Docet AMD Writing Sample

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Note: This writing sample contains extracts from the 'script' for elearning production build. It does not have the final elearning graphic design styling that is delivered through the Docet Learning Pool platform. Access to the platform is restricted to registered optometrists in the UK.

What is AMD?

The outlook for a patient with wet age related macular degeneration (AMD) is considerably brighter today than it was a decade ago. There is a high likelihood today that, if caught early and treatment and management plans are put in place, good vision can be preserved in the affected eyes.

This success is down to two factors: (i) the impressive effectiveness of anti-VEGF medicines that can arrest the development of AMD, and (ii) significantly greater awareness amongst the community of optometrists and ophthalmologists that early intervention really pays off in reducing the long-term burden for both patients, families, carers and the health care system.

This long-term success in treating AMD comes through the significantly greater understanding of systemic and molecular disease pathways surrounding AMD, which has in turn led to the development of anti-VEGF treatments.

Today's success in treating wet AMD is supported by data - there has been a substantial reduction in blind registrations related to AMD in recent years.[1]

1. Gale, RP, Mahmood S, Devonport H et al. Action on neovascular age-related macular degeneration (nAMD): recommendations for management and service provision in the UK hospital eye service. Eye. 2019 Mar;33(Suppl 1):1-21. doi: 10.1038/s41433-018-0300-3.

While treatment options for those diagnosed with dry AMD remain limited, advances in early diagnosis, including a significant increase in the use of OCT in high street optometry means that there is a greater opportunity for patients to be better informed of risk factors. This increases scope for patient education and the opportunity to implement lifestyle changes that can positively influence eye health and slow down the progress of dry AMD.

We hope that as you work through this course, you will be able to see this brighter outlook for today's AMD patients. The last decade has seen huge improvements in diagnosis and management of patients with all types of AMD and treatment for wet AMD. This course is a comprehensive update on those improvements and the current research being undertaken.

Talking about AMD: Well-known public figures with AMD

Dame Judi Dench

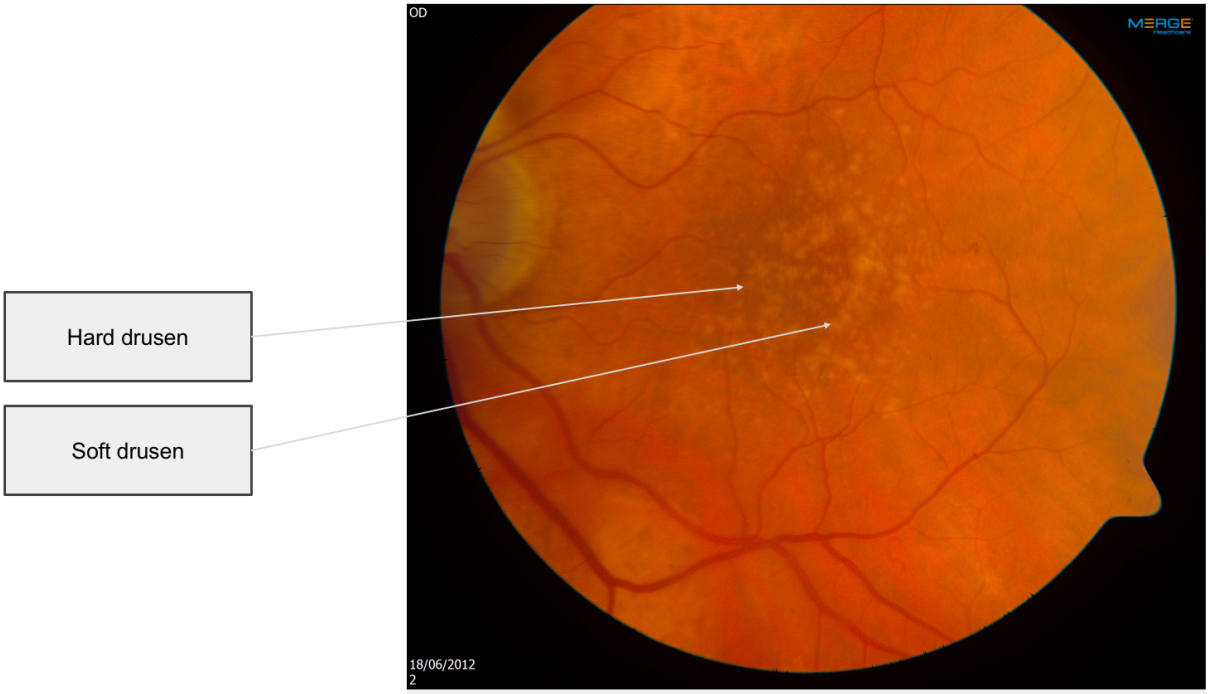
[Caption: Dame Judi Dench]

Actress Judi Dench has spoken candidly about her struggle with failing eyesight, following her AMD diagnosis. The actress, now in her 80s, has openly discussed the steps she is taking to cope with the condition. She receives treatment every six weeks, and while she still works regularly, she now relies on large print scripts and assistants to learn lines. She has spoken of her regret at no longer being able to drive or walk alone.

> "I can't read the paper now, I can't do the crossword, I can't read a book...There's nothing you can do. I can see enough. You adapt to it.
>
> "A couple of years ago I stopped driving, which was one of the most traumatic moments of my life. It was absolutely appalling. But I just know I'll kill somebody if I get behind the wheel of a car now.
>
> "On my scripts, my font is point size 22, so you can imagine if we're doing a sonnet of 14 lines, all the others will have one page and I'll have 14! It's ridiculous, it's a farce, but I'm not going to give in."

Recognising key features of AMD

Key features of early AMD and late AMD (dry) such as small, medium or large drusen, hard and soft drusen, retinal pigment epithelium (RPE) pigment disruption and geographic atrophy can all be seen in a fundus image, using a slit lamp biomicroscope with Volk lens, or indirect ophthalmoscopy.

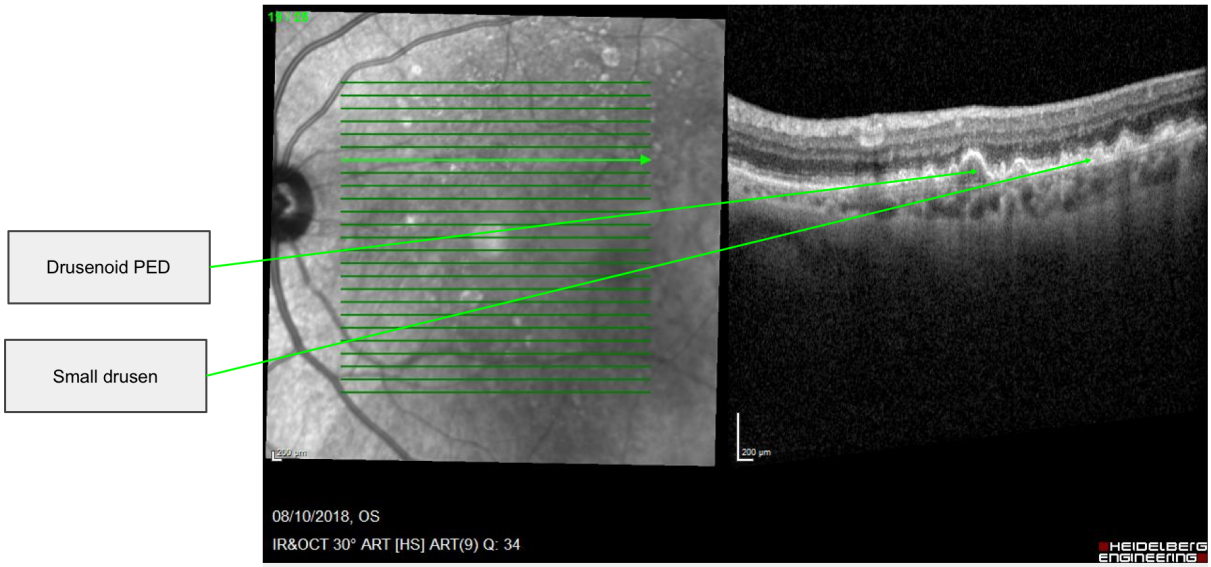


Hard and soft drusen are apparent across the macula region. Hard drusen appear as small, round deposits with clearly defined borders whereas soft drusen vary in size and shape. They are usually larger with less defined borders and cluster together.

[image: Unit_1_10 HardandSoftdrusen.JPG]
[Credit: Bradford Teaching Hospitals NHS Foundation Trust]
[image caption: Hard and soft drusen are apparent across the macula region. Hard drusen appear as small, round deposits with clearly defined borders whereas soft drusen vary in size and shape. They are usually larger with less defined borders and cluster together.]
[ART: adjust contrast, clean background, add arrows and labels indicating the hard and soft drusen]

On an OCT scan, drusen will appear as focal, hyperreflective elevations of the RPE, disrupting the RPE which is usually straight and smooth.

Where late AMD (dry) is present you will see larger, soft drusen appear as mounds below the RPE which is thinning. Visibility of Bruch's membrane and the choroid may be increased as the atrophy of the outer retina develops.

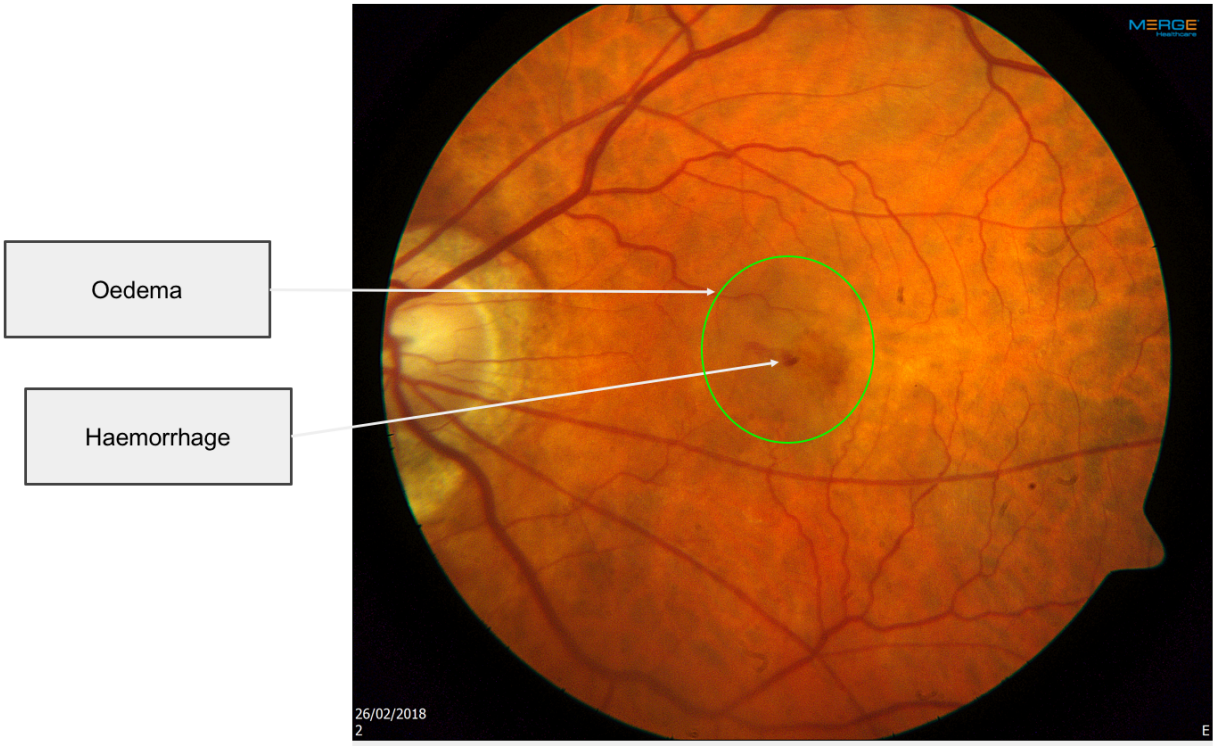


On OCT, small, hard drusen appear as thickenings of the RPE/Bruch's membrane complex. As drusen enlarge, they cause the the RPE to become more elevated, creating a drusenoid pigment epithelial detachment (drusenoid PED). This is seen on OCT as an arching of the RPE.

[image: Hard drusenOCT.jpg]
[Credit: Bradford NHS Trust]
[image caption: On OCT, small, hard drusen appear as thickenings of the RPE/Bruch's membrane complex. As drusen enlarge, they cause the RPE to become more elevated, creating a drusenoid pigment epithelial detachment (drusenoid PED). This is seen on OCT as an arching of the RPE.]
[Note: Useful note from Charlotte that drusen only get described as hard and soft when looking at the fundus as this is not something you can tell so much from the OCT.]
[ART: adjust contrast, clean background, add arrows and labels indicating the hard and soft drusen]

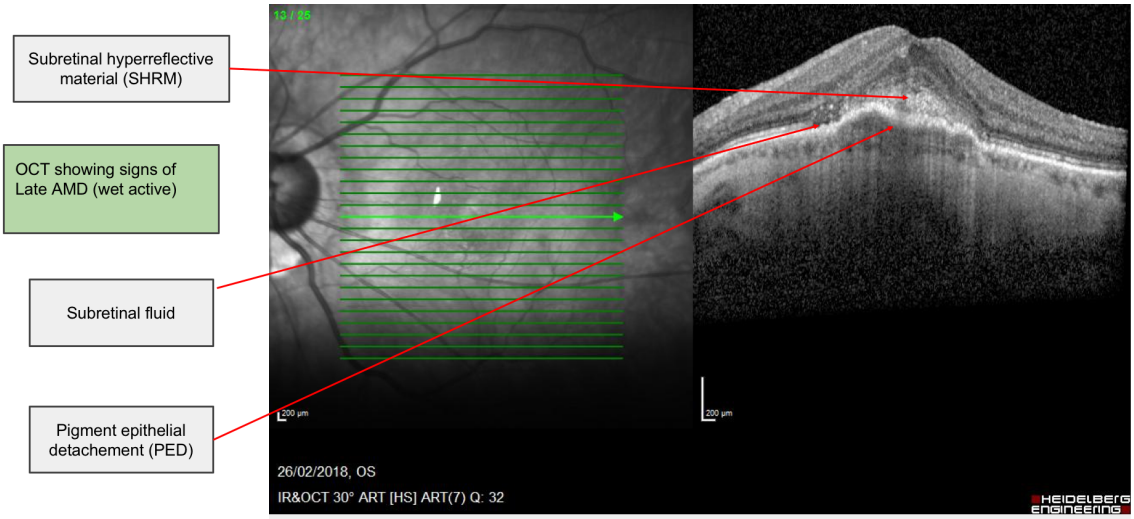
Neovascular AMD is identified by the presence of choroidal neovascularization (CNV), a condition where new blood vessels develop in the choroid. These blood vessels have a tendency to leak blood and other fluid. These may be visible on a fundus examination. On an OCT image the choroidal neovascular network is the hyperreflective area above or below the level of the RPE. As the membrane grows from below the RPE, it pushes up causing irregular RPE elevation. Leakage of these new blood vessels causes development of fluid, which appears as dark spaces. Fluid found above the photoreceptors is classified as intraretinal fluid (IRF). Fluid found below the photoreceptors but above the RPE is classified as subretinal fluid (SRF).[5]

5. Hiscox R. What you should know about OCT assessment, Part 1 - Macular scan. *Optician*, October 31, 2014. https://www.topcon-medical.co.uk/files/Local_TGB/Products/OCT/MacularScan_What_you_should_know_about_OCT_assessmentOPT_CET_Pt1_Web_311014.pdf . Accessed March 23, 2022.



This fundus image shows a small central haemorrhage and a larger surrounding area of oedema, roughly circumscribed by the green arrow. This oedema appears as a slightly grey, defocused area.

[image: Unit_1_12_ClassicCNV_FUNDUS.JPG]
[Credit: Bradford Teaching Hospitals NHS Foundation Trust]
[image caption: This fundus image shows a small central haemorrhage and a larger surrounding area of oedema, roughly circumscribed by the green arrow. This oedema appears as a slightly grey, defocused area.]
[ART: adjust contrast, clean background, add arrows and labels indicating the hard and soft drusen]



The shallow PED with the overlying hyperreflective area known as sub-retinal hyper-reflective material (SHRM) and slight sub-retinal fluid, are indicative of an active sub-foveal choroidal neovascular membrane (CNV).

[image: Unit_1_13_classicCNV_OCT.jpg]
[Credit: Bradford Teaching Hospitals NHS Foundation Trust]
[image caption: The shallow PED with the overlying hyperreflective area known as sub-retinal hyper-reflective material (SHRM) and slight sub-retinal fluid, are indicative of an active sub-foveal choroidal neovascular membrane (CNV).]
[ART: adjust contrast, clean background, add arrows and labels indicating the hard and soft drusen]

"OCT is very useful in the diagnosis of AMD. It gives you much more information in terms of the anatomical changes that have occurred, the presence of fluid is much easier to detect... also the location of the fluid."

[Image: Unit_1_1_Charlotte Hazel.jpg]
[image source: Bradford Filming Screengrab]

As the availability of OCT becomes more commonplace across optometry practice, developing a thorough understanding of how the structural information from a retinal OCT scan relates to what can be seen through slit lamp biomicroscopy (in conjunction with an indirect lens) and images from fundus cameras/digital retinal photography is crucial.

[text alongside video]
Watch Raj Gill talk about how an OCT machine helps him to have better knowledge of the retinal layers and make better clinical decisions.

[**video**: 15RG Raj Gill. How has OCT changed the way you think about the eye? Half screen width.]

[ADAPT Accordion. Title: Show transcript. Styling: Text with white background, minimal, below video clip.]
[note: Transcript will need to be updated to match final scene order in video edit]

Transcript

Has having the OCT machine changed the way you think about the eye?

The OCT allows us to make significantly more accurate clinical decisions. Using OCT has allowed me to become more familiar with all of the retinal

structures. To be able to see exactly where, which layer the leak occurs in, or where the bleed occurs, and then be able to send that to the right place with the right level of urgency, it just means that it's much more efficient for the patient and we feel like we're doing a better job.

Prevalence and consequences of progression

European and global statistics

AMD is currently the leading cause of vision impairment in the developed world, accounting for 8.7% of all blindness worldwide.[12] It is the most common cause of blindness in developed countries, particularly in people older than 60 years.

12. Ghers KM, Anderson, DH, Johnson, LV , Hageman, GS. Age-related macular degeneration—emerging pathogenetic and therapeutic concepts. Ann Med. 2006; 38(7): 450–471. doi: 10.1080/07853890600946724

Worldwide estimates suggest that as of 2020 approximately 196 million people are currently affected by AMD. This figure is projected to increase to 288 million in 2040. The largest rise of cases will occur in Africa.[8]

8. Wong WL, Su X, Cheung CM, Klein R, Cheng CY, Wong TY. Global prevalence of age-related macular degeneration and disease burden projection for 2020 and 2040: a systematic review and meta-analysis. The Lancet. 2014;Feb;2(2):e106-16. doi: 10.1016/S2214-109X(13)70145-1.

Projections show a potential doubling of cases despite a decreasing prevalence, largely due to longer life expectancy. By 2040, the number of individuals in Europe with early AMD will range between 14.9 and 21.5 million, and for late AMD between 3.9 and 4.8 million.[13]

13. Colijn JM, Buitendijk GHS, Prokofyeva E, et al. Prevalence of Age-Related Macular Degeneration in Europe: The Past and the Future. Ophthalmology. 2017 Dec;124(12):1753-1763. doi: 10.1016/j.ophtha.2017.05.035. Epub 2017 Jul 14.

UK statistics

The number of people with AMD in the UK is expected to more than double from 600,000 in 2019 to 1.3 million by 2050.[3]

> 3. Owen CG, Jarrar Z, Wormald R, Cook DG, Fletcher AE, Rudnicka AR. The estimated prevalence and incidence of late stage age related macular degeneration in the UK. Br J Ophthalmol. 2012; 96(5):752-756. doi: 10.1136/bjophthalmol-2011-301109.

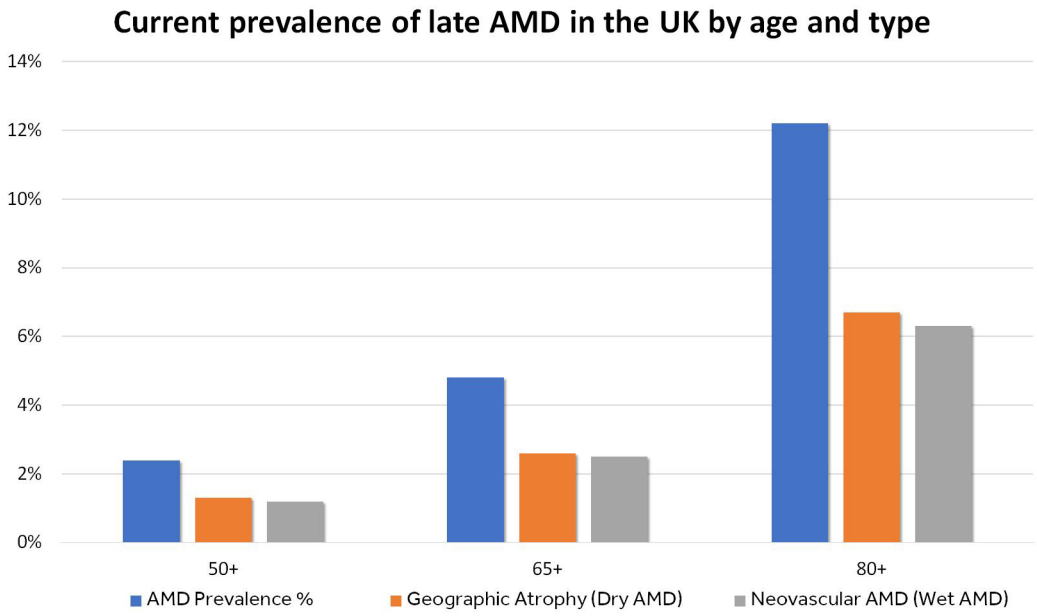
Currently, the prevalence of late AMD of all types in the UK among people aged 50 years or over is 2.4%. This increases to 4.8% in people aged 65 years or over, and 12.2% in people aged 80 years or over. The prevalence of geographic atrophy ranges from 1.3% among people over 50 to 6.7% for people over aged 80. Prevalence of neovascular AMD ranges from 1.2% among people over 50 years and increases to 6.3% for people over 80.[3]

> 3. Owen CG, Jarrar Z, Wormald R, Cook DG, Fletcher AE, Rudnicka AR. The estimated prevalence and incidence of late stage age related macular degeneration in the UK. Br J Ophthalmol. 2012; 96(5):752-756. doi: 10.1136/bjophthalmol-2011-301109.

Estimates indicate that almost 40,000 people develop neovascular AMD in the UK each year; given a total UK population of 60 million, this equates to 663 new cases per million per year. At age 60, prevalence of late AMD is around 1:2000 but by age 90 more than 1:5 are living with the condition.[3,14]

> 3. Owen CG, Jarrar Z, Wormald R, Cook DG, Fletcher AE, Rudnicka AR. The estimated prevalence and incidence of late stage age related macular degeneration in the UK. Br J Ophthalmol. 2012; 96(5):752-756. doi: 10.1136/bjophthalmol-2011-301109.

> 14. The National Institute for Health and Care Excellence (NICE). Age-related macular degeneration NICE guideline [NG82]. Context. https://www.nice.org.uk/guidance/ng82/chapter/Context. Published January 2018. Accessed March 23 2022.



[Caption: Current prevalence of late AMD in the UK by age and type.[3]]

UK projections

Growth of the ageing UK population will increase the number of cases of AMD. In 2010 it was estimated that 4.9 million UK residents over 75 years of age were affected by AMD. By 2035 this is set to increase to 8.9 million. Demand on eyecare services will continue to rise accordingly.[15]

- **Neovascular AMD** cases are predicted to rise by 59% from 2015 to 2035 with the prevalence in the population over 50 rising from 1.85% to 2.36% as the number of elderly rises.
- **Geographic atrophy** cases are predicted to increase by 58% from 2015 to 2035
- A 40% rise in the number of people with **'soft' macular drusen** is predicted from 2015 to 2035 to about 3.8 million people, representing 12.9% of those over the age of 50.[15]

15. The Royal College of Ophthalmologists. The Way Forward. Age-Related Macular Degeneration and Diabetic Retinopathy. Options to Help Meet Demand for the Current and Future Care of Patients with Eye Disease. London: The Royal College of Ophthalmologists; 2015. Available from: https://www.rcophth.ac.uk/wp-content/uploads/2015/10/RCOphth-The-Way-Forward-AMD-300117.pdf. Accessed March 23, 2022.

Case study 1: Jean Hollister

[Image: Jean Hollister 1]
[Image source: Shutterstock 1656926284]

Jean's Story

Jean is a 70 year old woman who has noticed a gradual reduction in near vision over the last few months. She is a non-smoker and her general health is good, although she takes medication for hypertension which she reports is well controlled.

She thinks she needs a stronger reading prescription because it has been over 2 years since her last eye examination. She is a carer for her husband who has dementia. She is a keen gardener and before her husband became ill she regularly went on hikes. She drives and relies on her car to go shopping and to take her husband to medical appointments.

“It’s been more than two years since I’ve come for an eye test and I’m here today because I’ve noticed that my sight is gradually getting worse. I find that reading the paper is getting harder and I struggle to read a lot of the books I borrow from the library because the print is too small. I spend a lot of time looking after my husband who has dementia. I want to be able to see more clearly as reading is a good distraction for me. I rely on my car as I drive him to medical appointments and to go shopping.”

Let’s think about Jean

Her general health is good. She is a non-smoker and only takes medication for hypertension which she reports is well controlled.

She is currently wearing bifocals with the following prescription and visual acuity:

R: -5.00/-1.50 x30 6/12+2 L: -4.50/-1.25 x35 6/9

Binocular: 6/9

Add +2.50DS (R: N8, L: N6)

You carry out a refraction and manage to improve her vision to 6/9 in both eyes and she can achieve N6 binocularly more easily with a +3.00DS reading add.

[knowledge check 1]

Based on the information above, what are the two most likely causes of her reduced vision? [4 way multiple choice]

Cataract [correct]

Macular changes [correct]

Corneal dystrophy

Diabetic maculopathy

Feedback [correct]

That’s right. Her age, time and gradual reduction in vision (mostly at near) make cataract and macular changes the most likely differential diagnoses. She is not a known diabetic so diabetic maculopathy is unlikely and she has no history of corneal dystrophy.

Feedback [incorrect]

Nearly right. Her age, time and gradual reduction in vision (mostly at near) make lens opacity and macular changes the most likely differential diagnoses. She is not a known diabetic so diabetic maculopathy is unlikely and she has no history of corneal dystrophy.

[Knowledge check 2 (Multiple choice, multiple answer)]

From the information provided so far, what risk factors can you identify that would indicate that Jean could develop AMD.

Select all those that apply:

Age [correct]

Family history

Gender [correct]

Ethnicity [correct]

Hypertension [correct]

Thyroid problem

Feedback [correct]

That's right. Age, gender, ethnicity and hypertension are all relevant risk factors.

Feedback [incorrect]

Good try. Age, gender, ethnicity and hypertension are the relevant risk factors.

We'll revisit Jean's story in unit 3 when some further investigations will be carried out to find the cause of her reduction in vision.

Living with AMD

Whilst many people take AMD in their stride, for others the diagnosis can be a shock. They may need to cut back on work, volunteering and leisure activities.

For those with more advanced progression and irreversible damage coping with AMD and vision loss can be a traumatic experience. Depending on the severity, everyday tasks can be difficult to perform. Reading, shopping, cooking, and writing can all seem challenging. It is important to address this and encourage your patient to seek support.

Relationships may change, and a person with AMD may need more help from family and friends than they are used to. These changes can lead to feelings of loss, lowered self-esteem, isolation and depression.

However, an early diagnosis and regular monitoring can help your patient to adapt and it may be several years before their vision is affected to a degree that affects their daily activities.

[Quote]
[Image: Unit_1_6_Peter_Allen.jpg]

"My eyesight is very important. Which would I miss most, my eyes, or walking? Losing my eyes. If I have to lose anything voluntarily, my eyes would be the last thing."

- Peter Allan, AMD patient

When giving a diagnosis it is important to be realistic whilst delivering the news with tact. There is currently no cure for dry AMD and for most people hearing that their sight will not improve and nothing can be done will come as a shock. You may wish to reassure them that even if AMD does advance significantly, it will only affect the central vision, so that even in the worst case scenario, peripheral vision will not be lost. Patients with late wet AMD that is treated with regular anti-VEGF injections can expect their vision to stabilise.

Giving patients information, signposting to useful websites and discussing low vision services are very important.[18] A patient may not take in everything you tell them so knowing they can go away and do further research will help. Explain the diagnosis and any course of action clearly and give your patient a chance to ask questions so there is less room for misunderstanding.

18. Understanding AMD (guide). Royal National Institute of Blind People (RNIB). https://www.rnib.org.uk/sites/default/files/Understanding_AMD_NV.pdf. Published Feb 2019. Accessed March 23, 2022.

A variety of services are available to help patients maintain independent living. In some cases, a referral to low vision services is appropriate, so ensure that any patients who are entitled have information on how to access them. The College of Optometrists, the RNIB and the Macular Society have a wealth of patient focused resources designed to explain AMD and support those with the disease.

[infopoint]
The topic of supporting your patients is covered in more detail in Unit 3.