

National Diabetes Retinal Screening Grading System and Referral Guidelines 2006

2008

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Citation: Ministry of Health. 2008. *National Diabetes Retinal Screening Grading System and Referral Guidelines 2006*. Wellington: Ministry of Health.

Published in August 2008 by the
Ministry of Health
PO Box 5013, Wellington, New Zealand

ISBN 978-0-478-31762-6 (print)
ISBN 978-0-478-30737-5 (online)
HP4630

This document is available on the Ministry of Health's website:
<http://www.moh.govt.nz>



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Foreword

Worldwide, blindness is one of the greatest fears people have. Loss of sight is a very real possibility for a person with uncontrolled diabetes, but it can be prevented with early detection and intervention. Diabetes is widely accepted as the most common cause of avoidable loss of vision in people of working age in developed countries. Although no country has reliable measures of the incidence of loss of vision from diabetes, international studies suggest that in New Zealand, about 70 people become legally blind every year as a result of diabetes.

The good news is that diabetic retinopathy can be detected reliably through effective screening programmes and early intervention can prevent or help reduce loss of vision. Equally important to service providers, screening is cost-effective and, in the longer term, cost-saving.

In 2001, the Ministry of Health developed a possible model for a National Diabetes Retinopathy Screening Programme. This model was described in the 'peer review' document. In 2004, the Save Sight Society and Ministry of Health brought together a wider group of ophthalmologists, optometrists and general practice representatives, with a view to refining and advancing the model.

The following National Diabetes Retinal Screening Grading System and Referral Guidelines (the Guidelines) includes, in part, a modification of the 'peer review' document, but also extensive new information and a completely revised grading system, which has been developed with the help of a smaller group interested in retinal screening.

New Zealand already has a variety of local diabetic retinopathy screening systems, some of which have operated effectively for many years. Developing national standards for grading and referral will inevitably require some established programmes to adjust their processes but the Guidelines are flexible and should allow a gradual convergence of the different systems over time.

A National Diabetes Retinopathy Steering Group (NDRSG) has been established. The NDRSG will have a vital role in the continuing development of the Guidelines, as well as developing guidelines for important changing and evolving areas, such as accreditation of training programmes, technology, standards and quality assurance. See Appendix B – National Diabetes Retinopathy Steering Group for details of the membership of the NDRSG.



Gordon Sanderson
Chair of the National Diabetes Retinopathy Steering Group

Contents

Foreword.....	iii
1 Introduction.....	1
1.1 Aim and scope.....	1
1.2 Purpose of grading	1
1.3 Importance of retinal screening people with diabetes	2
1.4 Development of the National Grading System	2
1.5 Risk of retinopathy.....	3
1.6 Link to government priorities	3
1.7 The Guidelines’ flexibility and review	3
2 Screening Recommendations	4
2.1 Screening methods.....	4
2.2 Principles of grading	4
2.3 Patients ineligible for screening.....	4
2.4 Screening Intervals.....	5
2.5 Use of pupil dilation	6
2.6 Screening pathway	7
3 Grader Recommendations	8
3.1 Introduction	8
3.2 Primary grader	8
3.3 Secondary grader	9
3.4 Designated ophthalmologist.....	9
4 Grading Classification and Referral Guidelines	10
4.1 Grading for image clarity and field size.....	10
4.2 Grading for diabetic retinopathy (retina peripheral to macula).....	11
4.3 Grading for diabetic macular disease	13
4.4 Grading for women who are pregnant and have diabetes	14
4.5 Grading for non-diabetic pathology and aberrations	14
4.6 Changes to referral guidelines	15
5 Data Requirements	16
5.1 Introduction	16
5.2 Minimum dataset	16
6 Quality Assurance Requirements.....	21
6.1 Overall responsibility.....	21
6.2 Grading team.....	21
6.3 Compliance with the Guidelines.....	21

6.4 Role of National Diabetes Retinopathy Steering Group	21
Glossary	22
Reference Material.....	26
Additional reference material for the Guidelines	26
Original reference associated with 2001 Draft Guidelines, Ministry of Health.....	27
Persons and Groups Involved in the Development of the Guidelines	29
Working group membership (2001) – Ministry of Health.....	29
Working group membership (2004–05) – Save Sight Society sponsored by Ministry of Health.....	29
Appendices	
Appendix A: The Guidelines Flowchart.....	31
Appendix B: National Diabetes Retinopathy Steering Group	32

List of Tables

Table 1: Field standard and size.....	4
Table 2: Guide to the establishment of safe screening intervals and onward referrals	5
Table 3: Guidelines for what is considered to be the minimum intervals for screening	6
Table 4: Grading for image clarity and field size.....	10
Table 5: Diabetic retinopathy grading classification and referral guidelines	11
Table 6: Diabetic macular disease classification and referral guidelines	13
Table 7: Grading and referral guidelines for women who have diabetes and are also pregnant ...	14
Table 8: Grading of non-diabetic pathology	14
Table 9: Changes to rescreening or referral guidelines as a result of clinical modifiers	15

List of Figures

Figure 1: Retinal screening pathway	7
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1 Introduction

1.1 Aim and scope

The aim of the Guidelines is to provide ophthalmologists, optometrists and those involved with photographic retinal screening with:

- a nationally consistent approach to classifying and referring people with significant diabetic retinopathy for review by an ophthalmologist, using eye screening photographs
- the ability to measure and monitor grading and referrals against a national grading and referral standard
- retinal screening images for comparison, training, and quality assurance purposes
- seamless examination of patients at different times and by different clinicians regardless of where the person chooses to go
- increased data for analysing diabetes trends.

The scope of the Guidelines includes:

- introductory information
- screening recommendations for diabetic retinopathy including the screening pathway and recommended methods of screening
- grading system and explanation of the different levels of Grader
- recommendations for recall and referral
- minimum dataset
- quality assurance activities.

The Guidelines are only a part of a wider national retinal screening programme, which aims to prevent visual loss due to diabetic retinopathy through nationally consistent retinal screening systems. The grading system will be the basis of quality assurance programmes for providers of retinal screening services. For more information on the national requirements for diabetic retinal screening see the National Service Framework, Tier 3 Diabetes Retinal Screening Service Specification (linked to the Tier 2 Diabetes Service Specification).

1.2 Purpose of grading

Grading is the use of an assessment system to classify and differentiate the severity of diabetic retinopathy. Grading of retinopathy photographs will allow comparison:

- among different groups of people with diabetes
- of the same person examined at different times or by different professionals.

Grading systems used on a national basis:

- provide a consistent approach to classifying and referring people with significant diabetic retinopathy
- enable measuring, monitoring and appropriate levels of service planning and provision
- allow national quality assurance management as a support network for providers and will assist in ensuring the quality of the service provision.

1.3 Importance of retinal screening people with diabetes

There is substantial evidence of the benefits of eye screening as part of retinopathy prevention. Screening has been shown to prevent avoidable loss of vision as well as being cost-effective. Under the National Retinopathy Screening Programme, the objectives of diabetes retinal screening are to:

- screen every person with known diabetes for the onset of clinically significant diabetic retinopathy
- identify people with early micro-vascular disease and inform primary care providers and/or the local diabetes team to ensure optimum diabetes and hypertension control
- refer those at risk of visual impairment (ie, those with severe grades of retinopathy, or with maculopathy, or proliferative disease), for management and treatment by ophthalmologists before avoidable loss of vision occurs.

The National Diabetes Retinopathy Steering Group (NDRSG) and the Ministry of Health recommend screening, using retinal photography, routinely every two years for people with diabetes who do not have retinopathy. Shorter intervals of screening should be based on the Guidelines, subject to the clinician's judgement in each individual case reflecting:

- the severity of retinopathy
- glycaemic control
- blood pressure control
- the risk of progression.

People with diabetes who are unsuitable for examination by retinal photography should have clinical assessment in lieu of screening (see section 2, Screening Recommendations).

1.4 Development of the National Grading System

These National Diabetes Retinal Screening Grading System and Referral Guidelines (the Guidelines) have been developed after an extensive review of the current diabetic retinopathy literature and the grading systems that are in use in New Zealand and overseas. Although adopting a grading system from another country has some appeal, all of the systems reviewed appear to have been developed to suit local conditions and are not suited to a New Zealand national programme.

All grading systems, including the Guidelines, are based on current evidence as detailed above. However, it is important to remember that photo screening images of people with diabetes cannot be directly compared to the standard photographs of the current evidence base. We must keep in context information that is derived from studies such as the Early Treatment Diabetic Retinopathy Study (ETDRS), which may imply a grade of retinopathy and risk of progression that cannot be assumed from the more limited photo screening examination. Nevertheless, in the absence of New Zealand photo screening-based data, the Wisconsin ETDRS studies are an internationally accepted guide to risk assessment.

1.5 Risk of retinopathy

All people with diabetes are at risk of developing retinopathy. In New Zealand, approximately 30 percent of people with diabetes have retinopathy and it is estimated that it threatens sight in 10 percent of people with diabetes. Among those with diabetes approximately:

- 25 percent have retinopathy that is already treated, is being treated, or is being monitored clinically by ophthalmologists
- 75 percent require regular screening.

The duration of diabetes is one of the most important factors determining the presence of diabetic retinopathy. Poor metabolic control with elevated blood glucose is causally linked to the development and progression of diabetic retinopathy. Other risk factors include:

- hypertension
- pregnancy
- nephropathy
- elevated blood lipids.

There are a number of different characteristics of retinopathy; each of these is explained in Glossary of Terms:

- Diabetic retinopathy
- Non-proliferative diabetic retinopathy (NPDR)
- Proliferative diabetic retinopathy (PDR)
- Macular oedema.

1.6 Link to government priorities

Diabetes and reducing inequalities in the health status of New Zealanders are two priority areas for the government. Diabetes is about three times more common in Māori and Pacific people, and the mortality rate in the 40–65 age range is nearly 10 times higher than for other New Zealanders. By 2011 the number of Māori people with diabetes is expected to double. These statistics put Māori and Pacific people at even more risk of diabetic retinopathy. See the National Service Framework, Tier 3 Diabetes Retinal Screening Service Specification (linked to the Tier 2 Diabetes Service Specification).

1.7 The Guidelines' flexibility and review

This is a 'living document'. The Guidelines are a flexible tool that will be adjusted by the National Diabetes Retinopathy Steering Group as data from the quality programme becomes available, practical experience suggests a problem, or new evidence is published. It is expected that the Guidelines will be formally reviewed at least every three years; however, amendments and additions may be made at any time during that period by the NDRSG.

The designated ophthalmologist (section 3.4) also has scope to modify the referral guidelines based on the experience of the Graders used, how the grading teams and their support/quality assurance structures are set up, and the risk posed by the patient's condition. However, the grading scale should not be modified by the designated ophthalmologist.

2 Screening Recommendations

2.1 Screening methods

Currently the two most sensitive methods for detecting diabetic retinopathy are mydriatic fundal photography and slit-lamp biomicroscopy through dilated pupils by an ophthalmologist, optometrist or any appropriately trained person. Providers should screen for diabetic retinopathy using retinal photography (preferably digital), or undertake a dilated pupil fundus examination using slit-lamp biomicroscopy if satisfactory photographs cannot be obtained. Assessment of corrected visual acuity is recommended.

2.2 Principles of grading

Each eye should be graded separately with the overall grading applied to the worst eye. The grading process should commence with a quality assessment of the photograph combined with field definition and field clarity.

Minimum field size is two 45-degree fields.

Table 1: Field standard and size

Field	Description	Extends to
Adequate macular field	Centre of optic disc at nasal edge of field	Field extends temporally at least four disc diameter (4DD) from the temporal disc margin
Adequate nasal field	Centre of the optic disc 1DD from the temporal edge of the field	Whole field extends nasally at least 3DD from the nasal disc margin

These full defined fields will provide for approximately 75-degrees horizontal and 45-degrees vertical. If less than 45-degree photography is used, then extra photographs will need to be taken of the same areas. Additional inferior and superior fields may be taken if retinopathy is suspected on the above standard fields.

2.3 Patients ineligible for screening

The following patients should not be graded in terms of the Guidelines unless otherwise agreed by the designated ophthalmologist:

- patients previously graded R4, R5 or M4, M5 (unless subsequently regraded lower by an ophthalmologist)
- patients who have had laser photocoagulation treatment for diabetic retinopathy within the last two years. Some of these patients may be able to be followed photographically but this will be outside the national screening system and is the responsibility of the local ophthalmology service.

2.4 Screening intervals

Table 2 is based on The Wisconsin Epidemiological Studies of Diabetic Retinopathy, published in *Archives of Ophthalmology* in 1984, 1989 and 1994 by Klein, et al. The table is a useful guide to the establishment of safe screening recall intervals, and onward referrals to ophthalmologists for patients with higher-risk retinopathy.

The classification is that used for epidemiological and photocoagulation studies and demonstrates the natural history of retinopathy and information regarding the influence of glycaemic and hypertensive control on the progression of retinopathy.

Table 2: Guide to the establishment of safe screening intervals and onward referrals

Retinopathy stage	Definition	Rate of progression (%)			
		To PDR		To high-risk stage	
		1 year	3 years	1 year	5 years
Minimal NPDR (level 20)	Ma only	Not documented			
Mild NPDR (level 30)	Ma and one or more of: retinal haem, HEx, CWS, but not meeting Moderate NPDR definition	5	14	1	15
Moderate NPDR (level 40)	H/Ma > std photo 2A in at least one quadrant and one or more of: CWS, VB, IRMA, but not meeting severe NPDR definition	12–26	30–48	8–18	25–39
Severe NPDR Pre-poliferative (level 50)	Any of: H/Ma > std photo 2A in all four quadrants, IRMA > std photo 8A in one or more quadrants, VB in two or more quadrants	52	71	15	56
PDR (level 60)	Any of: NVE or NVD < std photo 10A, vitreous/preretinal haem and NVE < ½ disc area (DA) without NVD			46	75
High-risk PDR (level 70)	Any of: NVD > ¼ to ⅓ disc area, or with vitreous/preretinal haemorrhages, or NVE > ½ DA with vitreous/preretinal haem	Severe visual loss (VA < 5/200) develops in 25–40% within two years			
Advanced PDR	High-risk PDR with tractional detachment involving macula or vitreous haemorrhages obscuring ability to grade NVD and NVE				
Macular Oedema	Retinal thickening within 2 disc diameters of macular centre	Can occur at any stage of diabetic retinopathy			
Clinically significant macular oedema (CSMO)	Retinal thickening within 500 µm of macular centre or hard exudates within 500 µm of macular centre with adjacent thickening	Can occur at any stage of diabetic retinopathy			

Key: Ma = microaneurysms; Hex = hard exudates; CWS = soft exudates; H/Ma = haemorrhages and microaneurysms; VB = venous beading; IRMA = intraretinal microvascular abnormalities; NVD = neovascularisation and fibrous proliferans involving the optic disc; NVE = neovascularisation and fibrous proliferans involving other areas of the retina.

Screening has been shown to prevent avoidable loss of vision as well as being cost-effective. Table 3 provides a guideline¹ for what is considered to be the minimum intervals for screening. See Section 4.6.1, Clinical Modifiers for where changes to these intervals may be appropriate.

Table 3: Guidelines for what is considered to be the minimum intervals for screening

Screening	Type 1 diabetes	Type 2 diabetes
Initial screening	<p>Adult – screen when the duration of diabetes is more than five years.</p> <p>Children – Screening can be delayed until puberty or five years after diagnosis, whichever is the earlier.</p>	All patients should be screened as soon as possible after diagnosis.
Ongoing screening	<p>* Regular retinal screening should be conducted at least every two years if no abnormality is detected.</p> <p>Once any diabetic retinopathy is detected, the frequency of the assessments will need to be increased depending on the severity of the retinopathy and the risk factors for progression to sight-threatening disease; see Table 5 – Grading for Diabetic Retinopathy (section 4.2) for more information.</p>	
During pregnancy	<p>*All pregnant women should be screened in the first trimester of their pregnancy. Those who have no retinopathy and no clinical modifiers can then continue their normal two-yearly screening – see ‘Table 7 – Grading and referral guidelines for women who have diabetes and are also pregnant’ (section 4.4) for more information.</p> <p>Those with:</p> <ul style="list-style-type: none"> • minimal retinopathy will require more frequent screening throughout the pregnancy • mild or more advanced retinopathy will require to be referred to an ophthalmologist for ongoing review during their pregnancy. <p>Also see Section 4.2, Grading for Diabetic Retinopathy.</p>	

* Some patients may require increased or reduced ‘ongoing screening’ (eg, patients with diet controlled diabetes with HbA1c less than 7). These intervals are guidelines and ophthalmologists may vary screening intervals providing sensitivity and quality are not compromised.

2.5 Use of pupil dilation

Pupil dilation is safe for ophthalmoscopic screening for diabetic retinopathy using Tropicamide 1 percent or, if needed, Phenylephrine 2.5 percent. It may not always be required for acceptable photographic screening using non-mydratic digital cameras. However, it is important that pupils are dilated sufficiently to take a clear image of the retina and dilation may be required to ensure this. Patients should be informed before they attend screening, where possible, that dilation may be necessary and warned of the associated risks (recorded informed consent is advised but independent legal advise is advisable). Risks can include:

- distorted vision
- lack of tolerance to bright light or sunlight
- possible distortion of balance
- driving or using machinery may be difficult and possibly hazardous and they should not drive themselves to their screening appointment unless absolutely necessary
- precipitating angle closure glaucoma occurs extremely rarely

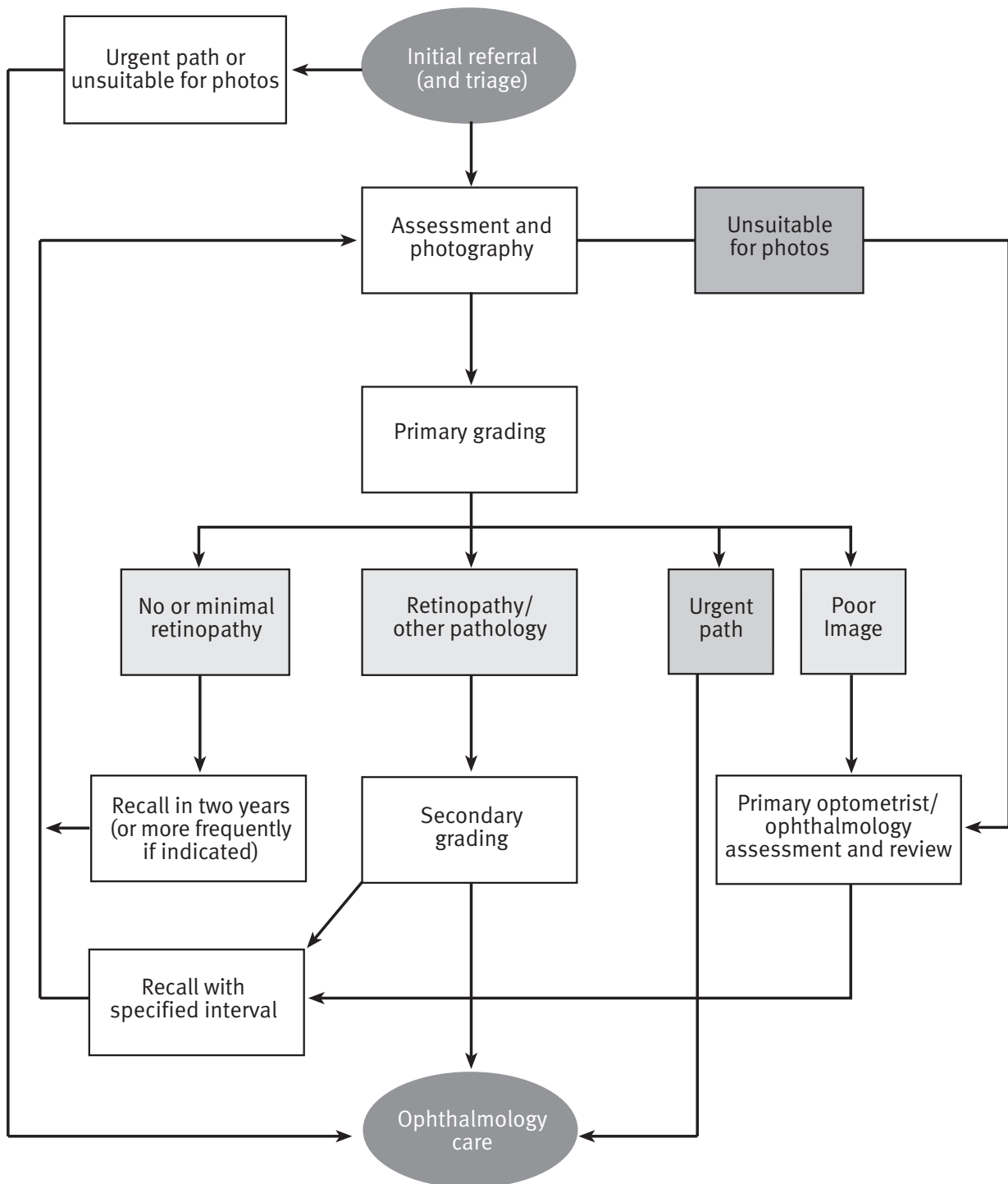
¹ This section will be reviewed within three years to take into account findings from data collection, quality assurance and international studies.

- unknown for use during pregnancy but potential benefits may warrant use in pregnant women despite potential risks.

2.6 Screening pathway

An overview of the retinal screening pathway is shown in Figure 1 below.

Figure 1: Retinal screening pathway



3 Grader Recommendations

3.1 Introduction

The level of grader required represents the minimum level of expertise for each grade of retinopathy. These levels are as follows.

- Primary grader could fulfil the grading role at levels R0, R1, M0, M1.
- Secondary grader could fulfil the grading role at all levels of retinopathy.
- Designated ophthalmologist has oversight of all graders within their district health board (DHB) or specified area. The designated ophthalmologist must be satisfied that graders have, in their professional opinion, adequate training and/or qualifications, and ensure quality assurance activities, including peer review, are undertaken to maintain high standards.

An ophthalmologist can grade at all levels but there must be a designated ophthalmologist overseeing the screening programme. Local screening providers may allow suitably trained personnel to grade within these levels but all graders must meet the minimum requirements outlined below and work under the supervision of the designated ophthalmologist as part of the National Screening Programme.

The NDRSG will work with vocational registration bodies to define and develop suitable national accreditation and qualifications for primary and secondary graders as part of the ongoing quality assurance work. Refer to Section 6, Quality Assurance Requirements.

3.2 Primary grader

Primary graders are:

- optometrists (vocationally registered by the Optometrist Board) familiar with the Guidelines and diabetic retinopathy gradings used
- non-ophthalmic medical practitioners and other allied health professionals such as nurses, medical photographers, ophthalmic technologists, who have:
 - completed an accredited retinopathy screening qualification recognised by the NDRSG
 - graded images in the ‘evaluative sets’ provided by the NDRSG to the standard set by the NDRSG
 - worked in a systematic DR screening programme under the supervision of a designated ophthalmologist for a period acceptable to the NDRSG but not less than 12 months, and had their work peer reviewed during that period
 - undergo audit by the designated ophthalmologist or person appointed by the designated ophthalmologist
 - grade a minimum number of patient image sets per annum to maintain proficiency.

Refer to Section 6, Quality Assurance Requirements, for details on each of these requirements.

3.3 Secondary grader

Secondary graders are:

- ophthalmologists (vocationally registered with the NZMC) familiar with the Guidelines and diabetic retinopathy gradings used
- optometrists who have:
 - completed an accredited retinopathy screening training programme recognised by their vocational registration body or the NDRSG
 - graded images in the ‘evaluative sets’ provided by the NDRSG to the standard set by the NDRSG
 - previously worked as a primary grader for a period of not less than 12 months in a systematic DR screening programme, and had their work peer reviewed during that period
 - grade a minimum number of patient image sets per year to maintain proficiency
 - undergo audit by the designated ophthalmologist or person appointed by the designated ophthalmologist
- others on application to the NDRSG on a case-by-case basis. This will generally mean those who have extensive experience as primary graders and their application is supported by the designated ophthalmologist.

Biomicroscopy screening would normally be performed by ophthalmologists but may be performed by a suitably qualified secondary grader at the discretion of the designated ophthalmologist, provided supervision and quality assurance is in place.

3.4 Designated ophthalmologist

Each screening provider will have a designated ophthalmologist who is responsible for oversight, quality and safety of the service. This aligns with the ‘National Service Framework, Tier 3 Diabetes Retinal Screening Service Specification’.

The designated ophthalmologist may modify the referral guidelines to take into account the experience of the grader and consistent quality of their grading. See Section 4.6.2, Referral to Ophthalmologist, for more details.

4 Grading Classification and Referral Guidelines

4.1 Grading for image clarity and field size

The following grading applies to the clarity and field size of the image.

Table 4: Grading for image clarity and field size

Grade	Brief description	Minimum features	Action
QA	Adequate	Clarity: <ul style="list-style-type: none"> • small vessels visible over majority of both fields including maculae Field size: <ul style="list-style-type: none"> • macula field – extends temporally at least 4 DD from temporal disc margin • Nasal field – extends nasally at least 3 DD from nasal disc margin. 	Proceed with grading.
QI	Inadequate	Does not meet all of the above criteria.	If photo screening: <ul style="list-style-type: none"> • has been performed undilated, repeat with mydriasis • is inadequate with mydriasis, refer to ophthalmology clinic unless biomicroscopy screening* available and the clarity and field size is adequate with this technique. If image is poor but is clear enough to establish retinopathy requires referral to an ophthalmologist then a grading can be allocated to the patient.

* Biomicroscopy screening would normally be performed by ophthalmologists but may be performed by a suitably qualified secondary grader at the discretion of the designated ophthalmologist if supervision and quality assurance is in place.

Additional notes: Quality grades based on two 45-degree fields:

- Macular field – centre of optic disc at the nasal edge of the field
- Nasal field – centre of optic disc 1 DD in from temporal edge of the field.

4.2 Grading for diabetic retinopathy (retina peripheral to macula)

Table 5: Diabetic retinopathy grading classification and referral guidelines

Grade	Brief description	Clinical signs	Outcome	Notes	Minimum level of grader
R0	No retinopathy	No abnormalities	Biennial photo screen		Primary grader
R1	Minimal	< 5 microaneurysms or dot haemorrhages	18 months photo screen		Primary grader
R2*	Mild	> 4 microaneurysms and dot haemorrhages. Exudates > 2DD from centre of macula. Some blot and larger haemorrhages acceptable. If more than 20 Mas or haemorrhages per photographic field upgrade to R3 moderate.	12–18 months Photoscreen	See additional notes for peripheral retinopathy.	Secondary grader
R3**	Moderate	Any features of mild. Blot or larger haemorrhages. Up to one quadrant of venous beading.	Refer to ophthalmologist	Review by an ophthalmologist in 4–6 months recommended. See additional notes for peripheral retinopathy.	Secondary grader
R4	Severe	One or more of: <ul style="list-style-type: none"> definite IRMA two quadrants or more of venous beading or four quadrants of blot or larger haemorrhages. 	Refer to ophthalmologist	Review by an ophthalmologist in less than four weeks recommended.	Secondary grader
R5	Proliferative	One or more of: <ul style="list-style-type: none"> neovascularisation sub hyaloid or vitreous haemorrhage traction retinal detachment or retinal gliosis. 	'Fast track' referral to ophthalmologist	Review by an ophthalmologist in less than one week recommended.	Secondary grader
RT***	Stable, treated diabetic retinopathy			See notes on laser scars overleaf.	Secondary grader

Additional notes for peripheral retinopathy: Recommendations for rescreening and referral are based on the grade in worst eye.

* **R2 Mild:** If haemorrhages are principally large, then referral for ophthalmic clinical review is suggested. (Secondary graders should liaise with the designated ophthalmologist to decide how these type of cases should be managed.) This does not preclude subsequent return to photoscreening if deemed appropriate. When grade is borderline mild/moderate, modifiers should be taken into account when considering recall interval for rescreening, or referral for ophthalmic clinical review. Groups or clusters of microvascular abnormalities confined to a small area of retina may be counted as one lesion in photographic fields that overall show mild disease.

** **R3 Moderate:** R3 is the threshold for referral to ophthalmologic care but some programmes may elect to keep these patients within the photoscreening programme. However, it is recommended that patients receive ophthalmic clinical examination to excluded significant peripheral disease beyond the photographic fields before continuing with photoscreening. First specialist assessment is suggested within 4–6 months and subsequent reviews may be at longer intervals.

*** **Laser scars:** Where a patient is known to have been discharged from ophthalmic care with stable retinopathy they can be graded in terms of the Guidelines. Normally a period of at least two years should have passed since their last treatment. Graders (see Section 3, Grader Recommendations) should be aware that retinopathy may be more difficult to visualise in the presence of laser scars. If there is any uncertainty, the patient should be referred to an ophthalmologist.

Cotton-wool spots: Cotton-wool spots are no longer felt to correlate with retinopathy severity or predictive of progression. They are therefore not part of the grading system but should prompt a search for other features such as venous beading or IRMA.

4.3 Grading for diabetic macular disease

Table 6: Diabetic macular disease classification and referral guidelines

Grade	Brief description	Clinical signs	Outcome	Minimum level of grader
M0	No macular disease	No microaneurysms, haemorrhages or exudate within 2DD of the centre of the macula.	Biennial photoscreen.	Primary grader
M1	Minimal	Microaneurysms and haemorrhages within 2DD but outside 1DD of the centre of the macula (no exudate).	Photoscreen 12 months unless Retinopathy requires referral.	Primary grader
M2*	Mild	Microaneurysms or haemorrhages within 1DD but no exudates or *retinal thickening and no reduction in vision.	Photoscreen 6–12 months or referral ² to ophthalmologist.	Secondary grader
M3*	Mild	Exudates (and/or retinal thickening) within 2DD of the centre of the macula but outside 1DD. Note: When both M2 and M3 are present, M3 grading takes precedence where both can't be recorded.	Ophthalmologist review in less than six months recommended.	Secondary grader
M4	Moderate	Exudates or retinal thickening within 1DD of the centre of the macula. Foveola not involved	Referral to an ophthalmologist. Ophthalmologist review in less than four weeks recommended.	Secondary grader
M5	Severe	Exudates or retinal thickening involving the foveola	Urgent referral to an ophthalmologist. Ophthalmologist review in less than one week recommended.	Secondary grader
MT	Stable, treated macular disease		Biennial photoscreen.	Secondary grader

* **Additional notes for M2 and M3:** Some methods of screening do not allow accurate assessment of retinal thickening, eg, photoscreening. Referral of M2 grade patients may be deferred if techniques such as biomicroscopy are part of the screening assessment. Visual acuity may also be helpful. The presence of clinical modifiers (section 6.6.1) would also influence referral of patients in this grade. Recommendations are based on worst eye.

² This recommendation will be reviewed by NDRSG within three years to take into account findings from data collection, quality assurance and international studies.

4.4 Grading for women who are pregnant and have diabetes

Women who have diabetes and are also pregnant should be initially photoscreened as early in first trimester as possible.

Table 7: Grading and referral guidelines for women who have diabetes and are also pregnant

Grade	Brief description	Clinical signs	Outcome	Minimum level of grader
P0	No retinopathy or macular disease	No retinopathy or macular disease (R0 M0).	Continue two-yearly screening. ³ If clinical modifiers (Section 4.6.1) present photoscreen three-monthly for remainder of pregnancy.	Primary grader
P1	Minimal	Minimal retinopathy, no macular disease (R1 M0).	Photoscreen a minimum of three-monthly for remainder of pregnancy.	Secondary grader
P2	> Minimal	More than minimal retinopathy and/or macular disease (>R1 >M0).	Refer to an ophthalmology clinic.	Secondary grader

4.5 Grading for non-diabetic pathology and aberrations

Inevitably when screening patients for diabetic retinopathy other pathology will be identified. Photoscreening is not a sensitive tool for detecting pathology other than diabetic retinopathy and patients must be informed that photoscreening is not a complete eye examination. When non-diabetic pathology is identified this will be assessed according to referral guidelines developed by the local ophthalmic service.

Table 8: Grading of non-diabetic pathology

Grade	Pathology	Outcome
NDP	<ul style="list-style-type: none"> • Age-related macular degeneration • Naevi • Venous occlusions • Myelinated nerve fibres • Cataract • Glaucomatous cupping • Epiretinal membrane • Hypertensive changes • Other. 	Refer for secondary grading (see section 3.3, Secondary Grader) or referral to an ophthalmology clinic according to local referral guidelines.

³ This is a guide and some designated ophthalmologists may choose to screen every three months throughout pregnancy regardless of retinopathy or presence of clinical modifiers.

4.6 Changes to referral guidelines

4.6.1 Clinical modifiers

Table 9 indicates when clinical modifiers may result in earlier re-screening or referral.⁴

Table 9: Changes to rescreening or referral guidelines as a result of clinical modifiers

Clinical modifier	Note	Outcome
Poor compliance including 'did not attend' (DNA) x 2 or greater		Consider reducing screening interval or referral
Very poorly controlled diabetes, ⁵ HBA1c > 9%		
Duration of diabetes		
Rate of progression of retinopathy		
Poorly controlled hypertension of >144/82 (evidence UKPDS)		
Dyslipidemia		
Renal failure		
Ethnicity	Where statistics indicate the person may be at risk of retinopathy	Consider reducing screening interval or review
Asymmetrical disease		
Type 1 diabetes > 15 years (insulin dependent diabetic mellitus (IDDM) > 15 years)	May have peripheral retinal ischaemia without significant changes in the fields covered by photography. Peripheral neovascularisation or features of severe retinopathy may be present beyond the field of view.	Advisable to refer for clinical examination by biomicroscopy of the peripheral retina and returned to screening, if appropriate

4.6.2 Referral to ophthalmologist

The designated ophthalmologist can modify the referral guidelines to take into account the:

- experience of the grader
- consistent quality of the gradings produced by the grader.

⁴ These recommendations will be reviewed by NDRSG within three years to take into account findings from data collection, quality assurance and international studies.

⁵ HBA1c levels should be available to screeners and be no greater than six months old. Screeners may need to liaise with primary caregiver to obtain this information.

5 Data Requirements

5.1 Introduction

The following is the suggested data that should be collected for each individual enrolled and at each retinal screening examination they undergo. Aggregated data is derived from enrolments and each examination, as well as from other sources. The data collected will provide useful information for quality assurance, audit, outcomes, etc. The information may also be necessary for DHB reporting, and for assessing the retinal screening programmes nationally.

The NDRSG is continuing to develop this section in conjunction with screening providers. There will be ongoing consideration of data requirements by, and of, the software required to achieve national reporting and standardisation without imposing constraints on existing programmes, but with the objective of improving funding and other support for retinal screening where it is needed.

5.2 Minimum dataset

5.2.1 For each enrolled person

The following data should be recorded in the retinal screening register database for each enrolled person (data aligned to PMS and PHO standard where possible).

Field	Data	
National Health Index number (NHI)		– (7 char) required
Gender	F, M, U	– (1 char) required
Family name (surname)		– (25 char) required
First name		– (25 char) required
Middle name(s)		– (20 char) optional
Date of birth	ccyy-mm-dd	– (8 char) required
Residential address	Address line 1	– (35 char) optional
	Address line 2	– (30 char) optional
	Suburb	– (30 char) optional
	City	– (30 char) optional
	Postcode	– (5 char) optional
	Country	– (30 char) optional
Contact phone(s)	Area code and phone number	– (15 char) optional
Ethnic origin	See Section 5.2.3, Ethnicity	– (5 char) required
Domicile code/geo code	NNNNNNN	– (7 char) required
Type of diabetes	1 – Type 1	
	2 – Type 2	
	3 – Type unknown	
	4 – Gestational	
	6 – Other known type	
	7 – IGT / IFG	– (1 char) required

Field	Data
Year diabetes diagnosed	CCYY – (4 char) required
Name of general practitioner	– (35 char) required
Practice ID	– (6 char) required
Name/address of GP practice	
Diabetes ‘education and management’ provider	GP team, specialist clinic, community diabetes clinic, other
Year person enrolled for retinal screening	
Year person exited retinal screening service	
Reason for exiting retinal screening service (Note: Several of 1–6 could be chosen)	<ol style="list-style-type: none"> 1. Grade R3 or worse 2. Grade M2 or worse 3. Referred for laser treatment 4. Dense lens opacities 5. Other pathology 6. Other
Year returned to retinal screening from clinical service	
Reason returned to retinal screening from clinical service	<ol style="list-style-type: none"> 1. Post cataract surgery, clear view 2. >2 years post laser – stable 3. Grading < R3, M2 4. Other pathology: OK to screen 5. Other

5.2.2 For each retinal screening examination

The following data should be recorded in the Retinal Screening Register database for each retinal screening examination appointment. (Unless otherwise stated fields are optional but recommended.)

Field	Data
National Health Index number (NHI)	– (7 char) required
New enrolment into eye screening (new to screening not the screener)	Yes/No
Date of last screening (client’s last screening)	ccyy-mm-dd – (8 char) required
Date of screening	ccyy-mm-dd – (8 char) required
Referrer	General practitioner, community diabetes clinic, diabetes physician, hospital diabetes clinic, other
ID of person grading screening images	– (12 char) required
Location screening undertaken	(Insert local pull down list)
Screening method	Digital photography, film photography, clinical (slit lamp biomicroscopy), other
Mydriatic used	Yes/No
Pregnant	0 – No – (1 char) required if female
	1 – Yes Gestation: ____/42 – Optional
HbA1c	– (4 char) required
HbA1c date	ccyy-mm-dd – (8 char) required
Compliance with screening over a 12-month period	Good, moderate (DNA x1), poor (DNA x2, or >)
Other disease: hypertension	0 – No – (1 char) required 1 – Yes
Renal disease	0 – No nephropathy 1 – Confirmed microalbuminuria 2 – Overt diabetic nephropathy 3 – Non-diabetic nephropathy 9 – Not established / not known (default) – (1 char) required
Is the patient a smoker?	0 – No (never) 1 – No – quit over 12 months ago 2 – No – quit within 12 months 3 – Yes – up to 10 day 4 – Yes – 10–19 day 5 – Yes – 20+ day – (1 char) required
Other	Yes/No

Field	Data
Retinopathy grade (worst eye) (or image clarity and field size)	R0, R1, R2, R3, R4, R5, RT, QI P0,P1,P2, U (unknown) – (2 char) required
Maculopathy grade (worst eye)	M0, M1, M2, M3, M4, M5, MT, U (unknown) – (2 char) required
Other significant pathology	Age-related macular degeneration, naevi, venous occlusions, myelinated nerve fibres, cataract Glaucomatous cupping, other
Referred to ophthalmologist	Yes/No
Recommended time to ophthalmologist clinic	1/52, 1/12, 3/12, 4/12, 6/12, Other
Interval recommended until next screening examination	1 – Every two years 2 – Every year 3 – Every six months 4 – Other 5 – Not required 6 – Not known – (1 char) optional
Has patient been given an eye referral today?	0 – No 1 – No in screening programme 2 – No – under ophthalmologist care 3 – Yes to retinal screening programme 4 – Yes to ophthalmologist 5 – Not required – (1 char) optional
Visual acuity left	Corrected/pin-hole eg, 6/6 = 6, 6/12 =
Visual acuity right	12, 6/60 = 60 Numeric – (char 3) optional

5.2.3 Ethnicity

There should be opportunities for recording three ethnicities, but if there is only one it should be prioritised ethnicity (see <http://www.nzhis.govt.nz/documentation/ethnicity/ethnicity-06.html>). Ethnicity code should be two digits, with allowance for five digits, as detailed below.

Code	Description	Code	Description
10	European not further defined	43112	Fijian Indian
11	New Zealand European/Pākehā	44	Other Asian
12	Other European	441	Sri Lankan
21	New Zealand Māori	442	Japanese
30	Pacific Island not further defined	443	Korean
31	Samoa	444	Other Asian
32	Cook Island Maori	44411	Afghani
33	Tongan	44412	Bangladeshi
34	Niuean	44413	Nepalese
35	Tokelauan	44414	Pakistani
36	Fijian (ethnic)	44415	Tibetan
37	Other Pacific Islands (not listed)	51	Middle Eastern
40	Asian not further defined	52	Latin American / Hispanic
41	Southeast Asian	53	African
42	Chinese	54	Other
43	Indian		

5.2.4 Aggregated data

The NDRSG is continuing to develop this section in conjunction with screening providers. However, the following are some examples of data that may be useful:

- Percentage of people with diabetes screened – % Māori, % Pacific Island, % NZ European, % Asian, % Other
- Estimated number of persons with diabetes and number screened per annum per DHB
- Overall % of retinopathy and its severity (grade)
- Number and % screened referred for ophthalmic care and reason (grouped)
- DNA % and number per ethnic group
- Number referred for laser treatment and cataract surgery
- Number of screening failures
- Number with 10% or > HbA1c
- Time from diagnosis to first screening and time from screening to grading of photos
- Percentage seen by ophthalmic service within wait period specified.

6 Quality Assurance Requirements

The NDRSG is continuing to develop this section in association with screening providers.

6.1 Overall responsibility

All graders' work is the responsibility of the designated ophthalmologist.

6.2 Grading team

It is recommended that quality assurance of primary graders, where possible, be undertaken by a 'grading team'. This team is made up of the secondary grader and/or designated ophthalmologist, together with and in the presence of the primary grader(s). This provides an opportunity for review of procedures, undertaking training, establishing agreed standards, and ensures collaborative reading outcomes and communication with patients and other providers. Distance reading may be required for some remote populations but this should be supplemented by regular audit and review meetings by the primary grader, secondary grader and/or designated ophthalmologist.

Where a team approach is not used, the designated ophthalmologist should carry out sampling of their graders' screenings at least every six months; the majority of the sample should be made up of cases identified as abnormal to ensure the grading given is correct. The designated ophthalmologist may choose to have another designated ophthalmologist, or equally qualified person, carry out this check for them.

6.3 Compliance with the Guidelines

Providers must ensure that retinal screening services are provided in accordance with this document, the Ministry of Health Service Specification for Diabetes Retinal Screening and subsequent documents to be developed.

6.4 Role of National Diabetes Retinopathy Steering Group

NDRSG will provide co-ordination and support for retinal screening services and ophthalmologists designated to oversee clinical quality. See Appendix B – National Diabetes Retinopathy Steering Group for details of the membership of the NDRSG. This will include the following functions.

- Reviewing and updating the National Screening Grading System and Referral Recommendations specified in this and subsequent documents.
- Recommending the appropriate standards for service delivery, equipment, training, clinical information, and information management systems that are required nationally to promote quality improvement and clinical best practice.
- Recommending clinical indicators to be used for quality improvement. These may be different from the accountability indicators used by the DHB or the Ministry of Health.
- Monitoring the quality and effectiveness of screening services to identify opportunities for improvement.

Glossary

Cataract	Opacity of the crystalline lens of the eye, associated with age and many other risk factors. The most frequent age-related cataract types are nuclear, cortical and posterior subcapsular (PSC). Early onset of cortical and PSC cataract occurs in people with diabetes.
Clinically-significant macular oedema (CSMO)	Leak from capillaries in the macular or perimacular region causes retinal thickening. When present within 2 disc diameters of the centre of the macula, it is termed macular oedema. When present within or close to the central macula, it is termed clinically significant macular oedema (CSMO). CSMO is best assessed using stereo slit lamp biomicroscopy (with or without a fundus contact lens) or from stereo photographs of the macula.
Clinical practice guidelines	Systematically developed statements to assist practitioner and patient decisions about appropriate health care for specific clinical circumstances.
Cotton-wool spot	An ill-defined white patch due to a micro-infarct within the retinal nerve fibre layer.
Diabetes mellitus	Diabetes mellitus is a chronic metabolic disorder characterised by raised blood glucose. Diabetes is classified by differences in aetiology, clinical presentation and natural history. Type 1 diabetes is an autoimmune disorder leading to absolute insulin deficiency. Type 2 diabetes is a much more common, complex disorder of variable insulin resistance and insulin deficiency.
Diabetic retinopathy (DR)	<p>Diabetic retinopathy may be defined as the presence of typical retinal microvascular lesions in an individual with diabetes. Microaneurysms, haemorrhages, hard exudates, intraretinal oedema, cotton-wool spots, new vessels, and fibrous tissue, comprise the clinical features of diabetic retinopathy. However, none of these individual lesions is specific for diabetes as they may occur in other disease processes such as hypertension, hyperviscosity, retinal vascular occlusions, inflammation or radiation.</p> <p>It is the pattern, symmetry and evolution that characterises the appearance as diabetic retinopathy. Diabetic retinopathy is first evident ophthalmoscopically as non-proliferative retinopathy which is characterised by microaneurysms, dot, blot or flame haemorrhages, hard exudates, intraretinal oedema, cotton-wool spots, intraretinal microvascular abnormalities and venous beading. The proliferative stage of diabetic retinopathy is characterised by the growth of abnormal new vessels and fibrous tissue in response to retinal ischaemia, and the development of pre-retinal or vitreous haemorrhage.</p> <p>If new vessels appear on or within one disc diameter of the disc margin, they are known as new vessels on the disc. Leakage from the capillaries in the macula results in retinal thickening or macular oedema, defined as thickening located within two disc diameters of the centre of the macula. When this is present within, or close to, the central macula it is often collectively termed Clinically Significant Macular Oedema (CSMO); M4, M5 in the Guidelines.</p>
Evidence-based guidelines	Clinical practice guidelines based on a systematic review of scientific data and publications.
Exudates	See Hard Exudate.
Florid diabetic retinopathy (FDR)	A particular type of retinopathy occurring in young IDDM patients. Features include marked capillary dilatation and a rapid, bloody progression to Severe proliferative retinopathy and visual loss. Now seen rarely, florid retinopathy was shown to respond to pituitary ablation, in the period before the introduction of laser treatment.

Fluorescein angiography	A valuable means of documenting the retinal capillary bed, the presence and features of macular oedema or to confirm the presence of new vessels, not otherwise seen. The test is conducted following an intravenous dye injection of sodium fluorescein solution and requires specially developed filters in a fundus camera. It is a most useful investigation in the management of macular oedema.
Gestational diabetes mellitus	Development of diabetes or elevated blood glucose in women during pregnancy. It usually regresses spontaneously in the post partum period.
Glaucoma	An optic neuropathy in which characteristic visual field defects occur in association with abnormal cupping of the optic disc. Glaucoma is frequently associated with elevated intraocular pressure and is frequently undetected until significant visual loss has occurred.
Grading of diabetic retinopathy	Assessment systems developed to differentiate the severity of diabetic retinopathy. Grading will allow comparison among different groups of patients, or of the same patient examined at different times.
Hard exudate	Well-defined irregular yellowish retinal deposits (lipid and fibrin), often at the margin of oedematous retina and derived from leaking retinal capillaries. These are also termed ‘hard exudates’ and are differentiated from cotton-wool spots, also termed ‘soft exudates’, which are retinal nerve fibre layer infarcts.
Hypertension	A systemic disease characterised by abnormally elevated blood pressure. Associated with an increased risk of many diseases, including vascular events as well as early mortality.
Macular oedema	<p>Macular oedema is abnormal retinal thickening located within two disc diameters of the centre of the macula, caused by leakage of capillaries in the macula or perimacular regions. The presence of macular oedema is best assessed by stereo slit lamp biomicroscopy (with or without a contact lens) or from stereo photographs of the macula. Other signs that may suggest the presence of macular oedema are exudates near the foveola or a reduction in visual acuity. Of these methods, stereo slitlamp biomicroscopy is the superior examination technique. Newer adjunct tests may assist when available, eg, Ocular Coherence Tomography.</p> <p>According to the Early Treatment Diabetic Retinopathy Study (ETDRS) classification, Clinically-Significant Macular Oedema (CSMO) includes:</p> <ul style="list-style-type: none"> • retinal thickening involving the centre of the macula • hard exudates within 500µm of the centre of the macula (if associated with retinal thickening) • intraretinal oedema more than one optic disc area in size, part of which is within one disc diameter of the centre of the macula. Refer to Grading Classification and Referral Guidelines (section 6) grades M2, M3, M4, M5. Laser treatment is advisable if CSMO is present. <p>It is important to note that macular oedema is the most frequent cause of decreased vision associated with diabetic retinopathy principally in people with Type 2 diabetes. It is important to detect and assess macular oedema, which can occur at any stage of retinopathy from Mild NPDR to advanced PDR, when grading diabetic retinopathy.</p>
Microaneurysm	One of the earliest diabetic retinopathy lesions, which appears as a round small red dot within the retina, due to saccular dilatations of capillary vessels.
Mydriasis	Pupil dilatation from short-acting eye-drops such as Tropicamide 0.5 or 1.0 percent. Mydriasis is essential in ophthalmoscopic screening for diabetic retinopathy, but may not be needed when using a newer non-mydriatic camera.

Nephropathy	A renal complication of diabetes. Form of microangiopathy similar to diabetic retinopathy, initially manifest by micro-albuminuria, which may progress to macro-proteinuria and end-stage renal failure.
Non-mydriatic camera	Fundus camera by which retinal photography can be performed satisfactorily either with or without dilating the pupils.
Non-proliferative diabetic retinopathy (NPDR)	Non-proliferative Diabetic Retinopathy (NPDR) is also known as ‘background retinopathy’ and includes all stages of diabetic retinopathy prior to the development of proliferative retinopathy or maculopathy. Features include retinal microaneurysms, haemorrhages, hard exudates, intraretinal oedema, cotton-wool spots, intraretinal microvascular abnormalities and venous beading. Signs of macular oedema are also classified as NPDR, if proliferative changes are absent.
Panretinal photocoagulation (PRP)	Application of photocoagulation burns (usually laser) to retinal areas outside the vascular arcade. PRP is the principal treatment technique for proliferative diabetic retinopathy and is usually applied in more than one treatment session. May be painful and require the use of peribulbar or retrobulbar local anaesthesia. Also termed ‘scatter’ photocoagulation.
Photocoagulation (laser treatment)	Surgical technique in which laser light is used to treat ischaemic or oedematous retina in patients with diabetic retinopathy. Subject of large randomised clinical trials, including the Diabetic Retinopathy Study Research Group (DRS) and ETDRS.
Proliferative diabetic retinopathy (PDR)	<p>Proliferative Diabetic Retinopathy (PDR) is an advanced stage of diabetic retinopathy, which is characterised by the growth of abnormal new vessels and then fibrovascular proliferation on the retinal surface in response to retinal ischaemia. It may co-exist with macular disease, especially in people with Type 2 diabetes. New vessels are fragile and tend to bleed causing pre-retinal or vitreous haemorrhage. Late contraction of the new vessels and fibrous bands produces retinal traction and may lead to traction retinal detachment. PDR virtually always requires prompt laser therapy to ablate the ischaemic tissue.</p> <p>People presenting clinically with evidence of new vessels, pre-retinal or vitreous haemorrhage should be referred urgently to the Ophthalmologist – refer to Grading Classification and Referral Guidelines (section 6). Some of these people may be asymptomatic, but present clinically as a sudden deterioration in acuity either on history or examination, a sudden onset of flashes or floaters, or an inability to visualise the optic fundus because of suspected blood in the vitreous.</p>
Risk factors	Factors which indicate a higher risk of having a particular disease than in the general population. The distinction between a risk factor and a disease, however, is not always clear-cut, as illustrated by hypertension or nephropathy as risk factors for diabetic retinopathy.
Screening	Examination of a group of asymptomatic people considered at risk for a particular disease in order to detect any pre-clinical disease. People detected during screening as likely to have disease are investigated further to arrive at a final diagnosis. Screening is conducted on the basis that early detection can improve quality of life or survival rate.
Sensitivity	The ability of a test to designate people with pre-clinical disease as positive is referred to as the sensitivity of the test. The screening test sensitivity is thus the ratio of the number of people with pre-clinical disease who are positive on testing to the total number of people tested who have pre-clinical disease. Detected cases are termed ‘true positives’, while cases of disease with negative test result are termed ‘false negatives’.

Specificity	The specificity of a test is its ability to designate as negative people who are not diseased. The specificity of a test also determines whether the frequency of false positives will be low enough for a screening programme to be useful.
Type 1 diabetes	Type 1 diabetes has a rapid onset in the young, slower in adults. People with Type 1 diabetes are insulin deficient and dependant on insulin therapy to sustain life (10% of people with diabetes have Type 1).
Type 2 diabetes	Type 2 diabetes is a progressive disorder of variable insulin resistance and insulin deficiency, with an insidious onset. It is associated with hypertension, central obesity, and dyslipidaemia. It is more common in Māori and Pacific peoples. Management includes diet, exercise, and weight control. Oral agent and insulin therapy are needed by many people with Type 2 diabetes to maintain glycaemic control. (90% of people with diabetes have Type 2).

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Persons and Groups Involved in the Development of the Guidelines

Working group membership (2001) – Ministry of Health

- Gordon Sanderson, Optometrist, Dunedin. Chair, Royal New Zealand Foundation for the Blind.
- Gillian Clover, Ophthalmologist, Auckland.
- Jan Raftery, Retinal Photographer, Auckland
- John Grylls, Optometrist, Wellington.
- Keith Maslin, Ophthalmologist, Wellington
- Maggie Wilson, Diabetes Nurse Specialist, Christchurch.
- Mark Donaldson, Ophthalmologist, Auckland.
- Rod Keillor, Ophthalmologist, Dunedin.
- Sandy Dawson, Chief Clinical Advisor, Ministry of Health, Wellington.
- Shaun KcKenzie-Pollock, General Practitioner, Nelson.
- Su Hendeles, Ophthalmologist, Dunedin.
- Gillian Bohm, Senior Advisor, Ministry of Health, Wellington.

Working group membership (2004–05) – Save Sight Society sponsored by Ministry of Health

Ophthalmic Representatives from Retinal Screening Programmes in New Zealand (Met in June 2004 in Wellington, and subsequently reviewed draft Guidelines):

- Derek Sherwood, Chair, Nelson.
- Carolyn Hope, Counties Manukau.
- Mark Donaldson, Auckland.
- Peter Haddad, Tauranga.
- Su Hendeles, Palmerston North.
- Jan de Kock, Wanganui.
- John Grylls, Wellington.*
- Myalin Van Newkirk, Southland.
- Rob Jacobs, Auckland.*
- Paul Herrick, Wellington.
- Gordon Sanderson, Dunedin.*
- David Dalziel, Northland.
- Tahira Malik, Waitemata.
- Clive Straker, Hamilton.
- Mary Jane Houliston, Hawkes Bay.
- Kevin Taylor, New Plymouth.
- Keith Maslin, Wellington.

- Clare Ballantyne, Canterbury.***
- Rod Keillor, Dunedin.
- Shaun McKenzie-Pollack, Nelson.**
- Gillian Clover, Mangere Community Health Trust.

* Optometrist

** General practitioner

***Diabetes nurse specialist

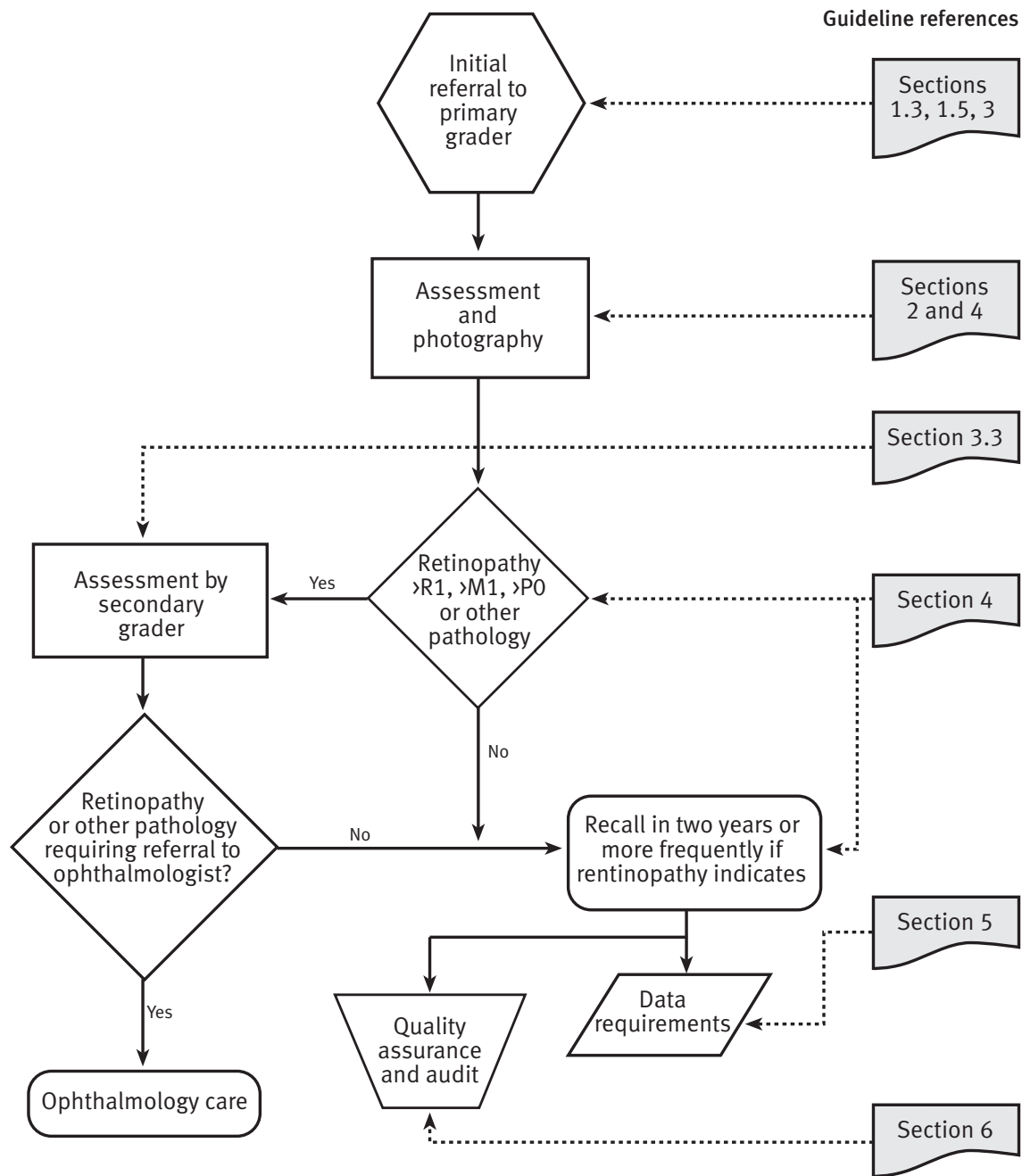
Invited but did not attend:

- Keith Gross, Rotorua.
- Archie McKillop, Palmerston North.

Save Sight Society of NZ Retinal Screening Guidelines Co-ordinating Committee:

- Dr Paul Herrick, Chair of Save Sight Society, Ophthalmologist.
- Dr Derek Sherwood, Chair Prevention and Education Committee, Ophthalmologist.
- Mr Gordon Sanderson, Secretary, Optometrist.
- Dr Gillian Clover, Past Chair, Ophthalmologist.

Appendix A: The Guidelines Flowchart



Appendix B:

National Diabetes Retinopathy Steering Group

The serving members of the NDRSG are:

- Gordon Sanderson, Optometrist, University of Otago Medical School (Chair)
- Derek Sherwood, Ophthalmologist, Nelson Marlborough DHB
- Ainsley Morris, Ophthalmologist, Canterbury DHB
- John Grylls, Optometrist, Kapiti
- Keith Maslin, Ophthalmologist, Capital & Coast DHB
- Clive Straker, Ophthalmologist, Waikato DHB
- Carolyn Hope, Ophthalmologist, Counties Manukau DHB
- Sandy Dawson, Chief Clinical Advisor, Ministry of Health
- Paul Badco, Senior Policy Analyst, Ministry of Health (Secretary).

Membership of the NDRSG is for three years at which time nominations will be sought from:

- Save Sight Society
- The New Zealand Association of Optometrists
- The Royal New Zealand College of General Practitioners
- Royal Australasian College of Physicians.

The Chair of the NDRSG, Gordon Sanderson, is currently seeking nominations from these groups in order to confirm the current membership and make up of the group. In addition, the NDRSG is seeking a general practitioner and a diabetes physician representative.



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