



ATLAS LITERATURE REVIEW

Issue 2 • Nov 2021



Welcome to the second issue of Centre for Eye Health's **ATLAS Literature Review**. Each quarter we'll be bringing you reviews from our pick of the latest literature as part of your ATLAS subscription.

This quarter has seen the publication of some exciting research that will impact the way many optometrists practice. Elisa Wang and Sharon Ho have meticulously reviewed the latest literature, identifying those with greatest clinical impact for inclusion in this update. We trust you will find this a convenient and time-efficient way to stay up to date, and we have included full references in case you want to explore any of the papers in more depth.

Also new this quarter is an additional search function for the ATLAS. Now you can narrow down your differentials with the help of our retinal image pictorial search function. We have also added more interesting cases from the CFEH clinic, and will be releasing a brand new glaucoma chapter in the ATLAS next week. It has certainly been a busy few months!

Finally, we would like to take this opportunity to draw your attention to our recently launched podcast series. The podcasts provide a 5 minute discussion of newly published papers, presented by our research team. They are completely free and are a great way to extend your understanding of emerging research in the area of ocular disease. To listen, [click here!](#)

In the meantime, we hope you find this literature review as interesting as we do!

- Michael Kalloniatis & Gordon Doig, Editors

In this issue:

Prepared by Sharon Ho and Elisa Wang

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Our work would not be possible without the generosity of Guide Dogs NSW/ACT and their supporters.



Your purchase of ATLAS and our other educational materials helps to support Centre for Eye Health, and Guide Dogs NSW/ACT, and for that we are incredibly grateful.

Guide Dogs.

OCTA provides useful insights about glaucoma patients with disc haemorrhages

Prepared by Elisa Wang and Sharon Ho

Summary: Disc haemorrhages are a risk factor for the development and progression for glaucoma. This study evaluated the longitudinal changes in rates of retinal nerve fibre layer (RNFL) thinning and vessel density loss, in glaucoma patients with and without disc haemorrhages. The study evaluated optical coherence tomography angiography (OCTA) scans over a period of time.

Key findings: Disc haemorrhage was associated with a higher rate of RNFL thinning and higher rates of capillary density loss. Eyes with disc haemorrhage lose vessel density faster compared to eyes without disc haemorrhage.

Clinical applications: Clinicians could use OCTA to monitor disc haemorrhages in patients diagnosed with (or susceptible to) glaucoma. Furthermore, since disc haemorrhages are associated with faster RNFL thinning, clinicians may find it useful to monitor patients with disc haemorrhages more frequently to expedite treatment upon the detection of glaucoma progression.

Reference: Rates of Circumpapillary Retinal Nerve Fiber Layer Thinning and Capillary Density Loss in Glaucomatous Eyes with Disc Hemorrhage.

Takashi N, Sasan M, David RCC, et al.

American Journal of Ophthalmology. 2021 Sep 26:S0002-9394(21)00470-0. Online ahead of print.

[Abstract](#)

Be wary of myopia when overminussing children to control their exotropia

Prepared by Sharon Ho and Elisa Wang

Summary: This study evaluated the effectiveness of overminus spectacle therapy for treatment of intermittent exotropia in children 3 to 10 years of age. Participants were assigned to overminus spectacle therapy (-2.50D for 12 months, then -1.25D for 3 months, followed by non-overminus spectacles for 3 months) or to non-overminus spectacle use.

Key findings: Distance exotropia control at 12 months was better in participants treated with overminus spectacles than with non-overminus spectacles. However, this was associated with increased myopic shift where 17% in the overminus group versus 1% in the non-overminus group had a refractive shift higher than 1.00D. The beneficial effect of overminus lens therapy was not maintained after treatment was tapered off for 3 months and children were examined 3 months later.

Clinical applications: Due to the increased risk of myopic shift and lack of persistence of the benefits of overminus lens wear after discontinuation, the utility of this protocol as a primary therapy for intermittent exotropia may be limited. Clinicians should weigh the potential benefit of better eye alignment against the increased risk of myopic shift, particularly in children who already have myopia.

Reference: Overminus Lens Therapy for Children 3 to 10 Years of Age With Intermittent Exotropia: A Randomized Clinical Trial.

Chen AM, Erzurum SA, Chandler DL, et al.

JAMA Ophthalmology. 2021;139(4):464-476.

[Abstract](#)

Advise your AMD patients to stop smoking and reduce their alcohol intake

Prepared by Sharon Ho and Elisa Wang

Summary: This study used genetic evidence to identify causal, modifiable risk factors for advanced age-related macular degeneration (AMD) and its subtypes; geographic atrophy and neovascular AMD (nAMD). The exposures were smoking initiation, smoking cessation, lifetime smoking, age at smoking initiation, alcoholic drinks per week, body mass index, systolic and diastolic blood pressure, type 2 diabetes, glycated haemoglobin, fasting glucose, and fasting insulin.

Key findings: Increased alcohol intake was associated with a higher risk of geographic atrophy. Smoking initiation and lifetime smoking behaviour were associated with increased risk of advanced AMD while smoking cessation resulted in a lower risk of advanced AMD. These associations were stronger for nAMD than for geographic atrophy. There was insufficient evidence to suggest that genetically predicted blood pressure, body mass index, and glycaemic traits were associated with advanced AMD.

Clinical applications: These findings reinforce existing public health messages regarding the increased risk of developing advanced AMD associated with smoking. Clinicians should also recommend reducing alcohol intake to their AMD patients, particularly since there are currently no known treatments for geographic atrophy.

Reference: Association of Smoking, Alcohol Consumption, Blood Pressure, Body Mass Index, and Glycemic Risk Factors With Age-Related Macular Degeneration: A Mendelian Randomization Study.

Kuan V, Warwick A, Hingorani A, et al.

JAMA Ophthalmology. Published online November 04, 2021.

[Abstract](#)

OCT is a suitable imaging device to detect neovascular AMD

Prepared by Sharon Ho and Elisa Wang

Summary: This study evaluated the diagnostic accuracy of routinely used monitoring tests for neovascular age-related macular degeneration (nAMD). The aim was to identify which test or combination of tests is best to detect onset of active macular neovascularisation in unaffected fellow eyes of patients with unilateral nAMD. Five index tests were assessed against fundus fluorescein angiography, which is the current gold standard for detecting neovascularisation.

Key findings: The sensitivities of the index tests were: Self-reported vision 4.2%, Amsler 33.7%, Visual acuity 30%, Fundus exam 53.8%, Optical coherence tomography (OCT) 91.7%. The specificities of all the index tests were above 80% except Visual acuity (66.3%). The combination of OCT with any other index test did not significantly improve diagnostic accuracy. The sensitivity of the combination of all index tests except OCT was lower than that achieved with OCT alone.

Clinical applications: OCT has the best diagnostic accuracy to detect new onset nAMD and is suitable for use on its own. All routinely conducted visual function tests performed poorly, questioning the current reliance on these tests in practice. Future studies may additionally evaluate OCT-angiography which, although is becoming rapidly adopted, is not yet widely available and so was excluded from this study.

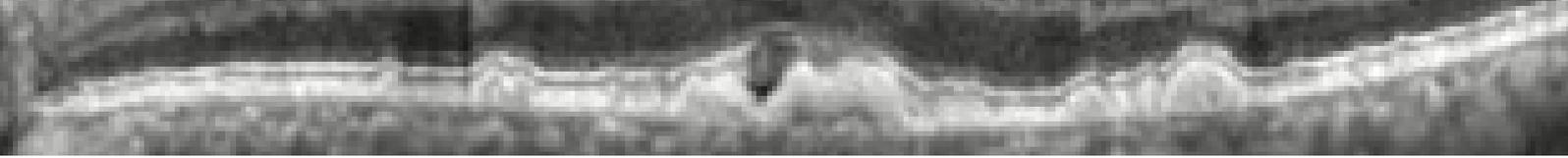
Case 1 illustrates the presentation of neovascularisation in an 84 year old patient

Reference: Diagnostic Accuracy of Monitoring Tests of Fellow Eyes in Patients with Unilateral Neovascular Age-Related Macular Degeneration: Early Detection of Neovascular Age-Related Macular Degeneration Study.

Sivaprasad S, Banister K, Azuro-Blanco A, et al.

Ophthalmology. 2021;28:S0161-6420(21)00557-1.

[Abstract](#)



Centre for Eye Health case study

Case 1: Neovascular membrane in 84 year old female

- A** Self-reported vision: "No changes noticed to eyesight recently."
Amsler: "A few wavy lines around the right-hand side edge of the grid."
Visual acuity: 6/7.5-1
Fundus exam: "Scattered drusen through both maculae (OD>OS)."

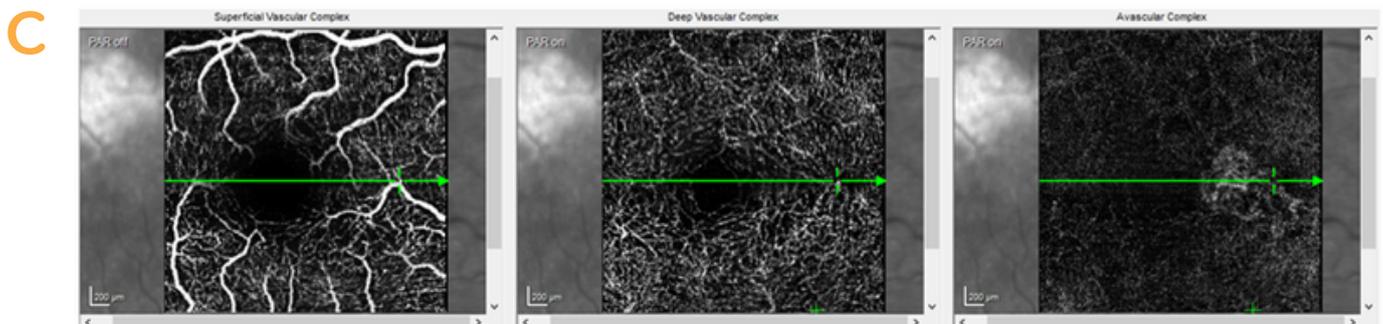
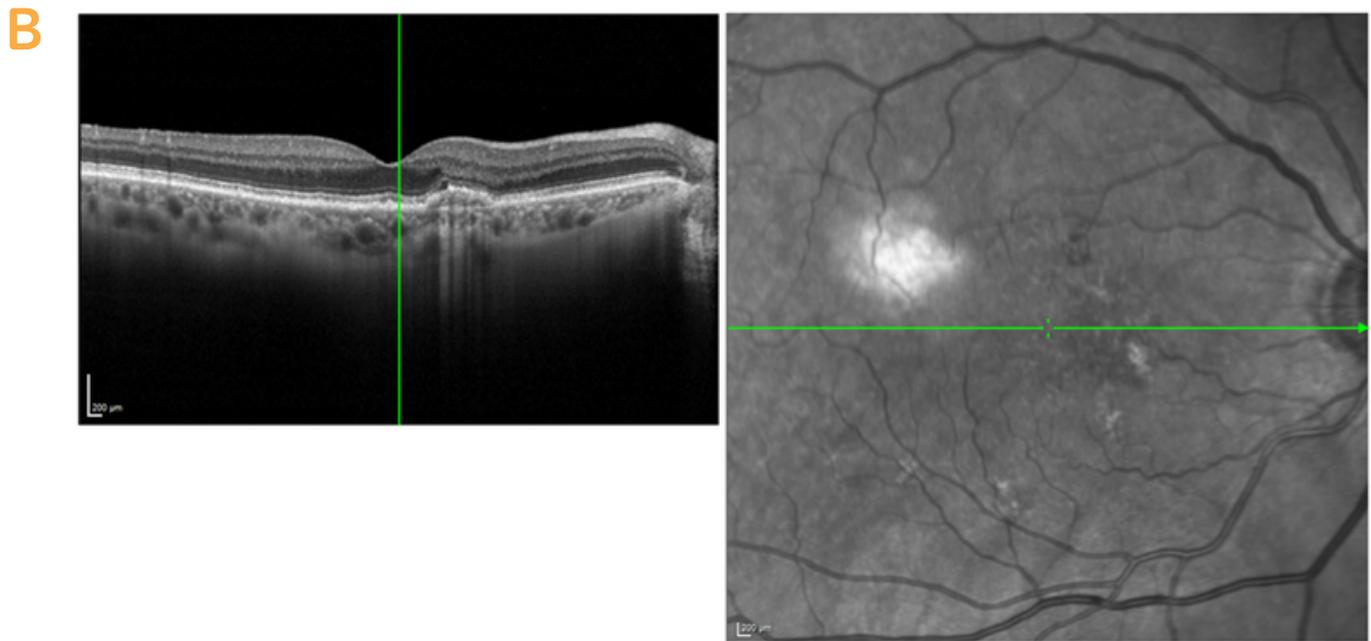


Figure: Test results of the same eye with nAMD.

A) Results of self-reported vision, Amsler grid, visual acuity, and fundus examination (quoted from the clinical records).

B) OCT output. The OCT B-scan (left) shows a likely macular neovascular lesion below the retinal pigment epithelium; Type 1 neovascularisation. The corresponding infrared image (right) shows a mottled appearance of the nasal macula at the location of the suspicious lesion, and a hyperreflective area in the superotemporal macula denoting a choroidal naevus.

C) OCT-angiography slabs. The Superficial Vascular Complex (left) and Deep Vascular Complex (middle) appear normal since neovascularisation is best visualised at the level of the outer retina/choriocapillaris. The Avascular Complex (right) shows an abnormal hyperintense vascular network.

Sight-threatening retina neovascularisation presents in many forms

Prepared by Elisa Wang and Sharon Ho

Summary: There are many eye conditions that look like neovascular age-related macular degeneration (nAMD) but are not quite the same and therefore do not have the same diagnosis. One such eye condition is polypoidal choroidal vasculopathy (PCV). Indocyanine green angiography (ICGA) is the current gold standard for diagnosing PCV. ICGA is an invasive and time-consuming technique; furthermore, it is not widely available.

This study developed nine criteria to help clinicians diagnose PCV (Table 1). The criteria are based on imaging technologies: colour fundus photography and optical coherence tomography (OCT).

Key findings: A noticeable feature of a PCV using colour fundus photography is an orange nodule shown in Figure 1. Other noticeable OCT-based features include sharp-peaked pigment epithelial detachment (PED) and sub-retinal pigment epithelium (RPE) round structure shown in Figure 2.

Clinical applications: The proposed criteria can help clinicians use colour fundus photography and OCT to distinguish PCV from nAMD in a non-invasive way.

Reference: Polypoidal Choroidal Vasculopathy: Consensus Nomenclature and Non-Indocyanine Green Angiograph Diagnostic Criteria from the Asia-Pacific Ocular Imaging Society PCV Workgroup.

Cheung CMG, Lai TYY, Teo K, et al.

Ophthalmology. 2021, 128(3):443-452

Abstract

Table 1: Nine features to diagnose PCV using non-invasive imaging technologies.

Non-invasive imaging technologies	Nine features for PCV Diagnosis
Colour fundus photography	1. Orange nodule 2. Extensive subretinal haemorrhage
OCT	3. Sharp-peaked PED 4. Sub-RPE round structure under the PED 5. Notching of the PED 6. Shallow separation of the RPE from the Bruch's membrane 7. Thick choroid with dilated Haller's layer vessels 8. Subretinal fluid 9. Complex RPE elevation

Figures 1 and 2 are overleaf.



Features in polypoidal choroidal vasculopathy

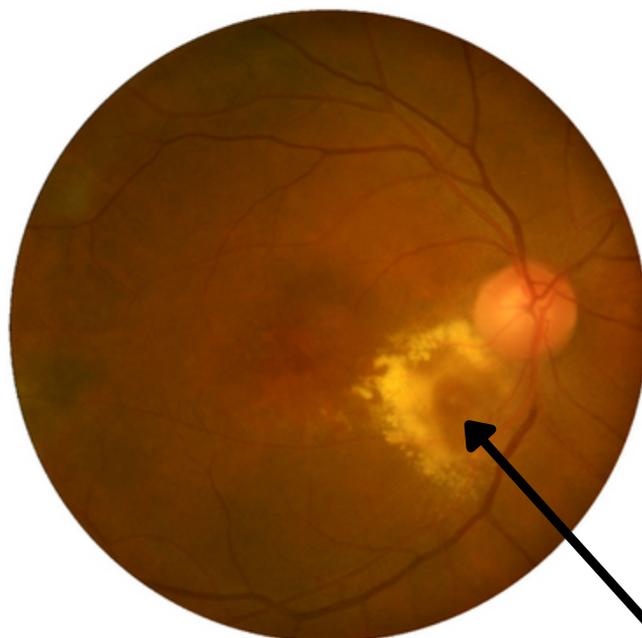


Figure 1: A fundus photo showing an orange sub-retinal round elevation of a PCV (black arrow): The appearance of the orange elevation is typical of PCV as described by the authors Cheung et al., however there is no sub-retinal haemorrhage evident in this case.

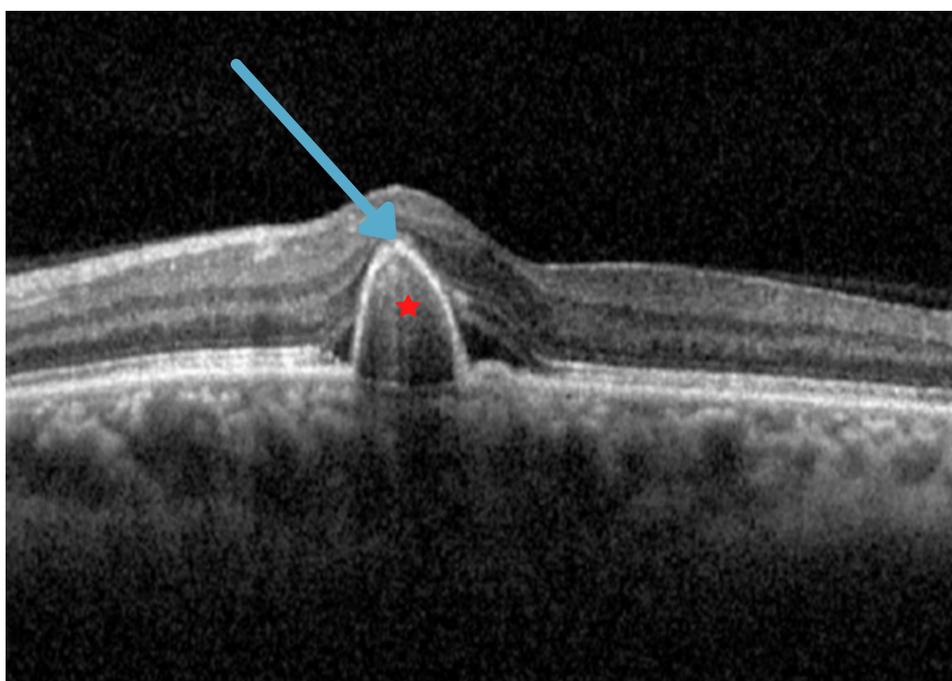


Figure 2: An OCT image of a sharp-peaked PED (the blue arrow points to the apex of an inverted "V" shape) and sub-RPE round structure (red star) occupying the space under the PED. This image captures these and other key OCT characteristics described by Cheung et al., including dilated Haller's layer vessels and the presence of sub-retinal fluid.

Patients with vision loss require a lot more services than optical aids

Prepared by Elisa Wang and Sharon Ho

Summary: This study provides insights about the experience of patients living with non-neovascular age-related macular degeneration (AMD). Participants with varying stages of AMD were individually interviewed about the impact of AMD on their daily activities, emotional wellbeing, and coping strategies.

Key findings: Some patients voiced that they were not concerned about their diagnosis because living with AMD was not affecting their daily life. Other patients recalled the emotional impacts of their AMD diagnosis, including: fear of going blind, fear of losing independence, psychological shock, and discomfort towards the uncertainty of their AMD progression. Notably, "worries over driving were of particular concern". A common strategy among patients is the involvement of family and friends to help cope with vision loss.

Clinical applications: Providing newly diagnosed patients with written materials about AMD is helpful for educating patients and improve the communication between clinicians and patients. Involving family and friends in everyday activities that have become difficult (e.g., reading and driving) could reduce the difficulty of social situations and the feelings of isolation that patients may experience. Peer support groups could also be recommended for patients diagnosed with any stage of AMD; however, clinicians should be cautious of recommending peer support groups for patients with early AMD since some individuals may find these groups distressing.

Reference: 'You've got dry macular degeneration, end of story': a qualitative study into the experience of living with non-neovascular age-related macular degeneration.

Taylor DJ, Jones L, Binns AM et al.
Eye. 2020, 34:461-473

Abstract



Centre for Eye Health

Guide Dogs.



Do you have patients with vision loss?

We run a low vision assessment clinic in Parramatta in collaboration with Guide Dogs NSW/ACT. The papers presented in this review highlight conditions that can cause irreversible vision loss if not identified and managed early. We are committed to providing clinical services to not only to facilitate early detection and management, but also to assist those who already have irreversible vision loss.

At our low vision clinic in Parramatta, our clinicians will conduct a full visual assessment, and use the information gained to recommend the most appropriate low vision aids and services to best help your patients meet their visual needs.

You can refer low vision patients through [this referral form](#).