RANZCO Screening and Referral Pathway for Diabetic Retinopathy#

Patient Presents

a. Screen for Diabetic Retinopathy every 2 years
b. Begin screening at diagnosis of Diabetes

Clinical Assessment

a. Clinical History
b. Clinical Modifiers* of risk of progression of Diabetic Retinopathy
c. Best Corrected Visual Acuity
d. Digital Fundus Photography (Non-mydriatic acceptable)

Grade Visual Acuity

a. 6/9 or worse (unexplained by other pathology): **refer to Ophthalmologist**
b. Better than 6/9: continue to Grade Image Quality

Grade Image Quality

a. Inadequate for accurate grading Diabetic Retinopathy:
   i repeat imaging with dilated pupils.
   ii If still inadequate: refer to **Ophthalmologist**
b. Adequate for grading Diabetic Retinopathy

Grade Diabetic Retinopathy

Communication

Communicate the results of Diabetic Retinopathy Screening to the patient and all physicians involved in their care (General Practitioner, Endocrinologist, Ophthalmologist) within 2 weeks

*** Clinical Modifiers**

Yearly screening for Diabetic Retinopathy should be undertaken routinely for patients in the following groups:

1. Duration of diabetes greater than 15 years
2. Poor Glycaemic control (HbA1c > 8% or 64 mmol/mol)
3. Systemic Disease
   a. Poorly controlled hypertension, blood lipids
   b. Other diabetic complications (Cardiac disease, cerebrovascular Disease, Renal disease)
   c. Foot Ulcers (Neuropathy, Peripheral Vascular Disease)
4. Indigenous or from a Non-English speaking background

Abbreviations:
DR – Diabetic Retinopathy
Hb – Haemorrhages
Hex – Hard exudates
IRMA – Intraretinal microvascular abnormality
MA – Microaneurysms
NPDR – Non-proliferative Diabetic Retinopathy
NVD – Neovascularisation at disc
NVE – Neovascularisation elsewhere
PDR – Proliferative Diabetic Retinopathy
VB – Venous beading

No Diabetic Retinopathy

i. Clinical Modifiers* Present: **Repeat screening in 1 year**
ii. Clinical Modifiers* Absent: **Repeat screening in 2 years**

Grade Diabetic Maculopathy

Grade NPDR (risk of PDR)

Pregnancy

Examination in First Trimester.
Action: **Routine referral to Ophthalmologist**

No Diabetic Maculopathy

Non-Centre Involving (Vision Threatening)

Definition: MA, Hb, Hex, Thickening within 2 disc diameters of the foveal centre.

Action: **refer to Ophthalmologist within 12 weeks**

Centre Involving (Vision Affecting)

Definition: MA, Hb, Hex, Thickening within 500 microns (1/3 disc diameter) of the foveal centre.

Action: **refer to Ophthalmologist within 4 weeks**

Mild NPDR

Definition: MA only.
One year risk PDR: 1-5%

Action: **repeat screening in 1 year**

Moderate NPDR

Definition: MA + Hb + VB (less than severe NPDR).
One year risk of PDR: 12-26%

Action:

i. **Comprehensive Eye and Fundus Examination required**
ii. **Refer to Ophthalmologist Recommended within 12 weeks**
iii. **Monitoring of Retinopathy co-ordinated with Ophthalmologist**

Severe NPDR

Definition: 20 MA + Hb in each quadrant of fundus, VB in 2 quadrants, IRMA in 1 quadrants (4:2:1 rule).
One year risk of PDR: 50%

Action: **refer to Ophthalmologist Recommended within 4 weeks**

Proliferative Diabetic Retinopathy (PDR)

Definition:
NVD, NVE, Iris Neovascularisation , Vitreous haemorrhage or Pre-retinal haemorrhage.

Action: **refer to Ophthalmologist within 1 week**

Sudden Severe Visual Loss

Definition: Vitreous haemorrhage, Retinal Detachment, Rubeotic Glaucoma

Action: **refer to Ophthalmologist same day**

This chart should be read in conjunction with the accompanying document: Clinical Notes for Screening and Referral Pathway for Diabetic Retinopathy.

In New Zealand, a national screening service is in place, free for patients. RANZCO recommends that patients should be referred on to the local service provider, where one is available. The RANZCO Diabetic Retinopathy Screening and Referral Pathway can be used as default where no screening service is available.

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Clinical Notes for RANZCO Screening and Referral Pathway for Diabetic Retinopathy in Australia

This document should accompany the *RANZCO Screening and Referral Pathway for Diabetic Retinopathy in Australia* chart.

1. **Patient Presentation**
    a. All patients with diabetes should undergo screening for diabetic retinopathy at the time of diagnosis of diabetes and then every 2 years if no retinopathy is present (NHMRC 2008, Guideline 4, pg 72).
    b. Children with Type 1 Diabetes should begin screening for diabetic retinopathy when they reach puberty (NHMRC 2008, Guideline 5, pg 72).
    c. Pregnant women with a history of diabetes should be screened for the presence of diabetic retinopathy in the first trimester of pregnancy (NHMRC 2008, Guideline 10, pg 72).
    d. Pregnant women who develop gestational diabetes do not require screening for diabetic retinopathy.
    e. Recognise and record the source of referral for the patient having diabetic retinopathy screening.
    f. Patients with diabetes who present 'opportunistically' for optometric review should be screened for diabetic retinopathy and the results of the screening examination communicated to their caring physician in the same way as a patient who is referred specifically for diabetic retinopathy screening.
    g. Patients already under the care of an ophthalmologist for management of diabetic eye disease do not require repeat screening, provided they are taking part in a regular programme of monitoring and treatment.

2. **Screening Examination**
    a. Collect appropriate demographic data
        i. Source of referral (contact details)
        ii. Contact details for all caring physicians (General Practitioner, Endocrinologist, Ophthalmologist)
        iii. Date of most recent screening examination for diabetic retinopathy (i.e. interval since last diabetic retinopathy screening examination) (Failure to attend for diabetic retinopathy screening examinations is a risk for vision loss – Diabet Med. 2016 Jul;33(7):904-11. doi: 10.1111/dme.12957. Epub 2015 Oct 6. Screening attendance, age group and diabetic retinopathy level at first screen. Scanlon PH1, Stratton IM1, Leese GP2, Bachmann MO3, Land M4, Jones C5,

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Ferguson B6; Four Nations Diabetic Retinopathy Screening Study Group.)

b. History
    i. Diabetes duration, medications, control
    ii. Vascular risk factors: Hypertension, Lipids, Smoking
    iii. Systemic Disease and complications of Diabetes
        1. Cardiovascular
        2. Cerebrovascular
        3. Renal
        4. Neuropathy
    iv. Past Ocular History
        1. Diabetic Retinopathy Treatment
        2. Other
    v. "Clinical Modifiers": Risks for progression of Diabetic Retinopathy

    Patients at higher risk of progression of diabetic retinopathy should be examined yearly if there is no evidence of diabetic retinopathy. (NHMRC 2008, Guideline 6, pg 72)
        1. Duration of diabetes greater than 15 years
        2. Poor Glycaemic control (HbA1c > 8% or 64 mmol/mol)
        3. Systemic Disease
            a. Poorly controlled hypertension, blood lipids
            b. Other diabetic complications (Cardiac disease, cerebrovascular Disease, Renal disease)
            c. Foot Ulcers (Neuropathy, Peripheral Vascular Disease)
        4. Pregnancy
        5. Indigenous, Non-English speaking
c. Assessment of Visual Acuity
    i. Best corrected visual acuity
    ii. (Pinhole vision is acceptable)
    iii. Recent or rapid deterioration in visual acuity should prompt referral even if vision is > 6/9
d. Digital Fundus Photography is the expected standard for fundus examination
    i. Pupil Dilatation
        1. Increases the sensitivity and specificity of detection of diabetic retinopathy
        2. Is Not mandatory if a high quality image is obtainable with a non-mydriatic camera or Ultra-Wide Field (UWF) camera (Ophthalmology 2016;123:1360-1367Identification of Diabetic Retinopathy and Ungradable Image Rate with Ultrawide Field

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Imaging in a National Teleophthalmology Program Paolo S. Silva, MD, et al) (Ultra-wide-field imaging in diabetic retinopathy; an overview Khalil Ghasemi Falavarjani et al, Journal of Current Ophthalmology 28 (2016) 57-60)

3. Is Mandatory if a high quality image cannot be obtained with a non-mydriatic camera or UWF camera

ii. Recommended images
   1. UWF Image
   2. Two 45 degree fundus images should be captured:
      a. Centred on the macula
      b. Nasal fundus, showing at least 3 disc diameters of the nasal fundus from the edge of the optic disc (this is the standard for the English NDS programme and the NZ programme)

iii. OCT Assessment of the macula aids the detection of diabetic macular oedema. However, its use in diabetic retinopathy screening programmes is not yet validated and therefore OCT imaging is not mandatory or recommended as part of a screening examination.

3. Grading of Diabetic Retinopathy

a. Should be undertaken by the optometrist who is conducting the screening examination. The screener will therefore also be responsible for determining:
   i. Screening interval (i.e. interval until the patient should return for the next diabetic retinopathy screening examination)
   ii. Referral for ophthalmologist review, if required.

b. Grading of diabetic retinopathy has 3 elements:
   i. Visual Acuity
   ii. Image Quality
   iii. Severity of Diabetic Retinopathy

c. It is recommended that all professionals involved in the screening and grading of diabetic retinopathy should be familiar with the epidemiology and clinical features of diabetic retinopathy. This could involve completion of an on-line diabetic retinopathy grading course (eg University of Melbourne Course).

4. Grading of Visual Acuity

a. Referral is recommended if visual acuity is less than 6/9. Substantial centre-involving diabetic macular oedema can be present despite normal vision.

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b. If visual acuity has fallen recently, referral should also be considered.

5. **Grading of Image Quality**
   a. The image should be of sufficient clarity and field to allow reliable detection of diabetic retinopathy. The small retinal vessels should be visible.
   b. The images should cover an adequate area of the fundus (two 45 deg images as detailed earlier)

6. **Grading of Diabetic Retinopathy**
   a. Grading is based upon the International Clinical Diabetic Retinopathy and Diabetic Macular Oedema Severity Scale. (Proposed International Clinical Diabetic Retinopathy and Diabetic Macular Edema Disease Severity Scales. C. P. Wilkinson et al. Ophthalmology 2003;110:1677–1682)
   b. Grading should focus separately on the two aspects of diabetic retinopathy that cause most vision loss
      i. Diabetic Macular Oedema
      ii. Non-proliferative Diabetic Retinopathy and the risk of Proliferative Diabetic Retinopathy.
      iii. Patients assessed to have Moderate Non-proliferative Diabetic Retinopathy should:
         1. Have a comprehensive ophthalmic examination including dilated examination of the fundus.
            a. Many patients with diabetic retinopathy will have changes that are outside the 45 degrees of a standard single field non-mydriatic retinal camera
               i. 8-15% have retinopathy only present outside this zone
               ii. 27% with proliferative diabetic retinopathy have neovascularisation outside this zone
               iii. (Diabetic retinopathy as detected using ophthalmoscopy, a nonmydriatic camera and a standard fundus camera. Klein R, Klein BE, Neider MW, Hubbard LD, Meuer SM, Brothers RJ. Ophthalmology. 1985 Apr;92(4):485-91)
         2. Routine referral to an ophthalmologist with an interest in the management of diabetic retinopathy is recommended, but not mandatory
         3. A collaborative regimen of monitoring of patients with moderate non-proliferative diabetic retinopathy could be

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established between the screening optometrist and the ophthalmologist.

7. **Communication of Results of Screening Examination for Diabetic Retinopathy**
    a. The result of diabetic retinopathy screening should be communicated, in a timely fashion, to the patient, and the patients caring physicians (General Practitioner, Endocrinologist and Ophthalmologist).
    b. The development/presence of diabetic retinopathy is an important finding, with implications for the risk of vision loss, and for the risk of systemic diseases related to diabetes including myocardial infarction, stroke and renal disease (Diabetes Care. 2007 Jul;30(7):1742-6. Epub 2007 Mar 26. Diabetic retinopathy and the risk of coronary heart disease: the Atherosclerosis Risk in Communities Study. Cheung N1, Wang JJ, Klein R, Couper DJ, Sharrett AR, Wong TY.)
    c. This allows appropriate steps to be taken to improve diabetes management (blood glucose control) and the management of other vascular risk factors in order to slow the progression of diabetic retinopathy and the development and progression of other vascular complications of diabetes including myocardial infarction, stroke, renal disease and foot disease.

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