MINISTRY OF HEALTH

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GUIDELINES FOR EYE CARE

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CONTENTS

Abbreviation

AA	Amplitude of Accommodation
CPS	Canadian Paediatric Society
DR	Diabetic Retinopathy
ERG	Electroretinogram
EOG	Electro-oculogram
EUA	Examination Under Anaesthesia
FB	Foreign Body
IOL	Intra Ocular Lens
IOP	Intra Ocular Pressure
IRMA	Intra-Retinal Microvascular Abnormalities
ME	Macular Edema
MoH	Ministry of Health
NRA	Negative Relative Accommodation
POAG	Primary Open Angle Glaucoma
PRA	Positive Relative Accommodation
PRP	Pan Retinal photocoagulation
STI	Sexually Transmitted Infections
UCG	Uganda Clinical Guidelines
VEGF	Vascular Endothelial Growth Factor
VEP	Visually Evoked Potential

Operational Definitions

Eye Care Worker:

An eye care worker is any health worker involved in delivery of eye services. This includes ophthalmic assistants, nurses, clinical officers, optometrists and ophthalmologists.

Primary Level:

For purposes of eye care delivery, a primary eye care level refers to any eye service from the village level, HCs II, III, IV up to district hospitals. Here only basic ophthalmic services like diagnosis of common eye conditions and provision of simple eye medication are carried out mainly by ophthalmic assistants and clinical officers.

Secondary Level:

This refers to centres were an ophthalmologist is based (usually referral hospitals). At these centres more elaborate diagnosis of eye conditions with advanced equipments are carried out, treatments for most of the eye conditions are performed including surgery for common eye diseases.

Tertiary Level:

These are centres with more advanced diagnostic and treatment facilities (e.g. laser, OCT etc) and have sub specialists. At the moment there are 5 of these centres in Uganda and these are; Benedictine Eye hospital in Tororo, Ruharo Eye Centre in Mbarara, Mengo, Agarwal's and Mulago National Referral Hospitals in Kampala.

FOREWARD

The provision of eye care services in Uganda has been ongoing without a standardized guide at the different levels of service provision that documents step by step management of the eye conditions in Uganda.

In view of the call by World Health Organization and International Agency for Prevention of Blindness as enshrined in the Global Action Plan for Eye Health, 2014-2019 to ensure standardized management of eye conditions, it was imperative that the Ministry of Health in collaboration with Eye Care Development Partners develop these Eye Health guidelines.

The guidelines have been developed to provide easy to use practical, complete and useful information for correct diagnosis and management of seventeen common eye conditions in Uganda, thereby complementing the Uganda clinical guidelines.

Proper utilization of these guidelines by Eye Care workers at all levels will enhance quality management of eye diseases, bearing in mind that the eye is a very delicate organ whose care requires clearly defined step by step guidelines. They will also facilitate clinical audits in eye care practice, thereby promoting quality improvement.

I call upon all Eye Care workers at all levels to make effective use of the guidelines in their day to day practice as we all strive to prevent visual impairment and blindness in Uganda

Prof. Anthony K. Mbonye
Ag. Director General Health Services

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Introduction

This is the first edition of the guidelines for eye care in Uganda. They have been developed to complement the Uganda Clinical Guidelines.

A study on the quality of cataract service in Uganda (Wabulembo 2014), indicated that although the quality of services was acceptable, there was no documentation of the steps for management of cataract and other eye conditions in Uganda. Health worker practice is based on knowledge acquired during training with no standardized guide for care at the different levels of service provision. In addition the Uganda Clinical Guidelines (UCGs) 2012, captures only 9 of the eye conditions, which are managed mainly at primary health care level.

The Ministry of Health (MoH) with support from Sight Savers constituted a task force of eye care experts to develop the Uganda Eye Care Guidelines. The taskforce undertook literature reviews and held stakeholder meetings to for input into the guidelines.

The Eye Care Guidelines aim to provide easy to use, practical, complete and useful information on how to correctly diagnose and manage the seventeen common eye conditions in Uganda. These guidelines are to complement what is in the UCGs based on the fact that the eye is a very delicate organ and therefore management of the eye required clearly defined and precise step-by-step guidelines for eye care workers at all levels. The guidelines will be used to orient eye care workers on the current management practices in addition to facilitating clinical audits in eye care practice. This in turn will ensure that patients receive the best possible eye care services, obtain prompt and effective relief or cure of their complaint and thereby make the most appropriate use of scarce diagnostic and treatment resources including medicines.

The guidelines will be circulated free of charge to all public, private sector prescribers, pharmacists and regulatory authorities in the country. There will be deliberate effort to undertake a carefully designed orientation training to introduce the guideline, its contents, the presentation of information and how to use it to best effect.

The eye conditions have been arranged by alphabetical order and are each the subject of an individual monograph, which follows a standard format. For each condition there is a title/description, risk factors, how does a patient present and management by facility level i.e. primary, secondary / tertiary.

Title/description

Each condition is given a title followed by a brief description of the condition, e.g. Diabetic Retinopathy – “A disease in which small blood vessels are damaged from elevated blood sugar over a prolonged period of time”.

Causes / Risk factors

Listed here are the pathological organisms, circumstances, or reasons for transmission of the disease or occurrence of the condition. Any pre-disposing factors will also be given in this part of the monograph.

How does a patient present?

Listed here are the main signs and symptoms that characterise the disease or condition with an indication of patient groups that may be more susceptible, e.g. children and the elderly. Where relevant, complications, which may result from having the condition (usually in a serious or chronic form) are also given.

Management

The therapeutic and other patient management measures necessary to deal satisfactorily with the particular condition are given in a logical sequence of steps. These measures may or may not involve prescribing specifically indicated medication.

2.0. Guidelines on Management of the Common Eye Conditions

2.1 CATARACT

Description :

Cataract means cloudiness of the natural lens.

Causes / Risk factors

There are a number of causes/risk factors of cataract in adults. The common ones are:

1. Old age
2. Diabetes (High blood sugar)
3. Certain drugs like corticosteroids
4. Eye injuries

Presentation

- Gradual painless loss of vision
- White pupil

Management of cataract

At primary care level

- Any patient with poor vision should be referred to the secondary /tertiary centres for further management.

At secondary / tertiary level history should bring out possible risk factors for cataract like;

- age of patient,
- use of drugs like corticosteroids,
- medical conditions such as diabetes,
- trauma and drug allergies.

Examinations:

General examination: like blood pressure measurement and general health.

Eye examination

- Measurement of visual acuity
- External examinations including lids and lashes
- Measurement of intraocular pressure
- Full slit lamp examination or torch examination with a loupe where possible
- Dilated pupil examination of the cataract and fundus
- Biometry

Investigations

- In patients where fundus is not accessible, B-Scan ultrasonography may be done to establish the status of the vitreous and retina.
- Blood sugar test

Pre-operative checklist

- Consent for surgery
- Biometry
- Intra-Ocular Lens (IOL) selection (type and power)
- Topical antibiotics
- Check for any infection around the eye including the lacrimal apparatus.

Treatment:

The treatment of cataract is surgery. This is normally done under local anaesthesia.

Anaesthesia

- Most adult cataracts should be done under local anaesthesia
- Recommended: Sub-tenon lignocaine. (See annex 1 for procedure). Avoid retrobulbar anaesthesia for the danger of optic nerve damage.
- A few patients may require general anaesthesia e.g. mentally retarded, non-cooperative patients, etc.

Surgical procedures

- Manual small incision cataract surgery with IOL implantation
- Phacoemulsification with IOL implantation.

Prophylaxis against infection

Its recommended that all patients undergoing cataract surgery should get;

- Topical Povidone iodine 5% solution immediately before surgery. This should be instilled in the lower fornices conjunctival sac
- Intra cameral antibiotics (Cefuroxime or Ceftriaxone) at the end of surgery or in the irrigating solutions (see annex 1 for preparation and administration)

Post-Operative care

It is recommended that all adult patients who have undergone cataract surgery should have at least 4 post-operative visits as follows;

1. 1st post-operative day
2. 1 week after surgery
3. 1 month after surgery
4. 3 months after surgery

Note:

In case there was intra operative complications the patient can be seen more frequently as advised, also in the event of unexpected discomfort outside scheduled visits such as panophthalmitis.

Post Operative Treatment

- Steroid/antibiotic combinations such as Betamethasone/Dexamethasone with Neomycin, Tobramycin with dexamethasone or dexamethasone with gentamycin eye drops applied every two to hours in the first post operative week then every three hours thereafter for 4-8 weeks.
- Analgesics
- Oral steroids such as prednisolone or dexamethasone (optional if there is severe inflammation)
- Non-steroidal anti-inflammatory drugs

Date of follow up

During the visit the following should be done:

- Check visual acuity for distance, near with and without the pinhole
- Slit lamp examination
- Fundus examination
    - Refraction with addition should be scheduled for tail end follow up (3 months)
- Intraocular Pressure

Surgery in special circumstances

This category includes patients with;

- the only eye
- Complicated cataracts
- Cataract following glaucoma surgery.

Cataract surgery in these patients should be performed by experienced ophthalmologists.

2.2 PAEDIATRIC CATARACT

Description

Cataract in children is unique in that it may interfere with the normal development of vision resulting in lazy eye (amblyopia).

Causes / Risk factors

- Hereditary/genetic disorders
- Intrauterine infections-TORCH, Drugs
- Metabolic diseases e.g. Diabetes
- Trauma
- Unknown in most cases

Presentation

- A white pupil (leukocoria)
- Older children may complain of poor vision
- “Dancing eyes” (nystagmus)
- Squints

Management

At primary level

- All children with above features should be referred to the secondary/tertiary level urgently.
- At secondary / tertiary level history should include;
- Age of onset of cataract
- Duration of cataract
- Any old photograph of child if available

Examinations

General examinations:
This should be done preferably by a paediatrician to assess the child's fitness for general anaesthesia. The examination should include the general health of the child and cardiac abnormalities if present.

Eye Examination

- Visual acuity
- Portable slit lamp examination of the eye
- Dilated fundus and cataract examinations
- Examine for nystagmus

Investigations
B-Scan ultrasonography, to assess the state of vitreous and retina in dense cataracts to rule out retinoblastoma.

Pre-Operative checklist

- Consent for surgery
- Biometry (on table)
- Topical antibiotics

Treatment

- The treatment of paediatric cataract is surgery. This is normally done under general anaesthesia. Surgery can be done as early as one month of age.

Surgical procedures

- The surgical technique for paediatric cataract is lens washout with primary posterior capsulotomy and anterior vitrectomy in younger children (up to 6 years).
- Intra ocular lens should be implanted in all children who are one year old and above.
- It is recommended that children with bilateral cataracts should have each eye operated separately (putting into consideration the facility and patient factors). This should be done within a week.

Prophylaxis against infection

- For all patients topical 5% Povidone iodine in the fornices immediately before surgery.
- For all patients intracameral antibiotics after surgery e.g. Cefuroxime, moxifloxacin etc.
- Aphakic children /those less than one year who are not implanted should be given aphakic glasses or contact lens.

Post-Operative Care

1. Inflammations: This should be prevented by sub-tenon's injection of depomedrol or triamcinolone immediately after surgery.
2. Topical steroid-Antibiotic drops should be administered post operatively.
3. Cyloplegic e.g. Atropine or cylopentolate should be administered from the first post-operative day to prevent pupillary abnormalities due to adhesion formation.
4. Frequent refraction and provision of optical corrections during post-operative visits.
5. Patching/occlusion therapy in case of lazy eyes (amblyopia).

Table 1: Post Operative Follow up Protocol

Paediatric Cataract/ lens wash out/ lensectomy	First post Operative visit	Second visit	Third visit	Subsequent visits	Remarks
	One week after discharge	One month after 1st visit	One month after 2nd visit	Every three months	
	Fundoscopy Refraction Steroid antibiotics Atropine drop TCA 1/12	Fundoscopy Refraction + spectacle Steroid antibiotics Amblyopia treatment	Fundoscopy Refraction + spectacle Amblyopia treatment	Refraction + spectacle Amblyopia treatment TCA 3/12 or 6/12	Under 6 years subsequent visit every 3/12. > 6years subsequent visits every 6/12

2.3 CONJUNCTIVITIS

Description

Inflammation of the conjunctiva of the eye.

Causes / Risk factors

- Infection: bacterial or viral
- Trauma: chemical, foreign bodies
- Smoke
- Allergy

Presentation

- Discomfort or foreign body sensation
- Watery discharge (virus or chemicals)
- Pus discharge (bacteria)
- Visual acuity is normal
- Redness (usually both eyes, but may start/ be worse in one, usually reddest at outer edge of eye)
- There may be swelling of lids or conjunctiva
- Itching (may be present)

Differential diagnosis

- Corneal ulcer / keratitis (tends to be in one eye only redness is greatest near the cornea, pain often great).

Management

Examination

- A slit lamp biomicroscopic examination where available, or torch examination with binocular loupe of the anterior segment of the eye is essential. This should also include flourescein staining of the cornea to rule out corneal ulcerations/keratitis.

Investigations

Pus swab

- Gram stain
- Culture and sensitivity

Treatment

Infective conjunctivitis

- Apply antibiotic eye drops chloramphenicol or Gentamicin or ciprofloxacin two or three hourly. Change treatment as indicated by results of culture and sensitivity where possible. Treatment should be continued for at least 7-10 days.
- Tetracycline ointment 1% or chloramphenical eye ointment 1% at bed time

NB: Gonococcal conjunctivitis should be treated aggressively and in line with syndromic management of Sexually Transmitted Infections (STIs). (See treatment of conjunctivitis of the newborn).

In allergic conjunctivitis

Use non-steroidal anti-inflammatory eye drops where available and affordable.

- Mast cell stabilizers like Sodium cromoglycate, alomide (lodoxamide), Patanol.
- Diclo-genta

NB: Use of Steroid eye drops should be limited to short duration for fear of unwanted complications. There is no indication for systemic steroids in allergic conjunctivitis.

Caution: Do not use steroid preparations unless sure of the diagnosis as they may mask infections.

Prevention of Conjunctivitis

- Personal hygiene; daily face washing
- Wear protective goggles when using dangerous chemicals
- Avoid irritants and allergens

2.4. CONJUNCTIVITIS OF THE NEWBORN

Description

This is inflammation of the conjunctiva characterised by discharges from the eyes in babies <1 month of age.

Causes

- Infections:
  - Usually from mother's birth canal or due to poor hygiene of the person caring for the newborn
    - Bacterial, e.g. Gonococci, Chlamydial
    - Viral: herpes simplex
    - Fungal e.g. Candida
- Chemical e.g. silver nitrate, concentrated povidone iodine eye drops

NB: Gonococcal conjunctivitis is potentially blinding. It presents with copious purulent discharges from the eye(s) and may cause corneal perforation within 24 hours of onset.

Presentation

- Reddening of one or both eyes
- Swelling of the eye lids
- Purulent or watery discharge
- Excessive production of tears (lacrimation)
- If not treated early will result in scar formation or perforation of the cornea, either of which will lead to blindness.

Management

Examination

- A portable slit lamp biomicroscopic examination where available, or torch examination with binocular loupe of the anterior segment of the eye is essential. This should also include flourescein staining of the cornea to rule out corneal ulcerations/keratitis.

Investigation

Pus swab

- Gram stain
- Culture and sensitivity

Treatment:

At primary level

Baby

- Frequent Cleaning with saline.
- Regular application of the topical eye drops
  - Gentamicin, chloramphenicol half hourly
- Apply **tetracycline eye ointment 1%** every 6 hours
- Refer for specialist care

Parents:

- Father/Mother: Oral doxycycline 100mg 12 hourly for 7 days. If mother is pregnant give oral erythromycin 500mg 6 hourly for 7 days.
- Follow up is important

At secondary and tertiary level

1. Baby
2. Parents

Baby

i) Ocular treatment

- Irrigation with saline if severe. Extreme caution should be taken to prevent pus spurting on the nurse's face and body.
- Topical application of eye drops; Gentamicin, Chloramphenical and ciprofloxacin
- Tetracycline Eye Ointment

ii) Systemic treatment (In suspected case of gonococcal conjunctivitis)

- IM ceftriaxone single dose: 25mg/kg-125mg/kg stat
- Then syrup azithromycin 20mg daily for 3 days

NB: Chlamydial organisms are commonly associated with other systemic infections such as pneumonia or Respiratory Tract Infection. Always take precaution whenever examining the patients. Use gloves and wash hands after examinations.

Parents

- Father/Mother: Tab Cefixime 400mg stat or IM Ceftriaxone 1g stat, then oral doxycycline 100mg 12 hourly for 7 days. If mother is pregnant give oral erythromycin 500mg 6 hourly for 7 days.
- Follow up is important
- Advice on sex. (NB puerperal period). It is important to emphasize that puerperal sex should be avoided. Barrier methods to be used when you must.

Management of complication such as corneal ulcers and perforation is important in preventing severe visual loss or blindness.

Prevention and prophylaxis

- Good antenatal care with screening and treatment of mother's genital or urinary tract infections, and spouse.
- Clean delivery
- **Prophylactic treatment** of all neonates soon after delivery: wipe the eyes of the newborn with sterile gauze immediately after birth then apply **tetracycline eye ointment 1%** single dose to both eyes or use 2.5% povidone iodine drops.

2.5. DIABETIC RETINOPATHY

Description

Is a disease in which small blood vessels are damaged from elevated blood sugar, over a prolonged period of time.

Table 2: Diabetic Retinopathy staging and management

Diabetic Retinopathy (DR) Stage	Clinical signs	Action at secondary level	Action at tertiary level
1. No diabetic retinopathy	No abnormalities	Monitor at secondary level	
2. (i) Mild NPDR	Micro aneurysms only	Refer to retina clinic	Follow up in 12 months
(ii) Moderate NPDR	More than just aneurysms but less than severe NPDR	Refer to retina clinic	Follow up 6-12 months
(iii) Severe NPDR	More than 20 haemorrhages in each quadrant or venous beading in 2 quadrants or Intraretinal microvascular abnormalities (IRMA)	Refer to Retina clinic	Either review in 6 months or consider pan retinal laser if follow up is unreliable
3. Proliferative Diabetic Retinopathy	Any new vessels at the disc (NVD) or elsewhere (NVE) Vitreous / pre-retinal haemorrhage	Urgent referral to retina clinic	PRP / Vitrectomy if vitreous haemorrhage or retinal detachment
MACULA EDEMA (ME)			
1. Macula edema absent	No exudates or retinal thickening	Follow up in 12 months	Follow up in 12 months
(i) Mild ME	Exudates or retinal thickening in posterior pole	Refer to retina clinic	Follow up in 6 months
(ii) Moderate ME	Exudates or retinal thickening 1DD or less from fovea, but not affecting fovea	Refer to retina clinic	PRP if CSMO, Review in 6 months if no CSMO
(iii) Severe ME	Exudates or retinal thickening affecting centre of fovea	Refer to retina clinic	Laser treatment or intravitreal injections of anti-VEGF

Causes / Risk factors

- Duration of Diabetes
- Poor control of Diabetes
- Hypertension
- Pregnancy. Occasionally associated with rapid progression of DR
- Kidney diseases if severe is usually associated with worsening DR
- High Body mass index is a risk factor for developing retinopathy.
- Smoking
- Alcohol
- Sedentary lifestyles

Presentation

Patients can present either with a sudden painless loss of vision or gradual and progressive loss of vision. Or discovered on routine examination

Management

At the primary level

All diabetic patients should be referred to a secondary or tertiary facility (Retina centre) for proper evaluation and management.

DR management is based on the International Council of Ophthalmology's Diabetic Retinopathy and Diabetic Macula Edema severity scales.

Assessment of patients at secondary and tertiary levels

History:

The history should include duration of Diabetes, control of Diabetes, elicit other risk factors and past medical history.

Examinations

General examinations: For general state of health of the patient and blood pressure measurements.

Eye examinations

This should include;

1. Visual acuity for distance, near and with the pin hole
   If no Diabetic Retinopathy refer to Diabetologist / Physician
   If you find evidence of Diabetic Retinopathy refer to Retina clinic

2. Assessment of anterior segment / slit lamp examinations.
   - State of the cornea
   - Anterior chamber
   - Iris for Rubeosis iridis
   - Lens for any opacity

3. Measure intraocular pressure

4. Assessment of Posterior segment (after dilating the pupil) with an indirect ophthalmoscope.

Investigations

- Random /Fasting Blood sugar (NR: 3.2---7.4 mmol/l), and where facilities are available the following:
- Fundus photography
- Optical coherence tomography
- Fluorescein angiography
- Hb Ac

NB: All regional hospitals or regional eye departments should have fundus cameras and trained technicians to take fundus photographs so as to bridge the gaps between eye clinics and diabetic clinics in a facility.

Follow up and treatment (refer to table above)

This may involve any of or a combination of the modalities below:

- PRP

- Anti VEGF
- Posterior Vitrectomy
- Low vision rehabilitation

In the management of Diabetic Retinopathy, of paramount importance are the following recommendations:

- Good control of Blood sugar
- Control of Blood pressure
- Healthy diet
- Exercise
- Control of body weight
- Cessation of smoking and alcohol ingestion
- Treatment of kidney diseases

2.6. FOREIGN BODY (FB) IN THE EYE

Description

Foreign bodies in the eye may cause a lot of discomfort or even very severe pain to the sufferers. Most times they enter the eye accidentally but may be intentional in children and mentally derailed individuals.

Causes

- Solids e.g. dust, insects, metal or wood particles

Presentation

- Foreign body sensation
- May be severe pain
- Tearing
- Redness
- FB may be visible

Differential diagnosis

- Corneal ulcer
- Other injury or trauma

Management

History:

- Find out the circumstance and the nature of the foreign body. Any first aid or treatment (including traditional eye medication) given.

Examination:

- Most times ocular foreign bodies lodge below the upper eyelid. It is therefore essential that all patients with complaints of foreign bodies in the eye have their upper eyelids everted for proper examinations and removal of the foreign bodies under a slit lamp or loupe.

At primary level

- Wash the eye with plenty of clean water or saline
- Make a thin "finger" of moistened cotton wool, move the eyelid out of the way and gently remove the FB
  - If this fails:
- Pad the eye and refer to an eye specialist

At a secondary or tertiary level

- Instil a local anaesthetic
- Do eye examination using a loupe or slit lamp
- Remember to evert the lids
- Remove the foreign using cotton swabs or forceps
- In very young children removal of foreign body may require general anaesthesia

2.7. KERATITIS/CORNEAL ULCER

Description

This refers to inflammation of the cornea.

Causes

- Infection: bacterial, viral or fungal leading to corneal ulceration
- Trauma: chemical, foreign bodies
- Exposure

Presentation

- Redness
- Tearing
- Fear of light
- The cornea is not clear and will stain with fluorescein in the case of corneal ulcer (pattern of staining depends on the causative agent, for example dendritic in viral keratitis).
- Visual acuity is usually reduced
- Condition is often unilateral
- The eye is painful

Management (adults and children)

- Explain the seriousness of the condition to the patient

Examination:

- All patients suspected of having keratitis should undergo corneal staining to demonstrate the extent and pattern of the epithelial loss.

Investigations
Pus swab

- Gram stain
- Culture and sensitivity

Treatment:
Treat the specific cause.

Antibacterial

- Fortified Gentamycin eye drops alternate with Chloramphenicol eye drops or ciprofloxacin eye drops alone 1-2 hourly for at least 10-14 days.
- Apply tetracycline eye ointment 1% or chloramphenicol eye ointment at bed time.

Antiviral

- Acyclovir eye ointment 5 times a day for 10-14 days for Herpes Simplex / viral keratitis

Antifungal agents

- Natamycin suspension, Voriconazole eyedrops 2 hourly for at least 2-4 weeks.

Supportive treatments

- Atropine eye drop to relieve pain.
- Vitamin A capsules for children.
- Admission may be necessary. Admission is mandatory in young children, one eyed patients, non-improvement in 72 hours of treatment, large ulcers more than 4mm in diameter, associated ocular complications like hypopion / sclerites.
- Surgery may be necessary in some circumstances i.e. conjunctival flap and tarsorrhaphy_
- Debridement (chemical/ mechanical)
- The use of topical corticosteroids in patients with infective keratitis is contraindicated.

2.8. LOW VISION

Description

Visual impairment is defined as a functional limitation of the eye(s) or visual system and can manifest as reduced visual acuity or contrast sensitivity, visual field loss, photophobia, diplopia, visual distortion, visual perceptual difficulties, or any combination of the above. A visual impairment can cause disability(ies) by significantly interfering with one's ability to function independently, to perform activities of daily living, and/or to travel safely through the environment. When these disabilities limit personal or socioeconomic independence, a visual handicap exists.

Classification

- Congenital (e.g. prenatal or postnatal trauma, genetic or developmental abnormalities)
- Hereditary (e.g. retinitis pigmentosa or Stargardt's macular degeneration)
- Acquired conditions (e.g. ocular infection or disease, trauma, age-related changes, or systemic disease)

Causes

- Congenital
- Hereditary
- Acquired

Presentation

- Loss of the ability to read standard-sized print

- Inability or limitation with respect to mobility and driving
- Difficulty performing work-related tasks or leisure activities
- Inability to recognise faces or familiar people

Management

- History

Examinations

- Visual Acuity
- Refraction
    i. Objective refraction (static retinoscopy and/or Autorefraction)
    ii. Cycloplegic retinoscopy (under 10 years)
    iii. Subjective refraction
- Ocular motility
- Binocular Vision Assessment
- Visual Field Assessment
- Ocular Health Assessment
    i. External examination
    ii. Biomicroscopy
    iii. Tonometry
    iv. Central and Peripheral Fundus examination

Supplemental Testing

Additional testing may be indicated by the presence of a specific disease or condition, a patient complaint, educational or work-related needs, or other unexplained findings.

- Contrast Sensitivity
- Glare Testing
- Colour Vision Testing
- Visually Evoked Potential (VEP)
- Electroretinogram (ERG)

- Electro-oculogram (EOG)

Treatment: In managing the patient's visual impairment, the clinician may choose to provide the low vision rehabilitative care, or to co-manage or refer the patient to an optometrist or low vision worker who has advanced training or clinical experience with vision rehabilitation. Patients should receive training on the use of devices.

Reduced Visual Acuity

i) Near

- Spectacle mounted reading lenses
- Hand magnifiers
- Stand magnifiers
- Electronic devices (CCTV)

ii) Distance

- Telescopes
- Electronic devices

2) Central Visual Field Defects

- Eccentric viewing training

3) Peripheral Visual Field Defects

- Prisms
- Mirrors
- Reverse Telescopes and Minus lenses

4) Reduced Contrast Sensitivity and Glare Sensitivity

- Illumination
- Filters

5) Non-optical Devices

- Large print
- Writing aids
- Reading stands

- Typoscopes
- Auditory aids

6) Additional Services

i. Education services

ii. Orientation and mobility services

iii. Counselling services (psychiatric, psychological and social work)

iv. Occupational therapy

v. Genetic counselling

2.9. OCULAR AND ADNEXA INJURIES

Description

An injury to the eye may result in vision loss. It is important to recognize serious eye injuries and give appropriate treatment or refer to a specialist immediately.

Eye injuries may take the form of:

1. Blunt injury from a blunt object like a ball or a fist
2. A perforating injury from a sharp object like a knife, high velocity projectiles from explosives, grinding and hammering)
3. Exposure to chemicals
4. Thermal injuries

2.9.1. Blunt Injuries

A blunt object striking the eye with great force may result in minor or severe injury to the eye. Different structures of the eye maybe involved.

Blunt injuries to the lid, cornea and the conjunctiva

Presentation

- Blunt trauma may result in eyelid swelling and subcutaneous bleeding. The degree of swelling may be mild to severe.

- There may be corneal abrasions and conjunctival swelling and sub conjunctival hemorrhages.

Management

History:

- The time of injury, cause of injury and any first aid/treatment provided including use of traditional eye medications should be explored.

Examination

Assess the visual acuity and if this is normal give:

Treatment

- Antibiotic drops or ointment (gentamycin, chloramphenicol eye drops or chloramphenicol or tetracycline eye ointment).
- Pain reliever – Paracetamol or a Non-Steroid Anti-Inflammatory Drugs
- A cold compress maybe helpful in lid swelling
- Reassure the patient

If the visual acuity is poor REFER THE PATIENT TO A SPECIALIST as this is an indication of injury to deeper structures.

2.9.2. Blunt injuries to the anterior chamber, lens, vitreous or retina

A blunt injury with decreased visual acuity is an indication that the injury has involved either the anterior chamber, lens, vitreous or retina.

Presentation

- In the Anterior chamber, there may be bleeding of various degrees (Hyphaema). This is a serious problem as it may lead to raised intraocular pressure.
- The lens may be dislocated or ruptured.
- There may be bleeding in the vitreous or a retinal haemorrhage or even a retinal detachment.
- All the above will result in poor vision and are potentially blinding conditions.

Management
Pad the affected eye, give a pain reliever and refer to an ophthalmologist for further specialized management.

2.9.2. Blunt injuries to the orbital bones

A blunt injury may result in orbital bone fractures. The commonest is a fracture of the ethmoid bone.

Presentation

- The patient may present with swelling of the eye and proptosis if there is haemorrhage in the orbit or a sunken or retracted eyeball depending on the site of the fracture.
- The patient may also complain of double vision (Diplopia)

Management
Pad the affected eye, give a pain reliever and refer to an ophthalmologist.

2.9.3. Penetrating Eye Injuries

Penetrating eye injuries are common in children and adults and result from injury by a sharp object.

Eyelids Injuries
A cut involving the eyelids may injure the lacrimal system if located in the medial aspect of the lid. A cut involving the lid margin needs to be repaired under magnification so that the margin is well approximated otherwise if not well repaired it will heal with a coloboma effect.

Corneal and Scleral Perforations
All perforations of the cornea or sclera are serious injuries and may lead to blindness.

Management

- Apply and eye shield to protect the eye, give a pain reliever and refer the patient immediately to an Ophthalmologist.
- At the secondary or tertiary level the treatment of corneal / scleral lacerations is immediate repair with 10/0 sutures under an operating microscope or if the laceration is extensive, an immediate evisceration of the eye should be performed.

2.9.4. Chemical Injuries to the Eye

Various chemicals may injure the eye when they come into contact with the eyes or face. Acids and Alkaline products will cause serious injuries to the lids, cornea and conjunctivae. Tear gas is used in crowd dispersion.

Presentation

- Exposure to chemicals affects all the exposed mucous membranes. (The eyes, nasal mucosae and mouth and throat).
- The eyes will sting and tear copiously.
- Alkaline products (like lime and mortar) may affect the inner layers of the eye resulting in glaucoma and iritis.

Management

- On exposure to acid or chemical products the eyes should be immediately irrigated with copious amounts of water as a first aid treatment.
- On arrival at a medical centre irrigation should be continued with normal saline to wash out the entire chemical.
- After irrigation of the eye apply an antibiotic ointment (chloramphenicol or tetracycline eye ointment) and pad the eye and refer to an ophthalmologist immediately.
- Tear gas injury is usually short lived and does not usually require treatment.

2.10. POSTOPERATIVE ENDOPHTHALMITIS

Description

This is severe inflammation involving both the anterior and posterior segments of the eye after intraocular surgery.

Cause

Typically, postoperative endophthalmitis is caused by the perioperative introduction of microbial organisms into the eye either from the patient's normal conjunctival and skin flora or from contaminated instruments. Once organisms gain access to the vitreous cavity, overwhelming inflammation is likely to occur, making rapid recognition, diagnosis, and treatment critical in optimizing final outcomes.

Presentation

- Decreased vision and permanent loss of vision are common complications of endophthalmitis.
- Bacterial endophthalmitis usually presents acutely with pain, redness, lid swelling, and decreased visual acuity.
- Fungal endophthalmitis presents less acutely with blurred vision, pain, and decreased visual acuity.

Management
Examination:

- A complete examination of both the anterior and posterior segments of the eye using a slit lamp or binocular loupe is essential in making a diagnosis of post-operative endophthalmitis.

Investigation

- Vitreal tapping for gram stain
- Culture and sensitivity analysis

Treatment

- Treatment should be instituted within an hour of presentation, especially in severe cases.
- Therefore all patients suspected with post operative endophthalmitis should be referred to an ophthalmologist immediately for proper diagnosis and treatment.
- The patient with severe endophthalmitis should be admitted and treated aggressively with topical, periocular and where possible intravitreal injections of drugs like vancomcin or ceftriaxone/cefuroxime and atropine to relieve pain.

Prevention

A mandatory step to reduce bacteria in the wound area is to apply povidone iodine 5% in the conjunctival sac for a minimum of three minutes prior to surgery (ECRS 2013), and 10% povidone iodine painting of the periocular skin.

2.11. PRIMARY OPEN ANGLE GLAUCOMA (POAG)

Description

It is a group of diseases that damage retinal and optic nerve cells that have as common end-point optic nerve damage associated with characteristic visual field change.

Risk factors

Demographic Factors

- Age: POAG inc reases in prevalence with age
- Ethnicity: Black people have the highest prevalence at all ages

Familial Factors

- Family history
- Genetics

Systemic Factors

- Vascular dys-regulation (migraine, vasospasm, abnormalities in ocular blood flow)
- Low ocular perfusion pressure (=BP-IOP)
- Diabetes (inconsistent association across studies)

Ocular Factors

- Raised IOP
- Myopia
- Central Corneal Thickness – thinner corneas associated with increased risk.

Presentation

It has no symptoms until eyesight is lost at a later stage. Damage progresses very slowly and destroys vision gradually, starting with the peripheral vision. It is progressive and usually relentless.

Management of POAG

Primary level

At the primary level, any patient with poor vision or suspected to have glaucoma should be referred to the secondary or tertiary centres.

Secondary/Tertiary levels

History

- Ocular history
- Systemic history
- Family history

- Review of pertinent records and assessment of impact of visual function on daily living and activities

Physical Examination

- Visual acuity
- Pupil reactions
- Slit-lamp biomicroscopy of anterior segment
- Measurement of IOP - Time of day should be recorded
- Central corneal thickness
- Gonioscopy
- Evaluation of optic nerve head and retinal nerve fibre layer with magnified stereoscopic visualization
- Evaluation of the rest of the fundus (through a dilated pupil whenever feasible)
- Visual field evaluation

Treatment Plan for glaucoma patients

- Set an initial target pressure of at least 20% lower than Pre-treatment IOP.
- Decide on mode of treatment
    - Medical
    - Surgery

In many instances, topical medications constitute the initial therapy.

- Filtering surgery may sometimes be initial therapeutic alternative. This should be done after due consent is obtained, and where drug costs/availability and compliance may be problematic.
- Choose a regimen of maximal effectiveness and tolerance to achieve desired therapeutic response. The commonly used anti-glaucoma drugs in Uganda currently are Timolol eye drops, acetazolamide tablets, pilocarpine and latanoprost eye drops.

Patient Education on treatment:

That the goal of treatment is to arrest/or delay the progress of the disease, not for visual improvement.

- Discuss diagnosis, severity of the disease, prognosis and management plan, and likelihood that therapy will be lifelong.
- Educate about eyelid closure or nasolacrimal occlusion when applying topical medications to reduce systemic absorption.

- Educate about the disease process, rationale and goals of intervention, status of their condition, and relative benefits and risks of alternative interventions so that patients can participate meaningfully in developing an appropriate plan of action.
- Also educate patients about screen checking especially when changing or procuring presbyopic glasses.

Pre-operative care:

- Informed consent.
- At least one preoperative evaluation by the surgeon.

Surgical treatment

The recommended surgical treatment for glaucoma in adults in Uganda is trabeculectomy with mitomycin C/5-flourouracil, whereas the surgical technique for glaucoma in children is either goniotomy or trabeculotomy+/-trabeculectomy.

Postoperative Care

- Visual acuity
- Slit lamp examination for bleb, leakage, anterior chamber depth, IOP and fibrosis.
- Follow-up on first day, and at least once from the second to tenth postoperative day.
- In absence of complications, additional routine postoperative visits during a 6-week period.
- Use topical corticosteroids in the postoperative period, unless contraindicated.

Prevention

Health education and screening of first degree relatives

Monitoring

It is recommended that all glaucoma patients who are on medical treatment or have had filtering surgery should be monitored for evidence of further physical damage (optic nerve damage) and functional loss (visual field changes) at least 4 times a year.

2.12. REFRACTIVE ERRORS

Description

Refractive error refers to the inability of images to be focused properly on the retina. The most common refractive errors are long sightedness, short sightedness, presbyopia and astigmatism.

Refractive error is a problem of the relationship between the optical parts of the eye (i.e., curvatures, refractive indices, and distances between the cornea, aqueous, crystalline lens, and vitreous) and the overall length of the eye.

2.12.1 Hyperopia

Hyperopia, also termed hypermetropia, long-sightedness or far-sightedness, is a common refractive error in children and adults. Clinically hyperopia can be physiological (axial or refractive) or pathological (mal-development, anatomical or pharmaceutically induced) in nature.

Classification (by degree of refractive error)

- Low hyperopia consists of an error of <+2.00 diopters (D).
- Moderate hyperopia includes a range of error from +2.25 to +5.00 D.
- High hyperopia consists of an error > +5.00 D.

Causes

- Axial etiology (length of the eye, small eyes)
- Refractive etiology (power of the eye)
- Trauma
- Paralysis of accommodation

Presentation

- Blurred vision
- Asthenopia (eye strain, headaches, etc)
- Accommodative dysfunction
- Binocular dysfunction
- Amblyopia (Lazy eye)
- Strabismus (Squint/crossed eye)

Examinations

- Visual Acuity (distance, near and pinhole)
- Refraction
    i. Objective refraction (Static retinoscopy and/or Autorefraction)
    ii. Cycloplegic retinoscopy (children under 10 years)

iii. Subjective refraction

- Ocular motility, Binocular Vision and Accommodation
- Ocular Health assessment (sit lamp and fundus assessments)

Management

- Optical Correction/Spectacles/Contact Lenses
- Vision Therapy/Orthoptics
- Refractive Surgery

2.12.2 Myopia

Myopia, short-sightedness or near-sightedness, is the refractive state of the eye which presents as blurred distance vision. Clinically myopia can be simple (length and power), pathological/degenerative (mal-development or anatomical) in nature, induced or pseudomyopia.

Classification (by degree of refractive error)

- Low myopia consists of an error of <-3.00 diopters (D).
- Moderate myopia includes a range of error from -3.00 D to -6.00 D.
- High myopia consists of an error > -6.00 D.

Causes

- Axial etiology (length of the eye, big eyeball)
- Refractive etiology (power of the eye)
- Ocular disease e.g. keratoconnus
- Trauma

Presentation

- Blurred distance vision
- Flashes & floaters (high myopia)
- Asthenopia (eyestrain, headaches, etc.) (pseudomyopia and induced myopia)

Examinations

- Visual Acuity (distance, pinhole and near)
- Refraction
  i. Objective refraction (Static retinoscopy and/or Autorefraction)

ii. Cycloplegic retinoscopy (under 10 years)

iii. Subjective refraction

- Ocular motility, Binocular Vision and Accommodation
- Ocular Health assessment (slit lamp and fundus assessments)

Supplemental Testing

May be indicated for identifying associated ocular conditions, documenting and for monitoring retinal changes in patients with degenerative myopia

These additional procedures may include:

- Fundus photography
- A- and B-scan ultrasonography
- Visual field testing
- Tests such as fasting blood sugar (e.g., to identify causes of induced myopia especially in sudden onset cases who were previously normal sighted**).**

Management

- Optical Correction
  - spectacles
  - contact lenses
- Vision Therapy/Orthoptics (for pseudomyopia)
- Refractive Surgery

Management of refractive errors in children should include management of amblyopia.

2.12.3 Presbyopia

Presbyopia is an age-related visual impairment. It results from the gradual decrease in accommodation expected with age and can have multiple effects on quality of vision and quality of life. Presbyopia has both clinical and social significance because the need to read and work at near and intermediate distances is important.

Classification

- Incipient (early/borderline)

- Functional (visual difficulties manifest)
- Absolute (no accommodative ability left)
- Premature (insufficient accommodative ability)
- Nocturnal (reduced amplitude of accommodation in dim illumination)

Causes

- Age (at or after age between 35- 40 years)
- Hyperopia (accommodative demand, especially if uncorrected)
- Occupation (near vision demands)
- Ocular disease/trauma (removal or injury to lens, ciliary body or zonules)
- Systemic diseases (diabetes, multiple sclerosis, cardiovascular accidents, etc)
- Drugs (decreased accommodation is a side-effect of prescription and over the counter drugs)
- Iatrogenic factors (intra-ocular surgery)
- Geographical factors (proximity to equator)

Presentation

- Blurred near vision
- Difficulty seeing at usual near working distance
- Asthenopia (fatigue, eye strain, headaches, etc.)
- Drowsiness
- Diplopia

Management

Examinations

- History
- Visual Acuity (distance and near)
- Refraction
    i. Objective refraction (Static retinoscopy and/or Autorefraction)
    ii. Subjective refraction

- Binocular Vision and Accommodation
  i. Plus lens to clear near vision
  ii. Positive and Negative Relative Accommodation (PRA/NRA)
  iii. Amplitude of Accommodation (AA)
  iv. Accommodative Convergence/Accommodation Test (AC/A ratio)
- Complete ocular assessment

Supplemental testing

- Retinoscopy to assess for any other coexisting refractive errors
- Intermediate distance testing (certain occupations, e.g. computer use, reading music, etc.)

Management

- Optical Correction
- Spectacles
- Single vision
- Multifocal lenses (Bifocals, Trifocals, Progresive Addition lenses, Occupational lenses)
- Contact Lenses (Mono-vision, Bifocal contact lenses)
- Refractive Surgery (Multifocal IOLs, Accommodating IOLs)

2.13. RETINOBLASTOMA

Description

This is a primary cancer of the retina and affects young children mostly under the age of 5 years with over 90% of cases being diagnosed by the third birthday.

Presentation

- White pupil (leukocoria)
- Squint
- Redness of the eye
- Swelling of the eye
- Glowing eye in the dark or Cat's eye reflex

Management

Primary level

- Ocular examination by mid wives immediately after birth
- Suspected children should be referred to the nearest secondary (Arua, Gulu, Lira, Soroti, Moroto, Mubende, Mbale, Fort portal, Jinja, Mengo, Mbarara, Kabale, Masaka and Benedictine eye Hospital, Tororo) or tertiary (Mulago Hospital and Ruharo eye centre) facility for proper assessment and management.

Secondary / Tertiary level

History:

- Time of onset
- Any treatment received so far
- Family history of the disease (siblings and parents)

Examination

A general examination of the child should be performed for the state of health, Regional lymph node enlargements (pre-auricular and sub-mandibular nodes).

Eye examination

This should preferably be done under general anaesthesia for staging of the disease.

Retinoblastoma staging (International Intraocular Retinoblastoma Classification)

Stage A: Small tumour (3mm or less) situated away from the macular and optic disc.

Stage B: Tumours of any size >3mm, tumours of any size near the macula and optic nerve, associated with sub-retinal fluid less than 3mm from the tumour but no sub-retinal seeding.

Stage C: Discrete local disease with minimal vitreous or sub-retinal seeding

Stage D: Diffuse or massive disease with significant sub-retinal and vitreous seeding and sub retinal fluid

Stage E: Poor prognosis disease; tumour touching the lens, neovascular glaucoma, tumour involving ciliary body, opaque media from haemorrhage, tumour necrosis with aseptic orbital cellulitis or phthisis bulbi.

Treatment:

There are numbers of treatment options available currently for patients with retinoblastoma in Uganda based on the stage of the disease.

1. For small tumours confined to the posterior pole, focal treatments should be preferred. This may take the form of

- ♦ Laser photocoagulation or
- ♦ Cryotherapy

2. Grade B and C tumours should be treated with cycles of chemotherapy and later focal treatment. Drugs available are Vincristine, Etoposide and Carboplatin.

3. Grade D tumours should also primarily be treated with chemotherapy and focal treatment. External beam radiotherapy should be considered as a salvage modality for eyes that have failed chemotherapy and focal therapy.

4. Grade E tumours should be treated by immediate enucleation of the involved eye.

Screening for retinoblastoma - Recommendations

1. It is recommended that all infants and children in whom someone has observed a white pupil (either in person or in a photograph) have a full dilated-eye examination including red reflex test within 72 hours by an ophthalmologist, or medical practitioner who is fully aware of the importance of leukocoria as a sign of Retinoblastoma.

2. It is also recommended that any child with strabismus or suspected strabismus be seen by their regional ophthalmologist.

   a) That the red reflex test be applied to any child with strabismus or suspected strabismus.
   b) That any child with strabismus or suspected strabismus and an abnormal red reflex should urgently be referred (within 72 hours) to an ophthalmologist.
   c) That the child in (b) above be seen at the designated retinoblastoma treatment centres

within 72 hours for the above signs of abnormality, which constitutes an emergency.

3. It is also recommended that we adopt the Canadian Paediatric Society (CPS) recommendations with respect to the suggested timing of vision screening for the general population.

   All children should be screened in their preschool years for amblyopia or its risk factors, as well as for ocular diseases that may have serious consequences, such as retinoblastoma and cataracts. It remains the responsibility of the child's paediatrician to ensure that these tests are performed by the most qualified personnel.

Suggested timing of vision screening for the general population (Adopted from CPS)

Age	Screening Guideline
Newborn to 3 months	• A complete examination of the skin and external eye structures including the conjunctiva, cornea, iris, and pupils. • An inspection of the red reflex to rule out lenticular opacities or major posterior eye disease. • Failure of visualization or abnormalities of the reflex are indications for an urgent referral to an ophthalmologist. • High-risk new-borns (at risk of retinopathy of prematurity and family histories of hereditary ocular diseases) should be examined by an ophthalmologist.
6 to 12 months	• Conduct examination as above. • Ocular alignment should again be observed to detect strabismus. The corneal light reflex should be central and the cover-uncover test for strabismus normal. Fixation and following a target are observed.
3 to 5 years	• Conduct examination as above. • Visual acuity testing should be completed with an age- appropriate tool.
6 to 18 years	• Screen as above whenever routine health examinations are conducted. • Examine whenever complaints occur.

Follow up of retinoblastoma cases

Retinobl-astoma	1st visit	2nd visit	3rd visit	Later
	One month after enucleation and or completion of chemotherapy. Fit prosthesis	Every 3 months in the first two years Do Examination Under Anaesthesia (EUA) in the opposite eye or socket to detect new tumour or recurrence until the child is old enough to cooperate for full dilated funduscope (approx. 3years old)	Every six months. Children with group C & D need longer F/ up with EUA.	Follow up with oncologist for those who had chemotherapy or radiotherapy.

2.14. SQUAMOUS CELL CARCINOMA OF THE CONJUNCTIVA

Description

This is a cancer on the surface of the eye (conjunctiva). It arises from the Squamous epithelia of the conjunctiva and tends to occur in older people (the average age of diagnosis is 60 years) and young adults (30 - 40 years) with HIV/AIDS.

Risk factors

- Prolonged exposure to ultraviolet radiations
- Old age
- HIV /AIDS

Causes

- Unknown
- Human papilloma virus implicated

Presentation

- Eye irritation / discomfort/ Foreign body sensation
- Red eye
- Growth / tumour on the eyeball that may exhibit the following features

- Leucoplakic (white), flesh-colored or red patch
- a rounded, elevated growth
- growths that have a gel-like appearance/gelatinous
- presence of large dilated blood vessels leading to the tumor
  In early disease the tumour often appears in the bulbar conjunctiva nasally or temporally or at the limbus

NB: Squamous cell carcinoma should be suspected in cases of chronic conjunctivitis that lasts longer than 3 months.

Diagnosis
Excision (total) biopsy and send specimen for histopathological examination.

Differential Diagnoses

- Pterygium
- Solar keratosis
- Pinguecula

Staging according to the Tumour, Nodes, Metastasis system

TX	Primary tumour cannot be assessed
T0	No evidence of primary tumour
Tis	Carcinoma in situ
T1	Tumour is 5 mm (0.2 inch) or less in size.
T2	Tumour is more than 5 mm in size, but has not grown into nearby structures.*
T3	Tumour has grown into nearby structures.

T4	Tumour has spread to the orbit or structures beyond the orbit.
	T4a – Tumour has spread to the soft tissues of the orbit but not the orbital bone.
	T4b – Tumour has spread into the bone.
	T4c – Tumour has spread into the paranasal sinuses.
	T4d – Tumour has spread to the brain.

Regional lymph nodes (N)

NX	**Regional lymph nodes cannot be assessed**
N0	No regional lymph node metastasis
N1	Regional lymph node metastasis

Distant metastasis (M)

M0	**No distant metastasis**
M1	Distant metastasis

Treatment

This depends on the clinical staging, that is, the size and extent of the cancer.

- Complete surgical removal
- Chemotherapy with eye drops for a few weeks or up to one year or injection.

Early disease confined to the conjunctiva

- Complete surgical removal /excision with or without adjuvant therapy to lower the risk of recurrence. These should be applied at the time of surgery or in the immediate post operative period.

Adjuvant treatments include;

- Cryosurgery
- Radiation therapy
- Brachytherapy may be used to treat tumours that cannot be completely removed by surgery or

tumours that have come back (recurred).

- Topical chemotherapy
- The drugs used most often for topical chemotherapy include Mitomycin C (Mutamycin) and 5-Fluorouracil (Adrucil, 5-FU) eye drops.

Tumour invading the eye ball / sclera

- Enucleation

Tumour metastases to orbit /distant

- Palliative care
  - Exenteration
  - Radiotherapy
  - Pain relieve
  - Counseling

2.15. STYE (External Hordeolum)

Description

Stye is a localized infection of the hair follicle of the eyelids.

Cause

- Bacterial e.g. Staphylococcus aureus, Streptococcus pneumoniae.

Presentation

- Itching in the early stages
- Swelling of the eyelids
- Pain, tenderness
- Pus formation
- May burst spontaneously

Differential diagnosis

- Chalazion
- Blepharitis

Treatment

- Use warm compress with systemic antibiotics e.g. Ampiclox, Doxycycline
- Surgery for lid abscess (I&D)

Prevention

- Good personal hygiene e.g. regular face washing.

2.16. TRACHOMA

Description
A chronic infection of the outer eye

Cause
Infection by *Chlamydia trachomatis* **sero-types A-C (a very small Gram- negative bacterium)**
Presentation

In early stages

- Reddening of the eye
- Irritation
- Follicles (grain-like growth) on the conjunctiva

In later stages

- Scar formation on the eyelids causing the upper eyelid to turn inwards (entropion) and causing the eyelashes to scratch the cornea (Trichiasis)

Differential diagnosis

- Allergic conjunctivitis (chronic)
- Other chronic infections of the eye

Management

Community diagnosis of trachoma is essential to establish whether the disease is of public health importance in that community. If a community is found to have trachoma of public health proportion then the **SAFE** strategy should be the appropriate approach.

S = Surgery for entropion- Bilamellar lid rotation (part of treatment)

A = Antibiotics –Azithromycin (part of treatment)

F = Face washing (part of prevention)

E = Education and environment improvement (part of prevention)

Antibiotic treatment (adults and children)

- A single dose of Azithromycin tablets or apply tetracycline eye ointment 1% twice daily for 4-6 weeks (until the infection/ inflammation has subsided)
- Refer to specialist if there is any complication

Prevention

- Good personal hygiene, regular face washing
- Health education and environmental improvement

2.17. UVEITIS

Description

An inflammation of the uvea of the eye (i.e. the iris + the ciliary body + the choroid)

Causes

- TB
- HIV
- CMV (cytomegalovirus)
- Toxoplasmosis
- Leprosy
- Autoimmune disease
- Trauma and others

Anterior Uveitis
Presentation

- Pain
- Photophobia
- Ciliary injection
- Poor vision
- Pupil small and irregular
- Keratic precipitates
- Cells and flare in the anterior chamber

NB. Diagnosis of uveitis requires expertise and can only be confirmed by slit lamp examinations.

Investigation:
The investigation of uveitis is broad ad requires a high index of suspicion.

Treatment

- Topical steroids
- Periocular steroids may be used in severe anterior uveitis
- Atropine eye drops to relieve pain

Posterior Uveitis
Presentation

- Poor vision
- Cells in the vitreous

Treatment

- Treat the primary condition if any
- Topical, periocular and systemic steroids
- Atropine/Cyclopegics to relieve pain in anterior uveitis

ANNEX

ANNEX 1: COMMON PROCEDURES IN OPHTHALMIC PRACTICE

A) PROCEDURE FOR SUB-TENON'S ANAESTHESIA:

1. Explain the procedure to the patient and obtain informed consent.
2. Make the patient to lie supine on the bed.
3. Anesthesia of the cornea and conjunctiva is achieved topically with amethocaine 1%, tetracaine 1% or proximetacaine 0.5%.
4. Disinfect the eye surface using drops of aqueous 5% iodine beneath the lower eyelid.
5. To avoid blinking and improve access, insert an eyelid speculum.
6. Ask the patient to look out and up so as to expose the inferonasal quadrant.
7. Using blunt and non-toothed forceps, a small tent of conjunctiva is raised 7-10mm from the limbus, and a small incision with a pair of spring ophthalmologic scissors is made so as to access the sub-Tenon's space.
8. Withdraw 5ml of lignocaine with or without Adrenaline into a 5 ml syringe.
9. Instill the anesthetic solution into the sub-Tenon space using a curved blunt tipped cannula which is attached to the 5 ml syringe through the conjunctival tunnel and gently slide along the contour of the globe maintaining close contact of its tip with the sclera, until the posterior segment is reached; the total distance is about 2 cm.
10. If when advancing, the cannula meets resistance (fibrous band or muscular insertion) it should be cautiously withdrawn and redirected.
11. The instillation itself should be gentle, step by step, in a manner to minimize reflux and allow good diffusion. A slight proptosis, a not more than reasonable conjunctival swelling around the access tunnel and a progressive mydriasis are good signs of an effective instillation.
12. At this point, the cannula is withdrawn altogether, the speculum removed, the eye closed and a uniform, gentle, pressure exerted for about 5-10 minutes.

An ideal sub-Tenon block consists of:

a) Hypotonia of the eyelids, ptosis,
b) Analgesia of the eye surface,
c) Mydriasis,
d) Akinesia,
e) Painless maneuvering of the globe.

It goes without saying that this is not always completely achieved, but one usually manages to obtain a good enough quality of block, of a nature to meet the most common clinical needs.

It takes usually 10-15 min to achieve the desired picture. If after about 10 min the level of anesthesia is not satisfactory, the eyelid speculum is reinserted and, via the same breach, the cannula is reintroduced and another 2 ml of anesthetic solution instilled.

Complications

Minor

a) A slight pain during the instillation is not rare, but never a real problem. Preoperative explanations, a good surface anesthesia, a gentle technique and an encouraging conversation are, together, a norm of good practice.
b) An overspill of anesthetic solution during the instillation is commonly observed; if large, it suggests an insufficient dissection.
c) Some chemosis always occurs around the conjunctival breach. Even if large, it does not usually interfere with the surgical needs. The cause could consist of too high a pressure of instillation, too large a volume of solution or mainly an inadequate dissection of the Tenon's capsule – circumstance when the anesthetic solution does not actually reach the sub-Tenon space.
d) A small conjunctival hemorrhage is quite frequent and fully acceptable. Attempts are made to make a reasonably tiny incision in a less vascular area; however, such is not always easily found. If gentle pressure has no effect, one has to appeal for diathermy.

Significant

Although rare, they represent a cause for concern and every effort has to be made to prevent them.

These include:

a) Diplopia, consequent to damage of the muscle insertions under the path of the instilling cannula.
b) Orbital and retrobulbar hemorrhage.
c) Scleral perforation, particularly in cases with previous scleral procedures. It is expected that the use of the soft plastic version of cannula reduces such complications.
d) Optic neuropathy, choroidal and retinal vascular occlusion are, fortunately, very rare. Their mechanism is rather obscure and a previous, known or hidden, pathology often exists.
e) By far, the most dangerous reported accident is a cardiorespiratory collapse, always due to a spread of the anesthetic agent to the subarachnoidian space, acting on the brainstem structures.

B) ANTIBIOTICS PREPARATION FOR INTRACAMERAL INJECTION.

A. GENTAMYCIN (200µg in 0.1ml)

1. Take 0.5ml from a vial of Gentamycin containing 40mg/ml
2. Make up to 10ml with Normal Saline
3. 0.1ml of this solution = 200µg

B. VANCOMYCIN (1.0mg in 0.1ml)

1. Add 10ml of 0.9% NaCl (not water for injection) to the vial Vancomycin 500mg to obtain an initial concentration of 50mg/ml.
2. Take 0.2ml of it and add 0.8ml of 0.9%NaCl solution to obtain a concentration of 10mg/ml or 1mg/0.1ml

C. CEFTRIAXONE (1mg in 0.1ml)

1. Add 10ml of Saline to 1,000mg vial of ceftriaxone.
2. Withdraw 0.2ml (20mg) of this solution and add 1.8ml of Saline to make 2ml (10mg/ml) then from this withdraw 0.1ml (1mg) and give intracameral injection.

C) ANTIBIOTICS PREPARATION FOR INTRAVITREAL INJECTION

I. CEFUROXIME (1mg in 0.1ml)

1. Add 15ml of “water for injection” into 750mg vial of Cefuroxime to obtain an initial concentration of 50mg/ml.
2. Shake Cefuroxime vial and water in it.
3. Withdraw 2ml (100mg) from this solution and add a further 8ml of “water for injection” making a total of 10ml with a concentration of 10mg/ml.
4. Draw 0.1ml from this solution; it contains 1mg.

AI. CEFTAZIDIME (2mg in 0.1ml)

1. Begin with a 500mg ampoule
2. Add 10ml water for injection (WFI) or saline and dissolve thoroughly to obtain a concentration of 50mg/ml

For a 250mg vial, a 1g vial, add 5ml, 20ml of WFI or saline respectively.

3. Draw up 1ml of the solution, containing 50mg of antibiotic.
4. Add 1.5ml WFI or saline giving 50mg in 2.5ml or 20mg/ml.

5. Draw 0.1ml (contains 2mg of antibiotic) for injection.

BI. AMIKACIN (0.4mg in 0.1ml)

1. Begin with a vial of 2ml that contains 500mg amikacin.
2. Draw 1ml (250 mg) of amikacin and add 1.5ml of WFI to make a concentration of 100mg/ml.
3. Dilute 0.4ml of this solution, containing 40mg of antibiotic, into 10ml WFI giving 4mg/ml.
4. Draw 0.1ml (contains 0.4mg of antibiotic) for injection.

D) STANDARD OPERATING PROCEDURES FOR INTRAVITREAL ANTIBIOTIICS INJECTION

I. PATIENT PREPARATION

- Provide sensible reassurance and explain every step of the procedure so that the patient knows exactly what is going to happen next.
- Check the notes and prescription to make sure that you are planning to inject the correct eye.

II. EXAMINATION SET UP

- Intravitreal injection should be given in a clean room.
- A good illumination is needed so that to see what is being done.
- The patient should be lying flat on a comfortable couch or bed, which should be high enough to give the injection without bending.
- Once the patient is lying down comfortably, scrub your hands and put on sterile gloves.

III. EQUIPMENT

- 1 vial of 500 mg vancomycin or 1 vial of 500 mg (250 mg/ml) amikacin
- 1 vial of 500 mg ceftazidime
- 3 x 10 ml sodium chloride 0.9% injection (saline)
- 4 x 10 ml syringe
- 2 x 5 ml syringe
- 2 x 1 ml syringe
- 1 x sterile galley pot (for amikacin)
- 6 x 21 G needles for preparation of antibiotics
- 2 x 30 G needles for intravitreal injection

IV. TECHNIQUE

- Use the 5% aqueous povidone iodine solution to clean and disinfect the eye to be injected.
- Instill topical antibiotics and povidone iodine 5% into conjunctival sac to disinfect the surface of the eye.
- Dry the skin around the eye to remove excessive povidone iodine and place a sterile drape.
- Insert a speculum to hold the eye open.
- Administer subconjunctival or sub-Tenon's anaesthetic.
- Localize the injection site by using a caliper to measure the distance behind the limbus in the inferotemporal quadrant: 4 mm (phakic eyes) or 3.5 mm (pseudophakic/aphakic eyes).
- Insert the 30 G needle at the injection site into the middle of the vitreous cavity, pointing at the optic disc (approx 7–8 mm deep) and inject antibiotics into the vitreous.
- 1st choice:
- vancomycin 1 mg in 0.1 ml and
- ceftazidime 2 mg in 0.1 ml
- OR 2nd choice:
- amikacin 400 µg in 0.1 ml and
- ceftazidime 2 mg in 0.1 ml
- Use a new syringe and a new 30 G needle for each drug.
- Do not mix drugs together in the same syringe.

E) PREPARATION OF FORTIFIED TOPICAL ANTIBIOTICS

I. FORTIFIED GENTAMYCIN 15mg/ml (1.5%)

1. With a syringe, inject 2ml of parenteral Gentamycin (40mg/ml) into 5ml bottle of Gentamycin 0.3% ophthalmic solution.

2. This gives a 6ml solution of fortified Gentamycin 15mg/ml (1.5%).

AI. FORTIFIED VANCOMYCIN 25mg/ml (2.5%)

1. Add 10ml 0f "water for injection" into 500mg of Vancomycin dry powder. This provides strength of 50mg/ml.

2. From this solution (50mg/ml), take 5ml and add 5ml of "water for injection" to make 25mg/ml concentration.

ANNEX II: FREQUENTLY ASKED QUESTIONS

What is a cataract?
A cataract is a cloudiness of the eye's natural lens, which lies between the front and back areas of the eye.

Who gets cataract?
About half of the population has a cataract by age 65, and nearly everyone over 75 years has at least one. But in rare cases, children can be born with cataracts. Additionally some diseases like diabetes mellitus increase the risk of developing cataracts.

Is cataract surgery risky?
All surgery involves some risk, so yes, it carries some risk. However cataract surgery is the most commonly performed type of eye surgery in Uganda.

How is a cataract removed?
A small incision is made into the eye. The surgeon will either remove the lens leaving the back membrane of the lens (called the posterior capsule) in place. Usually, a replacement lens called an intraocular lens is inserted.

What are possible side effects of cataract surgery?
As with any surgery, pain, infection, swelling and bleeding are possible, but very few patients have serious problems.

What is glaucoma?
Glaucoma is the name for a group of eye diseases associated with raised pressure in the eye resulting into damage to the optic nerve which carries information from the eye to the brain.

What is the treatment for glaucoma?
Various methods for glaucoma pressure-lowering are available. The ophthalmologist will discuss these options based on the condition of the patient.

How often should a person with glaucoma see an ophthalmologist?
Once the diagnosis and treatment regimen are established, the average patient needs to be seen 3-4 times yearly.

Who is at risk of developing glaucoma?

- Being aged 40 years and above
- Having a family history of glaucoma
- Having a history of serious eye injury
- Taking steroid medications
- Having diabetes
- Having high blood pressure

What is presbyopia?

Is a condition associated with aging in which a person's eye exhibits a progressively diminished ability to focus on near objects.

What is the main complain of a person with presbyopia?

Initially the patient experiences less ability to read in dim light but with time there is inability to see small print even in normal light.

Eventually the person will require glasses to be able to read.

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