



## Complete Summary

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### **GUIDELINE TITLE**

Management of diabetic retinopathy.

### **BIBLIOGRAPHIC SOURCE(S)**

Singapore Ministry of Health. Management of diabetic retinopathy. Singapore: Singapore Ministry of Health; 2004 Jan. 32 p. [24 references]

### **GUIDELINE STATUS**

This is the current release of the guideline.

## COMPLETE SUMMARY CONTENT

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## SCOPE

### **DISEASE/CONDITION(S)**

Diabetic retinopathy (proliferative and non-proliferative) and/or clinically significant macular edema

### **GUIDELINE CATEGORY**

Evaluation  
Management  
Screening  
Treatment

### **CLINICAL SPECIALTY**

Family Practice  
Internal Medicine  
Ophthalmology

## **INTENDED USERS**

Advanced Practice Nurses  
Allied Health Personnel  
Nurses  
Physician Assistants  
Physicians

## **GUIDELINE OBJECTIVE(S)**

- To identify patients at risk of developing diabetic retinopathy
- To treat patients at risk of visual loss from diabetic retinopathy
- To minimize the side effects of treatment and their impact on the patient's vision and quality of life
- To foster a multi-disciplinary and holistic approach in the management of diabetes mellitus and its possible long-term complications

## **TARGET POPULATION**

Patients with type 1 or type 2 diabetes mellitus, including pregnant patients with pre-existing diabetes mellitus

## **INTERVENTIONS AND PRACTICES CONSIDERED**

### **Screening and Diagnosis**

1. Fundal photography
2. Indirect ophthalmoscopy with slit-lamp biomicroscopy
3. Direct ophthalmoscopy through dilated pupils

### **Treatment/Management**

1. Referral to ophthalmologist
2. Focal/grid macular laser treatment
3. Scatter laser treatment
4. Cataract surgery followed by laser treatment (when presence of cataract precludes adequate photocoagulation)
5. Vitreous surgery
6. Follow-up care

## **MAJOR OUTCOMES CONSIDERED**

- Incidence of diabetic retinopathy
- Response to treatment
- Visual outcome (loss or preservation of vision)
- Quality of life

## METHODOLOGY

### METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

### DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

Not stated

### NUMBER OF SOURCE DOCUMENTS

Not stated

### METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Weighting According to a Rating Scheme (Scheme Given)

### RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

#### 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 nonexperimental 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

### METHODS USED TO ANALYZE THE EVIDENCE

Systematic Review

### DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not stated

### METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus

## DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

The guidelines were developed by an expert workgroup appointed by the National Committee on Ophthalmology. The workgroup conducted a systematic review of current medical literature and obtained inputs from experts in the area of diabetic retinopathy.

## RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

### 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.

**Good Practice Points:** Recommended best practice based on the clinical experience of the guideline development group.

## COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

## METHOD OF GUIDELINE VALIDATION

External Peer Review

## DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

The draft guidelines were presented to other ophthalmologists in the public and private sectors for their comments and then finalised and published.

## RECOMMENDATIONS

### MAJOR RECOMMENDATIONS

The recommendations that follow summarize the content of the guideline. Please refer to the original guideline document for more detailed recommendations. Each recommendation is rated based on the level of the evidence and the grades of recommendation. Definitions of the level of evidence (**Ia-IV**) and the grades of

recommendations (**A**, **B**, **C**, and **GPP**) are defined at the end of the Major Recommendations field.

## **Detection and Screening for Diabetic Retinopathy**

### **Detection of Diabetic Retinopathy**

**C** - As patients with sight-threatening retinopathy may not have symptoms, life-long evaluation for retinopathy by fundal screening of diabetic patients is a valuable and necessary strategy (American Academy of Ophthalmology Quality of Care Committee, 1993; Kohner & Porta, 1991; American Diabetes Association, 1998; Aiello et al., 1998). (**Grade C, Level IV**)

### **Screening for Diabetic Retinopathy**

**C** - It is commended that organization of the screening for diabetic retinopathy be the primary responsibility of the doctor-in-charge of the diabetic patients (Kohner & Porta, 1991). (**Grade C Level IV**)

**GPP** - Screening may be performed by fundal photography (preferred method), indirect ophthalmoscopy with slit-lamp biomicroscopy, or direct ophthalmoscopy through dilated pupils. In Singapore, fundal photography has been used for many years. The fundal photography facility should be made widely available to all medical practitioners who wish to send their patients for diabetic retinopathy screening. (**GPP**)

**GPP** - Patients with fundi that are poorly visualized due to media opacity should be referred to the ophthalmologist. (**GPP**)

Screening strategies depend on the rate of appearance and progression of diabetic retinopathy and on the risk factors that alter these rates. The recommended schedule for the initial and follow-up examinations is outlined in the table below.

**Table. Eye Examination Schedule**

<b>Condition</b>	<b>Recommendation of 1st Exam</b>	<b>Routine Minimum Follow-Up</b>
Type 1 DM	Within 3 to 5 years of diagnosis of diabetes	Yearly
Type 2 DM	At diagnosis	Yearly
Pregnancy in pre-existing DM	Prior to conception and during 1st trimester	Physician's discretion depending on results of 1st trimester exam

Adapted from American Diabetes Association Clinical Practice Recommendations 2004 (Fong et al., 2004)

### **Classification of Retinopathy**

**C** - All diabetic patients who are found to have retinopathy by their physicians need to be referred to an ophthalmologist for evaluation (American Academy of

Ophthalmology Quality of Care Committee, 1993; Kohner & Porta, 1991; American Diabetes Association, 1998; Aiello et al., 1998). **(Grade C, level IV)**

See original guideline document for details about the classification of diabetic retinopathy.

## **Treatment of Diabetic Retinopathy**

### **Rationale for Treatment**

**A** - Early referral to an ophthalmologist is particularly important for patients with type 2 diabetes and severe non-proliferative (pre-proliferative) retinopathy, since laser treatment at this stage is associated with 50% reduction in the risk of severe visual loss and vitrectomy (American Diabetes Association, 1998; Aiello et al., 1998; Ferris, 1996). **(Grade A, Level Ia)**

### **Treatment Strategies for Diabetic Retinopathy**

**A** - The following table shows recommended treatments for various degrees of diabetic retinopathy (Early Treatment Diabetic Retinopathy Study Research Group [ETDRS], 1985; ETDRS "Treatment techniques," 1987; ETDRS "Techniques for scatter," 1987; ETDRS, 1991; ETDRS, 1995).

**Table. Treatment Strategies**

<b>Degree of Retinopathy</b>	<b>Treatment</b>
No macular edema	None
Macular edema threatening or involving macular centre	Focal/grid macular laser
<b>NPDR</b> Mild/Moderate	None
Severe/Very severe	Consider scatter laser*
<b>PDR</b> Non high-risk & High-risk	Scatter laser without delay
Advanced	Scatter laser without delay+

**NPDR** - Non-proliferative diabetic retinopathy

**PDR** - Proliferative diabetic retinopathy

\*Especially in older-onset patients (type 2)

+See Section 5.3 on vitreous surgery in the original guideline document

**(Grade A, Level Ib)**

### **Vitreous Surgery**

**GPP** - It is advisable to refer cases requiring vitreous surgery to an ophthalmologist familiar with vitreoretinal surgery.

### **Sight-Threatening Diabetic Retinopathy with Cataract**

**GPP** - In patients in whom the presence of cataract precludes adequate photocoagulation, cataract surgery followed by prompt laser treatment is recommended. However, laser treatment should be given before cataract surgery if fundal visibility permits.

## Ophthalmic Follow-up of Diabetic Patients

**C** - The timing of the follow-up examination of patients with diabetic retinopathy is dependent on the status of the retinopathy.

**Table. Ophthalmic Follow-up**

Status of Retinopathy	Follow-up (months)
No retinopathy	12
Mild/moderate NPDR without retinal edema	6 to 12
Mild/moderate NPDR with retinal edema, but not threatening or involving macula	4 to 6
Mild/moderate NPDR with CSME or threatening the macula (Treat with laser)	1 to 4
Severe or very severe NPDR (Treat with laser)	1 to 4
PDR (Treat with laser)	1 to 4

Adapted from AAO summary Benchmarks, June 2001

**NPDR** - Non proliferative diabetic retinopathy

**CSME** - Clinically significant macular edema

**PDR** - Proliferative diabetic retinopathy

### (Grade C, Level IV)

#### Definitions:

#### Levels of Evidence

**Level Ia:** Evidence obtained from meta-analysis of randomised controlled trials

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**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.

## CLINICAL ALGORITHM(S)

None provided

## EVIDENCE SUPPORTING THE RECOMMENDATIONS

### REFERENCES SUPPORTING THE RECOMMENDATIONS

[References open in a new window](#)

### TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of supporting evidence is identified and graded for most recommendations (see "Major Recommendations").

## BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

### POTENTIAL BENEFITS

Appropriate management of diabetic retinopathy resulting in prevention or reversal of visual loss and improved quality of life

### POTENTIAL HARMS

Not stated

## QUALIFYING STATEMENTS

### QUALIFYING STATEMENTS

- These guidelines are not intended to serve as a standard of medical care. Standards of medical care are determined on the basis of all clinical data available for an individual case and are subject to change as scientific knowledge advances and patterns of care evolve.
- The contents of this publication are guidelines to clinical practice, based on the best available evidence at the time of development. Adherence to these guidelines may not ensure a successful outcome in every case, nor should they be construed as including all proper methods of care or excluding other acceptable methods of care. Each physician is ultimately responsible for the



management of his/her unique patient in the light of the clinical data presented by the patient and the diagnostic and treatment options available.

## IMPLEMENTATION OF THE GUIDELINE

### DESCRIPTION OF IMPLEMENTATION STRATEGY

#### Clinical Audit

A parameter for clinical audit could be the percentage of diabetic patients (both type I and type II) that have their fundi screened at least annually.

All diabetic patients should have their fundi screened at least annually.

### IMPLEMENTATION TOOLS

Audit Criteria/Indicators  
Patient Resources  
Staff Training/Competency Material

For information about [availability](#), see the "Availability of Companion Documents" and "Patient Resources" fields below.

## INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

### IOM CARE NEED

Living with Illness  
Staying Healthy

### IOM DOMAIN

Effectiveness  
Patient-centeredness

## IDENTIFYING INFORMATION AND AVAILABILITY

### BIBLIOGRAPHIC SOURCE(S)

Singapore Ministry of Health. Management of diabetic retinopathy. Singapore: Singapore Ministry of Health; 2004 Jan. 32 p. [24 references]

### ADAPTATION

Not applicable: The guideline was not adapted from another source.

### DATE RELEASED

2004 Jan

## **GUIDELINE DEVELOPER(S)**

Singapore Ministry of Health - National Government Agency [Non-U.S.]

## **SOURCE(S) OF FUNDING**

Singapore Ministry of Health (MOH)

## **GUIDELINE COMMITTEE**

Workgroup on the Management of Diabetic Retinopathy

## **COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE**

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## **FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST**

Not stated

## **GUIDELINE STATUS**

This is the current release of the guideline.

## **GUIDELINE AVAILABILITY**

Electronic copies: Available in Portable Document Format (PDF) from the [Singapore Ministry of Health Web site](#).

Print copies: Available from the Singapore Ministry of Health, College of Medicine Building, Mezzanine Floor 16 College Rd, Singapore 169854.

## **AVAILABILITY OF COMPANION DOCUMENTS**

Audit criteria and a continuing medical education (CME) self-assessment are available in the [original guideline document](#).

## **PATIENT RESOURCES**

The following is available:

- Management of diabetic retinopathy. Singapore: Singapore Ministry of Health; 2004. 6 p.

Electronic copies: Available in Portable Document Format (PDF) from the [Singapore Ministry of Health Web site](#).

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## **NGC STATUS**

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