the VF-14 score, 27% showed less "trouble with vision" and 24% had improvement in satisfaction with vision during the 12 month follow-up period.[4]

The indications for surgery will be the same as for the first eye. The timing of the second operation should be such that sufficient time has elapsed to allow any complications from the first operation to be detected and managed adequately.

5.5 Bilateral simultaneous cataract surgery

C Bilateral simultaneous cataract surgery is generally not recommended as cataract surgery carries a small risk of serious eye infection and total blindness can occur.[5] This is a C recommendation based on level IV evidence.

This is generally not recommended as cataract surgery carries a small risk of serious eye infection and total blindness can occur. The ophthalmologist has to be prepared to justify his action. If there is a complication during the first operation, the second eye operation should be postponed to a later date.

5.6 Choice of cataract surgery

B The current techniques available include Extracapsular Cataract Extraction (ECCE) with intraocular lens implant and phacoemulsification with intraocular lens implant. Either technique may be used. Where appropriate, patients may be informed of the two techniques available and advised which would be more suitable.[6-9] This is a grade B recommendation based on level III evidence.

Planned extracapsular cataract surgery with posterior chamber lens implant (ECCE and IOL) and phacoemulsification with foldable IOL (phacoemulsification and IOL) are the two main techniques in current use. However, there will be rare instances that IOLs may not be implanted.

ECCE and IOL is cheaper to perform but it takes about 6-8 weeks for the wound to heal, resulting in some constraints in rehabilitation during this time. The final astigmatic error is likely to be higher than when phacoemulsification is performed because the wound is large and there are 5-7 sutures.

Phacoemulsification and IOL requires more expensive equipment but the small wound allows immediate physical and visual rehabilitation a day or two after surgery. The final astigmatic error is likely to be low with the result that many patients do not require correction with spectacles for distance.

There is a general trend among many eye surgeons towards switching from ECCE to phacoemulsification because of greater patient satisfaction. However, the added cost of this procedure has to be justified. Either technique may be used. Where appropriate, patients may be informed of the two techniques available and advised which would be more suitable.

A systemic review of cohort studies and case series published in English between 1975 and 1991, which looked at outcomes of cataract surgery, was the basis for the US Agency for Health Care Policy and Research clinical practice guidelines.[6,7] This review considered 57 studies which reported changes in visual outcomes in 17,390 eyes after cataract surgery. No difference was found in the rate of improvement between standard extracapsular cataract extraction and phacoemulsification. Other reviews have found the same result except that surgically-induced astigmatism is lower after phaco-emulsification.[8,9] This translates to better unaided vision.

5.7 Choice of anaesthesia

The choice of anaesthesia will depend on many factors. It is the surgeon's responsibility to discuss the option of general, local or topical anaesthesia with the patient and anaesthetist. Due to the risks involved in general anaesthesia, it is thought that properly managed local anaesthesia may be the preferred option. This is especially so in patients with significant cardiac or pulmonary problems. The trend towards shorter operating time associated with phacoemulsification is leading to an increase in the use of topical anaesthesia. It is important for patients to be medically stable. Hypertension, diabetes or cardiac problems should be controlled.

5.8 Outcomes of cataract surgery

B At least 90% of patients undergoing cataract surgery should achieve a best corrected visual acuity of 6/12 or better in the absence of any other ocular pathology.[10,11] This is a grade B recommendation based on level III evidence.

The successful outcome of a cataract surgery is dependent on a fully equipped operating theatre with an operating microscope, microsurgical instruments and vitrectomy equipment when required. Cataract surgery can be carried out as day surgery or on an inpatient basis, depending on the surgeon and the patient. In most cases it would be more economical to have the operation done as day surgery.

Extracapsular or small incision surgery should be combined with implantation of a posterior chamber intraocular lens. The lens should be implanted in the capsular bag in preference to the ciliary sulcus. Phacoemulsification and small incision surgery are expected to lead to faster visual recovery and less surgically-induced astigmatism.

The quality of the surgical outcome is judged on the level of the best corrected visual acuity measured on the Snellen's chart. In general, at least 90% of patients undergoing cataract surgery should achieve a best corrected visual acuity of 6/12 or better in the absence of any other ocular pathology. This is again dependent on the age of the patient; where 96% of patients under age 60 years should achieve 6/12 and better, this reduces to 75-85% for those aged 80 years.

6 Training and certification

The training of trainees is an important issue and requires the cooperation of both the trainer and the trainee. All trainees should begin their training for cataract surgery in the wet lab. They should assist in many cases of cataract surgery before they start operating on their own. A programme for cataract surgery training is as follows:

1st Year	-	Wet lab and assisting cataract operations.
2nd Year	-	Begin cataract surgery under supervision.
3rd Year	-	Start having a list of cataract operations to perform under supervision of a consultant. Start phacoemulsification exposure.
Registrar	-	Start phacoemulsification training.

A certification process should involve the trainees having performed at least 100 ECCE operations each and having 2 consultants certify that they are capable ECCE surgeons. Certification for phacoemulsification should be done by 2 consultant phacoemulsification-trainer surgeons after the trainees have each performed at least 50 phacoemulsification operations under supervision.

7 Recommendations for evaluation

All patients undergoing cataract surgery should have the following recorded within 3 months of the operation:

1. A record of the best corrected visual acuity in the operated eye.

2. Any incidence of intraocular infection.

8 Workgroup members

1. Prof. Arthur Lim
2. A/Prof. Vivian Balakrishnan
3. Dr Ang Chong Lye
4. Dr Khoo Chong Yew
5. Dr Low Cze Hong
6. Dr Donald Tan
7. Dr Peter Tseng
8. Dr Ronald Yeoh
9. Dr Victor Yong
10. Dr Chan Wing Kwong
11. Dr Lee Chin Piaw
12. Dr Aliza Jap
13. Dr Sharon Tow

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