Introduction

This guideline is based on the best available literature to June 1999. Specific adaptations to the clinical environment of Alberta, Canada have been made. A special effort has been made to include the patient as a co-decision maker. Where particular deficits in the evidence-based literature have been identified, clinical reasoning and committee consensus have been utilized. The principle literature upon which these guidelines are based are found in the “Clinical Practice Guideline for the Management of Cataract in the Otherwise Healthy Adult Eye,” (American Academy of Ophthalmology, 1996). This guideline remains consistent with AAO and those of the Canadian Ophthalmological Society recommendations.

Guideline Goals

These guidelines are intended to assist practitioners with assessing cataracts:
- To identify the presence of cataract
- To quantify the impact on vision
- To determine the impact of reduced vision on the patient’s quality of life
- To educate and reassure the patient about his/her particular visual problem, including prognosis
- To perform the appropriate operation when indicated and if desired by an informed patient
- To provide necessary preoperative care, postoperative care, rehabilitation and treatment of any complications

Exclusions

These guidelines may not apply to the following:
- Individuals under the age of 18 years
- Individuals with other eye diseases

Recommendations

The primary purpose in diagnosing and caring for a patient with a cataract is to improve functional vision and quality of life:
- Non-surgical management of cataract is indicated if the patient can maintain normal function with the use of spectacle lenses, strong bi-focals and magnifying lenses, controlled illumination or dilation of the pupil to allow the patient to view around a central posterior sub-capsular cataract.
- Surgical management of cataract is indicated if non-surgical measures have proved inadequate for the patient’s visual requirements

The above recommendations are systematically developed statements to assist practitioner and patient decisions about appropriate health care for specific clinical circumstances. They should be used as an adjunct to sound clinical decision making.
The etiology of cataracts is not fully understood, however, epidemiological studies suggest that most cataract development is age related. Cross-sectional studies have identified cataracts in about 10% of all Canadians and this prevalence increases to about 50% for those aged between 65 and 74 years, and to about 70% for those over 75 years (Ontario College of Physicians and Surgeons, 1994). Cataracts are a major source of self-reported visual impairment and are the third leading cause of preventable blindness.

A number of investigations have revealed that cataract surgery significantly enhances the quality of life of patients. The formation of cataracts clearly has a profound impact on patients and their activities. In the early stages, the impact of cataract formation can be lessened somewhat by appropriate refraction and fitting of eyeglasses or contact lenses. Ultimately, surgery is the only effective therapy for a person with significant visual loss due to cataracts. It is anticipated that as the age of the population increases, the rate of cataract surgery will also increase. Although cataract surgery is not risk free, there are significant benefits which make surgery a viable and highly recommended therapy for patients with cataracts.

In 2002, over 250,000 patients had cataract surgery in Canada. In 1998-99, 16013 cataract extractions were performed in Alberta making it the most common surgical procedure in Alberta. Because cataract surgery is a common procedure, a clinical practice guideline may be a useful tool for practitioners. In 2006 the median wait time for cataract surgery in Alberta was 14.6 weeks. Cataract surgery is cost effective for the first eye and even more so for the second eye, even in patients with low probability of vision improvement.

The literature suggests that if no co-morbid ocular conditions are present, cataract surgery results in improvements in visual acuity in more than 95% of patients. In cases where ocular comorbidities exist, cataract surgery results in improved visual acuity in >80% of patients.

**Prevention of Cataracts**

Currently, there is no proven medical treatment to prevent the formation and progress of cataracts in the otherwise healthy eye. However, research is occurring, and factors that may initiate or facilitate the development of cataracts are being identified. Most cataracts are age related. Public education should be directed to the role that medications (e.g., steroids), toxic substances, systemic diseases, trauma and radiation (e.g., ultraviolet light and ionizing radiation) may play in the development of cataracts.

**Diagnosis - Evaluation of Visual Impairment**

No single test adequately describes the effect of cataracts on a patient’s visual status or functional ability. Although not a definitive measure of visual dysfunction, simple Snellen acuity is the most universally used index of visual functioning and a technique that is reasonably standardized. Snellen acuity is recognized as the best general guide for appropriateness of surgery. However, the need for flexibility with due regard to a patient’s particular functional and visual needs, environment and risks, all of which may vary widely, must be considered.
Non-Surgical Management

Non-surgical methods of management include patient education and reassurance about the cause of visual disability and the prognosis. In the developmental stage of nuclear sclerosis, a common type of cataract, myopia is induced and changing the spectacle lens prescription will often improve vision. Use of strong bi-focals and magnifying lenses often satisfies near vision requirements as the cataract progresses. Dilation of the pupil may allow the patient to view around a central posterior subcapsular cataract. However, the glare experienced from such a cataract may be unacceptable, particularly in those situations where the intensity of the ambient light is high. Controlled illumination may be of benefit for some patients. During this period of early cataract development, these measures may be used successfully by many patients in meeting their visual needs without recourse to surgery. Pupillary dilation has a limited role in the management of posterior subscapular cataracts.

Surgical Management

Surgery for cataract in the otherwise apparently healthy eye is considered when medical, optical and environmental measures have proven inadequate for the patient’s visual requirements. The patient should make the decision to proceed with surgery on the basis of the ophthalmologist’s recommendations and after considering both subjective and objective criteria. Subjective criteria includes the patient’s assessment of the impact of cataracts on his or her quality of life. Objective measures include tests of visual acuity and examination by a trained practitioner of the extent of cataracts.

Indications for Surgery

Cataract surgery is justified and appropriate when subjective, objective, and educational criteria are met.

Subjective

The subjective criterion is when the ability to carry out needed or desired activities is impaired. There are three elements of the subjective criterion:

1. **The patient’s own assessment of his/her visual disability (impact on driving, viewing TV, and special occupational or vocational needs) and, in particular, disability at near distances (e.g., reading, occupational activities requiring near vision).**

As a general rule, the better the Snellen acuity, the greater the need for verification and documentation of functional disability. When visual acuity is marginally reduced, the risk relative to the potential benefit of surgery becomes even more significant. The practitioner should provide documentation of the decreased vision which may include any of the following:

- Visual disability fluctuates as a result of environmental factors, (e.g., effects of glare, lights of oncoming cars or dim illumination)
- The ability to carry out needed or desired activities is impaired
- The patient complains of monocular diplopia or polyopia
- Visual disparity exists between the two eyes
- The patient is unable to carry out normal occupational activities or hold a driver’s license
2. **The patient’s perception of the impact of their disability on life-style.**

3. **The patient’s complaints of disabling glare.** Occasionally patients with cataracts present with the complaint of disabling glare. These patients will often see more poorly in daylight conditions, so that their visual complaints will be inconsistent with the visual acuity measured in a darkened room. When this appears to be the case, the assessment of visual function under conditions of ambient sunlight will often reveal the existence of this functional complaint and the reasons for it. The differences between measured acuity in a darkened room (and high contrast chart) and that of ambient light (e.g., pen light) producing glare and reduction of functional acuity needs to be documented. When such a verifiable, reproducible loss of vision can be documented mimicking the patient’s complaints, the patient can be considered for cataract surgery.

Glare testing and contrast sensitivity testing are methods designed to correlate objective findings of cataract formation with subjective visual loss and complaints.

**Objective**
The objective criterion is based on the level of visual acuity in the affected eye. The eye examination confirms that the cataract is the limiting factor for improving visual function and other factors do not preclude improvement following surgery. The patient’s medical and mental health should permit surgery to be performed safely.

**Educational**
The patient should be educated about the risks and benefits of cataract surgery and alternatives to treatment. In patients with visual acuity that is marginally reduced, the risk of surgery relative to the expected benefit should be re-emphasized to the patient. The patient should determine if the expected improvement of the disability outweighs the potential risk, cost and inconvenience of surgery.

A patient information handout which complements this guideline is designed to educate patients about cataract management. Information on how to obtain the patient information material is contained in the final section of this guideline.

**Visual Disability Due to Cataract in the One-Eyed Patient**
A one-eyed patient is defined as one who has permanent legal blindness in the other eye.

The ophthalmologist has the obligation to inform and educate this patient about the risk of total blindness when considering potential benefits of cataract surgery. The worse the vision in the fellow eye, the greater the need for caution when considering cataract surgery in the eye to be operated.

**Other Indications for Cataract Removal**
There are two other indications for cataract removal:

1. **Lens Induced Diseases:**
Documented evidence of the presence of lens induced diseases (phacomorphic glaucoma, phacolytic glaucoma, etc.) is necessary prior to cataract removal. Because of sight threatening complications, cataract extraction may be urgent.
2. The Need to Visualize the Fundus:
It is necessary to visualize the fundus in an eye that has the potential for sight (e.g., the patient has diabetes with significant risk of reduced visual acuity requiring management through clear media or B-scan) or when other special investigations demonstrate intraocular pathology where further attention is important and requires clear media.

Contraindications to Surgery
Surgery should not be performed under the following circumstances:

- The patient does not desire surgery
- Glasses or visual aids provide satisfactory functional vision
- Surgery will not improve visual function
- The patient’s life-style is not compromised
- The patient is medically unfit
- The patient has had a cataract removed in one eye which has not sufficiently healed to warrant the surgical removal of cataract in the second eye

The surgeon is responsible for ensuring that the patient undergoes a comprehensive preoperative eye examination.

The following are usually not indicated as part of the preoperative work-up of an otherwise healthy adult eye for cataract surgery, unless special circumstances, as documented in the chart, justify them: formal visual fields, glare-disability tests, contrast sensitivity tests, potential acuity tests, specular microscopy, fluorescein angiography, external photography, corneal pachymetry, B-scan ultrasonography, specialized colour vision tests, tonography and electrophysiologic tests.

During preoperative evaluation, the surgeon also has the following responsibilities:

- To ensure the criteria outlined in this document are met prior to surgery
- To ensure that the patient has a general medical history and physical examination as appropriate for the planned surgery and type of anaesthesia
- To ensure that appropriate keratometry and A-scan measurements have been performed if an IOL is to be implanted
- To select the appropriate IOL power when IOL implantation is planned
- To review the results of presurgical and diagnostic evaluations with the patient, and to discuss the findings with the patient or, in appropriate cases, another responsible adult acting for the patient. Informed consent should be obtained and documented. The surgeon shall, as part of the disclosure statement, specify that:
  1. The indication for cataract surgery is founded on the patient’s personal requirement for better vision and his/her reasons
  2. The surgery is not necessary solely because a cataract is present
- To make the patient aware of any other eye disease which may affect the prognosis for visual recovery
Phacoemulsification cataract extraction with implantation of a posterior chamber IOL is the current procedure of choice in the vast majority of operations for removing uncomplicated cataracts. To perform cataract surgery safely, anaesthesia of the eye is of critical importance. This goal can be met with topical, peribulbar, retrobulbar, or general anaesthesia.

The surgeon’s obligation to the patient continues until postoperative rehabilitation is complete. The operating ophthalmologist should provide those aspects of postoperative eye care within the unique competence of the ophthalmologist. If the operating ophthalmologist is going to be absent following the surgery, the ophthalmologist must make arrangements before surgery for referral of the patient to another ophthalmologist and to notify the patient in advance of the operation of those arrangements. Other aspects of the postoperative care may be undertaken by an optometrist at the discretion of the ophthalmologist. A final assessment should be performed by either an ophthalmologist or an optometrist.

The surgeon has an obligation to educate and instruct the patient about appropriate signs or symptoms of possible complications, eye protection, activities, medications, required visits and details for access to emergency care. Likewise, the patient has an obligation during the postoperative phase to follow the advice and instruction of the surgeon and to notify the surgeon if problems occur.

Criteria for discharge after ambulatory surgery include:
- Stable vital signs
- Return to preoperative mental state
- Absence of nausea
- Absence of significant pain

Before discharge, post-surgical care should be discussed with the patient and/or escort. Written postoperative instructions should be provided and a follow-up appointment arranged. An escort must be available to accompany the patient home.

Operative complications of an ocular or medical nature are possible indications for unplanned postoperative hospitalization.

Ocular complications can include hyphema, uncontrolled elevated intraocular pressure, threatened or actual expulsive hemorrhage, retrobulbar hemorrhage, severe pain or other ocular problems requiring acute management or careful observation.

Medical complications include cardiac instability, respiratory instability, a cerebrovascular episode, diabetes mellitus requiring acute management, uncontrolled nausea or vomiting, acute urinary retention, acute psychiatric disorientation, or other medical conditions requiring acute management or careful monitoring.
Possible indications for planned postoperative hospitalization include the following:

- Presence of medical conditions that require prolonged postoperative observation by a nurse or skilled personnel
- Best correctable vision in the unoperated eye is 6/60 (20/200) or worse
- Patient is mentally debilitated or diagnosed as mentally ill
- Patient is non-ambulatory or cannot exercise self-care (or responsible care is unavailable) during the immediate postoperative period

The ophthalmologist has responsibility for the patient’s follow-up care until the eye is healed.

Depending upon the individual philosophy of the surgeon, a patient without signs or symptoms of possible complications should normally visit his/her ophthalmologist one to three times following surgery.

The first postoperative visit will normally be the day following surgery. More frequent postoperative visits to the ophthalmologist may be indicated if unusual findings and/or complications occur. Further visits will need to be arranged with the patient’s eye care professional until the eye is healed. Routine assessment following the surgery will need to be performed either by an ophthalmologist or an optometrist.

Components of each postoperative examination include:

- Visual acuity (each visit)
- Intraocular pressure measurement (each visit)
- External examination (each visit)
- Slit lamp exam (each visit)
- Patient counselling/education (each visit), except where the patient’s condition does not allow it
- Ophthalmoscopy: a dilated fundus exam to include the peripheral retina should be performed at least once during this postoperative period

The timing and frequency of refraction will depend on patient needs, the amount of astigmatism and the stability of the measurement. Sutures may be cut or removed by the ophthalmologist for the reduction of astigmatism. Usually, optical correction can be prescribed two to twelve weeks after surgery.

Preoperative Evaluation

While it is assumed that the ophthalmologist will perform most of the examination, certain aspects of the ophthalmological data collection may be conducted by another trained individual under the ophthalmologist’s supervision and with his/her review.

Surgery

Most cataract surgery is performed in an outpatient setting. However, inpatient surgery may be necessary because of the need for complex ocular, general medical and nursing care, and multiple ocular conditions or procedures.
All patients undergoing cataract surgery with local anaesthesia require monitoring by qualified personnel. It is the responsibility of the operating attending surgeon to be personally present and responsible during opening and closing of all wounds related to the surgery, delivery of the cataractous lens and (if performed) the insertion and position of the IOL.

**Follow-up**

Postoperative care should be rendered in a setting where adequate instrumentation is available to carry out a normal eye examination.

Surgery is the only known treatment for cataracts which is able to restore or significantly improve vision. Non-surgical treatment of cataracts is aimed at reducing or eliminating the impact of the cataracts, however, it does not make the cataracts go away.

The decision to proceed with cataract surgery should not be made by the ophthalmologist alone; the patient must make the decision based on subjective and objective criteria which are meaningful for him or her. Cataract surgery may be postponed until the patient is unhappy with his or her vision. To aid the patient in making an informed decision, the ophthalmologist should provide him or her with appropriate patient information. The ophthalmologist should also advise the patient of key issues such as the waiting period for surgery and the costs which might need to be borne by the patient.

**Note on the Applicability of this Guideline**

The conclusions reached by the Alberta CPG Cataract Working Group depend on a number of dynamic factors. This guideline will be reviewed and updated as required based on emerging evidence and no later than three years from the date of issue.
2. Agency for Health Care Policy and Research,
Toward Optimized Practice (TOP) Program
Arising out of the 2003 Master Agreement, TOP succeeds the former Alberta Clinical Practice Guidelines program, and maintains and distributes Alberta CPGs. TOP is a health quality improvement initiative that fits within the broader health system focus on quality and complements other strategies such as Primary Care Initiative and the Physician Office System Program.

The TOP program supports physician practices, and the teams they work with, by fostering the use of evidence-based best practices and quality initiatives in medical care in Alberta. The program offers a variety of tools and outreach services to help physicians and their colleagues meet the challenge of keeping practices current in an environment of continually emerging evidence.

To Provide Feedback
The TOP Program encourages your feedback. If you need further information or if you have difficulty applying this guideline, please contact:

Toward Optimized Practice Program
12230 - 106 Avenue NW
EDMONTON, AB T5N 3Z1
T 780. 482.0319
TF 1-866.505.3302
F 780.482.5445
E-mail: cpg@topalbertadoctors.org