the children's hospital at Westmead

EYE CARE: PRE AND POST SURGERY

PROCEDURE ©

DOCUMENT SUMMARY/KEY POINTS

- This document provides specific information on pre-operative, perioperative and post-operative eye care.
- Optimal eye care is essential in order to minimise the risk of complications and enhance healing of the eye post-operatively.

The following procedures are outlined:

1. Administration of eye drops and ointment
   - general principles of pre-operative eye drops for dilating the eye
   - general principles of post-operative eye drops and ointments
2. Eye Care
3. Assessing / examining the eye
4. Post-operative care

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CHANGE SUMMARY

- No changes – due for mandatory review

READ ACKNOWLEDGEMENT

- All nursing staff caring for children with eye conditions should read and acknowledge this procedure.

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1 Pre-operative Eye Drops

1.1 General Principles

Used for:

- Adequate dilation of the pupil for surgery or examination
- Prophylactic antibiotic eye drops prior to surgery

Drop regime

- Commence dilating orders 1 hour prior to surgery
- The two most common pre-operative drops for dilating the eye are:
  - Cyclopentolate Hydrochloride, 0.5% to be used on children less than 1 year old or patients who weigh less than 10 kilograms. Cyclopentolate drops are given first.
  - Cyclopentolate Hydrochloride, 1% used in children older than 1 year.
  - Phenylephrine hydrochloride 2.5% given to all ages. (give one dose only)
- Dark brown eyes usually do not dilate as quickly as blue or hazel eyes due to the pigmentation in the iris muscle. Therefore, Cyclopentolate may need to be given 2 or 3 times at 15 minute intervals to dilate dark eyes.
- For all long procedures, Cyclopentolate must be given 3 times, even if dilated i.e. vitrectomy, lensectomy.

When to use dilating eye drops

- Examination under anaesthetic (EUA)
- Laser/cryotherapy (If child has glaucoma, check with surgeon prior dilating)
- Electroretinogram (ERG)
- Cataract Surgery, Capsulotomies
- Enucleation
- Intravitreal injection (of antibiotic or steroid)
- Retinal Surgery:
  - Vitrectomy, membranectomy
  - Persistent hyperplastic primary vitreous –PHPV
  - Cryotherapy for repair of retinal detachment,
  - Scleral buckle and gas exchange procedure

When not to use dilating eye drops

- For any glaucoma surgery.
- Trabeculectomy, Trabeculotomy or Goniotomy surgery
- Insertion of glaucoma drainage device

2 Administering Drops and Ointment

2.1 Pre & Post-Operative

1. Check the drops/ointment against the medication orders as per hospital policy.
2. Wash your hands.
3. For older children, show them the drops, and place a drop on the palm of their hand so that they can see what it looks like. If the child asks if the drop will sting or hurt, be honest and say that it will sting for about 30 seconds. (Cyclopentolate drops and Tropicamide drops do sting Phenylephrine drops do not sting)
4. **Position the child:** Infants may be immobilised by wrapping them. Older children can lie down. If the child's co-operation can be gained, ask child to look up and gently pull down on the lower lid. If not place the thumb and first finger gently on the upper and lower lids, close to the lashes and carefully pull the lids apart, being sure not to apply any pressure to the globe of the eye (see Figure 1).
5. **For drops:** Squeeze a drop of liquid into the middle to outer quadrant of the pouch. Hold the medication in the eye by pressing against the lacrimal area, or close eyes and avoid blinking for one minute.
6. **For ointment:** hold the tube parallel to the eye and then squeeze a ribbon approximately 0.5cm of ointment into the pouch. Commence applying the ointment at the inner canthus. Do not touch the eye, lids or lashes with the dropper or the nozzle. Release the lid and allow the child to blink to spread the ointment. Discourage the child to rub his/her eyes.
7. Wipe away the excess liquid/ointment with a clean, plain tissue and wash hands. The child may complain of blurred vision. This is normal while the ointment is melting and should subside after 1/2 hour.
8. For pre-operative drops to dilate the eyes, repeat the drops every 15 minutes depending on the orders. Check the pupil with a torch to ensure that the medication is having an effect in dilating the pupil. If after completing the drop regime and the drops have had little effect contact the attending surgeon for further instructions.

   NOTE: Topical medications can take over 1 hour to work. Some topical medications, such as dilators have a long lasting effect. Start the medication as soon as possible for the first case if necessary.
9. Label the drops/ointment and use only for the child prescribed. Keep refrigerated if indicated.
10. Discard once dilation or prescription has been completed, or medication has expired.

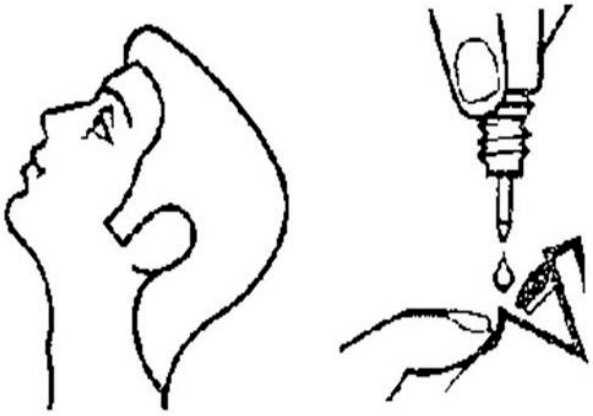

Figure 1: Instilling Topical Eye Medication

3 Post-Operative Drops/Ointment

3.1 General Principles

- Post-op drops may include one, two or three different drugs. Some drugs may prevent the absorption and action of others if given in succession.

  NOTE: Always wait 2-3 minutes after each drop for absorption to take place
- If drops and ointment are ordered, instil drops first, otherwise the ointment will interfere with the absorption of the drops.
- For optimal benefit the drops should be given in the following order:
  - **i.** Mydriatics (dilators) e.g. Atropine
  - **ii.** Miotic (constrictors) e.g. Pilocarpine.
  - **iii.** Antibiotics e.g. Chloromycetin.
  - **iv.** Beta blockers e.g. Timoptol.
  - **v.** Steroids e.g. Maxidex.

4 Eye Care

The eye should be cleaned:

- when there is discharge
- Post-operatively prior to instilling drops/ointment as charted by doctor.

Equipment required:

- Sterile gallipot
- Eye Shield (if required)
- A number of sterile eye gauzes
- Sachet of normal saline (room temperature)
- Paper bag to discard gauze
- Sterile eye pad (if ordered)
- Adhesive tape – pre cut
- Gloves (powder free)

4.1 Procedure

1. Prepare child and carer by explaining procedure, ensuring privacy.
2. Position comfortably with the head well supported.
3. Wash hands.
4. Open gallipot and eye gauze and pour saline.
5. As per doctors' orders remove eye pad and discard. An eye shield is often used for intraocular surgery or penetrating eye injury. The shield is a single patient use item. Wash shield in warm soapy water daily, rinse and dry shield well.
6. Wash hands again and put on gloves.
7. Moisten swab and gently clean the affected eye from the inner canthus to the outer using the swab only once. A moist swab should always be used for eye care to lessen irritation and avoid lint entering the eye.
8. Observe for any abnormalities (see examination of eye below).

   NOTE: Forceps are never used to clean the eye as they may cause trauma.

Figure 2: Eye Pad Application

9. Apply a sterile eye pad or shield if ordered as shown on in Figure 2 above. If using an eye pad make sure eye is closed underneath - if patient has deep set eyes it may be necessary to fold pad in half.

   NOTE: A corneal abrasion may result if eye is opened underneath the eye pad.

   Eye pad should be placed so that the inner edge covers half the bridge of the nose.

   Adhesive tape should be placed diagonally over the pad, taping from forehead to cheek.
10. Ensure the child is comfortable. Discard equipment and wash hands.
11. Sign medication chart if treatment has been instilled.

5 Procedure for Examining/Assessing the Eye

- A torch is essential for accurate assessment.
- The eye should be examined from the outside inwards.
- Always look at the patient's face as a whole to determine facial symmetry, noting any obvious ptosis (drooping eyelid), proptosis (eye pushed forward).

Then proceed as follows:

Lids

- Compare eyes, noting any facial asymmetry, lid swelling bruising, itching or discharge.

Conjunctiva

- Observe the conjunctiva for the degree of injection (redness), oedema (chemosis), sub-conjunctival haemorrhage.

Cornea

- The cornea should be clear.
- Note any clouding or smaller opacities.

Anterior Chamber

- Observe the depth.
- Note the presence of blood (hyphema) or pus (hypopyon) in the anterior chamber.

Pupil

- Observe the position (central), shape, size and reaction to light of the pupil. Any asymmetry of the pupil may be indicative of iris/wound prolapse or trauma. [2]

6 Instructions for Day Surgery Admissions

The following procedures are usually performed as a Day Surgery Procedure. All of these procedures have post-operative information sheets available from Middleton Day Stay Ward and the Eye Clinic.

6.1 Procedures

Examination under Anaesthetic (EUA)

EUA is done when a child will not cooperate for an examination in the outpatient department. (i.e. examination and photos of the retina.)

Lacrimal Probing and syringing

This procedure aims to unblock the tear duct. A probe is inserted through the punctum into the tear duct, opening the structure. A syringe with fluid and a small cannula is introduced into the punctum the fluid is pushed through and rinses all debris cleaning the lacrimal duct.

Strabismus/Squint

- Strabismus or squint is a misalignment of the eyes, in any direction, up, down, in or out
- Strabismus surgery aims to either weaken or strengthen the function of the eye muscle.
- Additional information can be found in the Parent Information section below.

Chalazion

A chalazion is a firm non-tender bump on the eye lid. The cause of the bump is due to a blocked Meibomain gland. The Meibomian gland produces oil and once the gland is blocked a chronic sterile inflammation appears under the eye lid.[3]

Additional information can be found in the Parent Information section below.

Ptosis

Ptosis is drooping of the upper lid which may occur unilaterally, bilaterally, constant or intermittent. It may be congenital, caused by failure of development of the upper levator muscle or it may be acquired through trauma, tumour or oedema. [4]

A frost suture can be placed on the eye lid. Frost sutures are a temporary stich that closes the eye lid together.

- Ptosis procedure may be performed as a Day Surgery procedure if:
  - It is not bilateral,
  - the family live in the Sydney metropolitan area
- Usually discharged day 1 - Frost suture is usually removed in the Eye Clinic prior to discharge by Ophthalmology CNC or Registrar.
- Due to poor blinking and poor lid closure after the procedure, ensure parents are educated to apply copious lubrication ointment especially at night to avoid corneal exposure. [3]
- Additional information can be found in the Parent Information section below.

Lensectomy

- The removal of a cloudy lens / cataract is called lensectomy
- Sometimes a lensectomy is performed for lens dislocation (ectopia lentis)
- Lensectomy is the term applied to the removal of a lens in a child. This is different to adult cataract surgery. In children the lens is soft and is aspirated or nibbled away. In an adult the lens is hard and needs to be removed in one piece or broken up by ultrasound into smaller bits and then removed (Phacoemulsification).
- Sometimes an intra-ocular lens (IOL) is inserted during the operation. The lens implanted is made of acrylic and stays in the eye permanently. [5]
- **Lensectomy procedure** is performed as a Day Surgery procedure depending on:
  - Child's age
  - If the procedure is unilateral
  - If they live in the Sydney metropolitan area
  - There are no other co-morbidities.
- **Discharge:** For Day Surgery Admission, the **child can be discharged** after 2 hours from the Day Surgery Unit, if he/she meets the discharge criteria.
  - If the lensectomy is *not performed* as a day surgery procedure, discharge is usually one day post-operatively.
- **Follow-up:** Usually 1 week post op. At this appointment the eye is reviewed and refraction is performed by the Ophthalmologist. If contact lenses are required they are prescribed, and ordered by the Eye Clinic Secretary.

  If contact lenses are required, another appointment is made for the following week for review with the Ophthalmologist and to see the Orthoptist to educate the parents on contact lens use and care.
- Home care:
  - Cleaning and instillation of drops
  - Limit physical activity

  Additional information can be found in the Parent Information section below.
- Parent education
  - Parents education in the Day Surgery setting regarding the procedure and post-operative care, cannot be over emphasized to reduce anxiety and will ensure the child and family are adequately prepared and supported on discharge

7 Instructions for Overnight Admissions

7.1 Post-operative Patient Management

Eye Observations

- If an eye pad is used as dressing observe for any increased discharge or bleeding.
- Ensure eye pad and/or shield are intact until reviewed the next day in the eye clinic. Reinforce if necessary and prevent child from rubbing eyes (they may require arm splints). If dressing is removed by the child, reapply and secure with tape.

Pain management

- See pain management orders.
- Children, who have had an enucleation, may require a Morphine infusion.

7.2 Day One Post-Operatively

Note: In the morning of day 1 post-op, the Eye Registrar will review the child in the Eye Clinic.

When dressings are removed:

- Clean the operated eye as per post-operative orders.
- Examine the eyes as per procedure above, document and report any abnormalities to Eye Registrar.
- Instil eye drops or ointment as charted after the operated eye has been cleaned.

7.3 Discharge

- Instruct parents on suitable analgesia.
- Instruct parents on cleaning the eye, administration of eye drops/ointment (technique, purpose, amount, and frequency) and continued eye care at home. Compliance to treatment is reduced if parents have no understanding of the purpose of the drops.
- Ensure follow up appointment is arranged.

8 Instructions for Inpatient Admissions

8.1 Glaucoma Surgery

- Glaucoma surgery aims to reduce the elevated intraocular pressure (IOP)
- Increased IOP leads to optic nerve damage and consequently visual loss.
- **Congenital Glaucoma:** Is caused by abnormal foetal development of the angles structures, leading to impaired drainage of the aqueous fluid and elevated IOP.
- **Infantile Glaucoma:** is when structural abnormality of the angles develops in the first two or three years of life. [6]

Discharge

Patients are usually discharged on day 1 or day 2. Depend on individual cases and surgeons preferences.

Trabeculotomy

Trabeculotomy is a surgical procedure that helps reduce intraocular pressure in the eye by opening the eye's draining system (Schlemm's Canal) to allow the aqueous fluid to drain better. The drainage angle of the eye is cannulated and then disrupted to create an opening between the Schlemm's Canal and the Anterior Chamber for the aqueous fluid to drain.

Goniotomy

Is where a few slicing incisions are made through the abnormal Trabecular Meshwork for the aqueous fluid to leave the eye.

Trabeculectomy

Involves making a scleral flap under which a hole is created to drain aqueous from the anterior chamber to the sub-conjunctival space. An anti-fibrotic agent is placed in the flap to delay healing. The flap is sutured back into place and forms a fistula into which aqueous can drain into scleral vessels. The bulge lying under the conjunctiva is called a "bleb". 6

Homecare

- Cleaning and instillation of eye drops, as prescribed by surgeon
- Protect ion of eye with shield/sunglasses is important. This should be worn at all times.
- Discourage the child from rubbing their eyes
- Parents are taught to observe the eye for signs of raised intraocular pressure (cloudy corneas, red irritable watery eye, pain) and infection (increased redness, swelling, discharge, temperature)
- Pain relief required regularly.

Additional information can be found in the Parent Information section below.

8.2 Dacryocystorhinostomy (DCR)

A DCR is performed to create a new drainage channel for the tears into the nasal cavity. Sometimes a tube is left inside the nose for 3-6 months to maintain the patency of the new drainage channel. [2]

Discharge:

- Usually discharged day 1 post-operatively.
- Observe for bleeding from wound or nostril. A small trickle of blood ooze from nostril may occur, however if bleeding continues or increases from nostril apply pressure and/or cool pack to nasal bridge and contact Eye Registrar.

Home Care

- Apply antibiotic ointment to nasal bridge wound and instil eye drops as ordered.
- Parents educated on wound care and signs of infection.
- No hot foods or drinks.
- Limit physical activity.
- Will require regular pain relief.

Additional information can be found in the Parent Information section below.

8.3 Orbital Surgery

Enucleation

This is a surgical removal of the eyeball itself. The extra ocular muscles are conserved and re-attached to an orbital implant that is implanted at the time of the enucleation. An eye prosthesis matching the other eye can be used after three months. [7]

Evisceration

The contents of the glove are removed, leaving the sclera intact. An orbital implant may be inserted into the sclera at the time of surgery.

Exenteration

Is the removal of the total contents of the orbit and if necessary the eyelids, plus any involved bone.

Post Orbital Surgery

- Observe for haemorrhage during first 24 – 48 hours.
- Dressing taken down after 24- 48 hours by Registrar or Ophthalmology CNC.
- Clean wound twice a day or PRN, after the dressing has been removed.
- The length of stay in hospital is approximately 2 – 4 days dependant on the type of procedure performed.
- Give regular pain relief.

Home care

- Parents need to be shown how to clean the eye and to instil medication into socket.
- Eye pad is to be worn for protection and comfort if requested by surgeon.
- Will require regular pain relief.

Additional information can be found in the Parent Information section below.

8.4 Retinal Surgery

Vitrectomy

Vitrectomy is the repair of a retinal detachment, caused by a retinal hole or tear. This surgery involves the removal of the vitreous fluid and the replacements of this fluid with gas, oil or saline to maintain the retina attached to the sclera while it heals.

Cryotherapy, laser or photocoagulation

- Cryotherapy is used to seal a hole or tear in the retina.
- Cryotherapy and laser can also be used to treat ocular tumours

Scleral buckle

A piece of silicone is sutured onto the outside of the sclera over the site of the retinal hole or the retinal tear. The sclera become indented or "buckled" inward closing and placing pressure over the retinal break [8]

Encirclement

A silicone band is positioned around the globe under the extra ocular muscles. The band allows for a greater indentation where there is a large area of detachment or multiple holes.

Gas exchange procedure

As vitreous cannot be replaced naturally, gas, air and oil is used to hold the retina in place whist is healing.

1. Gas Sulphur hexafluoride (SF6),
2. Gas Perfluoropropane (C3F8).
3. Air, which is absorbed within 24 to 36 hours
4. Gas and air mixture absorbed within 24 to 36 hours
5. Oil. As oil is heavy it places pressure on the retina. Oil is removed after 3 to 6 months

   Aqueous will eventually fill the vitreous chamber to replace the above substances as they are absorbed.

Discharge

- The stay in hospital is approximately 2-4 days.
- Pad remains intact until next day when it will be removed by Eye Registrar / CNC.
- Observe the entry sites of the incision in the sclera for bleeding or gaping.

- Cleaning and instillation of drops are important.
- Will require regular pain relief.
- Patient cannot see through the gas until it has been absorbed which usually takes a few weeks
- Check if the patient has/ needs a fluorescent green medical alert armband.

Patients who have received surgical gas into their eyes should wear an arm band to alert others that a gas has been used to treat the eye. These patients should not travel by aeroplane after surgery, as the high altitude will expand the gas in the eye.

9 Parent Information

9.1 Fact Sheets

- Congenital cataracts: http://www.chw.edu.au/parents/factsheets/eycongej.htm
- Your baby's eyes: http://www.chw.edu.au/parents/factsheets/eybabyej.htm
- How to make an eye patch: http://www.chw.edu.au/parents/factsheets/eyepatch.htm
- Your child's contact lens & patching therapy: http://www.chw.edu.au/parents/factsheets/eylenpat.htm
- Contact lens & children – helpful hints from parents: http://www.chw.edu.au/parents/factsheets/eycontlj.htm
- Eye Care – Strabismus Correction (Squint correction): http://intranet.kids/ou/orthoptics/resources/factsheets/eye_care_-_strabismus_correction.pdf
- Eye Care – Dacryocystorhinostomy: http://intranet.kids/ou/orthoptics/resources/factsheets/eye_care_-_dacryocystorhinostomy.pdf
- Eye Removal – Lid and Socket Care: http://intranet.kids/ou/orthoptics/resources/factsheets/eye_removal_-_lid_and_socket_care.pdf
- Eye Care – Eyelid Cyst Excision: http://intranet.kids/ou/orthoptics/resources/factsheets/eye_care_-_eyelid_cyst_excision.pdf

9.2 Homecare Guideline

- Eye Cleaning and Administration of Eye Drops or Ointment: http://intranet.kids/o/documents/policies/homecare/2006-8109.pdf

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