Cataract Surgery

FOR CONSULTATION

13 February 2013
1 Cataracts

1.1 Scope of HTA

This health technology assessment (HTA) evaluates the appropriateness and potential impact of introducing clinical referral or treatment thresholds for cataract surgery, a high volume scheduled surgical procedure within the publicly funded healthcare system in Ireland. The effectiveness of cataract surgery may be limited unless undertaken within strict clinical criteria.

The scope of this HTA is to investigate clinical referral and treatment thresholds for surgery for adults presenting with symptoms of cataract in Ireland. It does not cover juvenile cataract surgery or cataract surgery for lens-induced disease (phacomorphic glaucoma, phacolytic glaucoma, and other lens-induced disease) or cataract surgery in those with concomitant ocular disease that requires clear media (such as diabetic retinopathy). Input from an expert advisory group, along with a review of the clinical and cost-effectiveness literature was used to inform the criteria. Additionally the budget impact and resource implications were assessed, where appropriate.

1.2 Surgical indication

A cataract occurs when the lens, which is used to fine focus the image within the eye, becomes clouded (opacification). It usually develops over a period of time causing gradual eyesight deterioration, involving increasingly blurred and cloudy vision, glare, and may eventually lead to blindness.

Cataracts may develop in one eye only or in both eyes at the same time, although there may be significant difference in the degree of cataract present at a single time point. The rate of decline in vision is variable and unpredictable. Poor vision is a risk factor for falling which can cause major clinical injuries, hospital admissions, and limit independence. 

Cataracts are a common problem. Although they can occur at any age, incidence increases with increasing age; by the age of 75, a quarter of all people will have developed a cataract. Other risk factors for cataracts include: diabetes mellitus, smoking, alcohol, corticosteroid use and high Ultraviolet B exposure.
1.3 Surgical procedure, potential complications and alternative treatments

Surgical treatment involves removing the patient’s cloudy lens and implanting an artificial lens. Phacoemulsification is the preferred technique for cataract surgery. This involves using an ultrasound probe to break the opacified lens into tiny pieces, which are removed through a small incision in the cornea. This technique is used in the majority of cases in Ireland. However, there are a small number of instances where large-incision manual extracapsular cataract extraction may be the preferred option. An intra-ocular lens is then inserted through the incision.

During early cataract development, visual improvement may be achieved through a number of non-surgical means including: changes in glasses prescriptions, strong bifocals, tinted lenses, dilation of the pupil for small central cataracts, magnifying lenses and appropriate lighting. However, without cataract surgery, vision in the affected eye will continue to deteriorate and the only effective treatment to restore vision is the surgical removal of the affected lens.

Cataract surgery is widely perceived to be a safe procedure. Risks include anaesthetic and surgical complications. The majority of cases are done under local anaesthetic which has reduced the potential risks. Serious complications include endophthalmitis (0.02%-1.16%\(^1;3;6\)), toxic anterior segment syndrome, cystoid macular oedema (1.2%-3.3%\(^1;3\)), persistent corneal oedema, retinal detachment (0.26%-4\(^1\)), haemorrhage (0.06%-0.5%\(^1;3\)), decreased vision and general complications associated with surgery in the elderly.\(^1;5\) The most common post-operative complication is posterior capsular opacity which may occur in up to 40% of patients ten years postoperatively,\(^1;5\) although it is less common following phacoemulsification. It can be treated with Nd:YAG laser capsulotomy surgery.

1.4 Current practice in Ireland

In 2011, data from the Hospital Inpatient Enquiry (HIPE) scheme indicate that there were approximately 9,500 discharges from public hospitals for patients who had undergone cataract surgery.\(^8\) Eighty percent of these patients were over 65 years of age, with 18% of all patients classified as private. Cataract surgery is a high volume surgery in Ireland with, extracapsular crystalline lens extraction by phacoemulsification featuring in the top 20 day case procedures performed annually in public hospitals since 2005, and accounting for approximately 1% of all day case procedures.\(^9\)
The majority of patients are suitable for day case surgery under local anaesthesia, with a large shift from in-patient to day case surgery seen in recent years. In 2005, just 56% of cases were treated as day-patients compared to 90% of procedures in 2011. The average length of stay for those treated as in-patients was 3.3 in 2011.

The rate of cataract surgery varies across regions with a significantly higher rate seen in the West in 2011. There is also considerable regional variation in day case rates; 95% of cataract procedures in the Western region were conducted as day case procedures in 2011 compared to 82% of procedures in the Southern region. It is possible that the proportion treated as day cases may rise, although a full 100% will not be achievable, as a small number of patients will continue to require surgery under general anaesthesia and need inpatient treatment (e.g., co-existing ocular disease and unrelated conditions that limit the ability to conduct surgery safely under local anaesthetic such as a severe cognitive impairment).
Figure 1.2 Percentage of cataract procedures* performed as day cases 2005-2011.

Table 1.1 HIPE data per health region (2011).

<table>
<thead>
<tr>
<th>Health Region</th>
<th>Number of cataract procedures*</th>
<th>Directly standardised rate per 10,000**</th>
<th>Inpatient Bed-days</th>
<th>% Day case</th>
<th>Avg. age</th>
</tr>
</thead>
<tbody>
<tr>
<td>North East</td>
<td>1538</td>
<td>15.4</td>
<td>690</td>
<td>94%</td>
<td>70</td>
</tr>
<tr>
<td>Mid East</td>
<td>2480</td>
<td>18.8</td>
<td>704</td>
<td>87%</td>
<td>71</td>
</tr>
<tr>
<td>Southern</td>
<td>2105</td>
<td>15.4</td>
<td>993</td>
<td>82%</td>
<td>74</td>
</tr>
<tr>
<td>Western</td>
<td>3462</td>
<td>28.3</td>
<td>862</td>
<td>95%</td>
<td>74</td>
</tr>
</tbody>
</table>

* HIPE ICD-10AM/ACHI procedure blocks 0195-0202, all procedures, note one individual may receive up to two cataract procedures

** Rates are standardised for age and based on area of residence, Census 2011

Patients with a cataract who require surgery are generally referred for an outpatient consultant appointment by their general practitioner (GP), with a small number being referred directly by an optometrist. For a large proportion of individuals their cataract will be first diagnosed at an optometrist’s practice however all public patients require a referral direct from their GP to receive an ophthalmologist outpatient appointment. At present, there are no standardised referral criteria that are routinely used to prioritise referrals. This can result in unnecessary outpatient appointments and difficulties in triaging patients according to symptom severity. In February 2012, 6% of all outpatient referrals were for ophthalmology.
Although all patients will eventually need cataract surgery, it is suggested that up to 50% of those seen in outpatient clinics are considered not appropriate for surgical treatment when first seen and are instead scheduled for review in 6-12 months.\textsuperscript{(14)} As of December 2012, 4,266 people were on hospital waiting lists for cataract surgery, with almost 1 in 5 (19%) waiting over six months.\textsuperscript{(15)} Post surgery patients need a follow-up appointment to ensure the eye is recovering well. Previously this had been carried out at hospital as an outpatient appointment however through the post-cataract referral scheme some of these appointments are now being carried out by optometrists in the community.\textsuperscript{(17)}

2 Clinical referral/ treatment threshold

2.1 Review of the literature

A literature search was conducted during January 2013. The approach and general search terms are described in the separate appendix accompanying this document.

<table>
<thead>
<tr>
<th>Publication Type</th>
<th>Number</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical Guidelines</td>
<td>7</td>
<td>(1;3-7;18)</td>
</tr>
<tr>
<td>Literature reviews</td>
<td>2</td>
<td>(19;20)</td>
</tr>
<tr>
<td>Clinical Studies</td>
<td>3</td>
<td>(21-23)</td>
</tr>
<tr>
<td>Cost-effectiveness studies</td>
<td>1</td>
<td>(24)</td>
</tr>
</tbody>
</table>

2.2 Clinical evidence

For a cataract to be clinically significant, it must cause significant reduction in visual acuity, functional ability or both. Seven clinical guidelines for cataract surgery were found which specifically mention referral criteria for cataract surgery (Appendix 2).\textsuperscript{(1;3-7;18)} These guidelines highlight and recommend best practice based on the available evidence base. Within the UK National Health System (NHS), a number of primary care trusts (PCTs) have set their reimbursement policy for cataract surgery through the creation of defined clinical referral however a recent evaluation found that the majority of the criteria used were not based on national guidance or scientific evidence.\textsuperscript{(25)} Some examples of these referral thresholds are included in Appendix 2.\textsuperscript{(26-31)}

The Snellen Visual Acuity test is widely used to assess distance refractive error (such as hyperopia, myopia and astigmatism) in healthy eyes. It forms an explicit element of the referral criteria in guidelines in New Zealand\textsuperscript{(18)}, British Columbia\textsuperscript{(5)}, and the
US(4) and, through its use in assessing legal driving limits, it is also considered in other Canadian guidelines.(6;7) The Snellen visual acuity test also features in all PCT thresholds.(26-31) Visual standards for driving in Ireland, which have been endorsed by the Irish College of Ophthalmologists, require a visual acuity of 0.5 (6/12) or greater and also include specific guidelines on contrast sensitivity and glare,(32) both of which can affect those with cataracts. The medical fitness to drive guidelines, which include the visual standards, were updated in January 2013, with no major change to the required visual standards.(33)

There is evidence that using Snellen acuity alone is not a good predictor for those who will benefit from cataract surgery,(1) and self reported information relevant to a patient’s every day visual experience in the context of their own environment should be used in conjunction with standard visual function testing when deciding on surgery.(3) In addition to tests for visual acuity, the impact on the functional disability of the patient forms one of the criteria for referral for cataract surgery in all the guidelines reviewed.(1;3-7;18) How the functional disability is assessed varies across guidelines with some using a defined questionnaire(18) and others providing no defined criteria apart from a subjective assessment of the impact on the patient’s lifestyle.(3)

Assessing the extent to which a patient’s functional visual ability has been reduced by a cataract is critical in identifying patients suitable for referral for cataract surgery.(20) This is dependent on the individual’s own circumstances, for instance those who drive or require good eyesight for employment, may experience a greater reduction in their functional ability than those who do not. There are a number of validated instruments that can be used to assess visual functional status: Bernth-Peterson, Visual Activities Questionnaire, Activities of Daily Vision Scale (ADVS), Visual Function-14 (VF-14), Visual Function-8R (VF-8R), National Eye Institute Visual Function Questionnaire (NEI-VFQ) and Catquest-9SF. However, currently there is no single universally accepted questionnaire in clinical use.(1;3)

Tools have also been developed which combine both visual acuity and functional disability into one questionnaire. For example Churchill et al. (22) developed a short instrument which combines, five aspects: visual acuity; clinical modifiers; ability to work, give care, live independently; additional disabilities and extent of visual impairment into a single score. A modified version of this is in use in New Zealand (included in the Appendix page 17).(18) The Western Canada priority criteria tool(34) combines visual acuity, glare, ocular co-morbidity, visual impairment, other disability, ability to live independently and a clinical urgency rating; this has been validated and is used in Western Canada.(21)
These tools along with highlighting which patients require surgery also apply a scoring system which enables prioritisation of those patients with the most urgent clinical need. How they prioritise patients varies across tools with some applying more weight to lifestyle issues and others more to visual acuity measures.\(^\text{(35)}\) It is not clear which tool would be most relevant in the Irish context.

There is evidence that a formal preoperative assessment of the appropriateness of cataract surgery predicts postoperative improvement, with surgeries in those deemed as inappropriate experiencing a much smaller or no improvement post surgery.\(^\text{(23)}\) Hodge et al\(^\text{(19)}\) performed a systematic review of 27 studies, which investigated the consequences of waiting for cataract surgery. They found those that waited longer than 6 months experienced more vision loss, a reduced quality of life and increased falls compared with those waiting less than 6 weeks. However, the outcomes for patients waiting between 6 weeks and less than 6 months were unclear. There was little evidence available on the effect of vision loss or functional ability on these outcomes.

### 2.3 Cost-effectiveness evidence

Cataract surgery is considered an effective and cost-effective procedure, both in developed and developing countries.\(^\text{(36)}\) However, its cost-effectiveness for those patients who gain little or no significant improvements in visual acuity or functional ability is less clear.

In a study published in 2006, Naeim et al.\(^\text{(24)}\) examined the cost-effectiveness of cataract surgery versus watchful waiting in patients who had less than a 30% predicted probability of reporting improvements in visual function after surgery in the US. Patients were randomised to both groups; effectiveness was evaluated at 6 months post surgery using the ADVS and the Health Utilities Index (HUI3). A societal cost perspective was adopted. They estimated an incremental cost-effectiveness ratio (ICER) of $38,288 per quality-adjusted life year (QALY); this was considered cost-effective. However, for a subgroup of patients with a lower predicted probability of improvement, of 20%, the ICER was $53,500/QALY. They concluded that there may be a subgroup of patients, for whom a strategy of watchful waiting may be equally effective and considerably less expensive.\(^\text{(24)}\)

### 2.4 Budget impact and resource implications

Without any clear guidance on referral criteria in place for cataract surgery in Ireland, there is inevitably variation in referral patterns to outpatient clinics. It is suggested that up to 50% of those referred to outpatient clinics for cataract surgery are not suitable candidates for surgery when first seen, and are typically scheduled for
review in 6-12 months.\textsuperscript{(11;14)} Across all specialities, approximately 38% of individuals seen in outpatient clinics between 2005 and 2011, through the NTPF, were referred back to their GP without receiving surgical treatment.\textsuperscript{(10)} Implementing referral criteria would potentially reduce the number of unnecessary hospital outpatient appointments leading to a more efficient use of resources and a reduction in waiting times for patients.

The number of cataract surgeries performed is not expected to reduce. Given the rapidly rising population aged 65 years and older, need and demand for surgery is likely to increase. Instead it is hoped that introducing clinical referral and treatment thresholds would lead to an improved patient pathway: a reduction in inappropriate referrals would reduce the demand for outpatient appointments; the use of standardised referral criteria would enable better triaging of those referred for review. This should lead to those with a higher clinical need being seen and undergoing surgery earlier, with a potential reduction in waiting times for both outpatient appointments and surgery. The current estimated annual national cost of cataract surgery is €17.6million, based on the latest casemix costs (Table 2.2). Further increases in the percentage of patients undergoing surgery as a day case would reduce the overall cost of this care, releasing beds and resources for use and thus improving efficiency.

Table 2.2 Ready reckoner data reported in 2012 (based on 2010 activity).\textsuperscript{(37)}

<table>
<thead>
<tr>
<th>DRG code</th>
<th>Description</th>
<th>Cost/case (€)</th>
</tr>
</thead>
<tbody>
<tr>
<td>C15</td>
<td>Glaucoma/CX Cataract Procs (Day case)</td>
<td>1,510</td>
</tr>
<tr>
<td>C15A</td>
<td>Glaucoma/CX Cataract Procs (Inpatient)</td>
<td>4,458</td>
</tr>
<tr>
<td>-</td>
<td>Outpatient Appointment</td>
<td>139</td>
</tr>
</tbody>
</table>

### 2.5 Advice on clinical referral/ treatment threshold

Due to a lack of consensus in the international guidelines, there is no one tool that can be recommended for use as a referral threshold for cataract surgery. There is a need for clear surgical referral criteria. These should consist of a measure of visual acuity in conjunction with a measure of the effect of the cataract on a patient’s lifestyle. This should be applied in the primary care setting prior to referral to an outpatient clinic, and should be quick and easy to use, and be able to distinguish between those patients who would benefit most from surgery, how urgently they need to be seen and those who would be better served through watchful waiting or non surgical interventions.
Therefore, the following criteria are advised:

<table>
<thead>
<tr>
<th>The presence of a cataract does not in itself indicate a need for surgery. The decision to refer a patient for surgery should be based on consideration of their visual acuity, visual impairment and their potential for functional benefits.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cataract surgery is justified and appropriate when the patient experiences one, or more of the following:</td>
</tr>
<tr>
<td>• The best corrected visual acuity score is 6/12 or worse in the affected eye</td>
</tr>
<tr>
<td>• Difficulty carrying out everyday tasks such as recognising faces, watching TV, cooking, playing sport/cards etc.</td>
</tr>
<tr>
<td>• Reduced mobility, unable to drive or experiencing difficulty with steps or uneven ground</td>
</tr>
<tr>
<td>• Ability to work, give care or live independently is affected.</td>
</tr>
<tr>
<td>A patient should not be referred for cataract surgery if:</td>
</tr>
<tr>
<td>• The patient does not desire surgery</td>
</tr>
<tr>
<td>• Glasses or other visual aids provide functional vision satisfactory to the patient</td>
</tr>
<tr>
<td>• The patient’s quality of life or ability to function is not compromised</td>
</tr>
<tr>
<td>• The patient has concomitant ocular disease where functional improvement is unlikely.</td>
</tr>
</tbody>
</table>

Patients who are not referred for surgery should remain under the care of their GP and optometrist and be reassessed at 1 to 2 year intervals as appropriate.

Exceptions to the above criteria include; juvenile cataract, lens-induced disease (such as phacomorphic glaucoma, phacolytic glaucoma, and other lens-induced disease), and cataracts in patients with concomitant ocular disease that require clear media (such as diabetic retinopathy) for which cataract surgery is indicated. Individuals with any one of these indications, or where these are suspected, should be referred to an ophthalmologist.

### Discussion

Cataracts are a progressive disorder gradually leading to a reduction in sight, with surgery the only means to restore vision. However, in the early stages, patients can be effectively managed through non-surgical interventions; undergoing surgery at this time would provide little clinical benefit, but entails all the associated risks and costs. Without any clear referral criteria in place in Ireland for cataract surgery, this has inevitably lead to variation in the referral patterns, with up to 50% of those referred to outpatient clinics considered not suitable candidates for surgery when first seen.
The aim of implementing standardised referral criteria is to ensure that all patients receive the right care, at the right time and in the right setting. By implementing referral thresholds, patients would attend hospital only when appropriate, and remain under the care of their primary care practitioner until then. This would potentially improve the patient pathway through reducing unnecessary hospital appointments, leading to a reduction in waiting times for these appointments, improving access for those with the greatest clinical need and providing a more efficient use of resources.

There are a number of examples internationally where referral criteria have been agreed and implemented. However, while there is agreement that criteria used should consider both visual acuity and the effect on the patient’s lifestyle, there is no consensus on how this should be achieved, with a range of different systems in use. Using a short validated triage tool which combines aspects of vision and lifestyle together which could be implemented in a GP or optometrist’s setting would be the preferred option. The tool used in New Zealand included in the Appendix is an example of this type of triage tool. This would lead to greater clarity and transparency in the system, allow for improved equity of access and facilitate clinical audit.
References


(8) HIPE. *Hospital In-Patient Enquiry (HIPE) Portal data.* 2013.


(13) HSE. *Outpatient Data Quality Programme Update February 2012* [Online].

(15) National Treatment Purchase Fund (NTPF). *Hospital elective surgery waiting list data (December 2012).* 2012.

(16) Lottering, L. Personal communication. 2012.


(30) NHS Nottinghamshire County & NHS Nottingham City. *Commissioning Policy covering procedures of limited clinical value* [Online].


(33) Road Safety Authority. *Medical Fitness to Drive Guidelines (Group 1 drivers).* 2013.

(34) Western Canada Waiting List Investigators. *Cataract surgery priority criteria tool* [Online].


### Appendix 1 Coding

<table>
<thead>
<tr>
<th>HIPE Block code</th>
<th>Procedure code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>195</td>
<td>42698-00</td>
<td>Intracapsular extraction of crystalline lens</td>
</tr>
<tr>
<td></td>
<td>42702-00</td>
<td>Intracapsular extraction of crystalline lens with insertion of foldable artificial lens</td>
</tr>
<tr>
<td></td>
<td>42702-01</td>
<td>Intracapsular extraction of crystalline lens with insertion of other artificial lens</td>
</tr>
<tr>
<td></td>
<td>42698-01</td>
<td>Extracapsular extraction of crystalline lens by simple aspiration (and irrigation) technique</td>
</tr>
<tr>
<td></td>
<td>42702-02</td>
<td>Extracapsular extraction of crystalline lens by simple aspiration (and irrigation) technique with insertion of foldable artificial lens</td>
</tr>
<tr>
<td></td>
<td>42702-03</td>
<td>Extracapsular extraction of crystalline lens by simple aspiration (and irrigation) technique with insertion of other artificial lens</td>
</tr>
<tr>
<td>196</td>
<td>42698-02</td>
<td>Extracapsular extraction of crystalline lens by phacoemulsification and aspiration of cataract</td>
</tr>
<tr>
<td></td>
<td>42702-04</td>
<td>Extracapsular extraction of crystalline lens by phacoemulsification and aspiration of cataract with insertion of foldable artificial lens</td>
</tr>
<tr>
<td></td>
<td>42702-05</td>
<td>Extracapsular extraction of crystalline lens by phacoemulsification and aspiration of cataract with insertion of other artificial lens</td>
</tr>
<tr>
<td></td>
<td>42698-03</td>
<td>Extracapsular extraction of crystalline lens by mechanical phacofragmentation and aspiration of cataract</td>
</tr>
<tr>
<td></td>
<td>42702-06</td>
<td>Extracapsular extraction of crystalline lens by mechanical phacofragmentation and aspiration of cataract with insertion of foldable artificial lens</td>
</tr>
<tr>
<td></td>
<td>42702-07</td>
<td>Extracapsular extraction of crystalline lens by mechanical phacofragmentation and aspiration of cataract with insertion of other artificial lens</td>
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<tr>
<td>197</td>
<td>42698-04</td>
<td>Other extracapsular extraction of crystalline lens</td>
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<td>Other extracapsular extraction of crystalline lens with insertion of foldable artificial lens</td>
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<td></td>
<td>42702-09</td>
<td>Other extracapsular extraction of crystalline lens with insertion of other artificial lens</td>
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<tr>
<td></td>
<td>42731-00</td>
<td>Extraction of crystalline lens by posterior chamber sclerotomy with removal of vitreous</td>
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<td>200</td>
<td>42698-05</td>
<td>Other extraction of crystalline lens</td>
</tr>
<tr>
<td></td>
<td>42702-10</td>
<td>Other extraction of crystalline lens with insertion of foldable artificial lens</td>
</tr>
<tr>
<td></td>
<td>42702-11</td>
<td>Other extraction of crystalline lens with insertion of other artificial lens</td>
</tr>
<tr>
<td></td>
<td>42737-00</td>
<td>Needling of posterior capsule of lens</td>
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<td></td>
<td>42734-00</td>
<td>Capsulotomy of lens</td>
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<td>42788-00</td>
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<td>Corticolysis of lens material by laser</td>
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<td>42719-00</td>
<td>Capsulectomy of lens</td>
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<tr>
<td></td>
<td>42722-00</td>
<td>Capsulectomy of lens by posterior chamber sclerotomy</td>
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<td></td>
<td>42731-00</td>
<td>Capsulectomy of lens by posterior chamber sclerotomy with removal of vitreous</td>
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<td>42719-02</td>
<td>Mechanical fragmentation of secondary membrane</td>
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<tr>
<td>201</td>
<td>42716-00</td>
<td>Removal of juvenile cataract</td>
</tr>
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</table>
## Appendix 2 Clinical referral thresholds

<table>
<thead>
<tr>
<th>Guideline</th>
<th>Scope</th>
<th>Threshold</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Zealand-National Referral Guidelines (&lt;sup&gt;18&lt;/sup&gt;)</td>
<td></td>
<td><strong>Urgent Referral (within 4 weeks)</strong> for lens induced glaucoma</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Semi-Urgent (within 12 weeks)</strong> for cataract extraction required in order to treat posterior segment disease e.g. Diabetic retinopathy</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>All other cataracts are scored using the scoring system below and prioritised as follows:</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Routine (within 6 months)</strong> for patients who score between 21-50</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Deferrable</strong> for patients who score between 0-20</td>
<td>-</td>
</tr>
</tbody>
</table>
The presence of a cataract does not itself indicate a need for surgery. Cataract surgery may be indicated if:

- Visual acuity is significantly impaired (e.g., vision in the affected eye is worse than 6/18)
- There is a significant impact on daily living activities
- There is a risk of complications if left untreated (e.g., corneal decompensation)

The decision to proceed with surgery should be made in consultation with an ophthalmologist and considering the patient's overall health.

The Cataract Guideline Working Group reviewed the evidence and guidelines to develop recommendations for cataract surgery in adults.
indicated when the cataract reduces visual function to a level that interferes with everyday activities of the patient and the patient desires surgical intervention to improve vision.

The following specific indications for cataract surgery are suggested:

- **a) Visual disability and Snellen Acuity of 20/50 or worse**
  The visual impairment produced by the cataract is responsible for the patient’s disability in carrying out needed or desired activities (driving, reading, occupational needs) and the best correctable visual acuity in the affected eye is 20/50 or worse.

- **b) Visual disability and Snellen Acuity of 20/40 or better**
  The visual impairment produced by the cataract is responsible for the patient’s disability in carrying out needed or desired activities (driving, reading, occupational needs), as documented by any of the following reasons:
  - visual disability increases due to glare or dim illumination
  - patient complains of monocular diplopia or polypodia
  - visual disparity exists between the two eyes
  and the best correctable visual acuity in the affected eye is 20/40 or better.

- **c) Other indications for cataract removal**
  - Lens-induced disease: phacomorphic glaucoma, phacolytic glaucoma, and other lens-induced disease may require cataract surgery and the need for extraction may be urgent.
  - Concomitant ocular disease that requires clear media: cataract extraction may be required to adequately diagnose other ocular conditions such as diabetic retinopathy.

- **d) Visual ability in patients legally blind in one eye**
  The indications for surgery in patients with cataract in one eye who are legally blind in the other eye are the same as for other patients, except that the risk of total blindness must be considered and emphasized.

### Contraindications for Surgery

Surgery should not be performed solely to improve vision if:

- a) the patient does not desire surgery
- b) glasses or other visual aids provide functional vision satisfactory to the patient
- c) the patient’s quality of life is not compromised
- d) the patient is medically unfit
- e) the patient has concomitant disease where functional improvement is unlikely

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<table>
<thead>
<tr>
<th>Guidelines and Protocols&lt;sup&gt;(5)&lt;/sup&gt;</th>
<th>American Optometric Association- Quick Reference Guide&lt;sup&gt;(4)&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>indicated when the cataract reduces visual function to a level that interferes with everyday activities of the patient and the patient desires surgical intervention to improve vision.</td>
<td>Treatment of the patient with cataract depends on the extent of the patient's visual disability. Surgery is indicated when the cataract formation has reduced visual acuity to the level that it interferes with the patient’s lifestyle and everyday activities and when satisfactory functional vision cannot be obtained with spectacles, contact lenses, or other optical aids.</td>
</tr>
</tbody>
</table>

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material published since the release of the 1996 B.C. guideline, as well as the original literature. The Working Group found that while some new material has added to the general knowledge base and to the body of evidence regarding indications for and outcomes of cataract surgery, there are still relatively few published papers concerning evidence for the procedure and its outcomes.

**Indications for Surgery:**
### Indications for Surgery

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

**Subjective**

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

### Guidelines do not apply to:

- **Individuals under the age of 18 years,**
- **Individuals with other eye diseases**

---

**Table:**

<table>
<thead>
<tr>
<th><strong>Canadian Ophthalmological Society evidence-based clinical practice guidelines for cataract surgery in the adult eye</strong>[^1]</th>
<th><strong>Guidelines do not apply to:</strong> Individuals under the age of 18 years, Individuals with other eye diseases</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Indications for Surgery</strong></td>
<td></td>
</tr>
</tbody>
</table>
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.

**Objective**

The objective criterion is based on the level of visual acuity in the affected eye.

There are two other indications for cataract removal:

1. **Lens Induced Diseases**
2. **The Need to Visualize the Fundus**

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

**American Academy of Ophthalmology, Preferred Practice Pattern, Cataract in the Adult Eye**

Adults (18 years old and older) with cataracts.

The decision to recommend cataract surgery should be based on consideration of the following factors: visual acuity, visual impairment, and potential for functional benefits.

The primary indication for surgery is visual function that no longer meets the patient's needs and for which cataract surgery provides a reasonable likelihood of improved vision. Other indications for a cataract removal include the following:

- Clinically significant anisometropia in the presence of a cataract
- The lens opacity interferes with optimal diagnosis or management of posterior segment conditions
- The lens causes inflammation or secondary glaucoma (phacolysis, phacoanaphylaxis)
- The lens induces angle closure (phacomorphic)

Surgery for a visually impairing cataract should not be performed under the following circumstances:

- Tolerable refractive correction provides vision that meets the patient's needs and desires
- Surgery is not expected to improve visual function, and no other indication for lens removal exists
- The patient cannot safely undergo surgery because of coexisting medical or ocular conditions
- Appropriate postoperative care cannot be arranged
- The patient or patient's surrogate decision maker is unable to give informed consent for
non emergency surgery

| Cataract Surgery Guidelines, The Royal College of Ophthalmologists, UK(3) | Referral criteria for cataract surgery:
- the patient should have sufficient cataract to account for the visual symptoms
- the cataract should affect the patient's lifestyle

Other indications for cataract surgery include facilitating treatment and/or monitoring posterior segment disease e.g. diabetic retinopathy, correcting anisometropia or treating lens induced ocular disease. |

| Bedfordshire and Hertfordshire(26) | This policy does not extend to cataract removal incidental to the management of other eye conditions. |

Referral of patients with cataracts to ophthalmologists should be based on the following indications:

1. The patient has sufficient cataract to account for the visual symptoms.
2. The patient has best corrected visual acuity of 6/12 or worse in the worst eye and the reduced visual acuity is impairing their lifestyle:
   a. the patient is at significant risk of falls
   b. the patient's vision is impairing their ability to drive
   c. the patient's vision is substantially affecting their ability to work
   d. the patient's vision is substantially affecting their ability to undertake leisure activities such as reading, watching television or recognising faces.
3. The patient has best corrected visual acuity of better than 6/12 in the worst eye but they are working in an occupation in which good visual acuity is essential to their ability to continue to work e.g. watchmaker, microsurgeon.
4. The patient has bilateral cataracts, neither of which fulfils the threshold for surgery, but which together reduce binocular vision below the DVLA standard for driving.
5. The patient has best corrected visual acuity of better than 6/12 in the worst eye but they are experiencing some other significant impact on their quality of life, as a result of their visual symptoms.
6. The patient is willing to have cataract surgery:
   a. The referring optometrist or GP has discussed the risks and benefits using an approved information leaflet (national or locally agreed) and ensured the patient understands and is willing to undergo surgery before referring.

Second eye surgery in patients with bilateral cataracts will be funded if the criteria above are met again. This should be assessed not earlier than the post-operative review following surgery on the other eye.

Royal College of Ophthalmologists 2010. Cataract surgery guidelines.
Cataract surgery criteria and threshold
Best corrected visual acuity is - 6/12
Patients score >25 (out of 48) on the visual disability score

### Visual Disability Score

<table>
<thead>
<tr>
<th>Activity</th>
<th>Not at all</th>
<th>A little bit</th>
<th>Some</th>
<th>Quite a bit</th>
<th>Totally Disabled</th>
</tr>
</thead>
<tbody>
<tr>
<td>How much does your vision hinder, limit or disable you in each of the following activities? (Please score as 1 if you/hel don't do the activity)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Your usual daily activities</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Recognising people or objects across the street</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Reading price labels in shops &amp; supermarkets</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Reading a magazine, newspaper or book</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Watching Television</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Knitting or sewing</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Daytime driving</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Night-time Driving</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>How much is your vision hindered, limited or disabled by glare (dazzling light) in each of the following activities? (Please score as 1 if you/hel don't do the activity)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Your usual daily activities</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Walking outside on a sunny day</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Driving towards the sun or oncoming traffic</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Reading shiny paper (such as a magazine)</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

The patient should have sufficient cataract in the eye you are proposing to refer cataract surgery on, to account for the visual symptoms as evidenced in the Cataract Referral Form:
- Blurred or dim vision with a corrected binocular distance acuity of 6/10* (0.20 logMAR) or worse, or
- Blurred or dim vision with a monocular distance acuity of 6/18 (0.40 logMAR) or worse
- The cataract should affect the patient's lifestyle scoring ≥3 as evidenced in the Cataract Assessment Form
- The patient has waited 7 days to make a decision and wishes to undergo cataract surgery

NHS Suffolk (27)

surgery and understands the risks and benefits of this surgery.

**For second eye surgery**

If vision in the first operated eye is better than 6/10 (0.20 logMAR) corrected postoperatively then the patient will need to have sufficient cataract to cause blurred or dim vision with a monocular distance acuity of 6/18 (0.40 logMAR) or worse in the second eye to qualify for cataract surgery. If vision in the first eye does not correct to better than 6/10 then second eye cataract surgery can be offered only if the binocular corrected vision is 6/10 or worse or the second eye vision is monocularly worse than 6/18 corrected.

**Exceptions**
The only exceptions to the above referral criteria are as follows:

- Anisometropia (a large refractive difference between the two eyes, on average about 3 dioptres), which would result in poor binocular vision or disabling diplopia which may increase the risk of falls.
- Angle closure glaucoma including creeping angle closure and phacomorphic glaucoma
- Diabetic and other retinopathies including retinal vein occlusion and age related macular degeneration where the cataract is becoming dense enough to potentially hinder management.
- Oculoplastics disorders where fellow eye requires closure as part of eye lid reconstruction or where further surgery on the ipsilateral eye will increase the risks of cataract surgery
- Corneal disease where early cataract removal would reduce the chance of losing cornea clarity (e.g. Fuch's corneal dystrophy or after keratoplasty)
- Corneal or conjunctival disease where delays might increase the risk of complications (e.g. cicatrising conjunctivitides)
- Other glaucoma’s, inflammatory eye disease or medical retina disease where allowing a cataract to develop would hamper clinical decision making or investigations such as OCT, visual fields or fundus fluorescein angiography
- Neuro-ophthalmological conditions where cataract hampers monitoring of disease (e.g. visual field changes)

*6/10 equates to 6/9-2 on Snellen chart

Evans JR, Fletcher AE, Wormald RP, Ng ES. Stirling S. Prevalence of visual impairment in people aged 75 years and older in Britain: Results from the MRC trial of assessment and management of older people in the community. Br J Ophthalm 2002; 86: 795-800
Unless one or more of the following criteria are met, a best corrected visual acuity of better than 6/12 in the affected eye will not normally be funded.

Since the level of visual acuity that an individual requires to function without altering their lifestyle varies, measurements of visual acuity do not necessarily reflect the degree of visual disability patients may experience as a result of cataracts. The criteria set out below attempt to explicitly take that into account.

The legal visual requirement for driving falls somewhat between 6/9 and 6/12 (strictly speaking it is based on the number plate test) and it is anticipated that the thresholds set out below will not render the majority of people unable to drive. This policy also recognises the increasing body of evidence that second eye surgery does benefit patients.

This applies to both first and second eyes, with a best corrected visual acuity of 6/12 or worse in the affected eye used as the threshold for cataract surgery.


B. Busbee Cost-utility analysis of cataract surgery in the second eye. Ophthalmology, 110; (12): 2310-2317


Unless one or more of the following criteria are met, a best corrected visual acuity of better than 6/12 in the affected eye will not normally be funded:

1. Patients who are still working in an occupation in which good acuity is essential to their ability to continue to work (e.g. watchmaker)
2. Patients with posterior subcapsular cataracts and those with cortical cataracts who experience problems with glare and a reduction in acuity in daylight or bright conditions
3. Patients who need to drive at night who experience significant glare due to cataracts which affects driving
4. Difficulty with reading due to lens opacities
5. Patients with visual field defects borderline for driving, in whom cataract extraction would be expected to significantly improve the visual field
6. Significant optical imbalance (anisometropia or aniseikonia) following cataract surgery on the first eye
7. Patients with glaucoma who require cataract surgery to control intraocular pressure
8. Patients with diabetes who require clear views of their retina to look for retinopathy
9. Patients with wet macular degeneration or other retinal conditions who require clear views of their retina to monitor their disease or treatment (e.g. treatment with anti-VEGFs)

North Yorkshire and York PCTs\(^{(29)}\)

Patients should be referred where best corrected visual acuity as assessed by high contrast testing (Snellen) is:

- Binocular visual acuity of 6/9 or worse
- Reduced to 6/18 or worse irrespective of the acuity of the other eye
- The patient wishes to/is required to drive and does not meet Driving and Licensing Authority (DVLA) eyesight requirements
- Any suspicion of cataracts in children (e.g. altered or absence of red reflex at neonatal or 6 week check) should be referred urgently


Brogan et al. Can the use of visual disability questionnaires in primary care help reduce inequalities in cataract surgery rates?–a long term cohort study. In press


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At a glance guide to the current medical standards of fitness to drive (August 2006)

Royal College of Ophthalmologists cataract surgery guidelines (2004)

Royal College of Ophthalmologists visual standards for driving (1999)
The PCT will fund Cataract Surgery where there is a visual acuity of 6/12 (corrected) in the worst eye, or for:

1. Patients for whom it is vital to have good visual acuity in the worse eye for the purpose of fulfilling essential occupational responsibilities (e.g. watchmaker).

2. Patients with posterior subcapsular cataracts and those with cortical cataracts who experience problems with glare and a reduction in acuity in bright conditions.

3. Driving: the legal requirement for driving falls between 6/9 and 6/12 (strictly speaking it is based on the number plate test). It is anticipated that the threshold will not render the majority of people unable to drive as it applies to the worst eye only. Exceptions to this include:

   - Patients who need to drive who experience significant glare which affects driving;

   - Patients for whom it is vital to drive at night for the purpose of fulfilling essential domestic, carer or occupational responsibilities, and who experience glare that is related to cataract;

   - Patients with visual field defects borderline for driving, in whom cataract extraction would be expected to significantly improve the visual field.

4. Patients with glaucoma who require cataract surgery to control intraocular pressure.

5. Patients with diabetes who require clear views of their retina to look for retinopathy.

### Cataract Second Eye

1. Where the cataract procedure on the first eye has achieved a VA of 6/9 or better, and the VA for the second eye is 6/24 or better, then the patient should be discharged, unless receiving treatment for any other eye condition. The patient should be advised to attend an optometrist for an annual sight test or earlier if they notice any deterioration of vision.

2. If the first eye does not achieve a VA of 6/9 or better, then the second eye should be dealt with on clinical merit, taking into account any directly related essential responsibilities (i.e. the requirement for night driving).

3. There are circumstances, where despite good acuities, there may still be a clinical need to operate on the second eye fairly speedily e.g. where there is resultant anisometropia (a large refractive difference between the two eyes) which would result in poor binocular vision or even diplopia.

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| Department of Health. Commissioning Toolkit for Community Based Eyecare Services (DH 2007) |

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<table>
<thead>
<tr>
<th>Notinghamshire County and Nottingham City PCTs</th>
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</table>

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<th>South West London PCTs</th>
<th>The PCT will only fund elective cataract surgery where the following apply:</th>
</tr>
</thead>
<tbody>
<tr>
<td>The best corrected visual acuity is 6/9 or worse in either the first or second eye.</td>
<td></td>
</tr>
</tbody>
</table>

| Busbee BG, Brown MM, Brown GC, Sharma S. |
|--------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|
| The patient has impairment in lifestyle such as substantial effect on activities of daily living, leisure activities, and risk of falls. OR Surgery is indicated for management of ocular co-morbidities such as control of glaucoma, view of diabetic retinopathy etc. OR Patients with cataract having visual acuity better than 6/9 where there is a clear clinical indication or symptoms affecting lifestyle. For example, the patient with a visual acuity of 6/6 and symptomatic posterior subcapsular cataract, affecting activities of daily living and driving. | Weale et al. Cost Benefit Analysis of Cataract Surgery – English Longitudinal Survey of Ageing. National Institute of Economic and Social Research Discussion Paper 349 – November 2009. |