

**GLAUCOMA ALGORITHM
AND
GUIDELINES FOR GLAUCOMA**

SOUTH AFRICAN GLAUCOMA SOCIETY 2006

The Registrar
The Council for Medical Schemes
Private Bag X34
HATFIELD
0028

Dear Sir

RE: GLAUCOMA ALGORITHM AND GUIDELINES FOR GLAUCOMA

The South African Glaucoma Society, which is affiliated to the Ophthalmological Society of South Africa, would like to present the updated treatment algorithm and guidelines for glaucoma to the Council for Medical Schemes and other regulatory bodies to improve the mutual understanding of glaucoma, in addition to providing a rational approach to the diagnosis and management of glaucoma, based on evidence from prospective randomized clinical trials.

The document has been endorsed by the Ophthalmological Society of South Africa.

Glaucoma is the only eye disease classified as a chronic disease, amongst the legislated 25 chronic disease conditions. It is important, since it is one of the leading causes of blindness in South Africa and as such deserves adequate, up to date management. The prevalence of glaucoma is around 5 to 7% in the black population and 3 to 5% in the white population of South Africa. It thus has a major impact on the visual health of our nation. With proper treatment the quality of vision and of life can be maintained, but inadequate treatment can lead to blindness and the resultant socio-economic burden to the State.

These guidelines for glaucoma present the view of the South African Glaucoma Society and are in line with other International Glaucoma Societies' Guidelines. They include the classification and definition of glaucoma, an algorithm, initial patient examination tests, patient follow up examination tests, terminology, and references based on reviews of publications.

The new treatment algorithm is only a generalized version of glaucoma management, since the disease of glaucoma encompasses over 200 different types of glaucoma, many which necessitate different treatments and interventions at differing times in the disease process.

The fundamental changes in this new algorithm, compared to the previous, which was accepted for PMB purposes, are:

1. The substitution of prostaglandin analogues as first line treatment in almost all glaucoma's. This was already included in the previous glaucoma protocol, but the Department of Health excluded this unilaterally against the advice of the South African Glaucoma Society. We feel strongly that this is not acceptable (even in a second or third world scenario) and must be rectified in this new protocol. The available literature has proven beyond any measure of doubt the additional efficacy of prostaglandin analogues above topical beta blockers as first line treatment.
2. The inclusion of secondary glaucoma's in the algorithm
3. The inclusion of congenital glaucoma's in the algorithm.

GLAUCOMA MANAGEMENT AND DEFINITIONS

GOAL OF GLAUCOMA TREATMENT:

The goal of glaucoma treatment is the preservation of visual function adequate to the individual needs with minimal or no side effects, for the expected lifetime of the patient, with minimal disruption to his/her normal activities, at a sustainable cost.

Treatment guidelines are intended to support the general ophthalmologist in managing patients affected or suspected of having glaucoma. The clinical guidelines are to be considered as recommendations. Clinical care must be individualized to each patient, the treating ophthalmologist and the socioeconomic milieu. The availability of Randomized Controlled Trials makes it possible to apply scientific evidence to clinical recommendations.

GENERAL PRINCIPLES OF GLAUCOMA TREATMENT:

Glaucoma treatment aims to maintain the patient's quality of life at a sustainable cost. The cost of treatment in terms of inconvenience and side effects as well as financial implications for the individual and society requires careful evaluation. The quality of life is closely linked with visual function.

Evidence based treatment options in glaucoma - reduction of intra ocular pressure, improvement of ocular blood flow, and direct neuroprotection - have been adequately and widely documented in peer reviewed literature.

Early adequate lowering of the intra ocular pressure has been documented to preserve visual function, quality of life and prevent blindness. Glaucoma blindness may occur despite treatment and glaucoma patients at appreciable risk of visual disability thus needing rigorous management must be identified.

GLAUCOMA THERAPY:

At present, the only reliable glaucoma therapy is to lower intraocular pressure (IOP). After baseline data determination such as intraocular pressure, optic disc and visual field findings, a so-called target pressure is set at which it is believed that further progression of optic nerve damage can be prevented.

MONOTHERAPY

Because of compliance it is recommended to start with monotherapy.

There are many anti glaucoma drugs available. Prostaglandin derivatives have superseded beta blockers as first line medication. If the target IOP is not reached with the first choice drug or the patient does not tolerate the drug then it is recommended to switch to another monotherapy eg beta blockers, alpha agonists, carbonic anhydrase inhibitors, parasymphathomimetics or cholinergics.

ADJUNCTIVE OR COMBINATION THERAPY

Many patients do not reach target IOP on one medication. For them, adjunctive therapy for additional IOP lowering may be warranted. In such cases, it may be beneficial to add any of the above mentioned drugs. Combination medical therapy is recommended when a single agent is inadequate to achieve the desired target IOP. It may be indicated as first line treatment.

INTERVENTIONS

If more than two topical medications are required to achieve target pressure, a laser or surgical procedure should be considered.

CLASSIFICATION OF GLAUCOMA

In establishing treatment for glaucoma, classification according to the mechanism of intraocular pressure elevation is useful. In secondary glaucoma, the mechanism is not uniform, but depends on the subtype and disease stage.

1. Primary Open Angle Glaucoma
2. Normal Tension Glaucoma
3. Ocular Hypertension
4. Primary Angle Closure Glaucoma
5. Secondary Glaucoma
6. Congenital Glaucoma

DEFINITION OF PRIMARY OPEN ANGLE GLAUCOMA. (EGS 2003)

Primary open angle glaucoma is a chronic, progressive optic neuropathy causing characteristic morphological changes at the optic nerve head and retinal nerve fibre layer in the absence of other ocular disease or congenital anomalies. Progressive retinal ganglion cell loss leads to corresponding visual field defects.

The relative risk for primary open angle glaucoma rises continuously with the level of intra ocular pressure (IOP) and there is no evidence of a threshold intra ocular pressure for the onset of the condition. Thus 3 components indicating glaucoma disease must be evaluated at regular intervals: 1. intraocular pressure, 2. structural assessment of the state of the optic nerve head and retinal nerve fibre layer, and 3. functional optic nerve assessment with the visual field test.

DEFINITION OF NORMAL TENSION GLAUCOMA (EGS 2003)

Normal tension glaucoma is a subtype of primary open angle glaucoma where the intraocular pressure constantly remains within the statistically determined normal range, but progressive optic neuropathy and visual defects typical of glaucoma occur. This type of glaucoma is very common and does require repeated tonometry including 24 hour phasing and short term visual field assessment.

DEFINITION OF OCULAR HYPERTENSION EGS (2003)

The term ocular hypertension is used to indicate that the intraocular pressure is consistently outside two standard deviations from the normal mean. All other ocular findings- optic nerve head and visual fields – are within normal limits. In this subtype the cornea is often thicker than normal and the thickness needs to be measured.

CLASSIFICATION OF GLAUCOMA -continued

DEFINITION OF PRIMARY ANGLE CLOSURE GLAUCOMA (EGS 2003)

Primary angle closure is caused by appositional or synechial closure of the anterior chamber angle due to a number of mechanisms. This may result in raised intra ocular pressure and may cause structural optic nerve damage. The principal argument to strictly separate primary angle-closure glaucoma from primary open angle glaucoma is the initial therapeutic approach.

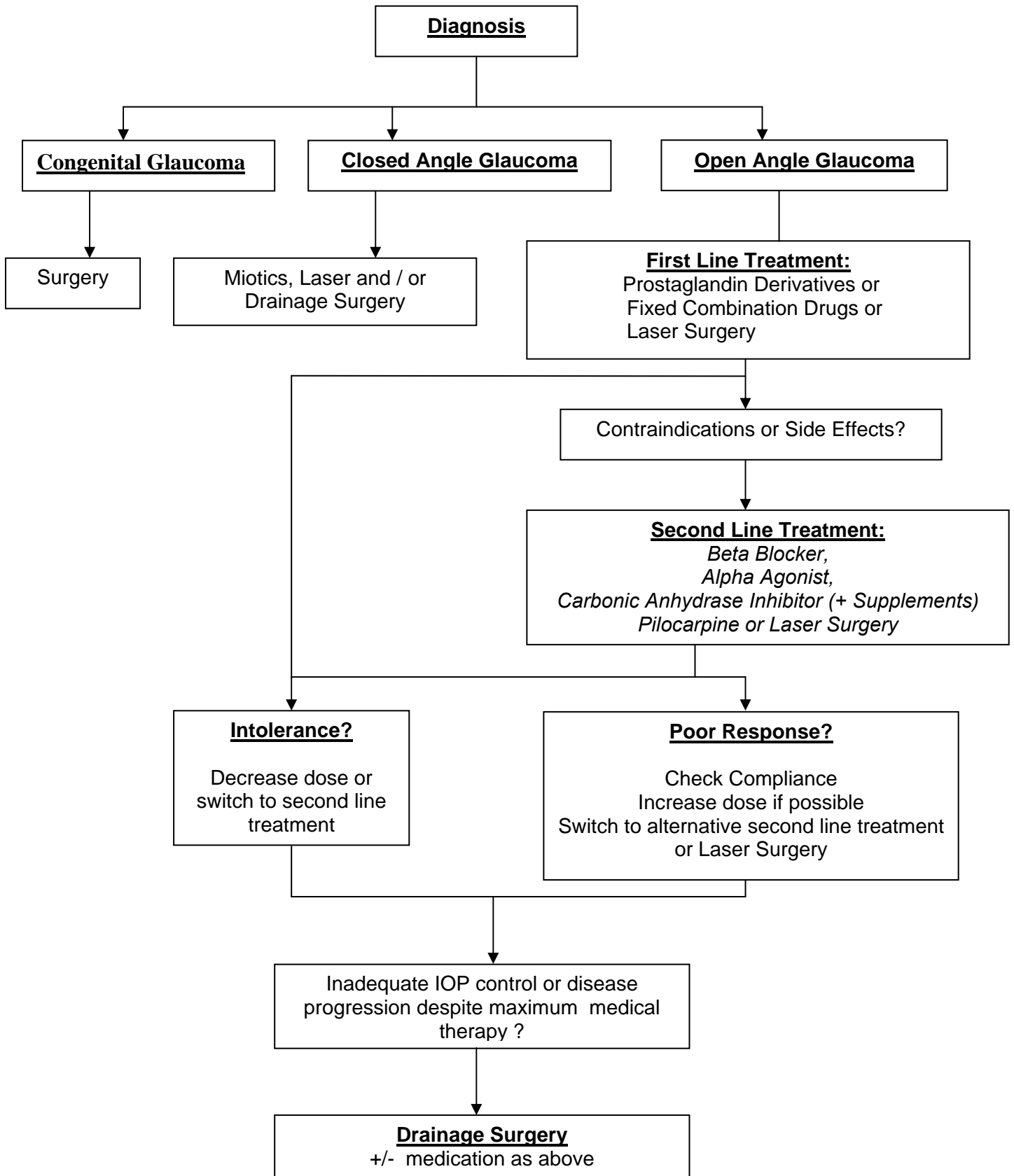
DEFINITION OF SECONDARY GLAUCOMA (EGS 2003)

In secondary glaucoma elevated intraocular pressure causes progressive typical glaucomatous optic neuropathy and visual field loss caused by other ophthalmological or extraocular diseases, drugs and treatments. In several forms of secondary glaucoma pathomechanisms leading to both secondary open angle and angle closure glaucoma are combined. In each case individual evaluation is necessary.

DEFINITION OF CONGENITAL GLAUCOMA (EGS 2003)

In congenital glaucoma a developmental malformation of the anterior chamber angle causes glaucomatous damage to the optic nerve head and prevents visual development. This subtype encompasses a wide variety of conditions with other congenital anomalies. Congenital glaucoma needs early assessment and surgical intervention to prevent structural damage to the optic nerve head and allow visual development.

GLAUCOMA ALGORITHM



GLAUCOMA DIAGNOSIS AND MANAGEMENT

INITIAL DIAGNOSIS: First Visit, New Patients, Baseline Tests in adequately equipped ophthalmology practice setting

- Lengthy initial consultation to elicit complete medical and surgical history and ascertain relevant risk factors
- Comprehensive clinical examination including slitlamp examination, tonometry, fundus and optic nerve head examination, gonioscopy, corneal thickness
- Special investigations to document the extent of structural damage to the optic nerve head and the retinal nerve fibre layer: optic nerve and retinal nerve fibre layer analysis or disc photography, computer assisted visual field analysis
- Comprehensive discussion and information session to inform patient re type of glaucoma, disease prognosis and implications, treatment options, importance of treatment compliance, and to answer patient questions

CONTROLLED PATIENTS: Follow Up and Management

- Patients should be seen 3 times per year. The first follow up visit within two months after diagnosis to ascertain IOP control / target pressure
- At each visit the following should be performed:
 1. History of possible side effects, drug efficacy, compliance, additional medical history
 2. Comprehensive clinical examination including slitlamp examination, tonometry, optic nerve head examination and gonioscopy
- Special examinations must be repeated:
 1. Disc and nerve fibre analysis (1 per year)
 2. Disc photography (1 per year)
 3. Computer assisted visual field analysis (2 per year)
 4. Retinal threshold trend evaluation (1 per year)
 5. if any interim corneal surgery repeat central corneal thickness measurement

UNCONTROLLED PATIENTS: Follow up and Management

- Patients may need to be seen up to 6 times per year
- At each visit the following should be performed:
 1. History of possible side effects, drug efficacy, compliance, additional medical history
 2. Comprehensive clinical examination including slitlamp examination, tonometry, optic nerve head examination and gonioscopy
- Special examinations must be repeated:
 1. Disc and nerve fibre layer analysis (2 per year)
 2. Disc photography (2 per year)
 3. Computer assisted visual field analysis (3 per year)
 4. Retinal threshold trend evaluation (3 per year)
 5. if any interim corneal surgery repeat central corneal thickness measurement

GLAUCOMA DIAGNOSIS AND MANAGEMENT-continued

COMPLICATED PATIENTS: Follow up and Management

- Patients must be seen up to 6 times per year
- At each visit the following should be performed:
 1. History of possible side effects, drug efficacy, compliance, additional medical history
 2. Comprehensive clinical examination including slitlamp examination, tonometry, optic nerve head examination and gonioscopy
- Special examinations must be repeated:
 1. Disc and nerve fibre analysis (2 per year)
 2. Disc photography (2 per year)
 3. Computer assisted visual field analysis (3 per year)
 4. Retinal threshold trend evaluation (3 per year)
 5. if any interim corneal surgery repeat central corneal thickness measurement

CONGENITAL GLAUCOMA PATIENTS: Follow up and Management

- As above, but includes regular examinations under anaesthesia, 2 to 6 per year until adequate intraocular pressure control is achieved.

GLAUCOMA TERMINOLOGY

1. COMPLIANCE:

Since glaucoma is a long-standing, progressive disease, requiring regular topical medication and regular follow-up appointments, a patient's continuous co-operation is essential for successful management. Compliance is influenced by the frequency of drop instillation, drug side effects, cost of medication and the lack of understanding of the disease.

2. FIRST LINE DRUGS :

First line drugs are molecules approved by the South African Glaucoma Society according to evidence - based data for efficient initial intra ocular pressure lowering therapy.

3. FIXED COMBINATION DRUGS:

Fixed combination anti-glaucoma drugs contain two different drugs with better compliance, fewer bottles and drops need to be used, less toxicity by preservatives occur, no washout effect on an adjunctive drug happens, and they reduce administration time.

4. INTRA OCULAR PRESSURE (IOP) :

The 'normal' IOP is a statistical description of the range of IOP in the population with a peak at 15 mm Hg. The IOP follows a circadian cycle often with a maximum between 8am and 11am and a minimum between midnight and 2 am. The diurnal variation can be between 3 and 5 mm Hg and is wider in untreated glaucoma. It is important to establish the diurnal variation to adjust treatment accordingly and to prevent wide diurnal IOP fluctuation on glaucoma treatment because this leads to glaucoma progression.

The most frequently used instrument to measure IOP is the Goldmann Applanation Tonometer. The central corneal thickness influences the above measurement and has to be measured once with every new glaucoma patient and repeated after any form of corneal surgery.

4. SECOND LINE TREATMENT:

Drugs such as beta-blockers, alpha-agonists, carbonic-anhydrase inhibitors and miotics, are used in addition to instead of first line drugs when the target pressure has not been achieved.

5. TARGET PRESSURE (TP)

A target pressure is an estimate of the mean IOP obtained which is expected to prevent further glaucomatous damage. The goal to achieve the therapeutic response is with the least amount of medication and side effects.

6. QUALITY OF LIFE (QoL)

The quality of life of glaucoma patients is affected by functional visual loss, inconvenience and side effects of medication, cost of treatment and the fear of blindness from the disease.

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ADDENDUM: GLAUCOMA CODES

Initial Diagnosis:

- 0142 Consultation
- 3009 Basic Capital Equipment
- 3014 Tonometry
- 3003 Fundus Examination with Diagnostic Lens
- 3002 Gonioscopy
- 3026 Disc and Nerve Fibre Layer Analysis or
- 3027 Disc Photography
- 3017 or 3016 Computer Assisted Visual Field Analysis
- 3020 Central Corneal Thickness Measurement

Follow Up and Maintenance Tests

- 0141 Consultation x 3 per year
- 3009 Basic Capital Equipment x 3 per year
- 3014 Tonometry x 3 per year
- 3003 Fundus Examination with Diagnostic Lens x 3 per year
- 3002 Gonioscopy x 3 per year
- 3026 Disc and Nerve Fibre Layer Analysis x 1 per year or
- 3027 Disc Photography x 1 per year
- 3017 or 3016 Computer Assisted Visual Field Analysis x 2 per year
- 3018 Retinal Threshold Trend Evaluation x 1 per year
- 3020 After any corneal surgical intervention: repeat Central Corneal Thickness Measurement

Management of Uncontrolled and Complicated Patients

- 0141 Consultation x 6 per year
- 3009 Basic Capital Equipment x 6 per year
- 3014 Tonometry x 6 per year
- 3003 Fundus Examination with Diagnostic Lens x 6 per year
- 3002 Gonioscopy x 6 per year
- 3026 Disc and Nerve Fibre Layer Analysis x 2 per year or
- 3027 Disc Photography x 2 per year
- 3017 or 3016 Computer Assisted Visual Field Analysis x 3 per year
- 3020 After any corneal surgical intervention: repeat Central Corneal Thickness Measurement

*If more than 6 examinations per year are asked for: Ophthalmologist needs authorization from a glaucoma expert

ADDENDUM: GLAUCOMA CODES

Management of Post Operative Glaucoma Patients

3021 Retinal function including refraction after ocular surgery x 2

Management of Congenital Glaucoma Patients

3080 Examination under anaesthesia 4 x per year

Glaucoma Surgery Codes

3061 Drainage Procedure

3062 Implantation of Aqueous Shunt Device

3063 Cyclocryo or Cyclolaser

3064 Laser Trabeculoplasty + 3201 Laser Hire Fee

3065 Removal of Blood from Anterior Chamber

3067 Goniotomy

3149 Iridotomy or Iridectomy Surgical

3153 Laser Iridectomy or Iridotomy +3201 Laser Hire Fee

3157 Division Anterior Synechiae

3158 Repair of Iris Dialysis and Anterior Chamber Reconstruction

3199 Repair of Conjunctiva by Grafting

3196 Use of Own Diamond Knife

Material Used With Glaucoma Surgery

Mitomycin C

5 Fluoro-uracil

Visco Elastics

Various Drainage Devices

ICD10 Codes

Glaucoma	H40
Glaucoma suspect	H40.0
Primary open-angle glaucoma	H40.1
Primary angle-closure glaucoma	H40.2
Glaucoma secondary to eye trauma	H40.3
Glaucoma secondary to eye inflammation	H40.4
Glaucoma secondary to other eye disorders	H40.5
Glaucoma secondary to drugs	H40.6
Other glaucoma	H40.7
Glaucoma, unspecified	H40.8
Congenital glaucoma	Q15.0

SUMMARY AND CONCLUSION:

The suggested South African glaucoma algorithm and guidelines for glaucoma aim to provide a rational approach to the diagnosis and management of South Africa's glaucoma patients, taking drug efficiency, cost effectiveness and affordability into account.

The algorithm and guidelines will be reviewed and updated yearly by the South African Glaucoma Society. Both will serve as a valuable reference to all the stakeholders involved in the management of glaucoma in South Africa.

The President and the Executive Members of the South African Glaucoma Society will be available for peer review.

Best regards

Yours sincerely

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