MINISTRY OF Health
Shaping Fiji's Health

Clinical Practice Guideline

GLAUCOMA

Clinical Practice Guideline – GLAUCOMA

1. Introduction

This guideline is adapted from the Singapore Ministry of Health Clinical Practice Guideline of 2005

2. Aim

This guideline is aimed at assisting the physician in

a. Diagnosing the type of glaucoma
b. Ordering the appropriate investigation
c. Administering the appropriate medication
d. Educating and counselling the patient and relatives.

3. Parameters of the Guideline

Targeted at patients with glaucoma other than Primary angle closure glaucoma. Acute Angle Closure Glaucoma will be covered in the guidelines for Eye referrals.

4. Definitions of Terms:

Glaucoma is defined as an optic neuropathy with characteristic changes in the optic nerve head and visual field. Raised intraocular pressure (IOP) is the main risk factor for the development and progression of glaucoma [1-5]

Glaucoma is classified into the following

4.1 **Primary Glaucoma**

a. Primary open angle glaucoma (POAG)
b. Primary angle closure glaucoma (PACG)
    i. Acute angle closure glaucoma (AACG)
    ii. Chronic angle closure glaucoma (CACG)

4.2 **Secondary Glaucoma** including the following major causes:

a. Steroid-induced
b. Uveitic
c. Rubeotic
d. Others

4.3 **Congenital / Developmental / Juvenile Glaucoma**

4.4 **Ocular Hypertension / Glaucoma Suspects**

5. Clinical presentation:

<u>Diagnosis of Glaucoma</u>

The clinical features of primary glaucoma are summarised in the table on page 3.

Table. 1 Clinical Features of Primary Glaucoma

	Acute Angle Closure Glaucoma	Primary Open Angle Glaucoma (POAG) & Chronic Angle Closure Glaucoma (CACG)
SYMPTOMS		
	• Painful red eye • Blurring of vision, haloes • Severe headache, nausea, and vomiting • History of similar episodes in the past • The patient is frequently an elderly lady.	• Usually asymptomatic until advanced stages of the diseases
SIGNS		
Visual Acuity	Decreased	Normal / decreased in advanced stages
Conjunctiva	Injected	Normal
Cornea	Hazy in symptomatic eye	Clear
Anterior Chamber	Shallow in both eyes Positive "eclipse sign" (nasal iris not illuminated by light shone from the temporal side	Deep in both eyes
Gonioscopy	Closed angles	POAG - open angles CACG - closed angles
IOP	Much higher than 21 mmHg and the eye may feel harder than fellow eye on digital palpation	Usually higher than 21 mmHg
Pupil	Mid-dilated in symptomatic eye	Relative Afferent Pupillary Defect (RAPD) if asymmetrical involvement
Optic disc	• May be difficult to examine due to hazy cornea • Can be normal, hyperemic or cupped if there have been previous neglected attacks	• Vertical cup disc ratio $\geq$0.7 in a normal-sized disc • Increase in cup disc ratio over time • Asymmetry in cup disc ratio $\geq$0.2 between the 2 eyes • Flame-shaped haemorrhages that extend across the disc margin (splinter haemorrhages) • Focal loss of neuroretinal rim (notching)
Visual Field	If glaucomatous nerve damage has been sustained, perimetry shows defects that are consistent with nerve fibre layer loss and these include: • Temporal island • Central island in advanced glaucoma • Nasal step • Paracentral or arcuate scotomas	

Diagnostic Evaluation and Monitoring of Glaucoma

Baseline Tests

1. Patients suspected of having glaucoma should undergo the following three baseline tests **(Grade C, Level IV)**[6];
    a. Inra Occular pressure (IOP) measurement by Goldmann Applanation Tonometry
    b. Disc documentation, C:D ratio or preferably by photography
    c. Perimetry
2. The visual acuity and IOP are neither specific nor sensitive enough in themselves to be effective diagnostic or screening tools **(Grade B, Level IIa)**[7]
3. IOP measurements should be combined with disc and visual field examination for greater sensitivity and specificity. **(GPP)**

Follow-Up

1. IOP measurement, disc appearance, and perimetry should be monitored during follow-up **(Grade C, Level IV)**[8]

Treatment of Glaucoma

Goals of Therapy

1. IOP lowering is the only clinically effective approach in the management of glaucoma **(Grade A, Level Ia)**[9]
2. The target IOP is an estimate of the mean IOP achieved with treatment that is expected to prevent further optic nerve damage. An individualised target IOP range should be set for every glaucoma patient **(Grade C, Level IV)**[10]

A. Pharmacological Treatment of Glaucoma

a. The first line of treatment in primary open angle glaucoma (POAG) is medical therapy and the choice of the drug depends on the target IOP, the safety profile of the drug, patient acceptance, and cost. **(Grade C, Level IV)**

Drugs for IOP lowering include:

- Beta-Blockers
- Prostaglandins and Prostamides
- Adrenergic Agonists
- Carbonic Anhydrase Inhibitors
- Parasympathetic (Cholinergic) Agonists

b. The first line of treatment in primary angle closure glaucoma (PACG) is a laser iridotomy. A laser iridotomy is also required for the fellow eye. Supplemental medical therapy may also be required. **(Grade A, Level Ib)**[11]

c. In the emergency setting of **acute angle closure glaucoma**, additional systemic drugs like osmotic diuretics and oral/parenteral carbonic anhydrase inhibitors may be employed to rapidly reduce the IOP to avoid permanent, devastating nerve damage **(Grade C, Level IV)** [12] . Check urea and electrolytes and creatinine if patient on systemic drugs.

B. Laser Therapy for Glaucoma

a. In open angle glaucoma, laser trabeculoplasty may be used as an adjunct to medical therapy **(Grade A, Level Ia)** [13]

C. Surgery for Glaucoma

a. Surgery is indicated in patients who fail or are unable to comply with medical therapy and may be combined with cataract removal for enhanced visual rehabilitation **(Grade C, Level IV)** [14]
b. Trabeculectomy is the primary surgery of choice in medically uncontrolled glaucoma **(Grade C, Level IV)** [15]
c. Patients who have undergone glaucoma surgery should be advised that there is a lifelong need to be aware of symptoms of infection, which include blurring of vision, pain, redness, discharge, and swelling. **Good Practice Points (GPP)**

D. Screening for Glaucoma

a. Routine population screening for glaucoma is **not** recommended at this stage. However, high-risk individuals such as first degree relatives of a glaucoma patient, age >65 years and elderly Chinese females (who are at risk of angle closure glaucoma) may be considered as target populations for case detection programs **(Grade B, Level IIa, IIb)** [16]

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

Accurate diagnosis and appropriate treatment of glaucoma in order to maintain useful visual function and the quality of life

POTENTIAL HARMS

Beta-blockers

Timolol and Timolol Suspension

- Irritation/stinging on instillation, pain, allergic reaction, decreased vision, corneal surface problems. May aggravate existing lung problems such as asthma and emphysema. Heart problems include lowered blood pressure, and heart failure may be worsened. Fatigue, giddiness, depression, impotence, insomnia, and hair loss.

Levobunolol

- Similar to timolol. May additionally cause inflammation of the eyes, transient decreased vision.

Betaxolol and Betaxolol Suspension

- May be safer for patients with asthma and emphysema compared to timolol. Other side effects are similar to timolol.

Adrenergic Agonists

Adrenaline

- Redness, eyelid inflammation, itching, and pigment deposits in the conjunctiva frequent. May increase failure rate of filtration surgery. May cause tachycardia, nervousness, headache, pupillary dilation and can exacerbate angina.

Dipivefrine

- Reduced incidence of side effects compared to adrenaline.

Apraclonidine

- May cause redness, irritation/stinging, allergic reaction, pupil enlargement. Long-term use occasionally associated with loss of effectiveness.

Brimonidine

- Irritation, stinging, redness. Generally avoided in patients using some antidepressants, and in patients with increased blood pressure associated with severe circulatory disease.

Parasympathetic Agonists

Pilocarpine & Pilocarpine gel

- Eye or brow ache common when first applying eyedrops; improves with time. Blurred vision, dim vision, small pupil. Induced near-sightedness may occur in younger patients.

Carbonic Anhydrase Inhibitors

Acetazolamide

- Tingling sensation in fingers and toes. May have increased frequency of passing urine, kidney stones, and electrolyte abnormalities. Abdominal upset, metallic taste with carbonated drinks, depression, fatigue, weight loss and impotence have been reported. Rarely, aplastic anaemia and severe allergic reactions occur.

Dorzolamide & Brinzolamide

- Occasional stinging, allergic reaction, itch, bitter taste.

Prostaglandin Analogues

Latanoprost, Travoprost, & Bimatoprost

- Local stinging, irritation, allergic reaction, and conjunctival hyperemia. may cause brownish colouration of the iris. May stimulate abnormal eyelash growth. Anecdotal reports of macular edema and re-activation of herpes simplex virus (HSV) keratitis.

Hyperosmotic Agents

Mannitol & Glycerol

- Nausea, vomiting, increased blood glucose levels in diabetics. Dehydration, headache, disorientation. Care in elderly patients with kidney disease, heart disease, or diabetes. Acute retention of urine may occur.

Trabeculectomy

- Trabeculectomy does not always succeed and even if it does in the short term, it may still fail over time.
- Augmentation with anti-metabolites is associated with a slightly higher risk of complications such as hypotony and infection.

Evidence Summary:

Levels of Evidence
Level Ia: Evidence obtained from meta-analysis of randomised controlled trials
Level Ib: Evidence obtained from at least one randomised controlled trial
Level IIa: Evidence obtained from at least one well-designed controlled study without randomisation
Level IIb: Evidence obtained from at least one other type of well-designed quasi-experimental study
Level III: Evidence obtained from well-designed non-experimental descriptive studies, such as comparative studies, correlation studies, and case studies
Level IV: Evidence obtained from expert committee reports or opinions and/or clinical experiences of respected authorities
Grades of Recommendation
Grade A (evidence levels Ia, Ib): Requires at least one randomised controlled trial as part of the body of literature of overall good quality and consistency addressing the specific recommendation
Grade B (evidence levels IIa, IIb, III): Requires availability of well conducted clinical studies but no randomised clinical trials on the topic of recommendation
Grade C (evidence level IV): Requires evidence obtained from expert committee reports or opinions and/or clinical experiences of respected authorities. Indicates absence of directly applicable clinical studies of good quality
GPP (good practice points): Recommended best practice based on the clinical experience of the guideline development group.

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Scope and Application	This CPG is intended for use by all health care workers in their daily care of patients who undergo ophthalmic procedures
Effective Date	2010
Supercedes Policy Number	Not applicable
Review Responsibilities	The Chairperson of the ophthalmic CSN will initiate the review of this guidelines every 3 years from the date of issue or as required.
Further Information	Ophthalmic CSN Chairperson

RESPONSIBILITY:

CPG Owner: National ophthalmic CSN

CPG Writer: Ministry of Health **Date:**

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National Medicines & Therapeutic Committee, MOH
Date: 23 November 2010

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National Health Executive Committee, MOH
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