



CENTRE FOR
Eye Research
Australia
cera.org.au

Understanding
**age-related
macular
degeneration**

Hope in sight™

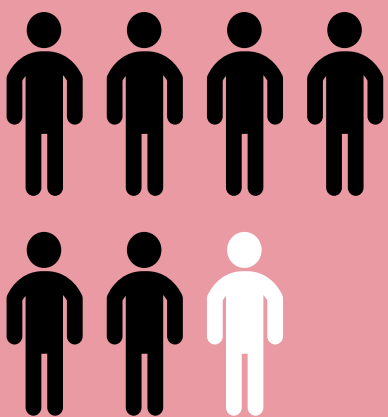


This guide contains general information relating to age-related macular degeneration and is intended for informational purposes only. This information is not intended to be used as medical advice and does not guarantee any outcomes.

Please do not use this information for diagnosing or self-treating any health or medical-related condition as this information is not a substitute for professional medical advice, diagnosis or treatment. If you think you may have a medical condition or emergency, please immediately consult a medical or health professional for assistance.

About age-related macular degeneration

Age-related macular degeneration (AMD) is a leading cause of severe central vision loss among Australians aged over 50.



**One in seven
Australians over
50 have signs
of AMD. Around
15 per cent
progress to
'late-AMD'.**

AMD is an eye disease that affects the macula – the central part of the retina at the back of the eye. The retina is full of light-sensitive cells that allow us to see. The macula provides the sharp central vision needed to read, drive and recognise faces.

Severe loss of central vision can occur in the late stages of AMD. Peripheral (side) vision is usually unaffected in AMD.

There are two forms of late-AMD – dry and wet. Dry AMD occurs when cells in the macula die and cause patches of missing vision. In wet AMD, abnormal blood vessels grow into the retina and start leaking. This causes damage to the retinal cells and loss of vision. Wet AMD is often more sudden and noticeable than dry AMD.

It is possible to have both wet and dry AMD.

How do I know if I have AMD?

There are often no symptoms of AMD until the disease advances and vision is affected. Regular eye checks are the only way to catch AMD early.

If you are at risk, now is the time to get your eyes tested regularly. If you smoke, it's another good reason to quit.

If you notice any of these symptoms, and they are persistent, see your eye healthcare provider.



Symptoms of the early stages of AMD include:

- taking a long time to adjust when moving from light to very dim areas
- difficulty with night driving.



Symptoms of late-AMD include:

- blurred vision
- distorted vision
- difficulty driving, reading or recognising faces
- dark patches in the centre of your vision.



Your risk of developing AMD increases if you:

- are over 50 years of age
- have a family history of AMD
- smoke.

Understanding AMD

Treatment and monitoring

Keeping a close eye on AMD
can reduce the risk of
irreversible vision loss.



In the early stages of AMD, your eye healthcare provider will check the retina of both eyes at your routine check-ups. Earlier stages of AMD remain stable for many people. But others will progress to the more serious late-AMD.

Quitting smoking and having a healthy diet, including plenty of dark leafy greens, can reduce your risk of the disease getting worse.

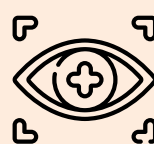


Wet AMD

Wet AMD can be treated with regular injections into the eye. These injections stop the bleeding that is damaging the retina but do not treat the underlying disease. Injections are given regularly, often monthly, to control the bleeding. Then, if possible, at less frequent intervals over several years to try to prevent further bleeding.

Injections do not cure wet AMD. They simply aim to stop the bleeding and help maintain the best vision for as long as possible.

Injections can sometimes improve vision if it's been badly affected and treatment starts early enough.



Check for AMD at home

If you are in the early stages of AMD, you should monitor your vision at home to check for sudden changes. You can do this with simple test called an Amsler grid. Download your free Amsler grid to print at home:

cera.org.au/amsler-grid

Hope in sight



Professor Robyn Guymer AM leads CERA's world-class team of macular researchers. They're working to prevent irreversible vision loss in people with AMD.



There have been many advances in AMD research. Yet there are still unanswered questions about the disease.

There are currently no effective treatments for dry AMD, or ways to prevent the early stages of AMD from progressing to the later stages of the disease. Researchers are still learning what puts some people with AMD at much greater risk of losing their sight.

Centre for Eye Research Australia (CERA) is working to bridge these critical knowledge gaps. The next few pages highlight the research projects aiming to revolutionise how AMD is diagnosed, monitored and treated.

Predicting AMD's path

Artificial intelligence (AI) and modern imaging are helping CERA researchers better predict who will progress to late-AMD.

About one in seven people with the early stages of AMD will progress to the late forms of the disease – dry AMD or wet AMD. This is when serious central vision loss can occur.

There is an effective treatment for wet AMD if it's started early enough. But complications that threaten vision in wet AMD are often detected too late.

Detecting wet AMD earlier would require those with the early stages of AMD to have eye checks more frequently. But this is impractical for most people, particularly as the majority will not progress to late-AMD.

CERA senior research fellow Dr Zhichao Wu is searching for a better solution. He's investigating new ways to identify patients who are at greater risk of progressing to wet AMD and losing vision.

Dr Wu and his colleagues will use powerful



modern imaging techniques to collect eye scans from 200 people with the earlier stages of AMD. This is a stage where people don't have changes to their vision but are at high risk of the disease progressing. Dr Wu and his team will then review participants to see who goes on to develop wet AMD.

AI technology will analyse the wealth of information in these detailed eye scans. This will potentially uncover data that researchers may not pick up or may not have even considered.

This could substantially improve how wet AMD is detected. The earlier specialists can intervene, the better chance patients have of preserving their vision.

Dr Wu's research is generously supported by the Macular Disease Foundation Australia.



It is hoped the findings from this research will transform how we predict who is likely to progress from the early to late stages of AMD.



Laser focus

CERA's world-first nanosecond laser treatment trial has shown the potential of this technology to slow some forms of early-AMD.

The three-year trial, carried out at five sites in Australia and one in Northern Ireland, studied 300 people with high-risk earlier stages of AMD. It compared the disease progression of those treated with a very fast, low dose nanosecond laser against those who did not receive the treatment.

Overall the laser did not appear to improve the outcome for people with AMD. But an interesting result was that the laser seemed to affect subgroups of participants differently, depending on the type of high risk early-AMD changes they had.

Those with a less severe disease pattern showed a four-fold decrease in disease progression, compared to those who were not treated. This is an encouraging finding as this less severe form of the disease is the most common and has the potential to benefit many patients.

These results, while very promising, still need to be validated in a further clinical trial. This is because the analysis of these subgroups was not originally planned as part of the trial.



The research is highly significant however, as it suggests that this new laser treatment is worth further investigation.

The findings are an exciting first step in finding a treatment that could slow the progression to late-AMD and prevent vision loss.



Understanding high-risk AMD

CERA is leading a flagship project to better understand a new high-risk group and discover new treatments that could save their sight.

Until recently, everyone with the early signs of AMD were considered to have the same type of disease. The risk of progression to late-AMD was determined by the size of waste deposits in the retina.

With new imaging techniques it is now possible to distinguish different types of deposits. One of these – reticular pseudo drusen, or RPD – appears to place someone at greater risk of AMD progression.

Around one in four people with the earlier signs of AMD have RPD. Yet researchers know little about these retinal deposits, including what causes RPD and their role in progressing AMD.

Answering these complex questions is the ambitious task of a new, five-year research collaboration. Clinicians and scientists at CERA, the University of Melbourne and the Walter and Eliza Hall Institute of Medical Research, as well as a host of international collaborators, will be joining forces on the project.

This world-leading research team will draw on many areas of expertise to undertake the world's most intensive study of RPD. This includes bioinformatics, artificial intelligence, genetics, molecular biology, anatomy, stem cells and clinical ophthalmology.

The ultimate goal of the collaboration is to understand the pathways that lead to AMD and its progression and open the door to new ways of treating the disease.



This project was awarded a \$5 million Synergy Grant from the National Medical Health and Research Council in late 2019.

Lighting the way

CERA researchers are developing a new test that could transform how we identify high-risk AMD patients and fast-track emerging treatments.

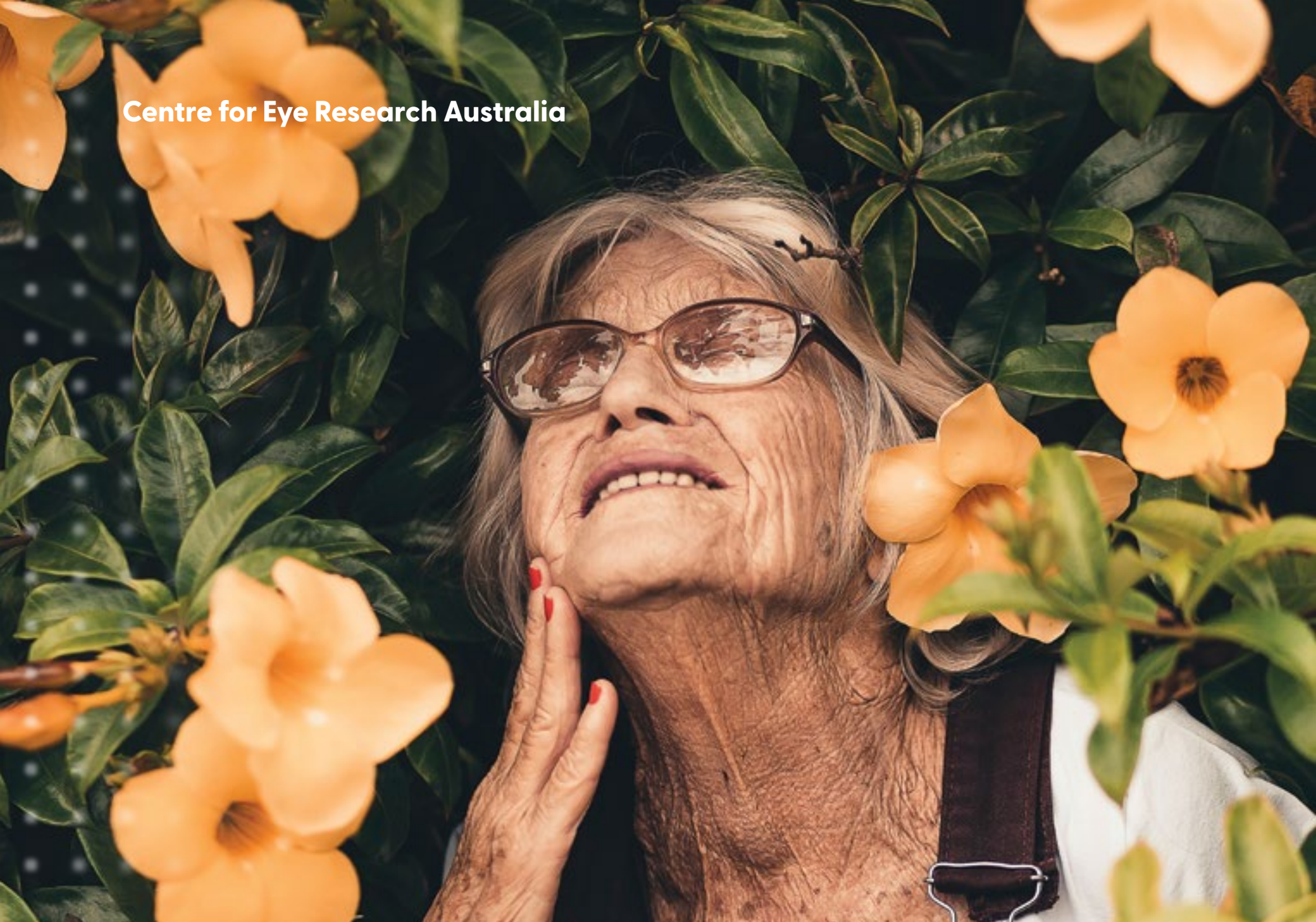
In the early stages of AMD, people may notice their eyes take a long time to adjust when they move from a light to dark area. This adjustment process is called dark adaptation.

Researchers have found that people with slow dark adaptation in the early stages of AMD may also be at higher risk of progressing to vision-threatening complications from the disease.

Associate Professor Chi Luu, Deputy Head of the Macular Research Unit, is investigating problems with dark adaptation to better understand what causes AMD. He is also developing a more efficient way to test and monitor the disease and assess new treatments.

The current test for dark adaptation involves sitting in a dark room for up to 30 minutes, responding to visual stimuli. It's a subjective test that requires a lot of concentration and is often very difficult to complete.

Associate Professor Luu hopes to develop



a quicker, easier and more comprehensive clinical test than the current process.

In future, this could become a standard test to identify patients at high risk of progression very early in the disease process so they could be monitored more closely. If there is a new treatment for AMD, this data could help select patients that would most benefit.

The test also has the potential to speed up clinical trials for the early stages of AMD. Dark adaptation is a measure of how the disease is progressing, and how well a treatment is working. This test could save researchers from having to test thousands of patients or follow them for years to know if a treatment is effective or not.



If new treatments for the early stages of AMD could get to patients faster, thousands of people could be spared a future of devastating vision loss.



Be part of future macular research

Clinical research is essential for discovering the cause of AMD and better treatments.

By taking part in clinical trials or studies you can make an invaluable contribution to this research.

Clinical research advances our knowledge of AMD so that we can help more people in the future. It also provides access to possible new treatments before they are widely available.

To express your interest in future clinical trials and studies at CERA, sign up at **cera.org.au**

Provide as much information as you can about your eye condition and history. This makes it easier for CERA researchers to see if there is a trial you might be suitable for.

Help us by supporting our research

Our work would not be possible without the generosity of our supporters.

Help our world-leading researchers continue to improve the lives of people with AMD and other eye diseases.

By making a donation you are making a difference too. Thank you.



To make a donation, please visit cera.org.au or call us on 1300 737 757.



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