

'Spots' the sign: Retinal detachment and vision loss prevention

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Background

Retinal detachment (RD) is a vision-threatening emergency requiring timely recognition and referral. Rhegmatogenous RD is the most common type, arising from a retinal tear that allows subretinal fluid to accumulate and subsequent RD. Posterior vitreous detachment (PVD) is common and usually benign, but can induce retinal tears. Hallmark symptoms (flashes, floaters, field defects and failing vision – referred to as the '4 Fs') should alert clinicians to possible RD.

Objective

To highlight the time-critical nature of RD and provide practical guidance for its recognition and management in general practice.

Discussion

Patients presenting with the '4 Fs', particularly high-risk groups, require urgent ophthalmic assessment. General practitioner (GP) evaluation for referral should include visual acuity, confrontation fields and, where feasible, fundoscopy.

RETINAL DETACHMENT (RD) affects approximately 1 in 10,000 Australians annually.¹ It causes painless vision loss due to physical separation of the neurosensory retina from the underlying retinal pigment epithelium, requiring surgical repair. While many patients present to an optometrist or emergency department, a proportion will present initially to general practice or urgent care settings, highlighting the importance of early recognition in primary care.

Rhegmatogenous retinal detachment (RRD) is the most common form of RD that occurs due to an underlying tear or break in the retina.² To use an analogy, it is like wallpaper at the back of the eye – when there is a hole or break in the wallpaper, fluid is allowed to seep through the hole, under the wallpaper and gradually lift the wallpaper away (Figure 1). Two other forms of RD exist: tractional retinal detachment (TRD) in patients with proliferative diabetic retinopathy as a microvascular complication of poorly controlled diabetes; and exudative detachment, which is often associated with underlying systemic or ocular inflammatory and/or neoplastic disease.^{1,2} We will largely be discussing RRD in this article.

In contrast, posterior vitreous detachment (PVD) (Figure 1; B and C) is a common, age-related phenomenon where the vitreous gel that is attached to the retina at the start of

life separates from the retina with age. Typical onset occurs between ages 40 and 60 years; however, risk factors like myopia, trauma and recent ocular surgery can cause earlier onset.³ Approximately 75% of Australians develop a PVD before the age of 65 years,⁴ mirroring epidemiological trends internationally.⁵ If PVD occurs in one eye, the fellow eye often follows in the same year or 1–2 years after. Most cases are benign and self-limiting, however patients with new symptoms warrant ophthalmic referral to exclude retinal pathology, particularly with high-risk features and/or in high-risk groups (Table 1). In particular, PVD with vitreous haemorrhage or 'haemorrhagic PVD' raises the probability of an underlying retinal tear by up to 70% compared with approximately 10–15% in uncomplicated PVD.⁶

Importantly, while PVD itself is a common and usually benign process, vitreoretinal traction during PVD due to the vitreous separation can lead to a retinal tear, allowing subretinal fluid to accumulate and cause RD. It is when the retina separates and detaches that vision loss occurs.

Clinical assessment

The '4Fs' of RD (flashes, floaters, field defects and failing vision) (Figure 2) are hallmark symptoms of RD and should be regarded as



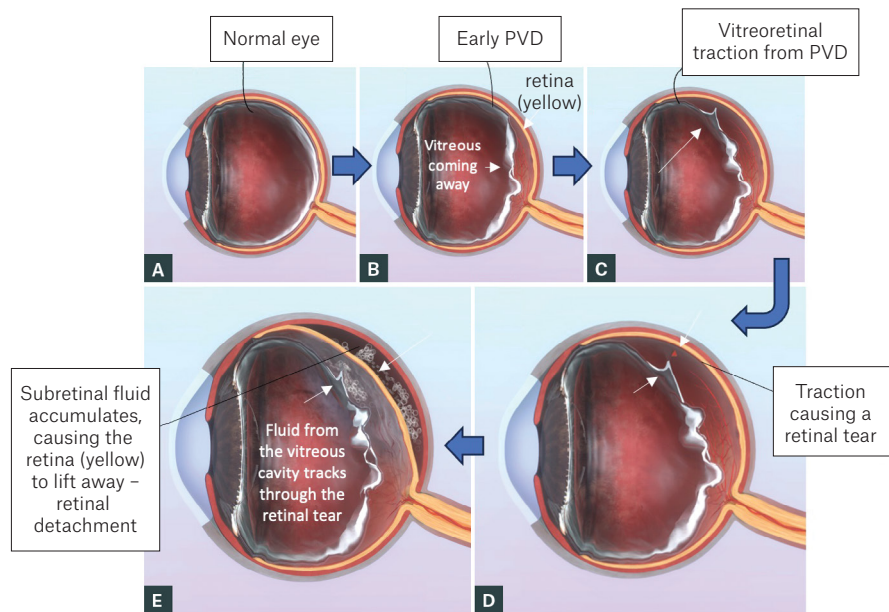


Figure 1. Sequence of events showing progression of retinal detachment.²¹ (A) Normal eye. (B) Early posterior vitreous detachment (PVD). (C) Early PVD with vitreoretinal traction. (D) Retinal tear. (E) Retinal detachment.

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Table 1. High risk groups for retinal detachment

High risk group	Details/description	Relative risk
Age	Older individuals (especially over 50 years); risk increases with age	Age 50–70 years is the highest risk age group ¹³
Myopia	Near-sightedness (long eyeball)	Risk increases with increasing myopia (eg -1D to -3D 4-fold risk, >-3D 10-fold risk ¹⁴ -5D up to 20 times baseline risk ¹⁵)
Previous retinal detachment	History of detachment in one eye raises risk in the other	~10 times the risk for fellow eye ¹⁶
Family history	First-degree relatives with retinal detachment increase individual risk	~2–3 times higher risk ¹⁷
Recent ocular trauma	Physical injury to the eye increases risk of retinal tears or detachment	0.8% after blunt trauma requiring RD repair, ¹⁸ ~29% after open globe injury ¹⁹
Recent ocular surgery	Cataract surgery or other intraocular surgery (especially complicated surgeries) increases detachment risk	~0.2–0.5% risk after cataract surgery, ^{20,21} up to 10% in complex cases ²²
Diabetic retinopathy	Diabetes-related scar tissue can lead to TRD	~5% of patients with proliferative diabetic retinopathy develop TRD ²³
Uveitis	Ocular inflammation can lead to serous/exudative detachment	~1–3% risk, ^{24,25} and with macular involvement up to 15% risk ²⁶

-1D, -1 Dioptres; RD, retinal detachment; TRD, tractional retinal detachment.

critical warning signs of possible detachment. While none are pathognomonic in isolation, their presence, particularly in combination or in higher-risk individuals (Table 1) warrants further ophthalmic evaluation.

Flashes can be perceived as brief, sometimes repetitive arcs of light, often described by patients like lightning and often occurring in the peripheral field. They result from mechanical stimulation of the neurosensory retina, typically due to vitreoretinal traction.

Floater are perceived as mobile opacities within the visual field. They are often described as black spots, lines, flies or cobwebs that drift with eye movement and lag slightly behind the point of fixation. They are caused by vitreous gel opacities casting shadows on the retina and are a common symptom in PVD and vitreous haemorrhage. While it is normal for some individuals to have stable, intermittent floaters, a sudden increase in floaters and associated flashing might indicate acute PVD, which has the potential to cause retinal tears and detachment.

A field defect is a curtain, veil or shadow in a patient’s vision that is a hallmark sign of RD. For example, a patient with a superior RD can describe an inferior ‘shadow’ or ‘curtain’ coming across their vision.

Failing vision is a red flag in any presentation; any acute loss of vision should prompt urgent ophthalmic referral.

Figure 3 is a simulation through an eye of a patient experiencing symptoms of RD,

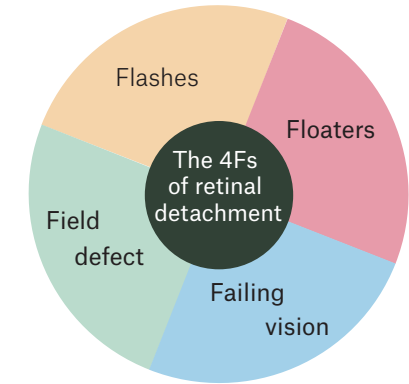


Figure 2. Hallmark symptoms of retinal detachment: The ‘4Fs’ – (1) Flashes, (2) Floaters, (3) Field defect and (4) Failing vision.

included with permission from One Right Eye (onerighteye.com).⁷ One Right Eye is a free online tool built for patient education, with first-person views to help patients understand their symptoms, disease progression and treatment options.⁷

Management and urgency

A targeted examination followed by prompt referral is necessary for all patients presenting with red flag symptoms. Visual acuity must be assessed for each eye, ideally with correction (glasses or pinhole) to account for refractive error which is common. If pinhole

is not available, consider using a small piece of paper with small holes created by a pen or pencil. This is particularly important for triaging the referral.

Field defects might be detected on confrontation testing. This relates to the area of suspected RD. For example, superior detachments will produce an inferior field defect, superotemporal detachments will produce an inferonasal field defect and so forth (ie mirroring the location of the abnormality due to the visual pathway). Assess whether central vision is affected (refer to macula on versus off detachment under 'Time is retina' section).

If available, fundoscopy might reveal RD that often has a raised, corrugated appearance (Figure 4). Associated features such as vitreous haemorrhage and/or fibrotic membranes (in the case of TRD) might be present. RD whether confirmed or suspected warrants referral to ophthalmology services.

Key information to include in the referral includes visual acuity, the timing of symptom onset, risk factors (Table 1), floaters, flashes and/or field defects and targeted examination findings. Table 2 summarises suggested triage and referral urgency approaches.

In many rural and remote communities, general practitioners (GPs) might be the only clinician initially available. Even without specialist equipment, clinical suspicion based on history, visual acuity testing and recognition of field defects are sufficient to justify urgent escalation. On-call ophthalmology services can assist in transfer of care decisions. Where available, local optometrists can provide dilated retinal assessment and are an important resource in these cases for immediate and accurate triage with dilated eye exams.

Time is retina

The longer the retina is detached, the lower the chance of meaningful recovery, even with technically successful surgery. A key concept is whether the RD is macula-on or macula-off.

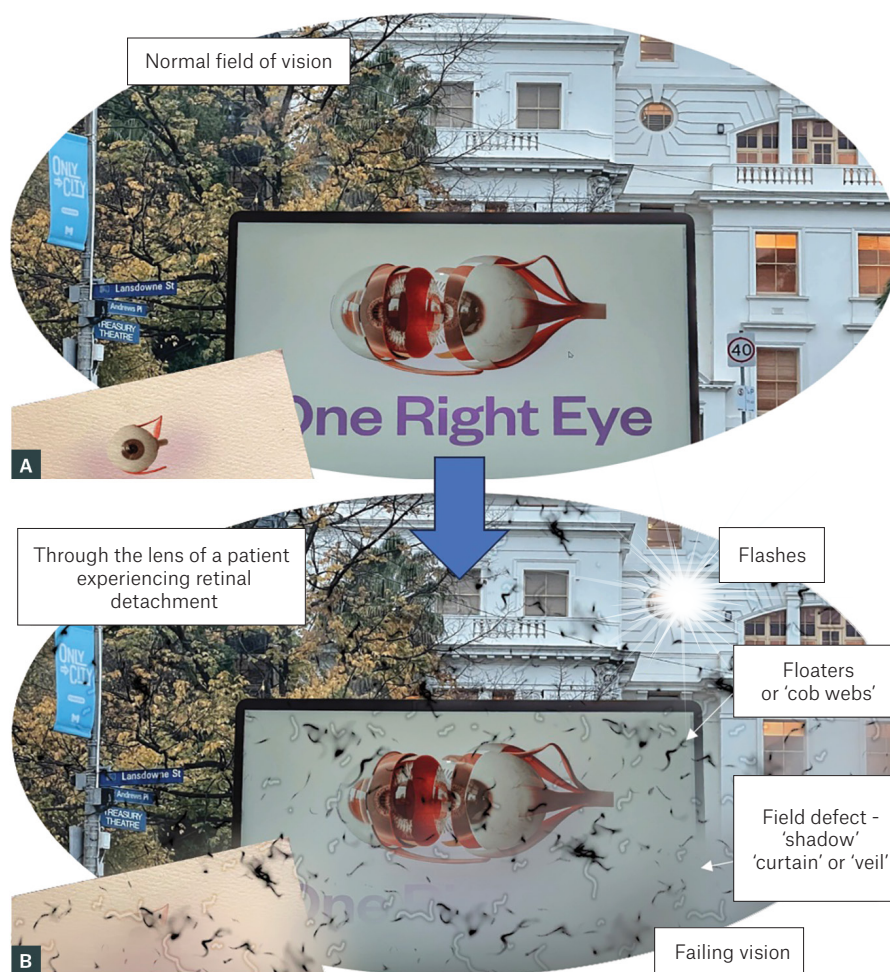


Figure 3. The patient's experience of retinal detachment.²¹ (A) Shows normal field of vision. (B) Shows flashes, floaters, field defect and failing vision (4Fs of retinal detachment).

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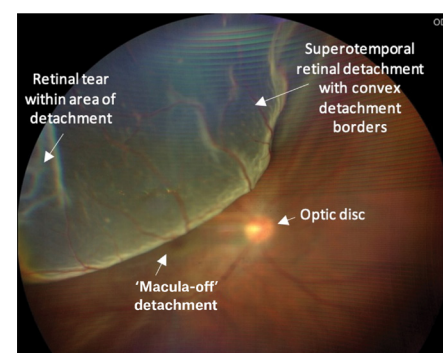


Figure 4. Colour fundus photograph of right eye showing the characteristic raised, corrugated appearance of a retinal detachment with a retinal tear within.

Adapted from materials produced by The Royal Melbourne Hospital, Medical Photography Studio, Department of Ophthalmology. The Royal Melbourne Hospital, 2025, with permission from The Royal Melbourne Hospital and the patient.

Table 2. Triage and referral timelines for flashes, floaters and suspected retinal detachment

Time frame	
Same-day assessment	Flashes and floaters accompanied by a field defect with a sudden deterioration of vision is highly suggestive of retinal detachment These patients should be referred immediately for same-day ophthalmic assessment – either via the on-call ophthalmology team, the nearest hospital emergency department with ophthalmology cover, or by direct phone discussion with local ophthalmology services
~24–48 hours	All patients presenting with new sudden onset flashes and floaters but normal vision require prompt dilated fundus exam to exclude retinal pathology This assessment can be conducted by an optometrist or ophthalmologist
~1–2 weeks	Chronic or long-standing floaters without vision loss and no flashes can be referred for semi-urgent review, as the risk of acute pathology is lower but still warrants evaluation

The macula, responsible for central, detailed and colour vision, contains the highest density of cone photoreceptors and is crucial for tasks such as reading, driving and recognising faces. In macula-on RD, central vision is still intact and outcomes are excellent when surgery is performed within 24 hours, maintaining vision in up to 85% of cases.⁸ Final best-corrected visual acuity (BCVA) can be excellent when the macula is still attached at the time of repair, having the potential to reach around logarithm of the minimum angle of resolution (logMAR) 0.04 ± 0.07 (23) (between 6/6 and 6/7.5 Snellen acuity). In macula-off RD, central vision has already deteriorated and prognosis worsens with time; while up to 70% of patients can achieve BCVA of 6/18 or better, poorer visual outcomes can occur, especially beyond 8 days of detachment.^{9,10}

Retinal tears (Figure 1; D) prior to their progression to RD can be treated by prophylactic barrier laser by ophthalmologists. This has been shown to prevent subsequent detachment in over 95% of cases.¹¹ Contemporary retrospective data demonstrate low RRD rates 6 months post laser retinopexy – around 3.3% overall.¹² The procedure is performed in clinic room settings under local anaesthesia and is generally well-tolerated by patients.

General practice considerations after retinal detachment repair

Patients commonly have questions about daily activities after RD surgery.

- **Driving:** Driving should be avoided until visual recovery is confirmed (~3 months as a guide) and legal visual standards are met (refer to article by Moshegov et al also in this issue titled ‘Assessing fitness to drive’).
- **Flying:** Air travel is prohibited while intraocular gas remains (used in many cases of RD repair). Gas expands at altitude, risking intraocular pressure (IOP) spikes, pain, secondary glaucoma and vision loss. Clearance should come from the patient’s ophthalmologist.

Conclusion

Ophthalmic presentations, particularly those involving the retina, can provoke significant anxiety and distress in patients, and also pose long term risk to vision if not addressed in a timely matter. GPs are well positioned to recognise the early warning signs of RD, educate patients to monitor red flag symptoms, and facilitate timely referral to ophthalmic and optometry services. In doing so, GPs play a crucial part in preserving vision, minimising long-term visual morbidity, and safeguarding quality of life in these patients.

Key points

- Recognise the hallmark symptoms of RD – the ‘4 Fs’: flashes, floaters, field defect and failing vision.
- Identify individuals at high-risk of RD including those with high myopia (marked short-sightedness), those with prior or family history of detachment, recent ocular

trauma or surgery and those with certain conditions (such as poorly controlled diabetes in cases of proliferate diabetic retinopathy).

- Act promptly when you are presented with possible RD – this is a time-sensitive condition and all patients presenting with flashes and/or floaters require a dilated fundus examination to exclude retinal tears or detachment. Presence of a field defect is almost pathognomonic for RD. Immediate, same day referral can prevent vision loss.

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References

References are available online only.

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References

- Kahawita S, Simon S, Gilhotra J. Flashes and floaters – a practical approach to assessment and management. *Aust Fam Physician* 2014;43(4):201–03.
- Xiong J, Tran T, Waldstein SM, Fung AT. A review of rhegmatogenous retinal detachment: Past, present and future. *Wien Med Wochenschr* 2025;175(7–8):186–202. doi: 10.1007/s10354-025-01085-9.
- Ramovecchi P, Salati C, Zeppieri M. Spontaneous posterior vitreous detachment: A glance at the current literature. *World J Exp Med* 2021;11(3):30–36. doi: 10.5493/wjem.v11.i3.30.
- Macular Disease Foundation Australia. Posterior vitreous detachment (PVD) and floaters. Macular Disease Foundation Australia, 2015. Available at www.mdfoundation.com.au/about-macular-disease/other-macular-conditions/pvd-and-floaters [Accessed 20 July 2025].
- Hikichi T, Hirokawa H, Kado M, et al. Comparison of the prevalence of posterior vitreous detachment in whites and Japanese. *Ophthalmic Surg* 1995;26(1):39–43. doi: 10.3928/1542-8877-19950101-09.
- Bond-Taylor M, Jakobsson G, Zetterberg M. Posterior vitreous detachment – prevalence of and risk factors for retinal tears. *Clin Ophthalmol* 2017;11:1689–95. doi: 10.2147/OPHT.S143898.
- One Right Eye. One Right Eye, 2024. Available at www.onerighteye.com [Accessed 8 June 2025].
- Gopal A, Starr M, Obeid A, et al. Predictors of vision loss after surgery for maculasparing rhegmatogenous retinal detachment. *Curr Eye Res* 2022;47(8):1209–17. doi: 10.1080/02713683.2022.2081980.
- Lee CS, Shaver K, Yun SH, Kim D, Wen S, Ghorayeb G. Comparison of the visual outcome between macula-on and macula-off rhegmatogenous retinal detachment based on the duration of macular detachment. *BMJ Open Ophthalmol* 2021;6(1):e000615. doi: 10.1136/bmjophth-2020-000615.
- Hazelwood JE, Mitry D, Singh J, Bennett HGB, Khan AA, Goudie CR. The Scottish Retinal Detachment Study: 10-year outcomes after retinal detachment repair. *Eye (Lond)* 2025;39(7):1318–21. doi: 10.1038/s41433-025-03613-8.
- Wilkinson CP. Evidence-based analysis of prophylactic treatment of asymptomatic retinal breaks and lattice degeneration. *Ophthalmology* 2000;107(1):12–15; discussion 15–18. doi: 10.1016/s0161-6420(99)00049-4.
- Moussa G, Samia-Aly E, Ch'ng S, et al. Vitreoretinal specialists compared with residents on outcomes of primary laser retinopexy in preventing retinal detachment in 958 eyes. *BMJ Open Ophthalmol* 2022;7(1):e000859. doi: 10.1136/bmjophth-2021-000859.
- Mitry D, Charteris DG, Fleck BW, Campbell H, Singh J. The epidemiology of rhegmatogenous retinal detachment: Geographical variation and clinical associations. *Br J Ophthalmol* 2010;94(6):678–84. doi: 10.1136/bjo.2009.157727.
- Mitry D, Charteris DG, Fleck BW, Campbell H, Singh J; The Eye Disease Case-Control Study Group. Risk factors for idiopathic rhegmatogenous retinal detachment. *Am J Epidemiol* 1993;137(7):749–57. doi: 10.1093/oxfordjournals.aje.a116735.
- Ludwig CA, Moshfeghi DM. Prevalence and management of retinal detachment in high myopia. *Retin Physician* 2023;20:20–23.
- Govers BM, van Huet RAC, Roosing S, et al. The genetics and disease mechanisms of rhegmatogenous retinal detachment. *Prog Retin Eye Res* 2023;97:101158. doi: 10.1016/j.preteyeres.2022.101158.
- Moledina M, Charteris DG, Chandra A. The genetic architecture of non-syndromic rhegmatogenous retinal detachment. *Genes (Basel)* 2022;13(9):1675. doi: 10.3390/genes13091675.
- Batchelor A, Lacy M, Hunt M, et al; IRIS Registry Analytic Center Consortium. Predictors of longterm ophthalmic complications after closed globe injuries using the Intelligent Research in Sight (IRIS®) Registry. *Ophthalmol Sci* 2022;3(1):100237. doi: 10.1016/j.xops.2022.100237.
- Strykowski TP, Andreoli CM, Elliott D. Retinal detachment after open globe injury. *Ophthalmology* 2014;121(1):327–33. doi: 10.1016/j.ophtha.2013.06.045.
- Kassem R, Greenwald Y, Achiron A, et al. Peak occurrence of retinal detachment following cataract surgery: A systematic review and pooled analysis with internal validation. *J Ophthalmol* 2018;2018:9206418. doi: 10.1155/2018/9206418.
- Morano MJ, Khan MA, Zhang Q, et al; IRIS® Registry Analytic Center Consortium. Incidence and risk factors for retinal detachment and retinal tear after cataract surgery: IRIS® Registry (Intelligent Research in Sight) analysis. *Ophthalmol Sci* 2023;3(2):100314. doi: 10.1016/j.xops.2023.100314.
- Petousis V, Sallam AA, Haynes RJ, et al. Risk factors for retinal detachment following cataract surgery: The impact of posterior capsular rupture. *Br J Ophthalmol* 2016;100(11):1461–65. doi: 10.1136/bjophthalmol-2015-307729.
- McCullough P, Mohite A, Virgili G, Lois N. Outcomes and complications of pars plana vitrectomy for tractional retinal detachment in people with diabetes: A systematic review and metaanalysis. *JAMA Ophthalmol* 2023;141(2):186–95. doi: 10.1001/jamaophthalmol.2022.5817.
- Shah DN, Al-Moujahed A, Newcomb CW, et al; Systemic Immunosuppressive Therapy for Eye Diseases Research Group. Exudative retinal detachment in ocular inflammatory diseases: Risk and predictive factors. *Am J Ophthalmol* 2020;218:279–87. doi: 10.1016/j.ajo.2020.06.019.
- Kinast RM, Solomon SD, Cubillan LD, Hovakimyan A, Acharya N, Cunningham ET Jr. Prevalence and causes of clinically detectable uveitic serous retinal detachment. *Eur J Ophthalmol* 2021;31(6):3093–98. doi: 10.1177/1120672121991391.
- Simmons-Rear A, Yeh S, Chan-Kai BT, et al. Characterization of serous retinal detachments in uveitis patients with optical coherence tomography. *J Ophthalmic Inflamm Infect* 2012;2(4):191–97. doi: 10.1007/s12348-012-0084-8.