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A standard clinical approach to primary diabetic eye care

Being able to provide comprehensive care for patients with chronic conditions such as diabetes in the face of busy workloads can be difficult. However, primary healthcare providers, including optometrists, must remain clear about their duty of care and critical role in reducing the burden of chronic disease. Adopting a standard clinical approach to diabetic consultations is a solution that allows best-practice care without significant disruption – all it takes is a bit of initial planning.

The diabetes epidemic, affecting more than 1.5 million Australians, is on the rise, with statistics showing an increase from 3.3% in 2001 to 5.3% in 2022.[1,2] Complications from long-term hyperglycaemia are often related to various microvascular changes in the retina, kidney and peripheral nerves. Ocular consequences include diabetic retinopathy (DR), diabetic macular oedema (DMO), cataracts, ocular surface disease and optic neuropathies.[3]

More than 80% of people with type 1 diabetes and over 60% of those with type 2 diabetes will develop some form of DR in the first 2 decades of the disease.[4–6]

In working-age adults (under 65 years), DR is the leading cause of preventable blindness globally.[2] It is a matter of when, rather than if, patients will develop DR. However, early identification and accurate grading allow prompt referral and timely intervention for the diabetic patient.

Room for improvement in primary diabetic eye care

Recent research into the appropriateness of diabetic eye care by a sample of Australian optometrists found it was largely appropriate with some areas for improvement in history taking and the retinal examination (**Figure 1**).[7] Very few practices met the achievable benchmarks of care (ABCs) for documenting duration of diabetes (7%), blood glucose control (7%) and high blood pressure (10%), while less than 25% met the benchmark for dilated fundus examination/retinal photography with grading.

However, most or all practices met the ABCs for visual acuity, recall period and suspected DMO or proliferative DR (PDR) referral. →

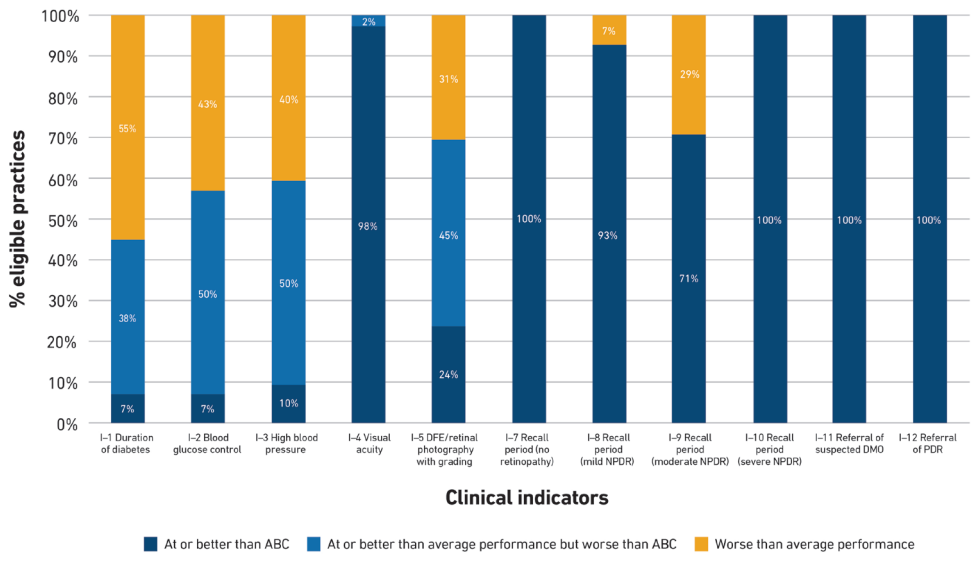

Figure 1. Practice performance for clinical indicators of diabetic eye care. Adapted from Gyawali et al.[7]

DFE = dilated fundus examination, NPDR = non-proliferative diabetic retinopathy, PDR = proliferative diabetic retinopathy

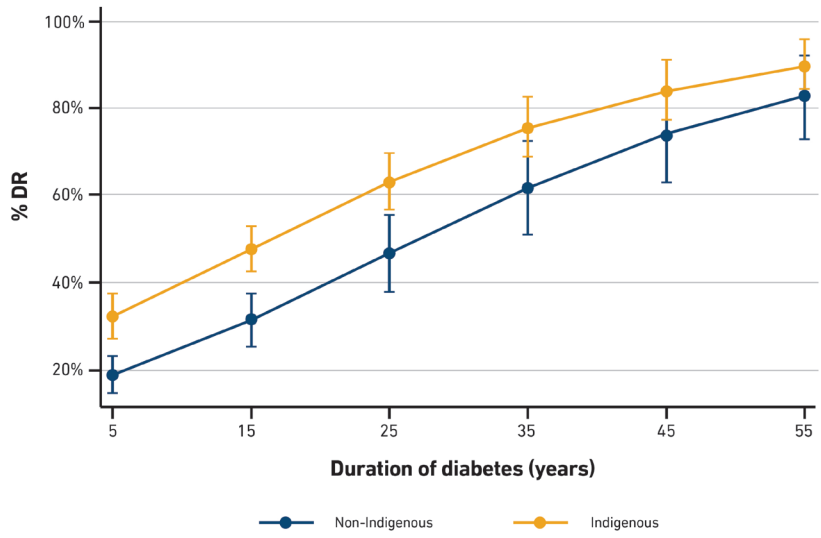

Figure 2. The prevalence of diabetic retinopathy according to duration of diabetes in Indigenous and non-Indigenous Australians. Adapted from Keel et al.[9]

Why and how to use diabetes benchmarks

The diabetes benchmarks represent a great opportunity for optometrists to streamline their consultations *and* achieve excellence in patient care – all with minimal disruption. This can be achieved by incorporating the benchmarks into a checklist for every diabetic consultation. Depending on the practice software, optometrists could create a primary diabetic eye care template to complete in real time.

Targeted history taking

Knowing where to focus your history taking allows optometrists to gauge the DR or DMO risk profile and the likelihood of finding diabetic eye disease. The extent and ease to which the patient answers your questions provides additional insight into how well they manage their diabetes.

Diabetes duration, diabetes type and age of onset

Knowing how long the patient has had diabetes is essential because DR prevalence increases with disease duration (**Figure 2**).[8,9] DR risk is greatest with type 1 diabetes after 5 years compared to type 2 diabetes of any duration.[10,11] Type 1 diabetes with an age of onset between 5–14 years is associated with the highest risk of proliferative DR.[10,11] However, DMO is more likely with type 2 and usually develops within 5 years after the onset of proliferative changes.[12]

Blood glucose control

Poor glycaemic control is known to increase the risk of ocular manifestations of diabetes.[4,11,13] The haemoglobin A1c (HbA1c) glycaemic index is the gold standard measurement of glycaemia,[10] and suboptimal control is usually indicated by a reading over 7% or 8%, depending on the patient's individual target.[14] However, a normal HbA1c does not rule out the possibility of DR because it does not always correlate with mean blood glucose levels.[15] The patient's HbA1c readings in the first 5 to 15 years after diagnosis provide better information – a poorer value during this timeframe confers a greater risk of DR, even if better glycaemic control is achieved over time.[16]

In reality, many patients do not know their HbA1c results, so gauging their degree of glycaemic control requires other lines of questioning. This includes asking about changes to the patient's diabetes management plan, including medication, and other non-ocular complications such as ischaemic vascular disease, renal disease, peripheral neuropathy, ischaemic heart disease, dental disease and cerebrovascular disease.

High blood pressure, cholesterol levels and smoking status

Blood pressure and cholesterol levels are important because systemic hypertension, hyperlipidaemia and renal disease are major risk factors for developing DR.[8,11,17] The patient's medication list is useful to check for antihypertensive and/or cholesterol-lowering medications. Smokers have an increased risk of vascular complications and DR.[17]

Ocular symptoms

Some patients with DR report no ocular symptoms, and early changes such as microaneurysms or early intraretinal fluid are picked up incidentally during routine testing.

In more severe cases, patients attend because of a noticeable change in vision. Blurry central vision or noticeable distortions, such as a wave when looking at straight lines, can suggest the presence of DMO or more prolific bleeding. Other symptoms include fluctuating vision, dark spots in vision, vision loss and poor colour appreciation.[18]

A sudden vision loss or a 'reddening' of vision may suggest a diabetic vitreous haemorrhage, detachment, or both. Sometimes, flashes or floaters will precede other ocular symptoms. This stage of diabetic disease usually signifies the greatest advancement and requires urgent treatment.[19] Red, painful eyes may be associated with rubeosis, potentially leading to angle closure.[19]

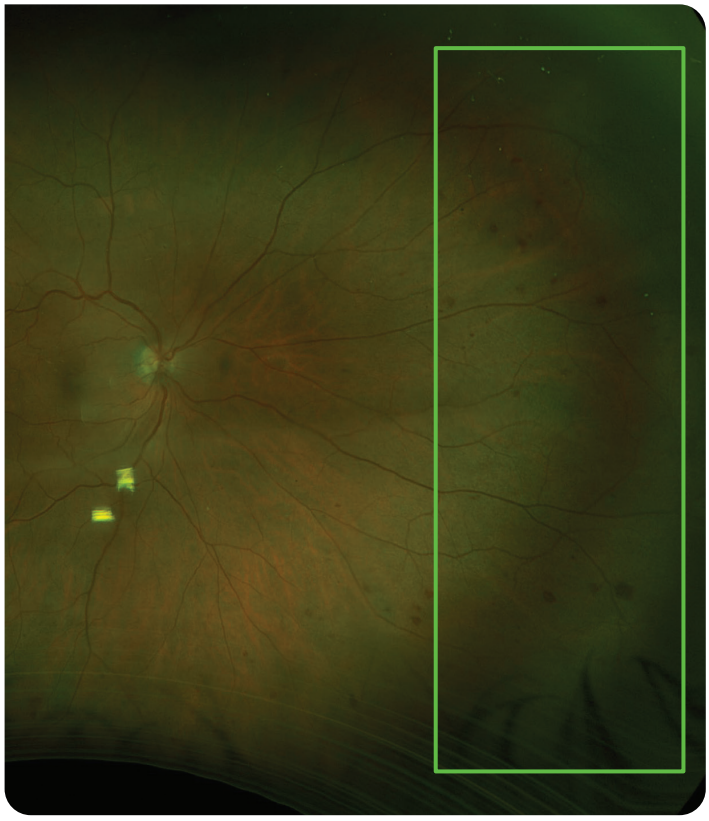

Figure 3. Ultra-widefield photography showing DR hemorrhages located predominantly in the peripheral retina (green rectangle) of a patient. (Source: Vision Eye Institute)

INCREASING PATIENT RECALL SUCCESS
Provide a summary of your findings, DR risk factors and review plan.
Provide information (or where to find information) about diabetic eye disease, including diabetic retinopathy and symptoms to monitor at home.
Pre-book the patient's next appointment.
Use a reminder system SMS or email.
Implement a protocol to track and manage missed appointments.

Table 1. Increasing patient recall success.

Comprehensive physical examination

Visual acuity, dilated fundoscopy with grading and iris exam

A comprehensive eye examination should include visual acuity, slit lamp examination, optical coherence tomography (OCT), dilated fundus examination and/or retinal photography (ideally with ultra-widefield photography if available) and grading. Examining the entire retina, including the posterior pole and the peripheral retina, is essential.

The presence of macular oedema is the first examination target with the division into non-centre-involving and central, where the visual acuity usually starts to drop. The presence and grading of non-proliferative DR (NPDR) occur in the identification of microaneurysms, haemorrhages and exudates, where the grade relates to the risk of progression through to proliferative retinopathy.[20] It is important to assess for neovascularisation of the disc, iris and elsewhere. Neovascularisation of the iris, if present, warrants an examination of the anterior chamber and angle to assess the risk of neovascular glaucoma and angle closure.

Assessing the peripheral retina can increase the grading severity of DR in 11% of eyes.[21] **Figure 3** shows DR haemorrhages predominantly in the peripheral retina of a patient (green rectangle). The presence of predominantly peripheral DR lesions has been associated with a greater risk of progression.[22]

Patient recall

A baseline screening at diagnosis should be advised for all patients, followed by at least 2-yearly reviews.[3,20] More frequent screening is indicated if DR risk factors are present.[20] If DR is present, the recommended recall period is at least yearly (mild DR), 6-monthly (moderate NPDR) or 3-monthly (severe NPDR).[3]

Between 50% to 75% of Australians with diabetes adhere to 2-yearly eye exams; however, only 21% to 28% of those who have had diabetes for over 10 years met the guideline of a yearly eye examination.[23]

Suggestions to increase recall success are presented in **Table 1**.

Referral

Patients with a retinal detachment or type 1 diabetes plus persistent vitreous haemorrhage require referral to an ophthalmologist, as do those with clinically significant macular oedema and signs suggestive of macular ischaemia.[3] Patients with suspected DMO, PDR or DR with reduced visual acuity should be referred to an ophthalmologist within 4 weeks.[3]

Ensure the patient understands why you are referring them to an ophthalmologist and the risk of not attending. Some optometrists prefer to ring and make the appointment while the patient is with them (or have their reception staff do so). A follow-up protocol for referred patients should also be considered. ●

Communicating with other healthcare providers

- Optometrists are also responsible for communicating their findings to the other healthcare professionals involved in the patient's care.
- Outgoing correspondence is an excellent opportunity to share information about the presence or absence of DR, the state of the lens or any cataract progression, corneal integrity and disc health, including glaucoma risk or progression. These reports can help other care providers understand that it may not be diabetes alone affecting the patient's vision.
- It is also important to note the patient's risk of progression and the signs and symptoms that should trigger an eye examination. For instance, floaters, flashes or a 'veil' over the patient's vision must be checked promptly for evidence of a retinal detachment or tear. An informed care team can help identify serious ocular concerns when reported by the patient and advise them to seek help from their eye care provider.
- The identification of any level of retinopathy should be a trigger for a comprehensive review of the patient's glucose control and noted in the report.

About the authors

Dr John McKenzie is a highly respected ophthalmologist and cataract surgeon with expertise in treating retinal conditions, including diabetic eye disease, age-related macular degeneration and retinal vein occlusion. He also has special interests in ocular oncology and children's eye health. Alongside his private practice, Dr McKenzie holds several public appointments (Western Health, The Royal Children's Hospital and The Royal Victorian Eye and Ear Hospital). He is also a Professor of Ophthalmology. Dr McKenzie consults privately at Vision Eye Institute Footscray.

Samra Ijaz is a therapeutically endorsed optometrist who graduated from the University of New South Wales with first-class honours in 2012. With over 10 years of experience practising as a clinical optometrist in the corporate sector, she uses her expertise to pursue her passion for ocular disease at Vision Eye Institute Hurstville in Sydney.

Amanda Moore is an orthoptist with a keen interest in vitreoretinal ophthalmology, ocular oncology, glaucoma and paediatrics. Since graduating from La Trobe University in 2021 with a Bachelor of Applied Science/Masters of Orthoptics, Amanda has been working with Vision Eye Institute. She also works publicly in Melbourne and both publicly and privately in Geelong. Further to clinical work, Amanda contributes to research via published articles and state and national orthoptic conference presentations.

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