

## On the day of discharge

The following should be checked:

- Visual acuity (if possible)
- Intraocular pressure (with a non-contact tonometer). It is important to avoid applying pressure on the eye as this can lead to an erroneous reading and can put pressure on the wound, leading to shallowing of the anterior chamber.
- Red reflex (using a direct ophthalmoscope)
- Posterior pole of the fundus (using an indirect ophthalmoscope).

After discharge, children are encouraged to wear dark glasses (sunglasses) for both protection and comfort.

## Initial follow-up

Children with complications should be reviewed weekly until improvement is noted.

The first follow-up visit for uncomplicated cases must be within 2–4 weeks after surgery. If possible, children should undergo refraction at this first postoperative visit; this minimises travelling for the parents and reduces the likelihood of missed follow-up appointments. Children undergoing cataract surgery (with or without IOL), should be dispensed spectacles within 2 weeks of cataract surgery. In older children who have undergone IOL surgery, the prescription of spectacles can be delayed until 4 weeks after surgery to allow the wound and refraction status to stabilise. (Where follow-up is uncertain, however, it is better to dispense spectacles on discharge). Remind parents about the importance of compliance with the prescribed eyedrops. Find out if they have any problems and support them to find solutions.

### Optical correction: non-IOL surgery

Prescribe single lenses, focusing on near vision until the age of 18–36 months and bifocals after that. Contact lenses are another option. Children older than 3 years benefit from bifocals with a +2D add. A flat top D-shape or executive bifocal are preferred in children as they give a wider field of view and less distortion (Figure 3); however, they may not be readily available with the high plus lenses required by children with aphakia. Although progressive lenses give very good visual quality, they are expensive and not recommended for children as their spectacles need to be changed very frequently.

### Optical correction: IOL surgery

Any residual refractive error, especially astigmatism, should be corrected with an

appropriate near vision addition, either in the form of bifocals or progressive lenses (depending upon the affordability) at the first postoperative visit. At each visit, compliance with spectacle wear should be discussed and any issues resolved. In cases of children with disabilities, this should be done with extra care, always encouraging the parents towards better compliance.

## Longer-term follow-up

Longer-term follow-up visits should take place every 3 months up to 2 years of age, every 6 months up to 5 years of age and thereafter yearly or as indicated until the child reaches maturity.

At each visit, the examination should include assessment of the visual acuity, refraction, and slit lamp examination for anterior segment details including IOL placement, pupil shape, clarity of the visual axis, any anterior chamber reaction, and measurement of intraocular pressure (using non-contact methods). Axial length measurement (especially in unilateral cataract or anisometropia) and fundus examination are also essential. Ocular motility and alignment should be assessed so that strabismus and/or amblyopia can be detected early.

Medication and advice (e.g patching) should be adjusted according to the findings. Extended medication should be given to those who may not return for follow-up due to travel logistics or financial constraints. Many families need reminders and special help (reimbursement) for follow-up. It is useful to have one dedicated person in the team to monitor this.

**Figure 3. A Bangladeshi child wearing executive bifocal spectacles after bilateral cataract surgery.**



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# Paediatric cataract: challenges and complications



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## Detection and management of amblyopia

Amblyopia should always be anticipated in children with unilateral cataract, asymmetrical bilateral cataracts (or where there is a delay between the first and second eye operation, or a delay of more than a year between diagnosis/detection and surgery), cataracts with anisometropia or traumatic cataracts with corneal scars. When amblyopia is detected, occlusion therapy (eye patching) must be instituted at the earliest opportunity. The patching regimen is the same with any strabismic amblyopia and sometimes needs to be aggressive at the start. It is crucial to explain the need for patching to the parents, since compliance is the greatest obstacle to the success of amblyopia treatment.

## Myopic shift

As all children are prone to a myopic shift, the axial length should be measured at every visit. A more rapid shift is seen in those operated early in life with emmetropic correction in infancy. Frequent refraction is necessary for optimal optical correction. Children under the age of 8 years undergoing IOL surgery should be slightly under-corrected, leaving them slightly hyperopic so that they can grow into emmetropia, thereby preventing very high myopia later.

## Management of low vision

Even with uncomplicated cataract surgery and a clear visual axis, some children still end up with low vision due to amblyopia or other ocular or central nervous system abnormalities such as cerebral palsy, periventricular leucomalacia, congenital rubella syndrome, etc. These children should be referred for vision rehabilitation.



Applying an eye pad after cataract surgery. KENYA

## Secondary IOL

A decision about whether to insert a secondary IOL in aphakic patients should be considered with caution, taking into account the status of eyeball growth (especially the anterior segment), glaucoma, posterior capsule support, and the potential to improve visual acuity. The sulcus is the easiest position for secondary lens implantation, although this has a higher risk of decentration. With the availability of improved technology and various lenses, each child who is in need should be given a choice, provided the parents understand the visual prognosis.

## Timing of the second eye operation

In infants under the age of 12 months with bilateral cataracts, the risk of amblyopia is very high after non-IOL surgery. Surgery on the second eye is recommended 2 to 3 days after the first eye during the same admission (total admission 5–6 days). Where anaesthesia risk is high, both the eyes can be operated in a single sitting.

If the parents of children undergoing IOL surgery are poorly resourced or have travelled a long way and may not come back for an operation on the second eye, then this can also be done a few days later, as most inflammation is seen within the first few days after surgery.

Bilateral surgery is becoming increasingly common in some countries, particularly in centres with limited access to a paediatric anaesthesiologist and when parents may not return for surgery on the second eye. Another consideration is the lower risk of repeated general anaesthesia. Strict aseptic measures must be observed to reduce the risk of bilateral endophthalmitis. Each eye is treated as a separate procedure with repeat scrubbing, gowning and gloving of

the surgeon and assistant. A new sterile instrument set must be used for the second eye. Contraindications include upper respiratory and ocular infections, congenital nasolacrimal duct obstruction and children at risk of increased inflammation such as those with juvenile rheumatoid arthritis.

## Complications

### Visual axis opacification

Visual axis opacification and membrane formation is common, particularly in young children. For significant opacity, i.e. with reduced visual acuity or where fundus details cannot be seen, YAG capsulotomy can be tried. Surgical membranectomy is required if YAG is not available or fails, or if a soft after-cataract (secondary cataract) has developed. This is best avoided by doing a primary posterior capsulotomy and anterior vitrectomy up until the age of 6–9 years. In older children, a prophylactic Nd:YAG laser capsulotomy can be done at the one week or one month follow-up, when the posterior capsule is unlikely to be fibrosed.

### Glaucoma

Glaucoma is common in children after surgery for congenital cataract and is difficult to manage. It is more frequent with microphthalmos, microconea, congenital rubella syndrome, anterior segment anomaly (such as aniridia, ectopia lentis, or spherophakia) and in traumatic cataract and those operated for cataract in infancy. It can occur many years after the operation. IOP measurement and recording is therefore

mandatory at all visits and central corneal thickness should be measured where indicated. Anti-glaucoma medication should be prescribed after consultation with a glaucoma expert. Apart from a rise in intraocular pressure, other important signs of glaucoma are an increase in axial length, rapid loss of hypermetropia or an increase in myopia and optic disc cupping.

### Postoperative uveitis

The incidence of severe postoperative uveitis has reduced with better surgical techniques, modern IOLs, in-the-bag placement of IOL, and less manipulation of the iris. Heparin-coated IOLs or intracameral heparin, where available, can also reduce the risk of uveitis. Early and frequent use of topical, periocular and systemic steroids in some cases can usually control the inflammation.

The trick is to ensure an in-the-bag placement of the IOL to minimise IOL and iris touch and subsequent iris chafing.

### Retinal detachment

Although retinal detachment is rare the retina should be examined at each visit particularly in eyes with long axial lengths or where surgery was complicated. Retinal examination can be challenging due to small pupils and peripheral capsular opacities.

### Endophthalmitis

Treatment for endophthalmitis in children is in principle the same as for adults. After surgery, loose sutures should be removed as they predispose to infection.

## ‘Glaucoma is common in children after surgery for congenital cataract’



A 13-year-old girl after cataract surgery. Good postoperative care is essential in order to avoid complications. KENYA