CLINICAL PRACTICE GUIDELINE FOR THE MANAGEMENT OF CATARACT AMONG ADULTS

PHILIPPINE ACADEMY OF OPHTHALMOLOGY

In collaboration with the

Family Medicine Research Group-Department of Family & Community Medicine

University of the Philippines - Philippine General Hospital

Manila, Philippines
SUMMARY OF RECOMMENDATIONS

DEFINITION

Recommendation 1
In medical practice, cataract is defined as any opacity of the lens that may or may not be associated with visual problems and manifest as an obstruction of the red orange reflex on funduscop[y. (GRADE C RECOMMENDATION)

Recommendation 2
In medical practice the objective of management of cataract is a) correction of visual impairment, b) maintenance of quality of life and c) prevention of progression. (GRADE C RECOMMENDATION)

CLASSIFICATION

Recommendation 3
In family practice cataract should be classified according to types based on visual impairment using the Snellen's far and near visual testing. (GRADE C RECOMMENDATION). The classification types are the following:

- Type I is characterized by patients with visual acuity better than 20/40 in the affected eye/eyes
- Type II is characterized by patients having visual acuity of 20/40 or worse in the affected eye/eyes

PHYSICAL EXAMINATION

Recommendation 4
In family practice, funduscop[y (GRADE C RECOMMENDATION), visual acuity testing and pinhole (GRADE B RECOMMENDATION) should be done for all patients suspected to have cataract.

Recommendation 5
For patients suspected of having cataract, slit lamp examination, dilated funduscop[y and tonometry should routinely be done in opthalmologic practice. (GRADE C RECOMMENDATION)
DIAGNOSTIC PROCEDURES

Recommendation 6
For patients with suspected cataract whose visual acuity is 20/40 or better but referred to ophthalmology for further evaluation contrast glare sensitivity may be done to detect potential problems in nighttime vision. (GRADE C RECOMMENDATION)

DIFFERENTIAL DIAGNOSIS

Recommendation 7
Among patients suspected of having cataracts, the following causes of visual impairment should be ruled out: a) error of refraction, b) corneal opacities, c) glaucoma, d) retinopathy, and e) age-related macular degeneration. (GRADE B RECOMMENDATION)

PROGNOSTIC FACTORS

Recommendation 8
Among patients with cataracts, the following socio-demographic characteristics need to be elicited because it leads to poorer outcomes: a) age, b) sex, c) social strata, d) education, and e) race. (GRADE B RECOMMENDATION)

Recommendation 9
The following clinical entities such as: a) diabetes, b) hematologic disorders, c) rheumatoid disorders, d) alcohol abuse, e) ocular trauma and concomitant ocular symptoms, f) myopia/high EOR, and g) steroid use should also be elicited because they also lead to poor outcomes. (GRADE B RECOMMENDATION)

SURGICAL APPROACH TO MANAGEMENT

Recommendation 10
Among patients with cataracts, any one of the following may be an indication for surgery: a) patient’s preference and needs, b) functional disability as measured by Snellens’ visual acuity test and modified VF-14, c) cataracts with concomitant ocular problems (GRADE C RECOMMENDATION).
Recommendation 11
Prior to cataract surgery, the patient must be informed about the benefits, possible side effects and complications and costs of available alternative surgical and anesthesia procedures. (GRADE C RECOMMENDATION)

Recommendation 12
Pre-operatively, keratometry, biometry and LAI should routinely be done. (GRADE C RECOMMENDATION)

Recommendation 13
Among healthy adult patients scheduled for cataract surgery under local anesthesia, no routine preoperative medical testing is necessary. (GRADE A RECOMMENDATION)

For patients who are symptomatic and are at high risk of developing cardiopulmonary complications, pre-operative work-up may be done. (GRADE C RECOMMENDATION)

Recommendation 14
Among patients undergoing cataract surgery, small incision surgery (either by phacoemulsification or manual phacofragmentation) and extracapsular cataract extraction (ECCE) are acceptable techniques. (GRADE A RECOMMENDATION)

Recommendation 15
Among patients who will undergo cataract extraction, implantation of an intraocular lens is recommended. (GRADE A RECOMMENDATION)

Recommendation 16
While local anesthesia is recommended in majority of patients undergoing cataract surgery, general anesthesia may be used when indicated. (GRADE A RECOMMENDATION)

Recommendation 17
Among patients who will undergo cataract extraction, surgery on an out-patient basis is recommended. (GRADE B RECOMMENDATION)

Recommendation 18
Indications for second eye surgery in those with bilateral cataracts are the same as for the first eye. Timing of second eye surgery is best discussed by the surgeon and the patient; however simultaneous cataract extraction is not recommended. (GRADE C RECOMMENDATION)
Recommendation 19
Post-operatively, topical antibiotics, steroids or NSAIDs are recommended. (GRADE A RECOMMENDATION)

Recommendation 20
Post-surgery, close follow-up with refractive evaluation of the patient is recommended until best corrected vision achieved. (GRADE C RECOMMENDATION)

NON-SURGICAL OPTIONS

Recommendation 21
Non-surgical management is recommended in the following conditions; 1) patient’s refusal of surgery, 2) no visual disability, 3) best correction results in satisfactory visual function and 4) surgery is unlikely to improve visual function. (GRADE C RECOMMENDATION)

Recommendation 22
Refraction that affords the best visual function together with patient education is the only non-surgical option for cataract patients. (GRADE C RECOMMENDATION)

HEALTH EDUCATION

Recommendation 23
Patient education should include the following; 1) advice on modifiable risk factors, 2) advice on eventual need for surgery for non-surgical patients, 3) advice on all available surgical procedures and outcomes, 4) advice that to date no medications have been proven to retard the progression of age-related cataracts. (GRADE C RECOMMENDATION)

REFERRAL

Recommendation 24
Patients with type II cataracts and those with Type I suspected of having other ocular blinding conditions should be referred to an ophthalmologist. (GRADE C RECOMMENDATION)
METHODOLOGY

The development of this clinical practice guideline was a joint project of the Philippine Academy of Ophthalmology (PAO), the UP-PGH Department of Family and Community Medicine (DFCM-PGH) and the Family Medicine Research Group (FMRG).

This project is divided into four phases: 1) formulation of the initial draft; 2) consensus development; 3) dissemination and implementation; 4) evaluation of effectiveness. The role of the PHIC was to provide financial assistance and as process observers and their presence did not affect the final recommendations in any way.

Phase I  Formulation of the Initial Draft of the Clinical Practice Guideline

The Ad Hoc Committee on Clinical Practice Guidelines of the Philippine Academy of Ophthalmology and the Family Medicine Research Group formulated the initial draft of the clinical practice guideline. The committee stood as the technical research group responsible for determining questions to be answered in the literature review. Questions were centered on a general approach to adult patients suspected of having cataracts with or without functional impairment. The committee also searched and appraised the medical literature that was used as the basis for the recommendations. The committee consisted of representatives of the Philippine Academy of Ophthalmology deemed to be experts in their field with background knowledge of evidence-based medicine and residents and consultants from the Family Medicine Research Group who were trained in the application of evidence-based medicine concepts in family practice.

An electronic search using MEDLINE, OVID, Cochrane and other internet resources was conducted to search for clinical studies limited to humans, any language and all journal publications from 1966 to the present. The citations generated by the searches were examined for relevance to the questions generated on the basis of article titles and/or clinical abstracts available. Full-text retrieval was done at the UP-PGH Medical Library and other libraries in Metro Manila. To supplement the electronic search, references of the full-text articles retrieved were reviewed for other publications that might be relevant to the questions at hand and their own full-text articles retrieved. A manual search of the British Journal of Ophthalmology, American Journal of Ophthalmology, Archives of Ophthalmology, and Ophthalmology journal dated 1997 to the present was done to retrieve other relevant articles that could have been missed by the previous search strategies. In addition, the Philippine Academy of Ophthalmology and the PHIC also submitted a few items not previously identified through the systematic literature review and if deemed to be relevant these were included.
A systematic assessment of the validity of the retrieved full-text articles were done using the appropriate critical appraisal guides formulated by the Family Medicine Research Group which was a modification of the user’s guide of the Evidence-Based Medicine Working Group. Separate guide questions were used for articles on a) diagnosis, b) differential diagnosis. c) harm and causation, d) prognosis, e) therapy or prevention, f) meta-analysis and g) clinical practice guideline.

Recommendations were then graded according to the strongest evidence found following the modified Canadian Task Force on Preventive Health Care Grading of recommendations briefly broken down as follows:

**Table 1. Grades of Recommendations**

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<tr>
<td>A</td>
<td>Good evidence (at least 1 properly conducted randomized controlled trial) to support the recommendation that the alternative be specifically considered.</td>
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<tr>
<td>B</td>
<td>Fair evidence (evidence from well designed controlled trials without randomization, from well designed cohort or case control studies, comparisons between times and places) the recommendation that the alternative be specifically considered.</td>
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<tr>
<td>C</td>
<td>Poor evidence (descriptive studies, experts' opinion) regarding inclusion or exclusion of the alternative, but recommendations may be made on other grounds.</td>
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<tr>
<td>D</td>
<td>Fair evidence (at least 1 properly conducted randomized controlled trial) to support the recommendation that the alternative be specifically excluded from consideration.</td>
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<tr>
<td>E</td>
<td>Good evidence (evidence from well designed controlled trials without randomization, from well designed cohort or case control studies, comparisons between times and places) the recommendation that the alternative be specifically excluded from consideration.</td>
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**Phase II  Consensus Development**

The FMRG and the Technical Panel of the PAO formulated an initial draft. The draft was sent to the individual members of the FMRG and Technical Committee of PAO for comments and revisions. The final version of the guideline that appears here was made after 2 rounds of consensus using the Delphi method.

**Phase III  Dissemination and Implementation**

Dissemination will be done by publishing the guidelines and making it available via the internet. The Philippine Academy of Ophthalmologists and Family Medicine Research Group will be responsible to disseminate the guidelines to other ophthalmologists, family medicine specialists and general practitioners via an interactive lecture workshop session on critical appraisal of a CPG.

**Phase IV  Effectiveness of Implementation**

The effectiveness of the guideline should be measured one year after its effective dissemination and can be done by reviewing the claims made at PHIC and doing random chart reviews among ophthalmologists and family medicine practitioners who consent to join a chart audit.
SUMMARY OF EVIDENCE

DEFINITION

Recommendation 1
In medical practice, cataract is defined as any opacity of the lens that may or may not be associated with visual problems and manifest as an obstruction of the red orange reflex on funduscop
ey. (GRADE C RECOMMENDATION)

Summary of Evidence
The Agency for Health Care and Policy Research in 1993 defined cataract as any lens opacity in general or further be qualified as the presence of any lens opacity with loss of visual acuity. The American Optometry Association also adopted a similar definition but further stated that for it to be clinically significant; accompanying loss of visual acuity or some degree of functional impairment should be observed. The normal lens is clear thus allowing light to pass, lens opacity results in blockage of some of the light. This then leads to obstruction of the red-orange reflex.

For the purpose of this practice guideline a cataract is any opacity of the lens, whether it is a small local opacity or a diffuse general loss of transparency. This opacity may or may not be associated with visual loss. On further examination such as funduscop
ey, the red orange color of the retina may be diminished. A cataract-free lens is one in which the nucleus, cortex, and subcapsular areas are free of opacities; the subcapsular and cortical zones are free of dots, flecks, vacuoles, and water clefts; and the nucleus is transparent, although the embryonal nucleus may be visible.

The mechanism of cataract formation is multifactorial. Oxidation of membrane lipids, structural or enzymatic proteins, or DNA by peroxides or free radicals may be early initiating events that lead to loss of transparency in both the nuclear and cortical lens tissue.

In cortical cataract, electrolyte imbalance leads to over hydration of the lens, causing liquefaction of the lens fibers. Clinically, cortical cataract formation is manifested by the formation of vacuoles, clefts, wedges, or lamellar separations that can be seen with the slit lamp. Nuclear cataracts usually occur secondary to deamidation of the lens proteins by oxidation, proteolysis, and glycation. In addition, the central region of the lens acquires a murky, yellowish to brunescent appearance that is visible in optic section with the slit lamp.

Age-related cataracts are created by loss of lens fiber nuclei and replacement epithelial cells that aberrantly migrate toward the posterior pole. These epithelial cells cluster, form balloon cells, and interdigitate with adjacent lens fibers and the deeper cortical fibers, breaking them down. The result is the lacy, granular, iridescent appearance of age-related cataracts.
Recommendation 2
In medical practice, the objectives of the management of cataract are: a) correction of visual impairment, b) maintenance of quality of life and c) prevention of progression. (GRADE C RECOMMENDATION)

Summary of the Evidence
The treatment decision for the patient with cataract depends on the extent of his or her visual disability. Hence, correction of visual impairment and disability should be the primary purpose of treatment and the primary basis for choosing intervention.

Standardizing the acceptable level of visual acuity using objective measures is difficult. Some patients may be giving more importance to their motor skills than visual acuity. A solution to this is the use of quality of life as another important outcome to consider.

Visual impairment invariably leads to some degree of functional loss, the objective of a comprehensive management for a patient with cataract should include an improvement of this potentially debilitating condition. Loss of function in turn would lead to diminishing activities that the patient can engage in and subsequent loss of productivity. So this too should be addressed. Two longitudinal studies looking into the outcomes of cataract surgery have measured degree of improvement in visual impairment as measured by visual acuity and improvement in functional impairment and quality of life as measured by VF-14, self-reported trouble with vision and the Sickness Impact Profile score.8-9

With epidemiological data linking some modifiable factors such as weight, concomitant illness, lifestyle to progression of cataracts; one goal then in the comprehensive management of such patients would be prevention of progression through risk factor modification.10-11

CLASSIFICATION

Recommendation 3
In family practice cataract should be classified according to types based on visual impairment using the Snellen’s far and near visual testing. (GRADE C RECOMMENDATION). The classification types are the following:

Type I is characterized by patients with visual acuity better than 20/40 in the affected eye/eyes

Type II is characterized by patients having visual acuity of 20/40 or worse in the affected eye/eyes
Summary of the Evidence

Cataracts may be classified based on its etiology such as aging or secondary to hereditary factors, trauma, inflammation, metabolic or nutritional disorders, or radiation.\textsuperscript{4-5} Cataracts due to aging are the most common. The International Classification of Diseases 9\textsuperscript{th} Revision classified cataract into infantile/pre-senile, senile, traumatic cataract, cataract due to other ocular disorder, cataract associated with other medical disorder, congenital cataract and unspecified cataract. While this classification has epidemiological value, it does not help so much in making clinical decisions such as when to operate, what procedures to use, complications to be expected etc. and therefore cannot be recommended to be used in family practice.

Other grading systems have been advocated for use in epidemiological studies of cataract. The Lens Opacity Classification System (LOCS, LOCS II, and LOCS III).\textsuperscript{12-15} Photographs of slit lamp cross-sections of the lens are used as references for grading nuclear opalescence and nuclear color, and photographs of the lens seen by retroillumination are used as references for grading cortical and posterior subcapsular cataract. Most systems use a sequence of four photographs for each of the cataract characteristics to be evaluated but the recently introduced LOCS III system uses six photographic references. In these systems, a numerical grade of severity is assigned to each reference photograph, and to interpolate the appearance of cataracts that fall between the reference photographs clinicians can use decimals to grade the cataracts in finer incremental steps.\textsuperscript{16} Photographic evaluation systems are also not readily available and cannot also be recommended in family practice.

This classification was adopted based on the most commonly available evaluation tools for eye problems in family practice. This classification is based on medical history and simple physical examination which include funduscopy and Snellen’s visual acuity testing. Type I cataracts are the uncomplicated cases with best corrected visual acuity of better than 20/40 using a standard Snellen’s chart. Patients with this type of cataract may be managed conservatively. Type II cataracts are those with complicating conditions such as diabetes with best corrected visual acuity of 20/40 or worse using a standard Snellen’s chart. These patients should be considered as candidates for surgical intervention.

PHYSICAL EXAMINATION

Recommendation 4

In family practice, funduscopy (Grade C Recommendation), visual acuity testing and pinhole (Grade B Recommendation) should be done for all patients suspected to have cataract.
Summary of the Evidence
The goal of the physical examination is to confirm the presence of cataract, examine the presence of other conditions that may complicate visual impairment and outcome of cataract management.

The impact of cataract on the patient can be objectively evaluated by the Snellen's visual acuity testing. A retrospective cross-sectional study done by Tobacman et al in 1998 revealed an Odds ratio of 5.13 in impairment in performing activities of daily living for patients with VA of <20/100. The American Academy of Ophthalmologists in 1996 stated that the impact of cataract on patients' function can be measured in terms of Snellen visual acuity. Although, they qualified that alone it would not be sufficient to adequately describe the effect of cataract on a patient's visual status or functional ability.

Funduscopy is also important to evaluate the presence of other ocular conditions that may complicate a cataract such as glaucoma, retinal problems etc. Family physicians should be proficient in doing this procedure and recognizing other ocular problems.

Recommendation 5
For patients suspected of having cataract, slit lamp examination, dilated funduscopy and tonometry should routinely be done in ophthalmologic practice. (GRADE C RECOMMENDATION)

Summary of Evidence:
A thorough physical examination of both eyes should be done among patients suspected of having cataracts. The goals of which should be to confirm the diagnosis and to exclude the presence of other ocular or systemic conditions that might contribute to the visual impairment. The American Association of Ophthalmologists and the American Optometry Association Consensus panel in separate reports for the management of patients with cataracts recommend the routine performance of slit-lamp examination, dilated funduscopy and tonometry for all patients suspected of having cataracts. These examinations allow for assessment of the severity of the cataract and would screen for other eye conditions. In the comprehensive adult eye examination recommendations of the American Academy of Ophthalmologists in 1996: Visual acuity with present correction (the power of the present correction recorded) at distance and at near., Intraocular pressure measurement., Slit-lamp examination: eyelid margins and lashes, tear film, conjunctiva, sclera, cornea, anterior chamber and assessment of peripheral anterior chamber depth, iris, lens and anterior vitreous and examination of the fundus: vitreous, retina (including posterior pole and periphery), vasculature and optic nerve were among the examinations recommended. They went on further to add that examination of anterior segment structures routinely involves gross and biomicroscopic evaluation prior to and after dilation. Evaluation of structures situated posterior to the iris may require a dilated pupil for better visualization.
DIAGNOSTIC PROCEDURES

Recommendation 6
For patients with suspected cataract whose visual acuity is 20/40 or better but referred to ophthalmology for further evaluation contrast glare sensitivity may be done to detect potential problems in nighttime vision. (GRADE C RECOMMENDATION)

Summary of the Evidence
Contrast and glare sensitivity tests are now being used as adjuncts to visual acuity in the assessment of visual functions. Acuity tests assesses only a portion of the entire visual fields area and measures mainly one visual talent, specifically, the ability to resolve fine details at high contrasts such that it may not be sensitive enough to detect subtle changes in visual function. There are patients who may have normal visual acuity and may still complain of poor performance in certain activities such as face perception and night driving. In this light although contradicting evidence are present in literature as to the value of these tests, it is being recommended.

A study by Rubin et al in 1993 suggested that in some patients, significant disability glare was present which was not correlated with acuity. Post-operative evaluation of these patients showed that improvement in contrast sensitivity and disability glare was independent of the improvement in visual acuity. Hence the need to perform these tests.20 In another study by Pfoff et al in 1993, the authors concluded that there is a subset of patients with Snellen acuity of 20/50 or better, who complained of glare symptoms and had given up nighttime driving who would benefit from contrast-sensitivity testing. Post-operatively, these patients had significantly improved contrast sensitivity and were driving at night. A benefit that would have been missed if only Snellen visual acuity was done.21

A case-control study done by Lasa et al in 1992 assessed the association between contrast and glare sensitivity and the specific type of lens opacities. One hundred twenty-eight patients with various types of cataracts and no other ocular diseases were studied and compared with twenty-nine control volunteers (1:4 ratio). Results showed that nuclear opacity was not associated, but increased severity of cortical (P<0.0001) and posterior subcapsular (p=0.0001) opacities were associated with abnormal contrast sensitivity. This study concluded that significant contrast sensitivity loss was present only in the patients with cortical or posterior subcapsular cataracts in the advanced stages and was associated with decreased visual acuity.22 Another study done by Ariyasu et al in 1996 that contrast sensitivity had a specificity of 41% and sensitivity of 62%. However, despite these low values the authors concluded that it was still a useful screening tool for visually disabling or vision-threatening eye conditions.23
DIFFERENTIAL DIAGNOSIS

Recommendation 7
Among patients suspected of having cataracts, the following causes of visual impairment should be ruled out: a) error of refraction, b) corneal opacities, c) glaucoma, d) retinopathy, and e) age-related macular degeneration. (GRADE B RECOMMENDATION)

Summary of the Evidence
A study was done to describe the age-specific prevalence of common eye diseases causing visual impairment and estimate among Australians. The result showed that uncorrected refractive error was the most common cause of visual impairment across all decades of life, rising from 0.5% in 40- to 49-year-olds to 13% among those aged 80 years and older. The other causes were diabetic retinopathy was 0.7% in 50- to 59-year-olds and 0.8% in those older than 80 years, glaucoma had a prevalence of 0.7% among 60-year-olds and rose to 4% of those older than 90 years, age-related macular degeneration rose from 0.8% to 16% in those older than 90 years. In another study by Kaimbo wa Kaimbo et al about of causes of blindness in Zaire, they reported cataract (54%), glaucoma (30%), uveitis (6%), corneal disorder (5%), retinitis pigmentosa (3%), atrophy of eye (3%) as common causes of blindness in the region. Another prevalence study by Adeoye conducted in Nigeria in 1996 revealed the following causes of blindness with its corresponding prevalence: cataract and its sequelae (48.1%), onchocerciasis (14.8%), primary open angle type glaucoma (11.1%), corneal scar/phthisis bulbi (7.4%) and optic atrophy (7.4%). Thus among patients with cataract or visual impairment, these conditions should be considered as one of the differential diagnosis.

PROGNOSTIC FACTORS

Recommendation 8
Among patients with cataracts, the following socio-demographic characteristics need to be elicited because it leads to poorer outcomes: a) age, b) sex, c) social strata, d) education, and e) race. (GRADE B RECOMMENDATION)

Summary of the Evidence
The effect of age as a prognostic factor is supported by the study of Schein et al among 552 patients undergoing first eye cataract surgery. They concluded that pre-operative age of 75 and older increased the likelihood of not improving even after cataract surgery (OR=3.57). The prevalence of blindness among females with cataracts was significantly higher than in males as was shown by the study of Limberg and Kumar in 1998. Leske in an earlier study concluded that the female gender was a significant risk factor for the development of cataract.
The Beaver Dam Eye Study observed higher frequencies of cataracts among patients with lower education and lower incomes. This effect of education for the development of any type of cataract supported the earlier findings in the Lens Opacities Case-Control Study. In this study, it was concluded that patients with lower education had a 46% increased risk of developing cataracts.

The effect of race as a prognostic factor for the development of cataract can be seen from a study taken from random sample of 3821 residents of Salisbury, Maryland, between the ages of 65 and 84 years who were identified from Medicare records. The clinical examination included acuity testing with an Early Treatment Diabetic Retinopathy Study chart and standardized refraction testing for those with a visual acuity worse than 20/30, slitlamp and dilated retinal examination by an ophthalmologist, tonometry, lens and fundus photography, and a suprathreshold visual field test. The results showed that African Americans had higher rates of impairment and blindness from cataract or posterior capsular opacification (2.7% vs 1.1%; P=.006), glaucoma (0.9% vs 0.1%; P=.006), and diabetic retinopathy (1.2% vs 0.2%; P=. 004).

An earlier study done by Javitt in 1995 concluded that Black Americans are twice as likely to be blind and half as likely to receive treatment for cataract and glaucoma as their white counterparts. This result suggests that race can be a prognostic factor for the development of blinding cataracts.

**Recommendation 9**
The following clinical entities such as: a) diabetes, b) hematologic disorders, c) rheumatoid disorders, d) alcohol abuse, e) ocular trauma and concomitant ocular symptoms, f) myopia/high EOR, and g) steroid use should also be elicited because they also lead to poor outcomes. (GRADE B RECOMMENDATION)

**Summary of the Evidence**
A national survey of hospitals in the UK was done to examine clinical outcomes of cataract surgery. Based on a cohort of 18,000 patients, the results showed that patients without co-morbid illness had better visual acuity (85%) than patients with co-morbid illness(65%). The other risk indicators were age and presence of other eye diseases. Leske et al also in 1999 supported these findings by concluding that the high prevalence of cortical opacities was related to diabetes, hypertension, and abdominal obesity.

Ocular co-morbidity such as glaucoma, diabetic retinopathy and age-related macular degeneration was associated with non-improvement in symptoms after cataract surgery (OR=2.16) in a study by Schein et al.

In an earlier study by Leske et al, 1991, oral steroid use was shown to increase the risk for development of posterior subcapsular cataract (OR=5.83).
Alcohol intake was also found out to be a significant prognostic factor for the development of cataract. In the matched-control study by Munoz et al alcohol intake of more than seven drinks was found to increase the probability of developing cataract (odds ratio 4.6; p<0.05). Another study by Arango et al also confirmed that alcohol increases the probability of wound complications after cataract surgery with an odds ratio of 2.9 but the association was not statistically significant (95% CI 0.6 and 13.0). In this study, hematologic disorders was also a significant predictor of wound complications following cataract surgery (OR=2.9).

SURGICAL APPROACH TO MANAGEMENT

Recommendation 10
Among patients with cataracts, any one of the following may be an indication for surgery: a) patient’s preference and needs, b) functional disability as measured by Snellen’s visual acuity test and modified VF-14, c) cataracts with concomitant ocular problems (GRADE C RECOMMENDATION)

Summary of the Evidence
The final decision to undergo cataract surgery should be made by the patient based on the ophthalmologist’s recommendation after considering both subjective and objective criteria. The subjective criteria are the patients’ preferences and needs, self-assessed functional disability and quality of life. The objective criteria are the visual acuity tests and extent of cataract involvement after the recommended minimum testing by ophthalmologists.

Emphasis on patient’s subjective needs as the main indication for surgery has also been recommended by the AAO, Alberta Medical Association and the British Columbia council.

Recommendation 11
Prior to cataract surgery, the patient must be informed about the benefits, possible side effects and complications and costs of available alternative surgical and anesthesia procedures. (GRADE C RECOMMENDATION)

Summary of the Evidence
In most circumstances, there is no alternative to cataract surgery for correcting visual impairment and/or increasing functional ability. The patient should be provided information about the findings of the eye examination, the option of surgical intervention, and any factors that could adversely affect postoperative visual acuity or ocular health. Potential benefits and possible complications should be discussed. In addition, the patient should be advised that cataract surgery is an elective procedure in most cases that should be performed only if his or
her visual acuity and functional ability are compromised. This information should be provided before the patient decides whether or not to proceed with cataract surgery.

If the patient has made the decision to proceed with cataract surgery, the family physician should assist the patient in selecting the ophthalmic surgeon and making the necessary arrangements for the procedure. The family physician should provide the surgeon with the results of the diagnostic and presurgical examination.

Weinstock in 1993 in a non-systematic review article emphasized the need to inform patients of the risks and benefits of surgery as well as some measures that may delay the need for it. Kikuchi in 1996 reiterated the need for informed consent prior to cataract surgery. The article further states the following: 1. Preoperative detailed explanation loses its meaning unless it is thoroughly understood by the patient. 2. In reality, many patients have not thoroughly understood the content of informed consent. 3. Full understanding by patients as well as by their family members is important. Thus, the need for full disclosure is necessary.

Recommendation 12
Pre-operatively, keratometry, biometry and LAI should routinely be done. (GRADE C RECOMMENDATION)

Summary of the Evidence:
Keratometry, biometry and lacrimal apparatus irrigation are adjunctive tests that are recommended by a panel of experts in order to ascertain the presence of other ocular comorbid conditions.

Keratometry is the process of measuring the radius of the curvature of the anterior surface of the central optical portion of the cornea to determine refractive error. Goes in a 1998 article stated that measuring astigmatism and refractive errors will enable a surgeon to use the ideal technique in each individual case. Astigmatism-neutral as well as astigmatism-inducing techniques should be used. He further emphasizes the need for correct pre- and postoperative keratometry. The AAO in 1996 also based on a consensus agreement recommended routine keratometry for all pre-operative patients with cataract.

In a retrospective survey done by Yortson et al in 1999, preoperative biometry and IOL power calculation increased the proportion of eyes obtaining an uncorrected vision of 6/18 or better from 73.8% to 81.3% after surgery.

Lacrimal apparatus irrigation is done to check the patency of the nasolacrimal duct. Obstruction of this passageway might lead to infection and greater post-operative complications. However, Amon in a review of cases in 1991 questioned the routine performance of lacrimal apparatus irrigation claiming that in some instances this led to worsening of the microbial flora and graver infection.
Recommendation 13
Among healthy adult patients scheduled for cataract surgery under local anesthesia, no routine preoperative medical testing is necessary. (GRADE A RECOMMENDATION)

For patients who are symptomatic and are at high risk of developing cardiopulmonary complications, pre-operative work-up may be done. (GRADE C RECOMMENDATION)

Summary of the Evidence
The AHCPR in 1993 in reviewing articles on pre-operative medical evaluation of cataract patients concluded that unsatisfactory evidence was published to test its cost-effectiveness insofar as it prevents intraoperative and postoperative events or uncovers previously unrecognized disease.¹

A randomized controlled trial was done by Schein et al in January 2000 involving 19,557 elective cataract operations in 18,189 patients. Each planned cataract operation in a single eye was randomly assigned either to a routine pre-operative or no-testing group. The pre-operative laboratory tests requested for the testing group include a complete blood count, 12 lead electrocardiogram, serum electrolytes, urea nitrogen, creatinine and glucose. The two groups were comparable in terms of the center at which surgery was performed, age, sex, race, coexisting illness, ASA risk class and self-reported health status. This study revealed that the overall rate of complications (intraoperative and post-operative events combined) was the same in the two groups (31.3 events per 1000 operations). Analysis done was stratified according to age, sex, race, physical status and medical history and it revealed no benefit of routine testing prior a contemplated cataract surgery.⁴²

Based on this routine pre-operative medical evaluation for all cataract patients are not recommended here. However, in the light that many patients undergoing surgery are elderly and with co-morbid medical problems that cannot be discounted; pre-operative medical testing for this high risk group was recommended by an expert consensus.

Recommendation 14
Among patients undergoing cataract surgery, small incision surgery (either by phacoemulsification or manual phacofragmentation) and extracapsular cataract extraction (ECCE) are acceptable techniques. (GRADE A RECOMMENDATION)

Summary of the Evidence
Currently, the two most common cataract extraction procedures being done in the Philippines are phacoemulsification and extracapsular cataract extraction (ECCE).

Extracapsular cataract extraction by phacoemulsification uses an ultrasonic device that emulsifies the hard nucleus enabling the surgeon to remove the lens material by a suction device. This method allows smaller incisions. In extracapsular cataract extraction by nuclear expression the hard nucleus is removed from the capsular bag in one piece and the residual
cortex is removed by irrigation and aspiration. This procedure requires a larger incision and several sutures to close the wound.

A meta-analysis done by Powe et al in 1994, which involved 90 studies published between 1979 and 1990, reviewed the effectiveness and risks of modern cataract surgery. The study showed that complications of IOL malposition or dislocation and retinal detachment were no different for phacoemulsification vs ECCE (pooled OR of 1.1; 95% CI: 0.5-2.4 and pooled OR 1.1; 95% CI: 0.4-2.8). However, the proportion of eyes with vitreous loss was lower following phacoemulsification than ECCE (pooled OR 0.14; CI 95% 0.05-0.41).43

In terms of intra-operative and peri-operative adverse events, numerous studies comparing the aforementioned procedures have been done. A one-year prospective study done by Oshika et al in 1992 assessed the time course of change in intraocular inflammation after three cataract surgery procedures. It demonstrated that immediate postoperative inflammation was significantly greater in the larger incision surgery groups.44

Schein in 1994 concluded that phacoemulsification was a better procedure than ECCE in terms of immediate post-operative complications (RR of 0.79 and 0.85, respectively). However, after four months of cataract surgery, the two techniques are comparable in terms of adverse event rate (RR 1.15).45

Another study done by Montan et al in 1998 revealed that a higher percent of endophthalmitis occurred in patients who had ECCE at 0.27% and only 0.20% for phacoemulsification.47 However, a systematic review by Taban et al in 2005 has indicated an increasing incidence in endophthalmitis associated with the development of sutureless clear corneal incisions over the last decade.78

The strongest study to date is a meta-analysis done by Snellingen, T., et al and published in the *The Cochrane Library*, Issue 2, 2004. This review included six randomized controlled trials evaluating surgical treatment for 7828 people with age-related cataract. Phacoemulsification gave a better visual outcome than extracapsular surgery. In addition, the costs per procedure were not markedly different between the two techniques. Extrapolation of these results to other parts of the world where cataract surgery is very different must, however, be made with caution.74

Another Meta-analysis by Wei Li You in 2004 likewise showed results in favor of phacoemulsification in providing excellent and immediate visual rehabilitation.75

Phacoemulsification is considered the standard of care for cataract surgery in the developed world,76,78 however, the cost of equipment, training, consumables and maintenance should be considered in a developing country. There is evidence pointing to manual phacofragmentation, also known as Manual Small Incision Cataract Surgery (MSICS), done through a scleral tunnel that does not need to be sutured,77 as an acceptable and cost effective procedure in addressing the cataract backlog in the developing world. In the single masked randomized controlled trial
by Gogate, et al., MSICS showed better short term visual results than standard ECCE, particularly before correction, without a higher rate of complications or adverse outcomes, and at a marginally lower cost. 

Nonetheless, more local data are needed to compare the value and applicability of these different techniques in our country where cataract is still the leading cause of blindness. Ultimately, the choice of technique of surgery for uncomplicated cataract depends on the type of cataract, the surgeon’s skills and available resources.

**Recommendation 15**
**Among patients who will undergo cataract extraction, implantation of an intraocular lens is recommended. (GRADE A RECOMMENDATION)**

**Summary of the Evidence**

The Madurai Intraocular Lens Study was a randomized controlled trial designed to compare safety, efficacy, and quality of life outcomes after either intracapsular cataract extraction with aphakic glasses (ICCE-AG) or extracapsular cataract extraction with posterior chamber intraocular lens (ECCE-PCIOL). Thirty-four hundred patients with age-related cataracts and having a best-corrected visual acuity less than or equal to 20/120 in the better eye were randomly assigned to either of the two cataract operative procedures. The main clinical outcomes were safety (complication rates) and efficacy (best-corrected visual acuity at 1 year equal to or better than 20/40). The results of this study were released in a follow-up report by Prajna et al in 1998. It reported that visual outcome was better in the ECCE-PCIOL with 96.3% having visual acuity of 20/40 or better as compared to 90.7% in the ICCE-AG (p<0.001). The cumulative incidence of complication throughout one year was lesser in the ECCE-PCIOL with 7.7% as compared to ICCE-AG with 14.5% (p<0.001).

The last phase of the study completed by Fletcher et al involved a subset of 1,700 trial participants who received questionnaires before surgery, at 6 months after surgery, and at 1 year after surgery to measure visual functioning and vision-related quality of life. Patients receiving ECCE-PCIOL reported larger beneficial changes than did those receiving ICCE-AG, compatible with additional beneficial effects of a moderate magnitude for visual functioning and of a smaller beneficial magnitude for quality of life. All between-group differences were highly statistically significant (P < .00001). The beneficial effect of the PCIOL in this study should be interpreted in the background that different surgical techniques were used.

In terms of the type of IOL to be used, numerous studies have also been done to compare silicone, polymethylmethacrylate, polycrylic and hydrogel. Different studies yielded different results. As such any of these BFAD approved intraocular lenses are being recommended.

Four randomized controlled trials revealed the similarity of silicone, acrylic and polymethylmethacrylate IOLs in terms of post-operative inflammation, displacement and rate of
astigmatism. In a study by Hasyashi et al in 2000 comparing silicone, acrylic, and poly(methyl methacrylate) (PMMA) intraocular lens; they concluded that there were no statistically significant differences in rates of irregular astigmatism post-operatively. Wang et al in 1998 in a randomized controlled trial concluded that the stability of PMMA and silicone IOLs were the same after phacoemulsification. Jung et al in another randomized trial looking into degree of tilt and decentration of the lenses also concluded that neither IOL decentration nor tilt showed significant progression up to 2 months in eyes with a silicone multifocal or acrylic IOL when the IOLs were placed properly in the capsular bag. They further added that amount of decentration and tilt was similar between lens types hence verifying the results of an earlier study. Schauersberger in 2000 comparing post-operative flare and inflammation in one hundred twenty eyes that were prospectively randomized to receive a foldable silicone (Pharmacia 920), hydrogel (Bausch & Lomb Hydroview), methyl methacrylate/hydroxyethyl methacrylate (Mentor MemoryLens), or acrylic (Alcon AcrySof) IOL concluded no significant differences between the groups.

Results of other studies tended to favor a specific type of IOL. A study done by Hollick et al in January 1999 compared the visual acuity, Nd:Yag capsulotomy rates and percentage of posterior capsular opacification with polymethylmethacrylate (PMMA), silicone and polyacrylic IOL implants three years after surgery. The study was a randomized, prospective trial consisting of ninety eyes of 81 patients with an overall follow-up rate of 71%. Results showed that patients with polyacrylic IOL are less likely to require capsulotomy and at three years, polyacrylic lens were also associated with less posterior capsule opacification compared to polymethylmethacrylate (PMMA) and silicone (median: 56%, 40% and 10% for the PMMA, silicone and polyacrylic IOL groups, respectively at p=0.0001).

Another two year randomized prospective trial done by Hollick et al May 2000 compared the mean percentage of posterior capsule opacification and laser capsulotomy rates with polymethylmethacrylate, silicone and hydrogel IOL implants at one and two years post-operatively. Results showed that hydrogel IOL were associated with a significantly higher degree of Posterior capsule opacification and more laser capsulotomies than PMMA and silicone lens.

**Recommendation 16**

While local anesthesia is recommended in majority of patients undergoing cataract surgery, general anesthesia may be used when indicated. *(GRADE A RECOMMENDATION)*

**Summary of the Evidence**

The current trend for anesthesia care in cataract surgery to date is the use of local anesthesia. Norregaard in 1997 did a cross-sectional survey to determine international variations in anesthesia care for cataract surgery and found that the use of general anesthesia was less than 3% for cataract surgeries performed in the United States, Denmark and Canada. In a study by Barker et al in 1996 regarding comparison of side effects between general and local anesthesia;
they reported a higher incidence of nausea (21% vs. 3%) and sore throat (41% vs. 3%) in the
general anesthesia group. However eye bruising was significantly higher in the local anesthesia
group (15% vs. 39%). Keyl et al in a prospective clinical trial comparing heart rate variability
also concluded that general anesthesia had no disadvantageous effects on perioperative cardiac
autonomic tone compared with local anesthesia.

As such, although local anesthesia is the preferred method; however general anesthesia may be
used when any of the following conditions exist precluding the safe use of local anesthetics: a)
extremely anxious patient who is unable to cooperate with the surgical team; b) known allergy
to local anesthetics; c) presence of medical disorders that are best managed under general
anesthesia (severe back pain, postural problems).

The following evidence will center on the comparison of local anesthesia procedures currently in
use. Retrobulbar and peribulbar anesthetic injections, the common techniques used in cataract
surgery have persistently reported complications. Topical anesthesia has been used as an
alternative. A non-randomized study done by Huhnermann et al 1996, comparing topical
anesthesia and peribulbar injection, revealed that there were no significant differences in the
improvement of visual acuity and the opinion if the patients about pain during the operation.

A study done by Khurana et al in 1994 compared peribulbar anesthesia vs. subconjunctival
anesthesia. The results showed that peribulbar anesthesia is more effective than
subconjunctival anesthesia as regards to orbicularis akinesia (p<0.05) and ocular akinesia
(p<0.05). However, it also showed no significant difference in the sensory anesthesia, analgesia
and intraocular pressure changes in the two groups (p<0.05). Assessing the effectiveness of
the block was ideal in 80% of patients in the peribulbar group in comparison to 51% in the
subconjunctival group (p<0.005) resulting to a relative benefit of 1.6; however, the block was
unsatisfactory in 14% in peribulbar group and 30% in the subconjunctival group (p<0.05).

A study by Patel et al in 1996 evaluated and compared the efficacy of topical and retrobulbar
anesthesia for cataract extraction with IOL implantation. Patients (N=138) were prospectively
randomized to the topical (N=69) or to the retrobulbar (N=69) anesthesia group by permuted
block restricted randomization. The topical group received topical 0.75% bupivacaine and IV
midazolam and fentanyl for anesthesia while the retrobulbar group received IV methohexital
followed by retrobulbar block with an equal mixture of 2% lidocaine and 0.75% bupivacaine plus
hyaluronidase. Results showed that there was more discomfort among patients in the topical
group while anesthesia was administered (no pain during delivery of anesthesia: 41% in the
topical group and 96% in the retrobulbar group, p<0.0001). Regarding the level of pain during
surgery, mean pain scores was higher among the topical group (1.13) compared to retrobulbar
group at 0.203 though the difference was not statistically significant, p=0.35. Eighty three
percent (57/69) in the topical group and 91% (63/69) in the retrobulbar group reported a pain
score of zero during surgery (p>0.005). Post-operative pain levels of zero were reported by 81%
(56/69) patients in the topical group and 66 patients (96%) in the retrobulbar group (p<0.05)
showing that there was more discomfort post-operatively in the topical group.
Recommendation 17
Among patients who will undergo cataract extraction, surgery on an out-patient basis is recommended. (GRADE B RECOMMENDATION)

Summary of the Evidence:
Demand for cataract surgery is increasing and the need to allocate limited resources while not compromising patient's visual function and satisfaction has led to the concept of day case surgery. In an audit done by Strong et al in 1991; it was concluded that daycase or out-patient surgery for cataract did not affect rate of preoperative complications. Furthermore, they observed that only 2.1% of daycase admissions resulted in unplanned in patient admission on the day of surgery. These daycase admissions also had a much lower cancellation of surgery than the in-patient admissions (0.4% vs 5.1%). A more recent study by Atalla et al also concluded that many patients who are hospitalized overnight for cataract surgery could be safely treated as day cases. They also reported that only 2.1% of the admitted patients actually needed other active ophthalmic and/or medical interventions necessitating admission. They further stated that shifting to daycase could lead to health care savings.

Recommendation 18
Indications for second eye surgery in those with bilateral cataracts are the same as for the first eye. Timing of second eye surgery is best discussed by the surgeon and the patient; however simultaneous cataract extraction is not recommended. (GRADE C RECOMMENDATION)

Summary of Evidence:
Javitt et al in 1995 concluded that cataract surgery in the second eye resulted in clinically and statistically significant improvement in functional impairment.

The present panel concurs with the earlier statements made by the AHCPR regarding the timing of the second cataract surgery. No studies have been retrieved comparing simultaneous cataract extraction with delayed second eye surgery. There is difficulty of performing simultaneous surgery and the potential bruising of both eyes leading to greater functional impairment making the second eye surgery a better option. According to the AHCPR, the following should serve as guides for the timing of the second eye surgery: a) vision of the second eye has recovered sufficiently; b) patient had enough time to assess the visual results of the first eye surgery; c) adequate time has passed to detect and treat the complications of the first eye surgery.

Recommendation 19
Post-operatively, topical antibiotics, steroids or NSAIDs are recommended. (GRADE A RECOMMENDATION)
Summary of the Evidence

Surgical manipulation of the internal structures of the eye produces varying degrees of inflammation. Corticosteroids have been used to diminish postoperative inflammation and recently, non-steroidal anti-inflammatory cyclooxygenase inhibitors have been evaluated as an alternative. The three studies cited here support the comparable effectiveness of corticosteroids and NSAIDs.

A randomized study done by Calvin et al 1995 comparing topical diclofenac with prednisolone for post-cataract inflammation showed that at one week and one month, the inflammation scores for the diclofenac group were lower than for the prednisolone group but the difference was not statistically significant. By one-month post-operative, the mean decrease in intraocular pressure in the prednisolone group was 0.9 mm Hg and the mean decrease in the diclofenac group was 4.7 mm Hg. However, the difference between the two groups was not statistically significant (p=0.074).

A 6-week, partially masked, three-arm study done by Ostrov et al 1997 evaluated the postoperative anti-inflammatory efficacy of 0.5% ketorolac, 1% prednisolone acetate or 0.1% dexamethasone instilled into the operative eye three times daily from 1 day before surgery to four weeks after surgery. This study showed that ketorolac is as effective as glucocorticoids.

A randomized, prospective placebo controlled study on the effects of diclofenac sodium in reducing ocular inflammation following ECCE and PCIOL. A significant reduction in inflammation and improvement in visual acuity was seen in the diclofenac group. Another randomized double-masked prospective clinical trial comparing the effects of ketorolac 0.5% and Diclofenac 0.1% ophthalmic solutions on inflammation after cataract surgery was done by Flach et al in 1998. A total of 120 patients was assigned and treatment with either ketorolac or diclofenac ophthalmic solutions. Results showed that the anti-inflammatory effects of the two treatment regimens were not statistically different at any of the post-operative visits.

Recommendation 20

Post-surgery, close follow-up with refractive evaluation of the patient is recommended until best corrected vision achieved. (GRADE C RECOMMENDATION)

Summary of Evidence:

There is an absence of strong evidence indicating the regularity of follow-up for cataract patients during the post-operative period. The AAO recommends that 1st visit be scheduled 48 hours following surgery with the goal of detecting and treating complications while the AHCPR recommends it to be done the 1st day post-surgery.

Since outcomes vary depending on individual patient characteristics and type of surgery performed; frequency and timing of visits are best discussed by the physician and patient.
Since the goal of surgery is to improve visual function, follow-up of patients until best possible vision is achieved becomes necessary.

NON-SURGICAL OPTIONS

Recommendation 21
Non-surgical management is recommended in the following conditions; 1) patient’s refusal of surgery, 2) no visual disability, 3) best correction results in satisfactory visual function and 4) surgery is unlikely to improve visual function. (GRADE C RECOMMENDATION)

Summary of the Evidence
Medical ethics dictate that the right of the patient to refuse any intervention be respected after the patient has been properly educated as to the need for surgery and the benefits of the contemplated procedure has been highlighted.

Most people over the age of 60 years have some degree of cataract formation. However, some persons do not experience a decrease in visual acuity or have symptoms that interfere with their activities of daily living. Still, others may be satisfied with the correction afforded by lenses. If the patient has few functional limitations as a result of the cataract and surgery is not indicated, it may be appropriate to follow the patient at 4 to 12-month intervals to evaluate eye health and vision and to determine whether functional disability develops.

It is important for patients to have a basic understanding of cataract formation, the ocular signs and symptoms associated with cataract progression, and the risks and benefits of surgical and nonsurgical treatments. Patients should be encouraged to report all ocular symptoms such as blurred vision, decreased vision in glare or low-contrast conditions, diplopia, decreased color perception, flashes, or floaters. Because most cataracts progress over time, it is important that patients understand that timely follow up examinations and management are important for proper decision-making and intervention to prevent further vision loss.

If surgery would not afford improvement in visual function or would pose a greater threat to the patient’s functional status; it would be prudent to inform the patient of such and advice against any form of surgery.

Recommendation 22
Refraction that affords the best visual function together with patient education is the only non-surgical option for cataract patients. (GRADE C RECOMMENDATION)
Summary of Evidence
Cataracts may cause refractive error, blurring of vision, reduced contrast, and glare problems. The initial treatment for Type I cataracts may include changing a spectacle or contact lens prescription to improve vision, incorporating filters into the spectacles to decrease glare disability, advising the patient to wear brimmed hats and sunglasses to decrease glare. Changing the lens prescription to compensate for any changes in refractive error will often significantly enhance the patient’s vision. To date there has been no evidence supporting the effectiveness of ophthalmic drops in retarding the progression of visual loss in patients with cataracts.

HEALTH EDUCATION

Recommendation 23
Patient education should include the following; 1) advice on modifiable risk factors, 2) advice on eventual need for surgery for non-surgical patients, 3) advice on all available surgical procedures and outcomes, 4) advice that to date no medications have been proven to retard the progression of age-related cataracts. (Grade C Recommendation)

Summary of the Evidence
Patient education is a vital part of the comprehensive management of any patient suspected of having a cataract. Since prevention of progression is one of the goals of management, advice on modifiable risk factors is one of the cornerstones of health education.

A prospective cohort study conducted by Christen et al (1992) revealed that cigarette smoking increases the risk of developing posterior subcapsular cataract (RR=3.17). In a case-control study done in 1993 by Munoz et al. revealed that heavy alcoholic drinkers were more likely to develop posterior subcapsular cataracts than were non-drinkers (OR=4.6). A study done by Hiller et al in 1997 revealed that a BMI of >/=27.8 was related to the development of all types of cataract (OR=1.47). In a study by Leske et al (1998) they concluded that diabetes (OR=2.3), hypertension (OR=1.49) and central obesity (OR=1.36) were related to cortical opacities in a black population. Interventions then to modify these risk factors are advised especially in populations in which they are highly prevalent to control potential visual impairment.

The patient should also be advised of how the cataract might affect performance of visual tasks and visually guided activities. For example, an individual who has 20/50 Snellen visual acuity in each eye, but elects to defer cataract surgery, should be advised of the possible risks due to impaired ability to perform tasks such as driving a car or operating machinery. Since the loss of vision among cataract patients is progressive, it is important to advice patients of the eventual need for surgery in most cases.
Since today's technological advancements has led to the development of different techniques of cataract extraction, the availability of different types of intraocular lenses, anesthesia and post-operative medications; it is vital that the patient be informed as to the availability of these options and their subsequent outcomes. This is done to enable the patient to make educated decisions regarding the management best suited for their individual needs.

REFERRAL

Recommendation 24
Patients with type II cataracts and those with Type I suspected of having other ocular blinding conditions should be referred to an ophthalmologist. (GRADE C RECOMMENDATION)

Summary of Evidence
The care of the patient with cataract may require a referral to an ophthalmologist, for the services outside the family physician’s scope of practice. During this time, coordination between the family physician and the ophthalmologist is vital, in order to provide the patient the best possible care.
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