Diabetes and Eye Health more than meets the eye

Vision Initiative - in association with PSA

Save Your Sight

Get Tested

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Vision 2020 Australia – Vision Initiative

RANZCO & OAA (Vic)

Proud members of
Vision 2020 Australia

Outline

- Vision 2020 Australia
- Vision Initiative
- the 5 major causes of preventable blindness and vision impairment
- diabetic eye care
- who's who and how to refer
- diabetic retinopathy - classifications
- management and treatments.

About Vision 2020 Australia

- national peak body
- represents over 50 member organisations
- provides a platform for collaboration
- part of VISION 2020: *The Right to Sight*.

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Why eye health and vision care?

- preventing avoidable sight loss is cost effective

  75% of vision loss is avoidable or treatable
- people with vision impairment are at a greater risk of suffering from secondary conditions:
  - falls
  - depression
  - early special accommodation
  - increased early mortality

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- the Victorian Government's response to the *National Eye Health Framework for Action to Promote Eye Health and Vision Loss*
- is managed by Vision 2020 Australia
- National Framework available at www.health.gov.au

Get Tested. Visit your optometrist or ophthalmologist or speak to your doctor.

Vision Initiative

The key message of the Vision Initiative

Save Your Sight – *Get Tested*

- funded by the Victorian Department of Human Services
- implemented by Vision 2020 Australia. The national branch of a global campaign to prevent avoidable blindness
- more than 54 member organisations #
- Victoria's public health response to the National Framework

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Vision Initiative

Goal:

To prevent avoidable vision loss and to reduce the impact of vision impairment for all Victorians through prevention, early detection and intervention.

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Objectives - Vision Initiative

- increase eye health awareness and promote preventative behaviours
- provide education about eye health to health professionals
- strengthen collaboration with Victorian stakeholders involved in eye health.

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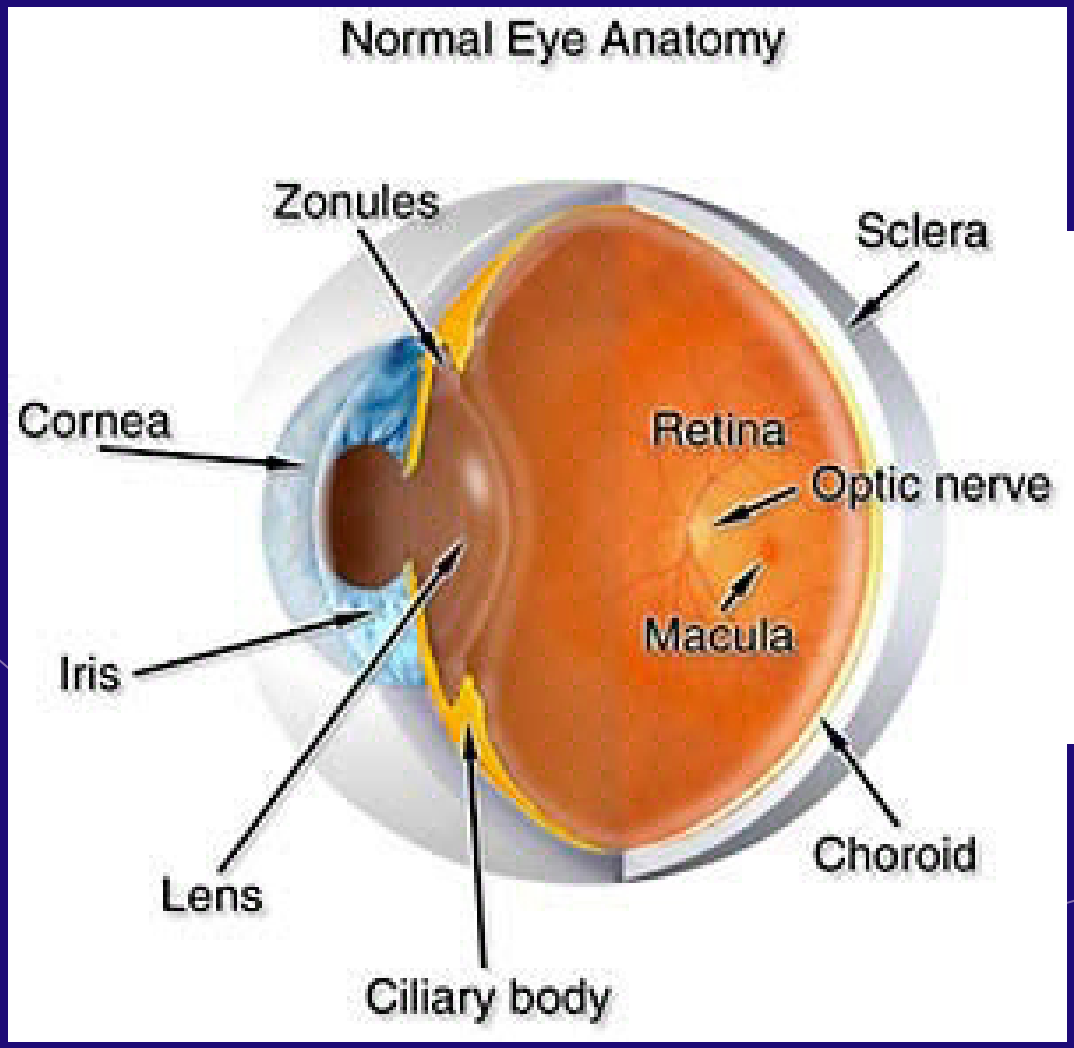
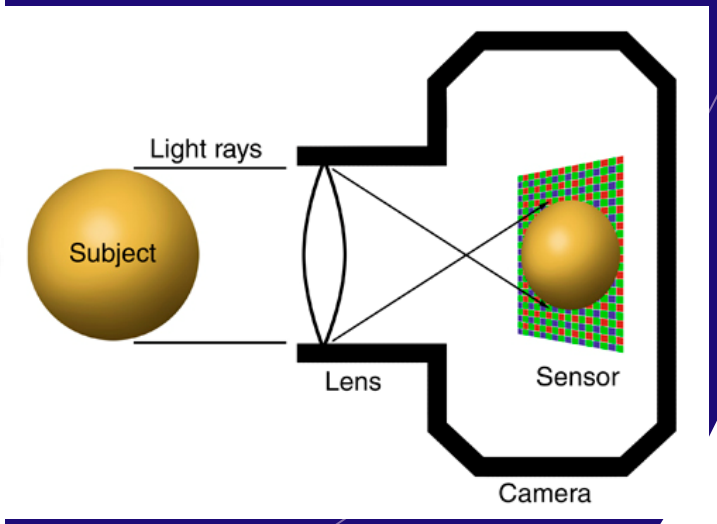
Structure and function of the eye





Structure and function of the eye

retinal blood vessels

macula (fovea in centre)

optic nerve

Causes of blindness and vision impairment

80% of vision loss is caused by five main conditions:

- age-related macular degeneration (AMD)
- cataract
- diabetic retinopathy
- glaucoma
- uncorrected and under-corrected refractive error.

Diabetes

- diabetic retinopathy is the major source of vision impairment from diabetes
- includes other diabetic eye disease
- only by regular eye examinations and timely treatment can vision loss be significantly delayed or reduced.

www.cera.org.au

Eye changes in Diabetes

- refractive, fluctuations in vision
- cataract
- glaucoma
- cranial neuropathies
- dry eyes
- retinal changes, diabetic retinopathy.

Diabetic Eye Disease

- everyone with diabetes is at risk for these changes
- Type 1 and Type 2 diabetics
- after 15 years of diagnosis 75% of all diabetics will have some retinopathy changes
- for the majority there is no immediate risk of loss of sight.

Vision problems from Diabetes are largely preventable.

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Prevention

- early detection and treatment essential
- regular review and coordinated care approach by GP and other eye care practitioners.
- target levels for
  - blood sugar levels < 7.0 mmol/L
  - blood pressure < 130/80 mmHg
  - cholesterol (LDL ideal) < 2.6 mmol/L
  - HbA1c < 7%.

For more information visit the publications section on the NH&MRC website www.nhmrc.gov.au

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Reducing retinopathy

- research shows for every 1 point decrease in HbA1C yields a 35-50% reduction in the risk of microvascular complications: vasculopathies, neuropathies, diabetic retinopathy.

Diabetic Retinopathy

- complication of longstanding diabetes
- elevated sugar levels damage the sensitive blood vessels in the retina
- painless loss of vision due to oedema or haemorrhage from leaky capillary pericytes or scar tissue formation in the retina, leading to detachment
- early treatment and diagnosis can prevent up to 98% of severe vision loss.

Detection – dilated retinal exam

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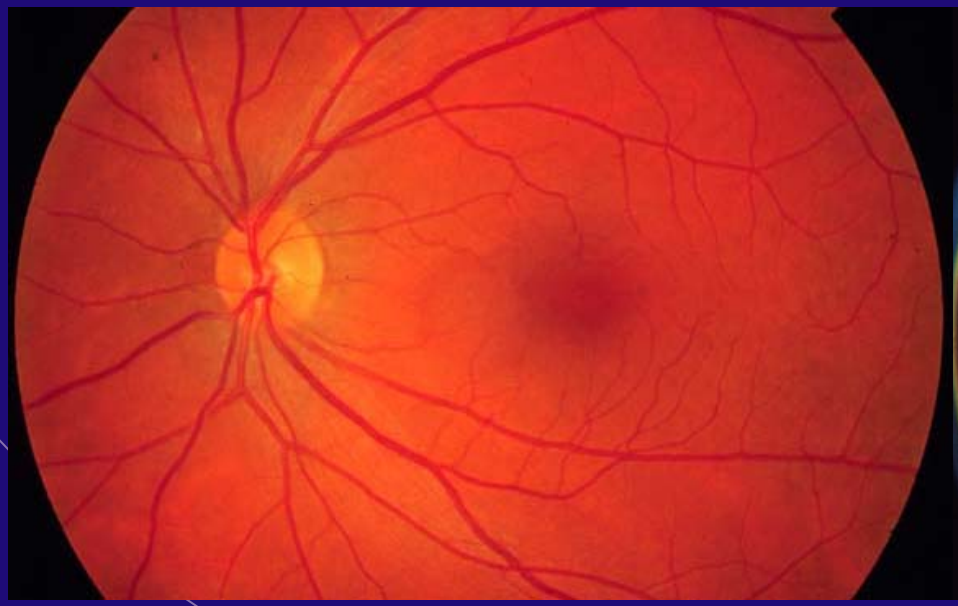
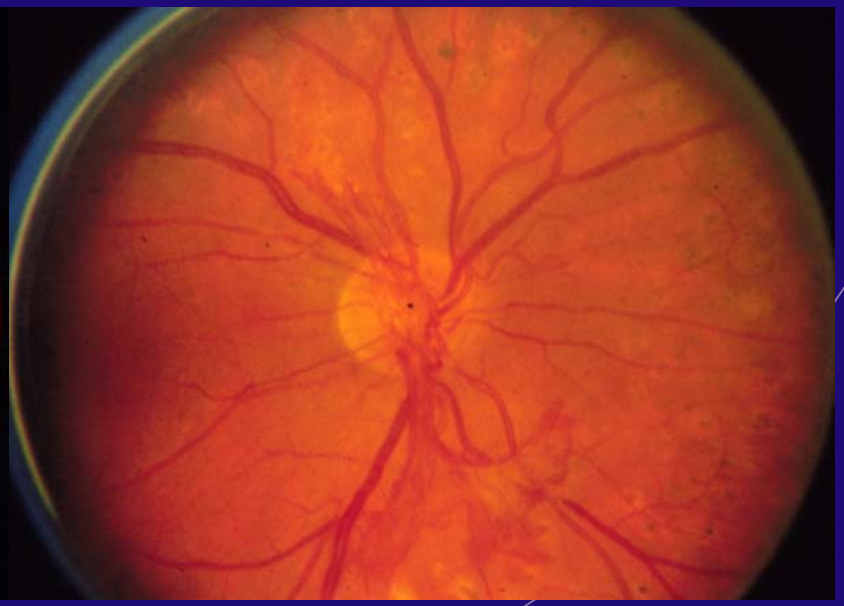
Diabetic Retinopathy



Healthy retina

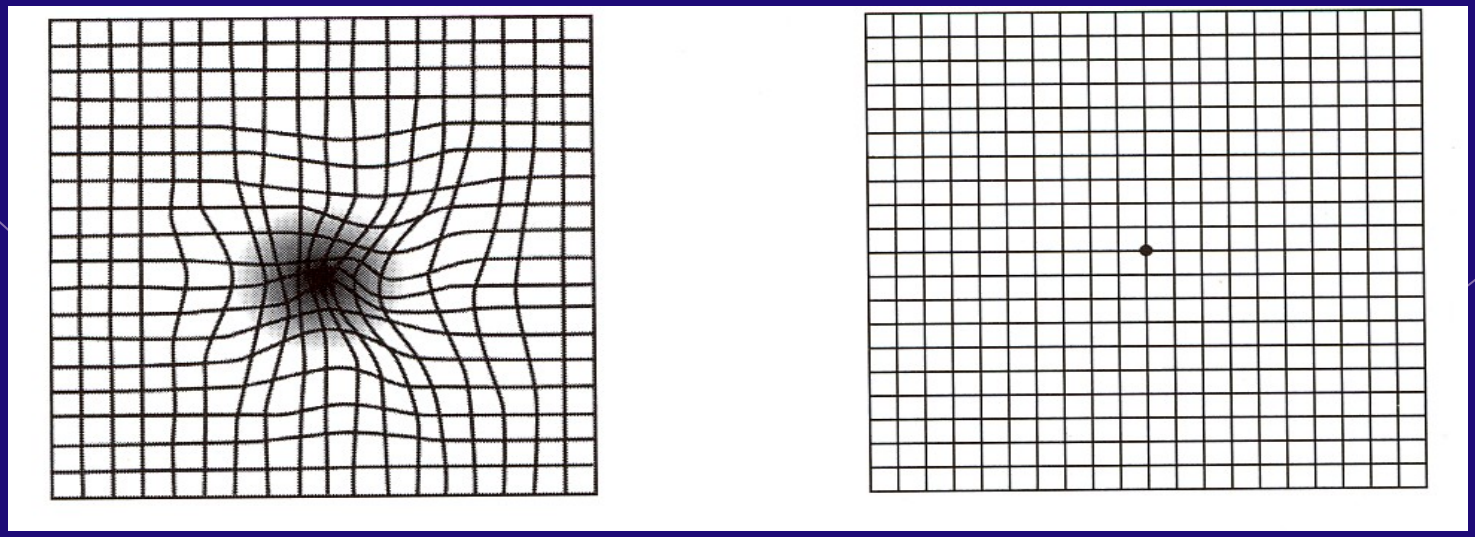


Haemorrhages and vascular defects cause scarring and loss of vision

Simulated view with Diabetic Retinopathy

Amsler chart/ Diabetes

- as for Macular Degeneration
- Amsler Grids are used to detect metamorphopsia – shape distortion in central vision



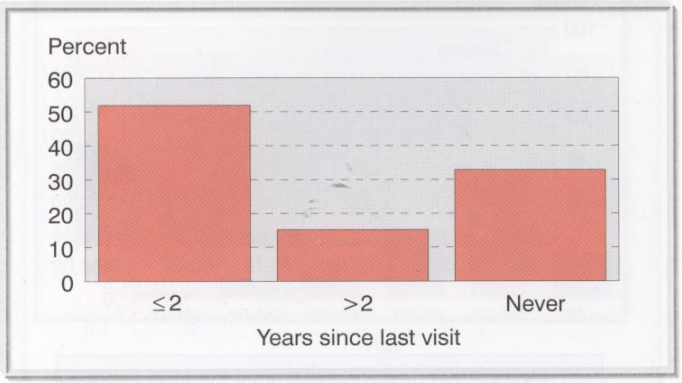
cera

Diabetic Eye Disease

Present Situation:

- 450,000 Australians have diagnosed diabetes and an equal number have undiagnosed diabetes.
- All are at risk of developing diabetic eye disease.
- Diabetic eye disease costs Australia $326 million per year.
- With early diagnosis and treatment, up to 98% of severe vision loss can be prevented.
- Lack of awareness and communication breakdowns are major impediments.

Diabetic Retinopathy Eye Exam



Only half the people with diabetes have a regular eye exam and one third have never been checked.

Solutions:

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NH&MRC guidelines for DR

- peak committees have reviewed research and provided evidence-based guidelines for classifying and management of DR
- issued in 1997 and updated in 2008
- all eye care practitioners recognise these guidelines.

For more information visit the NH&MRC website at www.nhmrc.gov.au

Those most at risk

- diabetes of a long duration
- poorly controlled
- insulin dependent
- high blood pressure (hypertension)
- high cholesterol
- smokers
- Aboriginal and Torres Strait Islander
- overweight.

Key to self management

- have regular eye examinations: 2 yearly*
- every diabetic should have a full eye examination at diagnosis
- report any change in vision immediately
- diabetic eye disease is frequently encountered in undiagnosed diabetics!
- keep excellent control.

Management : Diabetic eye care

Layer 1. Regular eye examinations, close monitoring of early retinopathy, general diabetic counselling and control of blood indices

Layer 2. If patients progress sufficiently,

same management as above 1 but with additional active treatment of specific progressive eye pathology by laser, intraocular injections or surgery.

Optometrists and Ophthalmologists

- skills to detect (new and progressing) pathology
- increasingly use retinal digital cameras and other technologies to accurately monitor eye changes over time
- some in each profession with special interest in diabetic eye disease and retinal disease. Speak to your local practitioners for information
- recognise the preventative value of regular eye exams in diabetes (specific Medicare items exist for this purpose).

Optometrists and Ophthalmologists

- report their findings and feedback to managing doctors (GPs, endocrinologists) and fellow eye care providers
- are mindful of the systemic nature of the illness and are alert to other complications
- can participate in GP Care Plans
- counsel patients about important elements in the management of the diabetes e.g., the value of HbA1c and other key markers (BP, Lipids, BSL, and lifestyle).

Low vision service providers

- low vision organisations and eye care practitioners provide low vision services
- these services help people to adjust to vision impairment by learning new ways to carry out daily tasks
- they also assist people in making the most of their remaining vision.

Referring to low vision service providers

- Vision Australia
  www.visionaustralia.org.au
  Ph: 1300 VISION (1300 847 466)

- Guide Dogs Victoria
  www.guidedogs.asn.au
  Ph: 9854 4467
  Email: referrals@guidedogs.asn.au

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How optometry prescribing works

- enabled under registration and drugs/poisons legislation: state based
- all states except WA
- optometrists must be endorsed by Registration Board, having passed an accredited course.
- can prescribe topical eye drugs.

How optometry prescribing works

- glaucoma patients through shared care with ophthalmologists
- mandatory part of optometry degree in Victoria since 2002 (additional 1 year training)
- also Graduate Certificate in Ocular Therapeutics
- > 30% of Victorian optometrists endorsed to prescribe.

What can be prescribed in Victoria

- steroids and NSAID
- anti-infection
- anti-inflammatory
- cycloplegics
- local anaesthetic

PBS optometry schedule

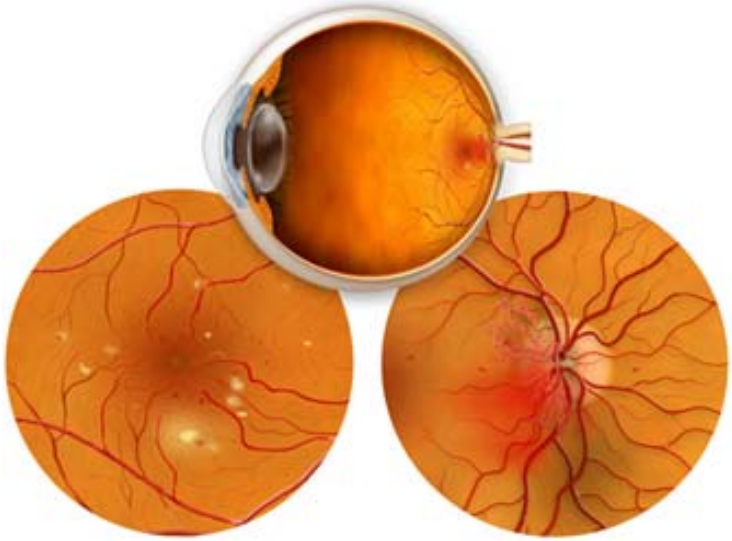
DRUG	RESTRICTION?	No. of REPEATS
chloramphenicol	Unrestricted	0 (10 mg); 2 (5 mg)
sulfacetamide	Unrestricted	2
Antivirals		
aciclovir	Herpes simplex keratitis	0
Steroids		
hydrocortisone	Unrestricted	0
fluorometholone	Unrestricted	0
NSAIDS		
flurbiprofen	Vernal kerato-conjunctivitis	0
sodium cromoglycate		
Lubricants (various)	Various restrictions Some authority required Check against brand/dose	Up to 5

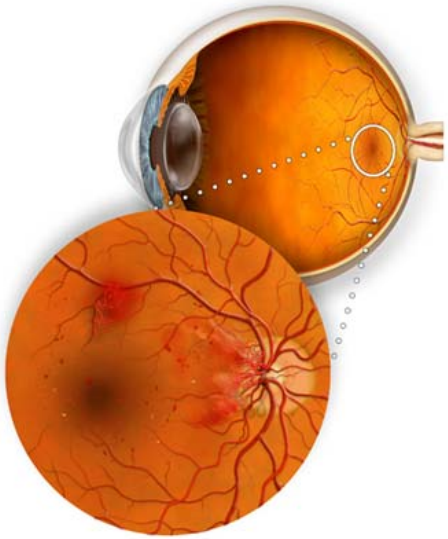
Glaucoma medications

- glaucoma medications soon to be on PBS when prescribed by optometrists
- pharmacists will be informed of start date: administrative arrangements underway to implement decision
- will be under shared care guidelines agreed between ophthalmologists and optometrists.

What is Retinopathy?

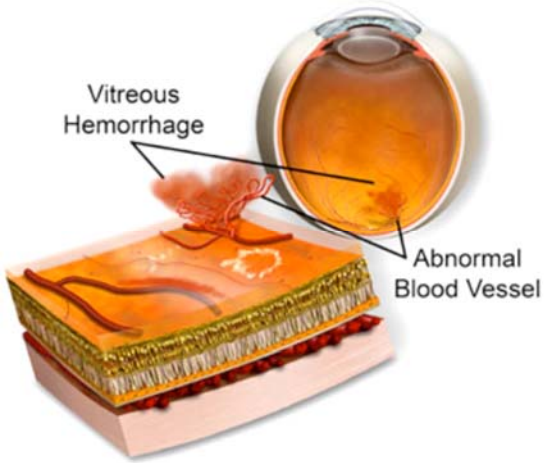
- “Damage to the microcirculation”
- There are different stages to the disease
- Non-proliferative or Proliferative retinopathy
- Macular oedema

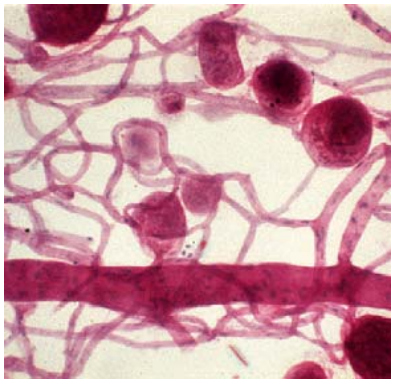




Diabetic Retinopathy

- The major histological change is the loss of pericytes and thickening of the capillary membrane, which leads to these capillaries becoming leaky
- The microcirculation ceases to properly supply the retinal tissue, leading to retinal ischaemia and infarction



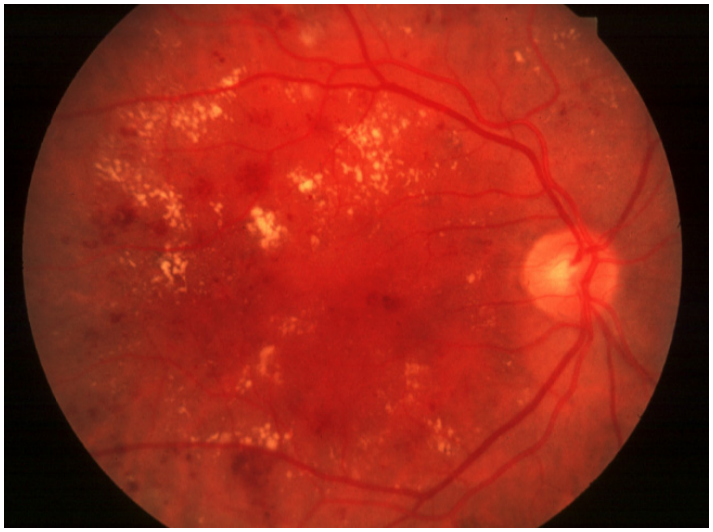


Non-Proliferative Diabetic Retinopathy

- Non-proliferative diabetic retinopathy (NPDR) may occur anytime after the onset of diabetes
- It is the first "stage" of diabetic retinopathy and the least concerning
- It is often present without any visual symptoms

Non-Proliferative Diabetic Retinopathy

- When the microcirculation fails to supply the retina, there are changes including:
  - Hard exudates (intra-retinal lipid deposits)
  - Oedema
  - Small haemorrhages
  - Venous beading
  - Cotton wool spots



Non-Proliferative Diabetic Retinopathy

- A dynamic process
- Despite areas of retina improving in appearance over time, the damaging effect of these intravascular leaks on retinal tissue is permanent
- Retinopathy restricted to these changes alone is referred to as background retinopathy

Proliferative Diabetic Retinopathy

- Proliferative diabetic retinopathy (PDR) is characterised by the development of neovascularization on or adjacent to the optic nerve and vitreous or pre-retinal hemorrhage
  - PDR usually occurs in eyes with advanced background diabetic retinopathy and is thought to be secondary to ischemia

Proliferative Diabetic Retinopathy

- Ischaemic peripheral retina is often asymptomatic but produces vasoproliferative factors
- The new vessels which form are leaky and often grow around the posterior surface of the vitreous
- These vessels often bleed leading to subhyaloid and vitreous haemorrhages which can result in sudden blindness

Classification	Clinical Signs	Referral
Minimal NPDR	Microaneurysms only, normal vision	Annual exam
Mild NPDR	Microaneurysms + haemorrhages	Referral to Ophthalmologist
Moderate NPDR	Microaneurysms + haemorrhages + 1/4 cotton wool spots	Prompt referral to Ophthalmologist
Severe NPDR, PDR	Intraretinal microvascular abnormalities or haemorrhages / microaneurysms in 4/4	Urgent assessment by Ophthalmologist required
High risk PDR	New vessel growth >1/3 of disc or vitreous haemorrhage	Urgent assessment by Ophthalmologist required

Macular Oedema

- Clinically significant macular oedema (CSME) is the leading cause of blindness in diabetics
- It is a condition of swelling of the macular related to the development of leaky capillaries and microaneurysms
- It can occur in all stages of the disease

Type	Clinical Signs	Referral
Clinically Significant Macular Oedema (sight threatening)	Retinal thickening or hard exudates within 500um from macular	Urgent assessment by Ophthalmologist
Impending CSME	Microaneurysms, haemorrhages or hard exudates near or within the macular but >500um from macular centre	Urgent assessment by Ophthalmologist

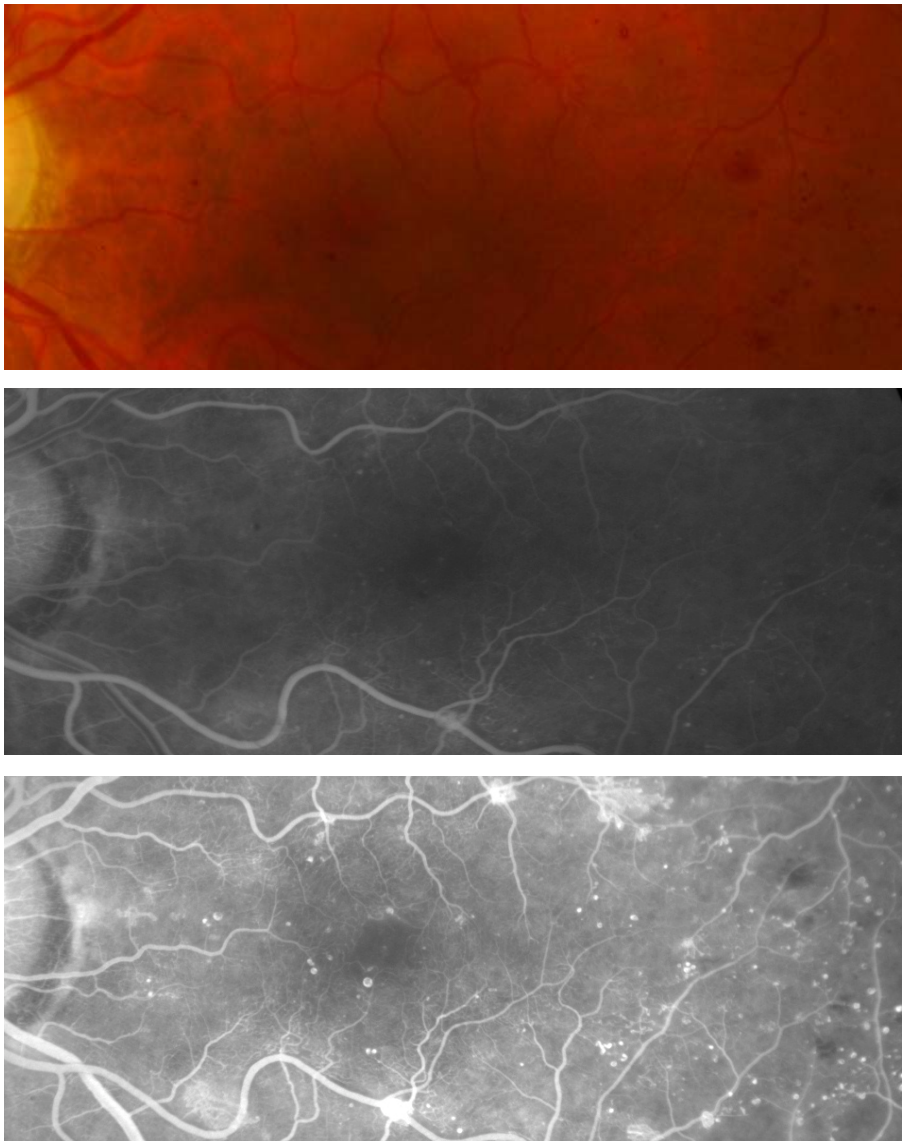
Fluorescein angiography

- Fundus fluorescein angiography is a test used to assess circulation of the retina by means of a fluorescein dye. A series of fundus photographs are taken after the dye is injected into a peripheral vein.

- It is used to assess macular oedema or PDR and is used to guide laser treatment

Fluorescein angiography

- Photographing the passage of dye through retinal vessels allows detailed viewing and easy location of the source of any leakage

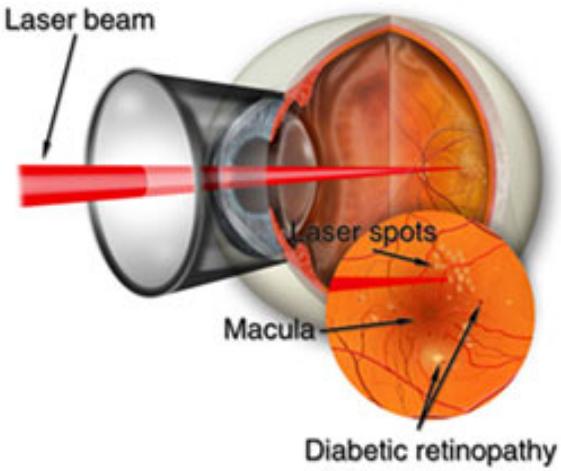


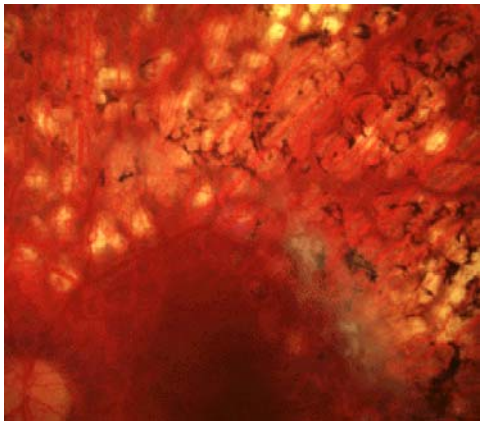
Management of NPDR

- Background changes are most significant when they involve the macular or surrounding retina as oedema, lipid and blood will impair visual acuity
- If diabetic changes are sufficiently distant from the macular, regular observation may be sufficient

Treatment of PDR

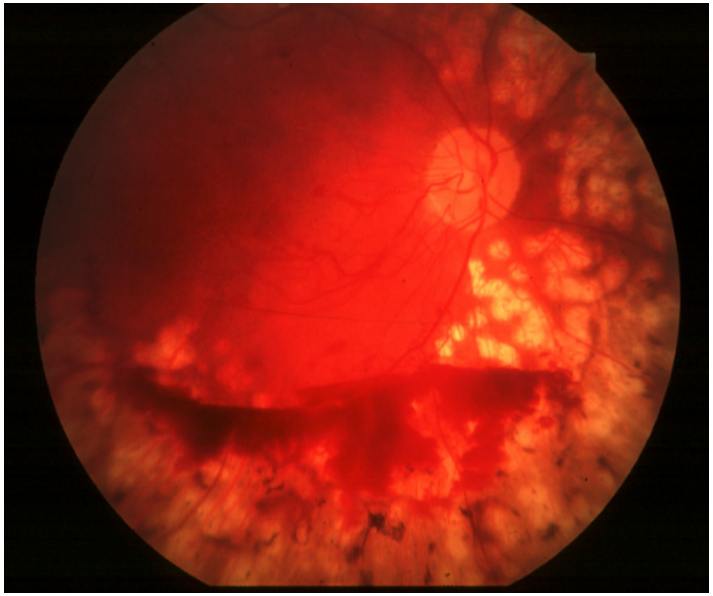
- Proliferative changes almost always require prompt laser therapy to ablate the ischaemic tissue
- Once the tissue is photocoagulated it ceases to produce the vasoproliferative mediators and permits regression of the new vessels

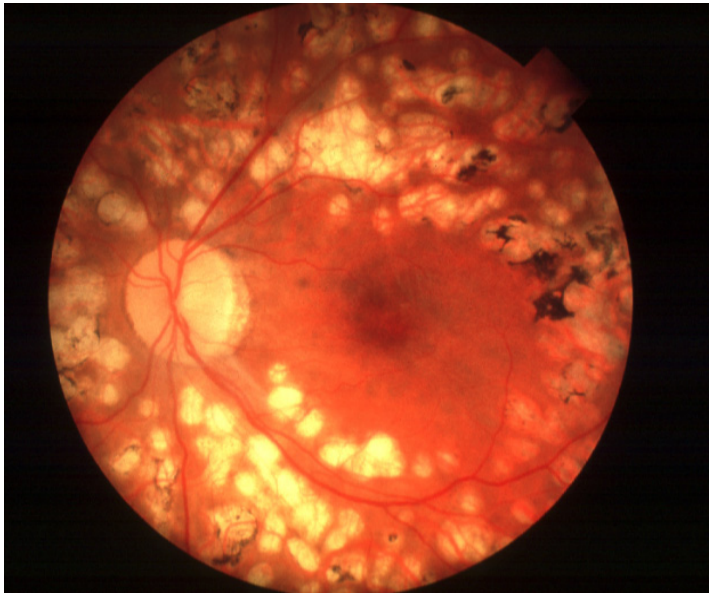




Laser Treatments

- Panretinal photocoagulation is used to manage PDR. Areas of the retina away from the macula are treated with scattered laser burns. The burns kill the retina so it no longer has hypoxic drive.



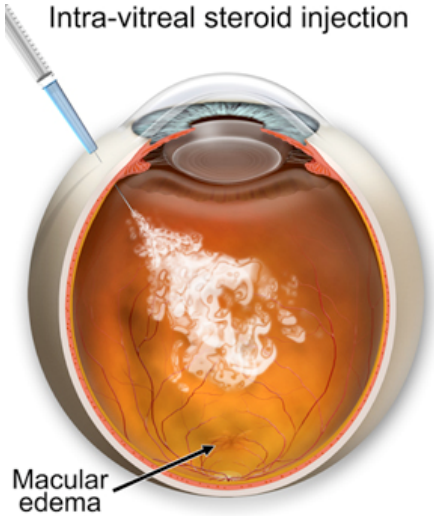


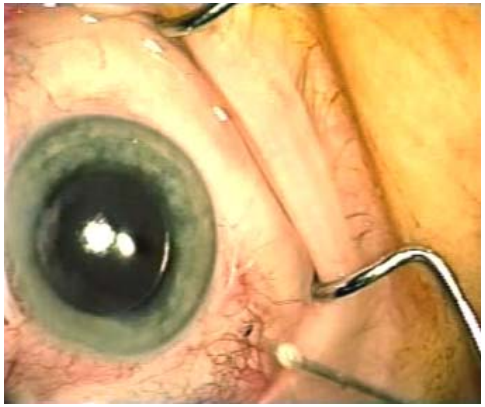
Laser Treatments

- Focal retinal laser is used to manage CSME
- Laser burns seal the blood vessel leaks and is usually performed in a single session in the Ophthalmologist's consulting rooms
- Blurred vision caused by oedema before surgery may not recover completely

Intravitreal Therapy

- Recent experimental use of injecting depo steroids and Anti-VEGF in the eye
- Tend to only have short term benefits and require regular injections
- Possible teratogenic effect makes these therapies unsuitable for younger population





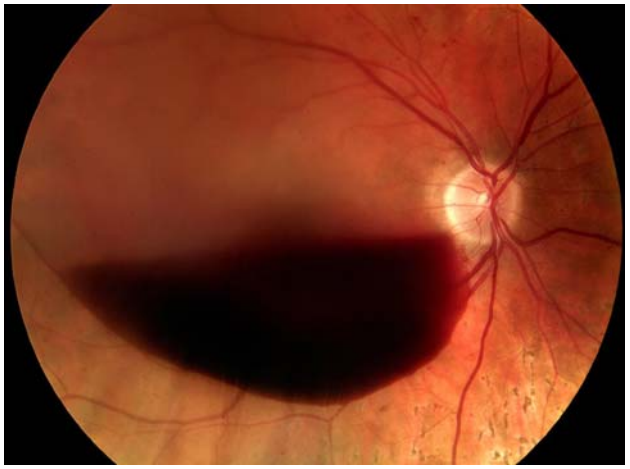
Warning signs

! Complaining of progressive loss of vision
! Extended periods between eye examinations
! Poor HbA1C and BP control

- It is still not uncommon for diabetics with severe proliferative retinopathy to present requesting their glasses be updated - unaware of the blinding disease process taking place!
- Ready-made reading glasses do not replace a proper eye examination

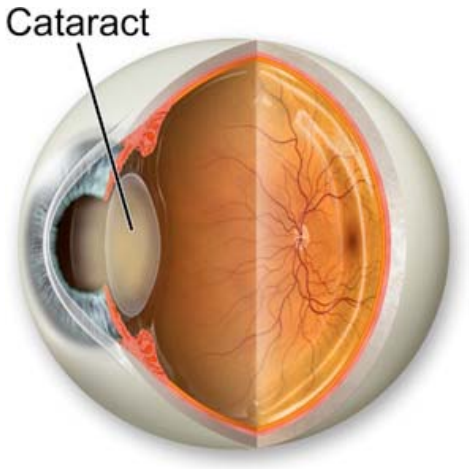
Associated Pathology

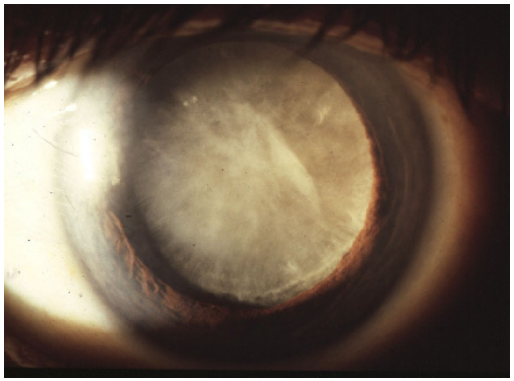
- Both diabetes and hypertension are known risk factors for retinal vein occlusion
- Vitreous and retinal haemorrhages can block patient's vision but will clear over time
- Glaucoma
- Retinal detachment



Associated Pathology

- Cataract development is more common in people with diabetes that in the general population
- Diabetes may significantly worsen the visual outcome after cataract surgery and the surgery may exacerbate pre existing retinopathy





Common Patient Questions

- *My diabetes is very mild, only needing diet control. Do I still need my eyes checked?*

  Yes. The risk is only slightly reduced in people with diet control alone. Your diabetes may also have been present for longer than you realise, which could increase your chances of developing retinopathy

Common Patient Questions

- *Can I still develop retinopathy if my diabetic control is very good?*

  Yes, but good blood sugar levels will reduce your risk considerably. Blood pressure and cholesterol also contribute

- *Why does my vision fluctuates a lot?*

  These changes could be due to retinopathy or the result from changes to the blood sugar content of the lens in the eye. Lens changes may not cause permanent damage but is a sign of unstable eye health

Common Patient Questions

- *Is there any point putting in effort into diabetic control if I already have retinopathy?*

  Yes. There is strong evidence that progression can be slowed by 50%, particularly in mild and moderate retinopathy. Good control may also slow progression of other diabetic effects such as kidney damage

Summary

- Everyone with diabetes is at risk
- The longer you have diabetes, the greater the risk of developing retinopathy
- Good HbAIC control will help prevent retinopathy
- Vision lost due to retinopathy cannot be regained, treatment aims to stop the progress of the disease
- Regular eye checks detect early retinopathy
- In addition to regular eye checks, patients should see their eye care provider immediately if their vision worsens

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- for more information please contact:

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www.visioninitiative.org.au
www.vision2020australia.org.au

Vision 2020 Australia would like to acknowledge the Victorian Department of Human Services for funding the Vision Initiative.

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End of Presentation

Questions?

Thank you

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