



The ROYAL COLLEGE of
OPHTHALMOLOGISTS

CLINICAL COUNCIL
FOR EYE HEALTH COMMISSIONING

Commissioning Guide:
Cataract Surgery

February 2015

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1 Plain language summary

- The presence of cataract causes disability and increases the likelihood that individuals will suffer adverse events such as falls.
- Cataract surgery is the only effective intervention to treat cataracts and is cost effective.
- Visual acuity on its own is not an adequate measure of visual disability from cataract and cataract surgery should be considered in the first or second eye of patients with significant visual symptoms due to cataract.
- Further research is required to validate additional measures of visual disability due to cataract and Patient Reported Outcome Measures of cataract surgery.
- A typical cataract surgery care pathway is described in the document but this must be personalised to the patient and adaptable for patients with specific needs.
- The risk of a poor outcome from cataract surgery is generally low but can be increased substantially by a range of systemic and ocular risk factors, many of which can be mitigated by careful preoperative planning by the cataract surgical team.
- Outcome measures of cataract surgery such as visual acuity, accuracy of refractive correction, occurrence of significant operative and postoperative complications should be recorded routinely. The data should be available to care providers and commissioners
- Commissioning of cataract care should encompass the whole cataract care pathway from initial assessment and treatment planning to final postoperative review.

2 Commissioning for cataract

In seeking to commission high quality cataract surgery services, it is recommended that commissioners work in partnership with a range of stakeholders, including the Hospital Eye Service, community optometry services, general practice, social care, adjacent clinical commissioning groups, health and wellbeing boards, service users and carers.

Commissioning Guidance aims to improve the health and wellbeing of people and communities, and support local service redesign to ensure the provision of high quality, cost-effective services that meet the needs of the local population and take into account patient experience.

High value care pathways provide patients and the public, health and social care professionals, commissioners and service providers with a clear description of what constitutes a high quality service. Organisations can use the guidance to assess their current performance against evidence-based measures of best practice, and identify priorities for improvement. Audit and peer review measures support the implementation of the recommendations through commissioning and the contracting process. Commissioning Guidance gives examples of measures that can be used in the service specification and how commissioners can incentivise provider performance by using the indicators in association with incentive payments such as Commissioning for Quality and Innovation (CQUIN).

Implementation of the guidance is the responsibility of local commissioners and/or providers, in their local context, in light of their duties to avoid unlawful discrimination and to have regard to promoting equality of access. Nothing in the guidance should be interpreted in a way that would be inconsistent with compliance with those duties.

We are keen to improve Commissioning Guidance for cataract care in order to better meet the needs of commissioners. Please send us your comments and ideas for future revisions.

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3 Introduction

This document has been written in response to emerging evidence of wide geographical variation in access to cataract surgery in England.¹⁻³ One recent report found that half of Commissioners restricted access to cataract surgery by the application of clinical thresholds and one in three made no allowance for second eye surgery.¹ Overall 9 in every 10 cataract surgery commissioning policies contained criteria that followed “neither national guidance nor scientific evidence.” Additionally, there is almost a threefold variation in the number of people having cataract surgery across England, with rates ranging from 285 to 804 per 100,000 population,⁴ which cannot be fully explained by variations in known risk factors for the development of cataract.

Although there are as yet no National Institute for Health and Care Excellence (NICE) recommendations for cataract surgery The Royal College of Ophthalmologists has published guidelines on the management of cataract⁵, which include recommendations on the standards that Commissioners should expect from any provider of cataract surgery. This document aims to provide evidence-based guidance to support the commissioning of high quality cataract services and to promote equity of access to the treatment of visual impairment caused by cataract.

4 Population to which the care pathway applies

This Commissioning Guidance applies to adults (persons >18 years old) with cataract in England. It does not apply to cataract surgery in children or surgery where the primary aim is correction of refractive error. See Appendix A for further details.

5 Cataract

Cataract is the presence of visually impairing opacity in the eye’s natural lens, which may occur in one or both eyes. Cataract is the leading cause of blindness in the world.⁶ Cataract surgery, whereby the natural lens is replaced by a clear intraocular lens implant, is currently the only effective treatment for cataract. Phacoemulsification (removal of the cataractous lens using ultrasound) is the standard surgical technique and is used in over 99.7% cataract operations in the NHS.⁷

Symptoms include blurred vision, glare (particularly in bright daylight or night time vision) and refractive change resulting in more frequent updates in spectacle prescription. Risk factors for cataract include increasing age, diabetes mellitus, corticosteroid use, female gender, socio-economic status, ethnicity, smoking and alcohol.^{5,8}

Cataracts may be classified into several types based on appearance. These include nuclear, cortical, posterior subcapsular and mixed. Nuclear cataracts result in progressive opacification of the central lens, typically causing impaired distance vision. Cortical and posterior subcapsular cataracts typically cause disabling glare, even before visual acuity is markedly impaired and can progress rapidly.

6 Patient Information for cataracts

Patients should be given accessible information in the format they require such as email, large print or audio.

Table 1 Links to patient information and shared decision making tools

Name	Publisher	Link
Understanding Cataracts	The Royal College of Ophthalmologists and the Royal National Institute of Blind People	https://www.rcophth.ac.uk/patients/ataract/
Cataract Surgery	NHS Choices	www.nhs.uk/conditions/Cataract-surgery/Pages/Introduction.aspx
Cataracts	College of Optometrists	lookafteryoureyes.org/eye-conditions/cataracts
Shared decision aid for cataracts	NHS RightCare	sdm.rightcare.nhs.uk/pda/cataracts
Guidance for those with learning disability	Seeability	<p>What is a cataract? (Easy Read) https://www.seeability.org/our-specialisms/?book=eye-care-conditions</p> <p>Having a cataract operation (Easy Read) https://www.seeability.org/uploads/files/PDFs_Books_Easy_Read/Cataract_operation.pdf</p>

7 Clinician Information for cataracts

Table 2 Links to clinical guidelines, decision support tools

Name	Publisher	Link
Cataract Surgery Guidelines	The Royal College of Ophthalmologists	https://www.rcophth.ac.uk/standards-publications-research/clinical-guidelines/
Cataract	Map of Medicine	healthguides.mapofmedicine.com/choices/map/cataract1.html
Cataract Surgery	The Royal College of Surgeons	www.rcseng.ac.uk/patients/recovering-from-surgery/cataract-surgery
Shared decision aid for cataracts	NHS RightCare	sdm.rightcare.nhs.uk/pda/cataracts/
Pre- and Post-Operative Cataract pathway	Local Optical Committee Support Unit	www.locsu.co.uk/enhanced-services-pathways/cataract-referral-and-post-op/

8 Cataract surgery

Cataract surgery is currently the only effective treatment to improve or maintain vision. It is the most commonly performed elective surgical procedure in the UK with around 330,000 cataract operations performed per year in England in recent years.⁹ The requirement for cataract surgery is anticipated to increase with increasing life expectancy and associated population numbers.¹⁰

There are no recent estimates of expected cataract surgery rates based on need. However, using the rate of provision of cataract surgery from 2011 Hospital Episode Statistics data as a crude estimate of demand, average expected rates of cataract surgery should be approximately 530 per 100,000 population or 3200 per 100,000 for those over 65 years old per year.^{11,12}

Historical data from the North London Eye Study in 1998 estimated that 30% of people 65 years or older had visually impairing cataract in one or both eyes.¹³ An additional 10% of people in this age group had already had cataract surgery. Some populations have a much higher prevalence of cataract. For instance, 77% of British people originating from the Indian Subcontinent age 42 years old or more have cataract.⁸ Diabetes is a risk factor for the development of cataract and cataract is the most common reason for failure to obtain a gradable photographic image for diabetic retinopathy screening.¹⁴ The NHS Diabetic Eye Screening Programme's achievable standard for ungradeable photographic images is 2.6-6.3%.¹⁵

9 Benefits of cataract surgery

Cataract surgery improves visual function and the benefits are lifelong unless negated by other eye disease.

Cataract surgery is associated with improvements in visual acuity, contrast sensitivity, depth perception, activity, anxiety, depression, visual disability, confidence, handicap and quality of life and reduction in falls.¹⁶⁻¹⁸

Cataract surgery is generally reported to be highly cost effective ¹⁹⁻²² and even in populations with mildly visually impairing cataract* it is estimated to be cost effective with an incremental cost per quality adjusted life year (QALY) of £13,172 over an individual's lifetime (assuming an anticipated lifespan of 10 years following surgery).¹⁷ Overall cataract surgery is, for example, reported to be comparable to hip replacement in cost effectiveness.²¹

10 Second eye cataract surgery

Approximately 40% patients undergo cataract surgery on both eyes.^{7,9} A recent systematic review²³ funded by the National Institute for Health Research concluded that second eye cataract surgery was associated with a clinically meaningful improvement in stereopsis (depth perception), but did not affect other measures of visual acuity or visual function or health related quality of life, apart from an improvement in the mental health component of health related quality of life in one randomised controlled trial. Second eye cataract surgery was reported to be generally cost effective and the probability of cost effectiveness at willingness-to-pay thresholds of £10,000 and £20,000 was 100%. The systematic review noted limitations including a relatively small evidence base (three published randomised controlled trials and three economic evaluations), lack of recent clinical effectiveness studies, and recommended further research to evaluate the clinical effectiveness and cost-effectiveness of second eye cataract surgery in NHS practice.

A report by the Scottish Health Technologies Group (Healthcare Improvement Scotland) identified data from a randomised controlled trial supporting second eye cataract surgery, cost-effectiveness over an individual lifetime and concluded that "individual patient need should always be considered in prioritising access to second-eye cataract surgery."²⁴

A detailed analysis of patients who were unhappy with their vision after their first cataract operation found that anisometropia and cataract in the fellow eye accounted for more than a third of such cases.²⁵

* Baseline visual acuity was 6/12 or better in 75% patients.

11 Thresholds for cataract surgery and legal visual acuity requirements

Visual acuity is the most common measurement of visual function as it can be quickly and easily measured. However, the sole use of visual acuity can underestimate visual disability because it does not take account of symptoms such as glare or reduced contrast sensitivity.

The current visual function standards required to drive a car or motorcycle (Group 1 licence) are the ability to read a car number plate at 20 meters and a Snellen visual acuity of at least 6/12 with both eyes open, in addition to visual field requirements. Although a Snellen visual acuity of 6/12 is a requirement for driving, it is not an exact equivalent to being able to read a car number plate at 20 meters and the calculated equivalent is between 6/9 and 6/12 Snellen.²⁶ For group 2 licence holders (such as lorry or bus drivers), a visual acuity of at least 6/7.5 Snellen in the better eye is stipulated in addition to more stringent visual field requirements.²⁷ Glasses or contact lenses may be worn to meet these standards.

Historically, “cataract causing visual impairment” was defined as a visual acuity in one or both eyes poorer than 6/12 where the impairment was attributable to a lens opacity.²⁸ This level is no longer considered an appropriate threshold for surgical intervention due to the need for good vision to maintain independence (for example, driving), rising patient expectations and advances in surgical technique.²⁹ There is no evidence, however that patients who do not drive have less demanding requirements for vision than those who drive, or that patients are more tolerant of cataract in the second eye than the first eye. There is no justification therefore for routinely applying a higher threshold to the decision to operate for non-drivers or second eye cataract surgery.

Significant improvements in visual symptoms and visual function may occur following cataract surgery even where the preoperative visual acuity is 6/6 or better. However, the risk of worse visual acuity after surgery also increases where the preoperative visual acuity is very good^{7,9,30}, so surgery should be considered at this level of visual acuity only where the patient is experiencing significant symptoms attributable to cataract.

The Royal College of Ophthalmologists’ National Ophthalmology Database shows that, for the period 2006-2010, 3%, 5% and 36% of eyes undergoing cataract surgery have preoperative visual acuities of better than or equal to 0.00, 0.18 and 0.30 logMAR respectively (equivalent to 6/6, 6/9 and 6/12 Snellen)⁹ indicating that before restrictions on access to cataract surgery based on visual acuity were commonplace, eyes with visual acuities of 6/9 or better accounted for less than 10% of cataract surgery.

Although visual acuity remains a useful component of the assessment of visual disability from cataract, cataract surgery should be considered in the first eye or second eye of a patient who has disabling visual symptoms attributable to cataract. For instance, a patient who experiences disabling glare due to cataract when driving may still achieve a visual acuity of better than 6/9 under ideal conditions of illumination. This recommendation is consistent with advice from the Royal College of Ophthalmologists,³¹ and where implemented in local Commissioning guidance has been found to be practical and equitable.³²

In patients with learning disability or cognitive impairment for other reasons, it may not be possible to measure visual acuity accurately and in these cases, clinicians will need to base the clinical decision to offer cataract surgery on clinical examination findings and information provided by carers.

On occasions, cataract surgery may be performed primarily to aid the management of other eye conditions, for instance to facilitate surveillance or treatment of diabetic retinopathy or to improve intraocular pressure control in primary angle closure glaucoma.⁵

There has been considerable interest in the measurement of visual disability as a basis for a decision to offer cataract surgery. Estimates of visual disability include the effects of cataract on lifestyle and activities of daily living, history of falls, caring responsibilities and need to continue driving or working. A number of tools for estimating visual disability caused by cataract have been published, [34-38](#) however, none have yet been validated for use in UK populations. Further research is needed before they can be recommended for routine use, including cost effectiveness; particularly in community Optometric practice prior to referral, where the majority of such assessments will take place.

12 Recommended high quality cataract care pathway

A high quality cataract care pathway should provide equity of access based on individual need, and it is therefore important that commissioning of cataract care embraces the whole care pathway. The cataract pathway starts with an assessment where a patient with disabling visual symptoms is confirmed to have a cataract, which accounts for those symptoms and where the patient indicates their willingness to have cataract surgery following an explanation of the risks and benefits. Most referrals for consideration for cataract surgery are made following assessment by a community Optometrist, although a significant minority of patients listed for cataract surgery are already under the care of the hospital eye service for other conditions such as glaucoma and are listed directly. The postoperative phase of the cataract pathway includes a clinical examination to check for, or treat any postoperative complications, assess visual outcome and refractive status and ascertain the patient's satisfaction. In many cataract services, community optometrists are commissioned to deliver much of the preoperative and postoperative phases of the cataract pathway, though commissioning arrangements may vary depending on geographical factors and the needs of the local population. An exemplar care pathway for cataract surgery published by the NHS Institute for Innovation and Improvement is summarised in [Appendix B.39](#)

An optimal cataract pathway will offer patients access to practical and emotional support. Many providers are able to offer this through access to an Eye Clinic Liaison Officer (ECLO), which is a valuable resource for patients and their families/carers, particularly where the patient's circumstances require special planning of the surgical admission.

The cataract pathway should also cater for the needs of a small percentage of patients whose care needs to be individualised in order to secure the best achievable outcome of surgery, to reduce the risk of complications, or to make the experience of surgery tolerable. This includes accounting for the needs of those without social support at home, those with disabilities, including any that may also impair optimal post-operative care and those whose first language is not English. ECLOs can also offer advice and support to patients in these groups.

Approximately 4-5% of patients require general anaesthesia to undergo cataract surgery^{7,9}, some of whom require formal preoperative assessment by an anaesthetist or a physician because of the existence of systemic co-morbidities.

The risk of operative complications and a poor visual outcome can vary by 10-fold or more depending on the presence of a range of common ocular and systemic risk factors.⁴⁰ Although many aspects of preoperative assessment for cataract surgery can be delegated, it is very important that the final decision to operate and individualised planning of care is undertaken in advance of the patient's admission by an appropriately qualified and skilled member of the cataract surgical team responsible for the patient's operative care⁵.

Although cataract care pathways are often delivered in units that offer a wider range of ophthalmology services, including out-of-hours emergency cover, this is not always the case. Emergency situations fortunately rarely arise during the cataract pathway, but a high quality cataract pathway must have contingency arrangements for such situations. Good communication and clear hand-over of care is essential where the cataract pathway is shared between secondary care and primary care providers.

Another important component of a high-quality cataract care pathway is its ability to support high-quality training and continuing professional development for cataract surgeons and other professionals who contribute to the cataract pathway.

13 Quality dashboard for cataract surgery

Providers of cataract care should be able to supply Commissioners with up to date outcome data to allow monitoring of the clinical care provided. Where most or all of the postoperative phase of the cataract pathway takes place in a primary care setting, there should be a mechanism for feedback of visual and refractive outcome data and patient satisfaction to the surgical team[†]. For aspects of care where continuous audit is not practical, periodic sampling audit may be indicated. The benchmark data in Table 2 are derived from large case series and summarise the mean and distribution of significant complications of cataract surgery, visual and refractive outcomes.

These outcomes are influenced by case-mix, and a service that operates on a high proportion of patients with multiple ocular or systemic co-morbidities is likely to have a higher incidence of complications such as posterior capsule rupture than a unit that operates selectively on uncomplicated patients. Figures which appear to deviate significantly or persistently from the mean do not therefore necessarily indicate a cause for concern, but should prompt further analysis.

[†] See LOCSU pathway for example mechanism (www.locsu.co.uk/community-services-pathways/cataract-referral-and-post-op)

Table 3 Mean Complication rates and outcomes from large UK data series.

Parameter	National mean or value from large case series; Add 95% CI
Overall mean rate of posterior capsule tear and/ or vitreous loss.	1.9 to 2.0%(7,9)
Rate of endophthalmitis.	Less than 1 in 1000 - where intra-cameral cefuroxime is used routinely (41)
Proportion achieving 6/12 or better best measured (no pre-existing ocular co-pathology).	95%(7,9)
Proportion achieving 6/12 or better best measured (with pre-existing ocular co-pathology).	80%(7,9)
Proportion achieving 6/6 best measured (no pre-existing ocular co-pathology).	51%(7,9)
Proportion achieving 6/6 best measured (with pre-existing ocular co-pathology).	30to 33%(7,9)

Posterior capsule tear rates will vary with the proportion of patients with ocular co-morbidity. Best measured was defined as the better visual acuity of uncorrected distance visual acuity (UDVA, without glasses or contact lens) or corrected distance visual acuity (CDVA, with glasses or contact lens, with pinhole visual acuity considered if CDVA not available), measured in clinic at between 3 weeks and 3 months after surgery.

Posterior capsule tear and/ or vitreous loss is a serious intraoperative complication due to its association with delayed visual recovery, need for further surgery, long-term visual dissatisfaction and elevated risk of additional complications such as retinal detachment.

Data from the Cataract National Dataset in the UK of 55,567 cases showed older age, small eyes, ocular co-morbidity, poor pupil dilation and posterior capsule rupture (PCR) to be independent predictors of loss of vision following cataract surgery (defined as doubling of the pre- to post-operative visual angle).⁴⁰ The rate of PCR was the only modifiable risk factor for vision loss⁴⁰ and higher PCR rates are associated with increasing age, male sex, diabetic retinopathy, glaucoma, longer axial length, advanced cataract and trainee surgeons.⁴²

A small proportion of patients develop visually-impairing opacification of the posterior capsule of the lens following cataract surgery requiring YAG laser capsulotomy (OPCS code C7340) to restore the quality of vision. Typically, this occurs from a few months to a few years following surgery.

13.1 Patient reported outcome measures (PROMs).

There is currently no widely validated PROM for cataract surgery. Based on a systematic review and study of cataract PROMs, the Catquest-9SF questionnaire currently appears to be the most promising instrument.^{43,44} Catquest-9SF has been validated in an English speaking population (Australia), but has not yet been validated in the UK. A National Institute for

Health Research (NIHR) applied cataract research programme is currently funded to develop a short form cataract PROM suitable for use in the NHS.⁴⁵

14 New devices and techniques in cataract surgery

The standard cataract surgical procedure commissioned by the NHS is phacoemulsification with implantation of a monofocal intraocular lens. The cataract pathway and outcome measures described in this document relate to the use of monofocal intraocular lenses. Some providers may offer variants to the standard procedure although this does not attract additional funding unless agreed on an individual patient basis with the commissioning organisation.

14.1 Intraocular lens (IOL) types:

Monofocal IOLs are the current standard IOL design used for cataract surgery in the NHS. These have a single focal point and, where the intended refractive outcome is one of good unaided distance visual acuity, patients usually require glasses for reading. Alternative types of IOLs are available at additional cost (so called “premium lens”), and include toric (to correct astigmatism) and multifocal or accommodative (which aim to give good distance and near vision without glasses).

14.1.1 Toric intraocular lens

Toric intraocular lenses are commonly used where cataract is accompanied by significant corneal astigmatism. A systematic review found that toric intraocular lenses result in increased unaided distance visual acuity.⁴⁶

14.1.2 Multifocal and accommodating intraocular lens

These intraocular lenses are designed to provide good near and distance vision and thus to minimise the need for reading glasses). They have a significant cost premium and are not routinely available to NHS patients.

A recent Cochrane review concluded that multifocal IOLs were effective at improving near vision without any adverse effect on distance visual acuity. However, there was an associated reduction in contrast sensitivity and increased risk of perception of halos and, ultimately, patient motivation to achieve spectacle independence at this expense appeared to be the biggest determinant of patient acceptance.⁴⁷ NICE guidance recommends special arrangements for patient selection, preoperative counselling and consent beyond that required where monofocal IOLs are used.^{48,49}

14.2 Laser assisted cataract surgery:

Lasers can automate some of the steps of cataract surgery (including corneal incisions to reduce astigmatism) with greater precision and consistency than can be achieved by a surgeon. Currently there is limited evidence for the efficacy of the procedure and a NIHR Horizon Scanning Centre briefing concluded that whilst early studies are promising, further research is needed to determine the effectiveness and long-term safety profile of laser assisted cataract surgery compared to current techniques.⁵⁰

15 Recommendations for further research and guidance development

- Further research on the prevalence of visually disabling cataract and the causes of variation in rates of cataract surgery.
- Further research to validate measures of visual disability caused by cataract.
- Further research to develop patient-reported outcome and experience measures for cataract surgery.

16 Guideline Development Group

A commissioning guidance development group was established to review and advise on the content of the commissioning guide. This group met three times, with additional interaction taking place via email.

Name	Designation
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16.1 Funding statement:

The development of this commissioning guidance has been funded by the following sources:

- The Royal College of Ophthalmologists
- Nottingham University Hospitals Trust (under £10,000)

16.2 Conflict of Interest Statement

Individuals involved in the development and formal peer review of commissioning guidance are asked to complete a conflict of interest declaration. It is noted that declaring a conflict of interest does not imply that the individual has been influenced by his or her interest. It is intended to ensure interests (financial or otherwise) are transparent and to allow others to have knowledge of the interest.

The following interests have been declared by the Group:

- **The Royal National Institute of Blind People** receives money from pharmaceutical companies in the form of educational grants. In recent years we have been supported by Novartis, Allergan, Alcon and Bayer for initiatives such as the provision of Eye Clinic Liaison Officers in eye clinics. The funding is declared in RNIB's annual report and each year the support given by pharmaceutical companies represents less than 0.001% of our overall funding.
- **Ms Sophie Coronini-Cronberg** is a Consultant in Public Health at BUPA.

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18 Appendix A: Scope of these Commissioning Guidelines

1. Adult cataract:
 - a. Age-related cataract. (ICD code H25.x)
2. Exclusions:
 - i. Other cataract (ICD code H26.x)
 - ii. Other disorders of the lens (ICD code H27.x)
 - iii. Cataract in diseases classified elsewhere (ICD code H28.x)
 - iv. Refractive lensectomy
3. Procedures:
 - a. Phacoemulsification with intraocular lens implantation.
 - b. Extracapsular cataract extraction.
 - c. Intracapsular cataract extraction.
 - d. Other techniques for removal of crystalline lens.
 - e. Anterior vitrectomy (concurrent with cataract extraction).
 - f. OPCS codes: C71.x, C72.x, C74.x, C75.1
4. Reimbursement codes:
 - g. BZ01Z Enhanced cataract surgery.
 - h. BZ02Z Phacoemulsification cataract extraction and lens implantation.
 - i. BZ03Z Non-phacoemulsification cataract surgery.

19 Appendix B: Recommended high quality cataract care pathway

An overview of an exemplar cataract care pathway is shown below and this is derived from the Royal College of Ophthalmologists Cataract Surgery Guidelines,⁵ the NHS Institute for Innovation and Improvement for best practice guidance on cataract³⁹ and incorporates the recommendations previously made by the Royal College of Ophthalmologists on cataract surgery commissioning.⁵¹

Key points

1. Patient visits GP or optometrist for assessment and is referred directly to the hospital eye service. Patients may also be listed for cataract surgery from hospital eye clinics.
2. Pre-operative assessment:
 - Measurement of visual function and ocular examination including biometry.
 - Provision of patient information leaflets.
 - Verification of suitability for day case surgery including discussion of anaesthesia options (usually topical or subtenons anaesthesia, but general anaesthesia may be required in some circumstances).
 - Identification of need for second eye surgery if there is cataract affecting both eyes, postoperative anisometropia or another indication for second eye surgery. (see [‡] below)
 - Completion of cataract consent form and discussion / choice of post-operative refractive target.⁵
 - Verification that the case is appropriate to the level of expertise of the operating team and its clinical facilities. Adequate account must be made for any ocular or systemic co- morbidity which might increase the technical difficulty of the procedure, or increase the risk of complications.⁵
3. Day of surgery:
 - Ophthalmologist or appropriately trained nurse marks eye and confirms consent. Preoperative check using NPSA surgical safety checklist⁵³ performed prior to surgery.
 - Patient reviewed by a trained nurse following surgery- postoperative patient information, post operative appointment date confirmed, and post-operative drops already dispensed.
4. After-care:
 - 2-4 week review by nurse, optometrist or ophthalmologist

[‡] If a patient has cataract surgery in both eyes, surgery on both eyes may be performed at the same admission (immediate sequential bilateral cataract surgery, ISBCS) or over 2 separate admissions. A RCT comparing both techniques found surgical outcomes and patient satisfaction were similar in both groups and cost analysis suggested significant savings for cases that underwent surgery at the same sitting after accounting for travel and paid home-care costs.⁵² ISBCS is currently not standard practice due the risk of a complication in both eyes associated with the same theatre sitting (albeit extremely small) and the option for IOL power selection refinement for the second eye surgery based on the outcome of the first.

- 4-6 weeks post-operative refraction by optometrist.

(This may be combined as a single postoperative visit)

Providers of cataract care should be able to demonstrate to commissioners that the service makes appropriate provision for complications of surgery or other unexpected events which may occur during the cataract care pathway, including arrangements for urgent review or handover of care. There should also be a commitment to the culture and practice of training and continuing professional development of staff.⁵

20 Appendix C: Search Questions And Search Strategies

Short title	Cataract surgery
Research question	What is the clinical and cost effectiveness of surgical procedures for adults with cataracts?
Population(s)	Adult patients undergoing surgery for the following conditions: Idiopathic (age related) cataract. (ICD code H25.x) Familial (congenital) cataract. (ICD code H26.x) Cataract secondary to conditions known to increase the risk of cataract. (ICD code H28.x) Cataract following ocular trauma. (covered by ICD code H26.1) Lensectomy for non-optical reasons (eg. angle closure, aqueous misdirection) Second-eye cataract
Intervention(s)	Procedures: Phacoemulsification with intraocular lens implantation. Extracapsular cataract extraction. Intracapsular cataract extraction. Other techniques for removal of crystalline lens. Anterior vitrectomy (concurrent with cataract extraction). OPCS codes: C71.x, C72.x, C74.x, C75.x, C77.x, C79.1 Non-operative aspects: Models of care (care pathways)
Comparators	N/A
Outcomes	Visual scores Quality of life Disability scores Risk from cataract associated falls and other accidental injury Cost effective (£ per QALY) Post-operative complications (including endophthalmitis)
Exclusion criteria	Paediatric cataract (ICD code Q12.0) Refractive lensectomy
Level of search	Level 1 and 2 search for: Guidelines Systematic reviews Economic evaluations Commissioning grey literature
Notes	Database limit (where available): English language only Date limits: 2003-present

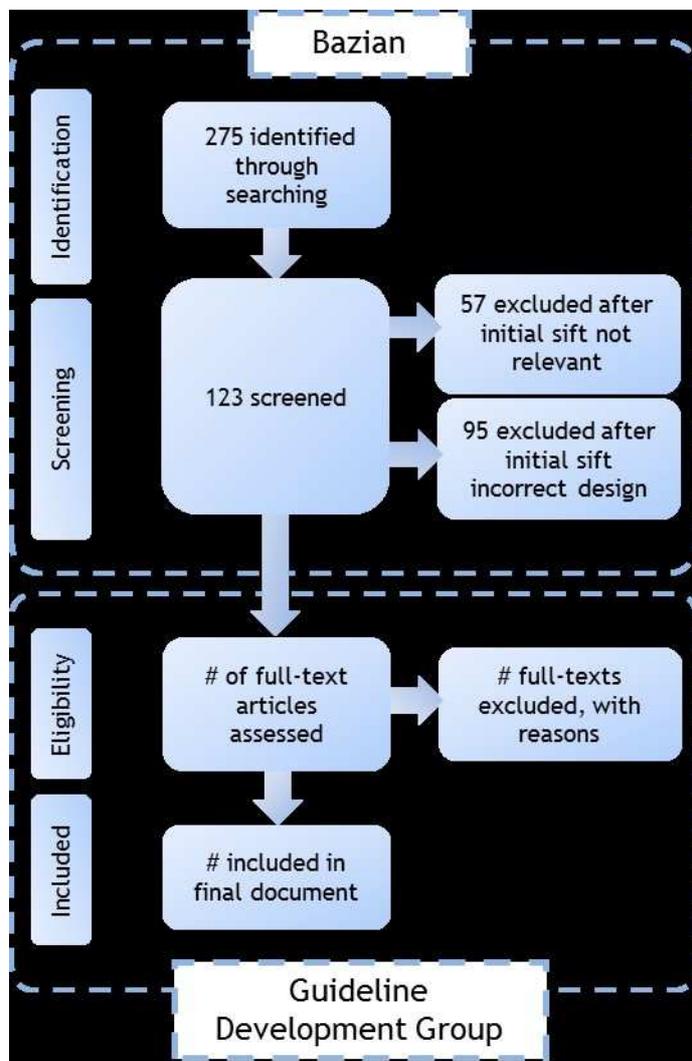
21 Appendix D: Search record

Databases and sites searched	Dates searched	Search terms/strategy	Number of hits
Cochrane Library: Cochrane Database of Systematic Reviews – CDSR	27/09/13	<ol style="list-style-type: none"> 1. MeSH descriptor: [Cataract Extraction] explode all trees 2. MeSH descriptor: [Cataract] explode all trees 3. urg* or implant* or extract* or remov*:ti,ab 4. #2 and #3 5. ((cataract and (idiopathic or age related or familial or secondary or ocular trauma or second eye)) or (crystalline lens and remov*)):ti,ab 6. (surg* or implant* or extract* or remov* or lensectomy):ti,ab 7. #5 and #6 8. #1 or #4 or #7 from 2003 to 2013, in Cochrane Reviews (Reviews only), Other Reviews, Technology Assessments and Economic Evaluations 	24
Cochrane Library: Database of Abstracts of Reviews of Effects – DARE	27/09/13	As above	29
Cochrane Library: Health Technology Assessments (HTA)	27/09/13	As above	20
Cochrane Library: NHS Economic Evaluation Database (NHSEED)	27/09/13	As above	24
MEDLINE	27/09/13	<ol style="list-style-type: none"> 1. Cataract Extraction/ 2. Cataract/ 3. (surg* or implant* or extract* or remov*).ti,ab. 4. 2 and 3 5. ((cataract adj2 (idiopathic or age\$related or familial or secondary or "ocular trauma" or second\$eye)) or ("crystalline lens" adj remov*)):ti,ab. 6. (surg* or implant* or extract* or remov* or lensectomy).ti,ab. 7. 5 and 6 8. 1 or 4 or 7 9. exp review/ 10. (scisearch or psychinfo or psycinfo or medlars or embase or psychlit or psyclit or cinahl or pubmed or medline).ti,ab,sh. 11. ((hand adj2 search\$) or (manual\$ adj2 search\$)).ti,ab,sh. 12. ((electronic or bibliographic or computeri?ed or online) adj4 database\$).ti,ab. 13. (pooling or pooled or mantel haenszel).ti,ab,sh. 14. (peto or dersimonian or der simonian or fixed effect).ti,ab,sh. 15. or/10-14 16. 9 and 15 17. Meta Analysis/ 18. (meta-analys\$ or meta analys\$ or metaanalys\$).ti,ab,sh. 19. ((systematic\$ or quantitativ\$ or methodologic\$) adj5 (review\$ or overview\$ or synthesis\$)).ti,ab,sh 20. (integrative research review\$ or research integration).ti,ab,sh. 21. or/17-20 22. 16 or 21 23. 8 and 22 24. limit 23 to (english language and yr="2003 -Current") 	121

EMBASE	27/09/13	<ol style="list-style-type: none"> 1. Cataract Extraction/ 2. exp Cataract/ 3. (surg* or implant* or extract* or remov*).ti,ab. 4. 2 and 3 5. ((cataract adj2 (idiopathic or age\$related or familial or secondary or "ocular trauma" or second\$eye)) or ("crystalline lens" adj remov*).ti,ab. 6. (surg* or implant* or extract* or remov* or lensectomy).ti,ab. 7. 5 and 6 8. 1 or 4 or 7 9. exp review/ 10. (scisearch or psychinfo or psycinfo or medlars or embase or psychlit or psyclit or cinahl or pubmed or medline).ti,ab,sh. 11. ((hand adj2 search\$) or (manual\$ adj2 search\$)).ti,ab,sh. 12. ((electronic or bibliographic or computeri?ed or online) adj4 database\$).ti,ab. 13. (pooling or pooled or mantel haenszel).ti,ab,sh. 14. (peto or dersimonian or der simonian or fixed effect).ti,ab,sh. 15. or/10-14 16. 9 and 15 17. Meta Analysis/ 18. (meta-analys\$ or meta analys\$ or metaanalys\$).ti,ab,sh. 19. ((systematic\$ or quantitativ\$ or methodologic\$) adj5 (review\$ or overview\$ or synthesis\$)).ti,ab,sh. 20. (integrative research review\$ or research integration).ti,ab,sh. 21. or/17-20 22. 16 or 21 23. 8 and 22 24. limit 23 to (english language and exclude medline journals and yr="2003 -Current") 	29
NHS Evidence - guidelines	27/09/13	Cataract surgery	184
NHS Evidence – commissioning	27/09/13	Cataract surgery	147
National Guidelines Clearing House	27/09/13	Cataract surgery	49
Google	27/09/13	“cataract surgery” commissioning (first 50 records scanned for indicative CCG thresholds, commissioning guides)	660,000
Total number after first sift		Tagged with ‘Included’	123

22 Appendix E: Evidence Base

A systematic search of the literature was undertaken. The Guideline Development Group came to a consensus on the topics and questions for the search, formulated in a PICO structure if appropriate. The systematic search was undertaken by Bazian Ltd on 15th October 2013 and included the Cochrane Libraries, MEDLINE, EMBASE, NHS Evidence – guidelines, NHS Evidence – commissioning, National Guidelines Clearing House, Google and other grey literature including the Royal College of Ophthalmologists and College of Optometrists websites. The following Figure illustrates the search flow. For areas where there was an absence of evidence identified by the Bazian search, separate additional searches were made as required.



23 Appendix F: Glossary

- **Anisometropia:** unequal refractive power in the two eyes (for instance where one eye is more short-sighted than the other). This may occur in the time between cataract surgery on the first eye and that on the second eye, and cannot always be corrected satisfactorily with spectacles.
- **Astigmatism:** uneven focussing power of the eye, usually due to uneven curvature of the cornea.
- **Biometry:** measurement of the eye prior to cataract surgery to estimate the power of the intraocular lens implant that will be required to focus the eye at a desired distance.
- **Endophthalmitis:** sight threatening infection inside the eye; a rare, but serious complication of cataract surgery.
- **Phacoemulsification:** the use of ultrasound waves to help soften a cataract, facilitating its removal.
- **Posterior capsule tear and/ or vitreous loss:** An uncommon complication of cataract surgery where there is an unplanned breach in the capsule of the natural lens (which is normally kept intact in order to support the lens implant) that may be accompanied by prolapse of the vitreous gel. This occurrence

increases the risk of further complications following surgery and a poorer visual outcome.

- **Snellen chart/ visual acuity:** A Snellen chart is the traditional test used to measure visual acuity (the ability to perceive detail) and consists of letters in lines of decreasing size, usually read at a distance of 6 metres. Snellen scores are expressed as the distance from the chart divided by a letter size value, with typical values in order of improving visual acuity being 6/60, 6/36, 6/24, 6/18, 6/12, 6/9, 6/6, 6/5, 6/4. 6/6 is considered to be good/ normal vision and is equivalent to the “20/20” value used in the United States.