



# **What is Stargardt Disease?**

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Prepared by Retina Australia (Qld) Inc  
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These booklets have been prepared to provide factual information about most common retinal dystrophies – retinitis pigmentosa, Stargardt disease, Usher syndrome and macular degeneration. They also contain information about support groups which you might find helpful.

They have been prepared in consultation with professionals who work in the field of eye disease, persons with the particular conditions and family members. These booklets have been made possible by a grant from Queensland Health through the Statewide Health and Community Services Branch. They are also available in alternative formats – such as tape and from the Retina Australia website. The typeface conforms to the large print guidelines for vision impaired people produced by Blind Citizens Australia.

Our thanks also go to Darren Le Brocque, graduate medical student, The University of Queensland, who helped format these books in their original editions and Nayomia Stibbe and Anne Housego for their work in preparation of this current edition. We are also grateful for the editorial assistance from Dr Rowan Porter (consultant ophthalmologist), Associate Professor Jan Lovie-Kitchin (QUT Department of Optometry) and Mrs Robyn Richards RA (NSW). Sources are acknowledged at the bottom of relevant pages.

Contact details for each state or territory organisation is placed in the centrepiece of this booklet.

# Structure and Function of the Eye

## Introduction

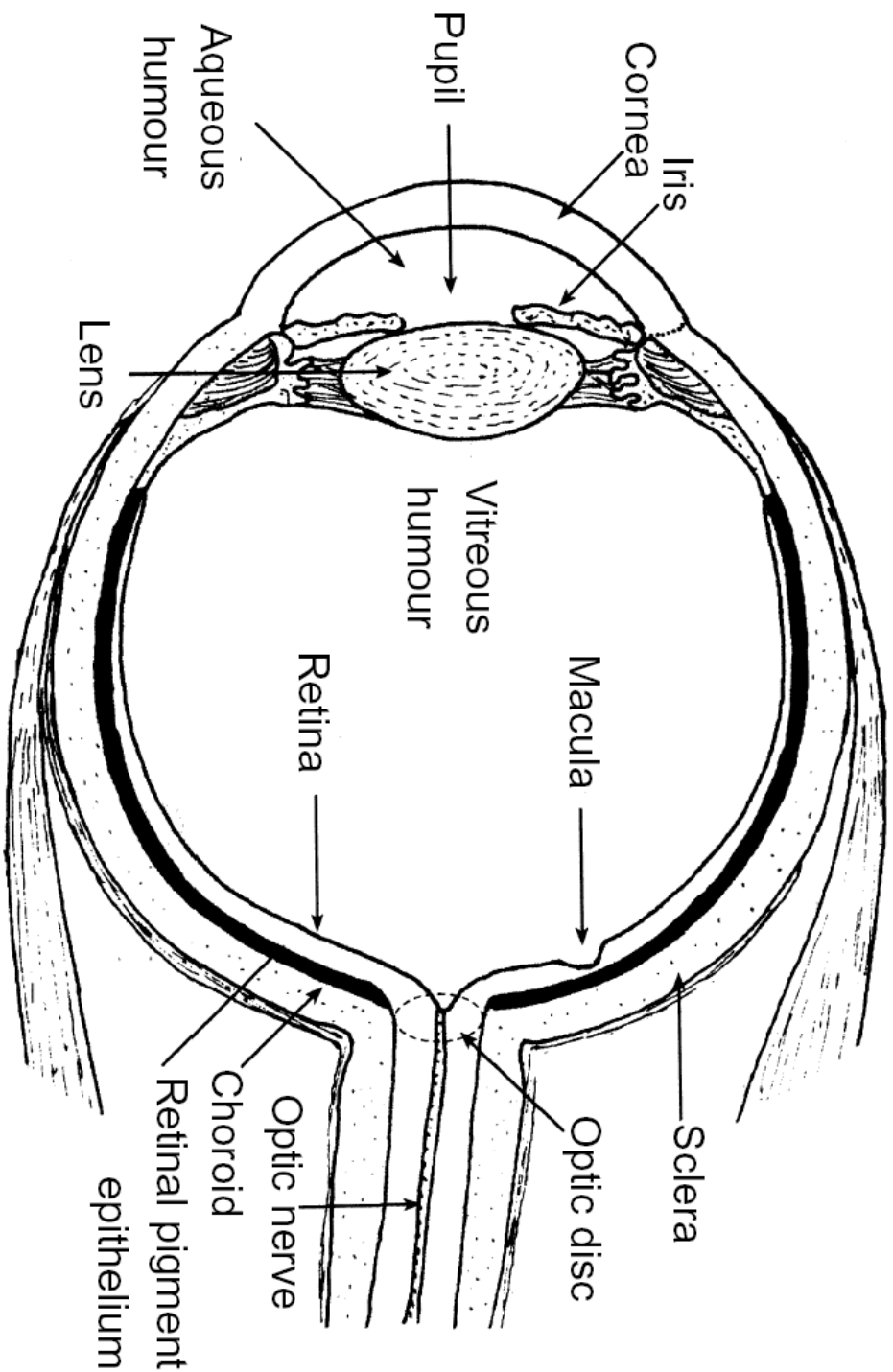
Before discussing the condition of Stargardt Disease, it is important to have some understanding of the structure and function of the eye.

## Structure

The eye consists of several parts which are somewhat similar to a camera (see diagram).

- **sclera** – the white material which we normally see as the white of the eye. It is the eye's outer protective coat.
- **cornea** – the transparent, curved structure at the front of the eye.
- **iris** – through the cornea can be seen the iris, which is that part of the eye which gives it colour – blue, brown, green, grey etc.

- **pupil** – in the middle of the iris is the pupil, which is the black part of the eye. The pupil constricts or dilates depending on the amount of light passing through it.
- **lens** – situated immediately behind the iris and pupil is a transparent disc with both sides being convex. It divides the eyeball into two parts – anterior and posterior chambers.
- **anterior chamber** – a fluid with the consistency of water circulates around this chamber. This fluid is called the **aqueous humour**.
- **posterior chamber** – this is filled by the **vitreous humour** which has the appearance of transparent jelly.
- **retina** – situated at the back of the eyeball. It consists of millions of nerve cells which are divided into two main groups – rods and cones. They are so described because of their appearance under a microscope.



- **cones** – concentrated around an area of the retina called the **macula**.
- **rods** – although some are placed near the macula, the majority of rods are spread out to cover the rest of the retina.
- **retinal pigment epithelium** – a dark coloured layer of cells underlying the retina responsible for providing oxygen and other nutrients to the rods and cones.
- **choroid** – located behind the retina, it consists of a large network of blood vessels which transport oxygen and other nutrients to the retinal pigment cells.
- **optic disc** – the nerve cell connections from all the rods and cones travel to the optic disc, a small yellow oval structure seen by the ophthalmologist or optometrist.
- **optic nerve and beyond** – the optic disc is the front part of the optic nerve which passes

from the eyeball to make connections throughout the brain.

## **Function**

When we see an object, the light travels from that object initially to the cornea. The light then passes through the aqueous humour, pupil, lens and vitreous humour to reach the retina. During this passage, most of the light becomes focused on the macula while the remainder reaches the more peripheral part of the retina.

At the macula, the light causes chemical reactions in the cones, which consequently send messages from the eye to the brain. The brain then recognizes these messages and indicates to the person that they have seen this particular object. The cones are also responsible for us being able to recognise colours and to read.

The light which strikes the periphery of the retina makes contact with the rods. These rods do not serve the important function of seeing objects, but are essential to helping us see in the dark. They also help us detect objects to the sides, above

and below the object on which we are directly focused. This function prevents us from bumping into obstacles when moving around.

Retinal cells are provided with oxygen and other nutrients from the retinal pigment cells which are kept supplied by the rich blood circulation through the choroid.

## **How is Vision Tested?**

### **Visual acuity**

This is a test of macular or cone function. It is tested using the familiar chart (Snellen Scale) with letters of varying sizes. The patient is seated 6 metres from the chart and is then asked to read from the top. The size of each letter on the bottom line is designed so that a person with normal vision should be able to read them. Thus, a person sitting 6 metres from the chart and reading this line has a vision described as 6/6 – that is normal vision.

The size of the letters on the chart increases above the bottom line. Again, the letter sizes are designed so that a person with normal vision could

see these letters at a distance of 9, 12, 18, 24, 36 and 60 metres respectively. However, a person with decreased visual acuity, when seated at 6 metres, may only be able to read these larger letters. Hence, their vision may be described as 6/9, 6/12, 6/18, 6/24, 6/36, or 6/60 depending on which line they can read – that is when seated at 6 metres they can read a line which a person with normal eyesight could read at 9, 12, 18, 24, 36 or 60 metres respectively.

When a person is unable to see the top letters of the chart, and they have a visual acuity of less than 6/60, they may be asked to move closer to the chart, perhaps to 3 metres or 1 metre distance. If they can read the top line at these distances, their vision may be described as 3/60 or 1/60. If this test is unsuccessful the person may be asked to detect whether a nearby torch is switched on or off when a room is darkened. Vision would then be described as 'light perception'.

## **Visual Fields**

This is primarily a test of the function of the peripheral retina.

This is tested by first asking the person to focus on a small white point on a dark screen. A small light is then moved in from outside the person's line of sight and they are asked to say when they first see the light. This is tested several times to the right, left, above and below each eye. These results are then marked on a chart and compared with what a person with normal vision would be expected to see. A normal visual field is described as being about 140° in every direction. Decreases in visual fields may reflect abnormalities of the eye or the pathways which go right back to the brain.

## **Ophthalmoscopy**

The ophthalmoscope is used by the optometrist or ophthalmologist to examine inside the eye for cataracts, internal damage, or changes in the retina due to various disease processes.

## **Electrical Studies**

- **Electroretinogram** – this is a measure of the electrical function of the cells of the retina. The activity is significantly decreased in

people with generalised retinal disease, such as RP or Stargardt disease.

- **Electro-oculogram.** This is a measure of the function of RPE and the overlying photoreceptors. It is particularly important in distinguishing between a rare retinal degeneration (Best's disease) and RP or Stargardt disease.
- **Dark Adaptive Testing.** In people with retinal disease, the rods and cones adapt slowly to variations in light intensity. Such changes can be tested using special electrical equipment and occasionally may be of value in giving added information in the diagnosis of retinal disease.

## Dye Studies

Occasionally, the ophthalmologist will want to check further the functions of the retina. By injecting a special dye (fluorescein) into the blood stream, it shows up areas of good or bad function. The ophthalmologist then takes photographs to demonstrate the degree of damage.

## **Blood Tests**

In Australia at present, blood tests for genetic eye diseases are not done routinely. However, in research projects, examination for genetic abnormalities may be undertaken. This situation may change with time as the expense of the tests decreases and their availability becomes more widespread.

## What is “legal blindness?”

A person who is legally blind is entitled, depending on their age, to either a Disability Support Pension (DSP) – Blind or an Aged Pension- Blind. The DSP- Blind is independent of income.

A person is legally blind when they have permanent blindness according to the following guidelines –

- visual acuity on the Snellen Scale, after correction by suitable lenses, must be less than 6/60 in both eyes,
- visual field constriction to within 10 degrees of fixation in the better eye, irrespective of corrected visual acuity or
- a combination of visual defects resulting in the same degree of visual impairment as that occurring in the above points. (1)

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1. Social Security Act, Section 95- Qualification for DSP-Permanent blindness.

## **What is Stargardt disease?**

In Stargardt disease, the cone cells, situated at the macula, deteriorate in function and eventually die. The rod cells generally remain intact. Symptoms usually start at a young age – usually under 20. People with Stargardt disease start to experience difficulty with reading and fine handwork as well as distinguishing colours. These symptoms progress with age. In some, this deterioration is rapid, while in others it is much slower. There is no way of detecting how fast this deterioration will occur in any individual. By the age of 50, about half will have a visual acuity of 6/60 or worse (see above definition of legal blindness). People with Stargardt disease do not usually have a problem with peripheral vision, and hence usually have little problem with bumping into objects when moving around. They may however experience difficulties in adjusting to light.

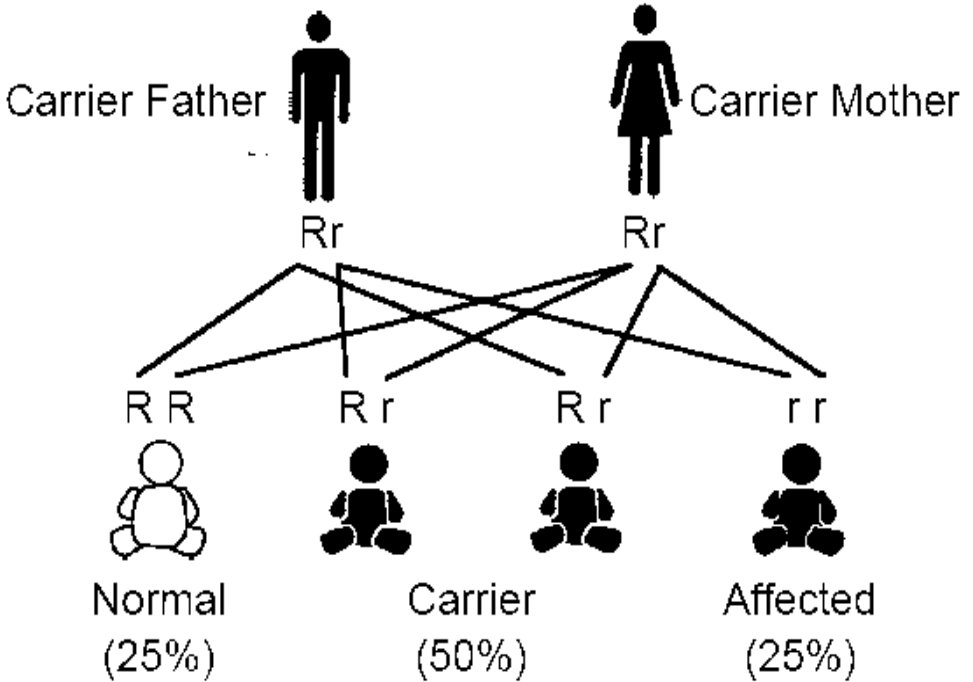
The diagnosis is usually made as a result of deterioration in visual acuity and typical appearances around the macula on ophthalmoscopy. Electrical tests, such as the electroretinogram (ERG), electro-oculogram and dark adaptation testing can measure the progress

of the disease, but are not usually necessary for its diagnosis.

## **What is the inheritance of Stargardt disease?**

Stargardt disease is usually inherited as an autosomal recessive disorder. In this situation, both parents are carriers and if their child has Stargardt disease, she/he has received one abnormal gene from each parent. If one child in a family has the disease, it is possible that 25% (1 in 4) of any other children will be affected. Males and females are equally affected. The parents are carriers of the disease, but are not affected by it themselves. The diagram indicates how the recessive gene “r” is passed from the two carrier parents to their children.

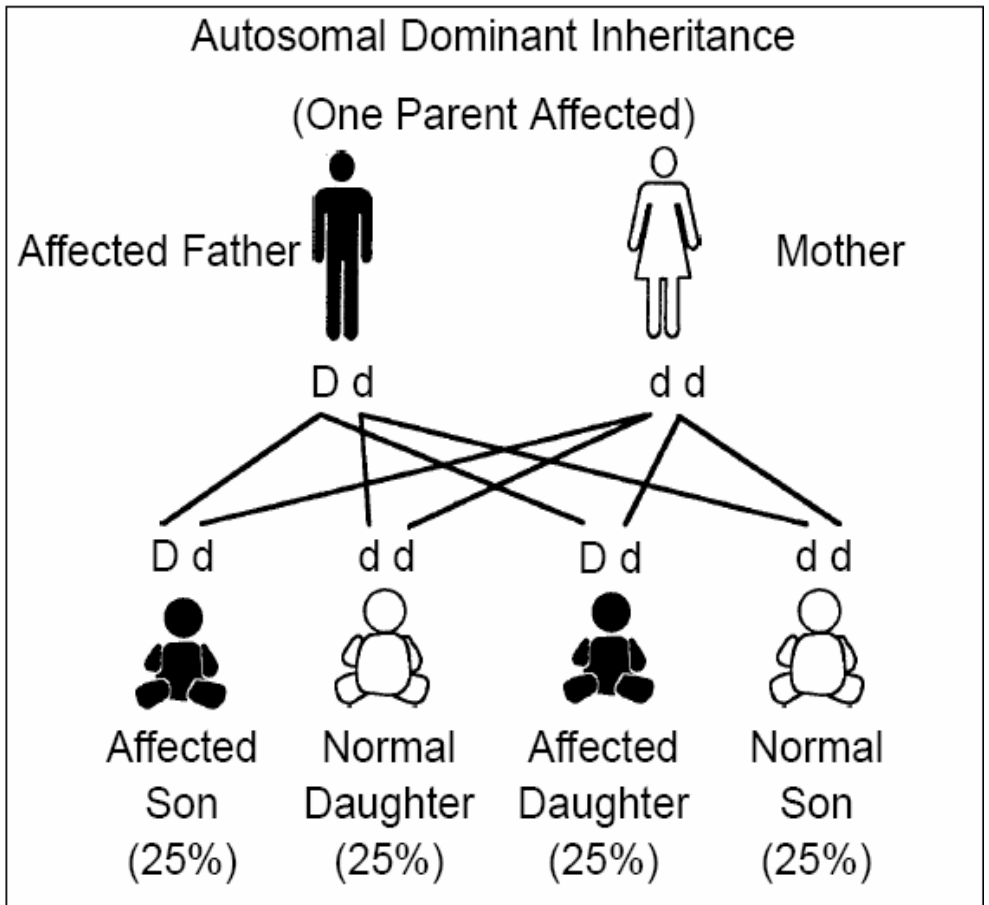
Autosomal Recessive Inheritance  
(Both Parents Carriers)



There are several different variations of the gene responsible for Stargardt disease, so that variations in the severity of the symptoms can occur. Blood testing is not yet available in Australia.

Stargardt disease is occasionally inherited as an autosomal dominant condition. In this situation, one parent is affected and, for each pregnancy,

there is a 50% chance (1 in 2) that the child will be affected. Males and females are equally affected. The diagram shows how the dominant gene “D” is passed from the affected parent to half of his/her children.



Clearly, in order to determine the likelihood of your children and other members of your family being affected, you should consult your doctor or seek genetic counselling. Because Stargardt disease usually runs in families, all family members are encouraged to have a thorough eye examination.

### **Is there any treatment for Stargardt disease?**

At our current state of knowledge, there is no cure for Stargardt disease. However, research on this and other related diseases, such as retinitis pigmentosa, is taking place in Australia and overseas and it is possible that a form of treatment will be available in the near future.

### **Other Supportive Measures**

The irreversible loss of vision may be quite significant. There are many measures that can be used to help support people with this degree of vision loss.

## Sunglasses

Glare is a major problem for many people with Stargardt disease.

It has been shown that the blue component of the light is the one most responsible for producing glare. It has also been shown that sunglasses which contain lenses that specifically block out the blue component of light, are very effective in reducing glare and have been very beneficial for people with Stargardt disease. (1)

It is important that people discuss this with their optometrist to try various types of lenses to determine which is best for them. The spectacles are commonly called “blue block” sunglasses.

1. C. E. Reme. Recommendations of Protective Eyewear for Patients Suffering from Degenerative Retinal Diseases. Laboratory of Retinal Cell Biology, University Eye Clinic, Zurich, Switzerland. (2001)

# Maintaining One's Independence

## Low Vision Devices

Does a progressive loss of vision mean that people will become increasingly dependent? The vast majority of people can maintain their independence if they maximise their support systems. Many devices, services and techniques are available which provide a person with a vision impairment increased mobility and independence. Special lenses, orientation and mobility training and illumination are some examples. The ability to function independently can be learned just as speaking, writing and walking. The local agencies for people with a vision disability will give aid and advice on all aspects of daily living. Retina Australia in your state has a list of agencies which may help any particular needs.

## What are low vision devices?

Low vision devices help people obtain the most use of their remaining vision. They may be optical lenses, magnifiers and telescopes, or nonoptical devices such as lamps, large print and tape

recorders. Clearly, new computer products are being developed on a regular basis and some can be very helpful. To determine which devices will assist you, it may be necessary to obtain a thorough low vision evaluation from a specialist in the field. Most states have Low Vision Clinics with specialized staff such as optometrists, occupational therapists, specially trained nurses and orientation and mobility instructors. Information about these clinics can be obtained from the Retina Australia office in your state.

## **Orientation and Mobility**

It is clear that a key component of independence is one's ability to move around with as little help as possible.

**Driving** - People with Stargardt disease may be able to drive in the early stage of the disease. However, for some driving may never be an option, if symptoms are severe at an early age. Whatever the age, once their visual acuity has reached 6/12, it may be important to consider giving up driving. Clearly, this is not an easy decision and should be made in consultation with family, friends, general practitioners, optometrists or ophthalmologists. It

should be pointed out that planning to use public transport (usually free) and taxis (half priced if on a blind pension) can be a reasonably cost effective alternative (depending on where you live). The Federal Government has published a booklet which gives advice to optometrists, general practitioners and ophthalmologists regarding this.  
(1)

**White cane training** – Independence, orientation and mobility may be enhanced by white cane training.

This is a skill taught by specially trained instructors from the Guide Dogs Association in each state. Individual training will help people to be orientated at their home, work and to explore transport options and recreational facilities.

Dog guides – These can also be used to increase orientation and mobility, but negotiation, planning and training needs to take place with the local Guide Dog Association.

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1. Assessing Fitness to Drive – guidelines and Standards to Health Professionals in Australia – 2<sup>nd</sup> Edition. 2002. Austroads.

# **Why should I continue to see my optometrist and ophthalmologist?**

When the diagnosis of Stargardt disease is made, people are often told that there is nothing that can be done to cure the disease. While this may be true at our present state of knowledge, there are many factors which need to be considered to ensure the optimum use of your remaining vision.

Visits to the optometrist or ophthalmologist may therefore continue to be important for the following reasons:

## **Follow up appointments**

A follow up appointment is important to answer questions that arise once the shock of the initial diagnosis has passed.

## **Obtaining a second opinion**

It is common when one receives the devastating news that you have an incurable eye disease, to be very angry and to not believe the person who

has given you this news. It is perfectly reasonable to seek another opinion to ensure the correct diagnosis, and to reassure you that all avenues of history, examinations and tests have been undertaken.

## **Monitor the progression of the disease**

Even though there is no cure, understanding the progression of the disease may help in planning lifestyle changes, such as work changes or changes in work design. As the condition slowly progresses in most cases, it is necessary to upgrade visual devices and supports as the years go by.

## **Prescription of spectacles to help improve residual vision**

In people with normal vision, visual acuity and reading ability change with age and spectacles are often required. The same situation occurs in people with Stargardt disease and it is important that optimal magnification is achieved. Prescription of sunglasses to reduce glare may also be important.

## **Referral for the disabled persons pension (DSP - Blind) when sight deteriorates further.**

Although being declared legally blind can have some negative consequences, the DSP (Blind) is not means tested and attracts other features, such as free train and bus travel, half fare taxi vouchers and help with rates and other service bills.

## **Assessment of other family members**

The recognition or exclusion of Stargardt disease in other family members is important in determining the inheritance pattern and ensuring that all family members have optimum access to diagnosis and support. Referral to a geneticist may also be necessary.

## **Referral to Low Vision Clinic or orientation and mobility support**

This has been referred to in previous sections.

## **Referral to local support agencies such as Retina Australia**

Information is provided about these agencies later in this booklet.

## **Diagnosis and removal (when necessary) of cataracts.**

The lens is normally perfectly transparent. Cataracts commonly occur with increasing age and decrease this normal transparency. Clearly, this can decrease further the vision already impaired by Stargardt disease. Removal of the lens with the cataract and replacement with a plastic lens can thus improve residual vision.

## **Diagnosis of other eye conditions which may make vision worse, such as glaucoma and diabetes.**

There is no reason why these two diseases could not develop as the person with Stargardt disease ages. Glaucoma is treatable, but, if it is not detected early enough, may cause even more deterioration in vision. Diabetes can be controlled with diet and medication, and treatment may halt the progress of eye deterioration.

# Living with Stargardt disease

You may have been told recently perhaps, or you may have known for some years that you have Stargardt disease. This diagnosis may explain the months or years of increasing difficulty in reading and fine tasks such as needlework. Then you are told that, as yet, there is no cure for Stargardt disease and that you have to face the prospect of slowly getting worse. What then? Slow loss of sight is a very difficult thing to live with, especially when you may not receive the immediate understanding offered from the community to people with total loss of vision. Indeed, many people will not believe that you have a problem because you have no apparent signs of a vision disability.

The first and hardest step towards living positively with a vision impairment is accepting it. For people with Stargardt disease, that means knowing the extent and limits of your vision and using intelligently the visual clues you receive. A person with normal vision must do this too, in certain circumstances. The driver who plunges into a fog has two alternatives — he can decide that he cannot see a thing, panic and stop, which might cause an accident. Or he can see (even if it is only

the nearside kerb) and move cautiously down the road. The person with Stargardt disease can panic or move down the road.

Accepting that you have an impairment of vision is never easy. You may go through times of despair and of feeling resentful and bewildered. All these reactions are quite understandable, especially as the very nature of Stargardt disease makes adjustment difficult. But the way in which you feel with Stargardt disease will determine the type of life you and your family will share from day to day. Try to ignore it and you will experience constant reminders that it is there. Write yourself off as totally incapable and you will be missing out on many of life's enriching experiences. Tackle each new problem steadily as it arises, using clues from all your senses — smell, touch, hearing and balance — and you will find that you can live more positively with Stargardt disease.

The following table highlights many misconceptions about vision impairment in general. It also provides the factual information in response. The facts provided in the table may help

you and other family members, friends and workmates, become better informed about vision impairment and obtain a greater understanding of its complexity.

<b>Myths</b>	<b>Facts</b>
People who are legally blind have no sight at all.	Only a small percentage of those who are legally blind have absolutely no vision. Many have a useful amount of functional vision.
People who are blind have an extra sense that enables them to detect obstacles.	People who are blind do not have an extra sense. Some can develop an “obstacle sense” by noting the change in echoes as they move towards objects.
People who are blind automatically develop better acuity in their other senses.	Through concentration and attention, individuals who are blind can learn to make very fine discrimination in the sensations they obtain. This is not automatic but rather represents a better use of received sensations.

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<b>Myths</b>	<b>Facts</b>
<p>People who are blind have superior musical ability.</p>	<p>The musical ability of people who are blind is not necessarily better than that of sighted people but many people who are blind pursue musical careers as one way in which they can achieve success.</p>
<p>Braille is not very useful for the vast majority of people who are blind; it should only be tried as a last resort.</p>	<p>Very few people who are blind have learned Braille, primarily due to fear that using Braille is a sign of failure and to a historical professional bias against Braille. Authorities acknowledge the utility of Braille for people who are blind.</p>

<b>Myths</b>	<b>Facts</b>
<p>Braille is of no value for those who have low vision.</p>	<p>Some individuals with low vision have conditions that will eventually result in blindness. More and more, authorities think that these individuals should learn Braille to be prepared for when they cannot read print effectively.</p>
<p>If people with low vision use their eyes too much, their sight will deteriorate.</p>	<p>Only rarely is this true. Visual efficiency can actually be improved through training and use. Wearing strong lenses, holding books close to the eyes and using the eyes often, cannot harm vision.</p>
<p>Mobility instruction should be delayed until secondary school</p>	<p>Many authorities now recognise that even preschoolers can take advantage of mobility instruction, including the use of the cane.</p>

<b>Myths</b>	<b>Facts</b>
The long cane is a simply constructed, easy to use devise.	The National Academy of Science has drawn up specifications for the manufacture of the long cane and using it properly
Guide Dogs take people where they want to go.	The Guide Dog does not “take” the person anywhere. The person must first know where he or she is going. The dog is primarily protection against unsafe areas and obstacles.

## **Is it common to experience emotional distress after receiving a diagnosis of Stargardt disease or other retinal degeneration?**

Yes. After receiving a diagnosis of a retinal degeneration such as Stargardt disease, it is not unusual to experience fear and confusion. Some people accept the situation more quickly than others: some experience a period of temporary depression before they can accept and adjust to the condition. In addition to depression, it is not uncommon to also feel denial, anger and frustration. Sometimes, just knowing that you are not alone can be helpful. While not a common condition, Stargardt disease is the commonest cause of hereditary macular disease in young adults. You may wish to contact your local Retina Australia group where you will have the opportunity of meeting others and sharing your experiences.

## **What about employment?**

Many people with retinal degenerative diseases can continue to lead productive lives and some may continue to pursue a desired career goal. As problems, or potential problems, are identified,

they can often be solved by the use of mechanical aids, extra training or job modifications. Vocational counselling offered through an educational institution, government rehabilitation departments or agencies for people with vision disabilities, can be most beneficial in planning or maintaining a career.

### **Does pregnancy have an effect on Stargardt disease?**

There is no convincing evidence that pregnancy affects Stargardt disease, but the matter has not been properly studied so far.

### **Everyone is different.**

Stargardt disease can manifest itself in different ways. For some, loss of central vision is slow. There will be only slight loss, over perhaps ten years. Others may have periods of rapid loss, often with years in between of no apparent decline. Still others have been aware of impaired vision from childhood or teens, when they had difficulty with ball games, especially at dusk. With so much variation in the symptoms and effects, it is not surprising that the public find Stargardt disease

difficult to understand. Thus a person with Stargardt disease has a great deal of difficulty reading but little trouble in moving around without bumping into things. It is most important for mutual understanding, especially within the family, that the person with normal vision should recognize and comprehend the difficulties involved.

### **How can one help?**

How can others best help people with Stargardt disease? Don't be over-protective but observe what they can do without help. Use of magnifiers and large print instructions can be helpful. If you are the one who has Stargardt disease, explain what you can do without help. If the family is always tense and over-protective, this can be morale destroying. When helping your family to understand your vision impairment, use incidents that are particularly relevant to them: e.g. when you have been unable to read the telephone book make a point of asking for help. Living with Stargardt disease can be hard for all members of a family and the one who has the condition can do much towards making life happier by helping family and friends to understand.

## **Are there other retinal degenerations besides Stargardt disease?**

There are many other hereditary diseases which may affect the retina. The list is long and not all are mentioned here. Symptoms will also vary. Conditions include retinitis pigmentosa (see companion booklet), macular degeneration (see companion booklet), Best disease, rod-cone dystrophy and choroideremia. Clearly, consultation with an ophthalmologist is essential to ensure that the correct diagnosis is made. The Retina Australia organization in your state will provide information and support for all hereditary retinal degenerations.

### **Groups for inherited retinal conditions**

The special difficulties caused by RP have led, in recent years, to the formation of RP groups in all mainland Australian states and territories and in many countries throughout the world. More recently, these groups have broadened their scope to embrace all hereditary retinal diseases and, to some extent, MD. Hence, the names of groups have changed to Retina Australia (Queensland),

Retina Australia and Retina International. The state organizations within Australia are independent, self-help groups of people with RP and related conditions, their families and friends, whose aims are to assist people in coping with RP and related conditions and to encourage research.

### **What services are offered by local Retina Australia organisations?**

All state Retina Australia groups seek to foster support, information, awareness, advocacy, research and fundraising within their state. In practical terms, these goals –

- Seek all practical means to assist those affected and their families and to give such assistance as necessary and when requested.
- Disseminate information to professionals and nonprofessionals about RP and related conditions.
- Exchange information with each other and Retina International.

- Interact with Retina Australia in providing funds for research and biennial congresses.
- Ascertain the cause and means to cure or arrest the deterioration in RP and other retinal dystrophies.
- Interact with all other agencies who provide services for people with vision disabilities
- Provide advice to the government and wider community.

Retina Australia is responsible for distributing funds for research following recommendations of its Research Advisory Committee. It is also responsible for an Australian biennial congress. Contacts with Retina International are also important.

# Research

Intensive research has been fostered by the world's RP groups and is making headway in unravelling the mysteries of RP and Stargardt disease and will hopefully soon lead to effective treatment and ultimately a cure.

Current approaches to research include –

- Understanding the structure and function of the retinal cells and their interaction with connections to the brain.
- Modification of the diseased retinal cells by genetic manipulation.
- Replacement of the diseased retinal cells with stem cells- derived either from embryos or adults.
- Insertion of electronic equipment to function as a bionic eye.

Significant valuable research in Australia is contributing to the global effort in trying to overcome RP and other degenerative eye diseases. Australian research is funded by Retina Australia, through its grants program, and the National Health and Medical Research Council (NH&MRC).

Information about current research can be obtained through the local Retina Australia office or the various research websites. It is important to appreciate, however, that much information on the Internet may not have been examined with appropriate scientific rigor, so it is always important to check the source and to determine whether the work has been reviewed by other scientists working in that field. Retina Australia can put you in touch with local experts to help evaluate the merits of any research project.

## **Funding for Research**

Retina Australia receives donations from each of the state bodies and makes available around \$200,000 a year for Australian research. Any contribution over \$2 is tax deductible.

# Useful Contact Information

If you require support, assistance with funding or more information about services or research, the following may be of help to you.

## **Retina Australia**

Website:

[www.retinaaustralia.com.au](http://www.retinaaustralia.com.au)

Email:

[admin@retinaaustralia.com.au](mailto:admin@retinaaustralia.com.au)

Freecall:

1800 999 870

## **Retina Australia (Queensland)**

Phone: 07 300 300 65

Facsimile: 07 300 300 65

Free call

(outside of Brisbane): 1 800 000 999

E-mail:

[admin@retinaqld.org.au](mailto:admin@retinaqld.org.au)

Postal address

P.O. Box 16295

Brisbane City East

QLD 4002

Office: Level 1, Harris Terrace,  
46 George Street  
BRISBANE. QLD

**Retina Australia (ACT) Inc**

[Ra1act@retinaaustralia.com.au](mailto:Ra1act@retinaaustralia.com.au)

**Tasmania** (as for Victoria)

**Retina Australia (Vic) Inc**

[support@retinavic.org.au](mailto:support@retinavic.org.au)

(03) 9650 5088

**Retina Australia (NSW)**

[admin@retinaaustraliansw.com.au](mailto:admin@retinaaustraliansw.com.au)

(02) 9744 7738

**Retina Australia (WA) Inc**

[hazel@rawa.com.au](mailto:hazel@rawa.com.au)

(08) 9388 1488

**Retina Australia (SA) Inc**

[sara@retinaaustralia.com.au](mailto:sara@retinaaustralia.com.au)

(08) 8362 1111

**Northern Territory**

(as for South Australia)

## **Genetic Advice**

Queensland Clinical Genetic Service  
Royal Children's Hospital and District Health  
Service

Address: Back Road  
HERSTON QLD 4029

Phone: 07 3636 1686

Facsimile: 07 3636 1987

## **Vision Rehabilitation**

QUT Vision Rehabilitation Centre

Address: QUT Kelvin Grove Campus  
Victoria Park Road KELVIN GROVE QLD 4059

Phone: 07 3864 5743

07 3864 5695

Facsimile: 07 3864 5665

Email: [optometry.enquiries@qut.edu.au](mailto:optometry.enquiries@qut.edu.au)

Website:

[www.hlth.qut.edu.au/opt/research/lowvision.jsp](http://www.hlth.qut.edu.au/opt/research/lowvision.jsp)

## **Orientation and Mobility**

### Guide Dogs (Queensland)

Address: 1978 Gympie Road  
BALD HILLS QLD 4036

Phone: 07 3261 7555

Facsimile: 07 3261 7500

Email:

[admin@guidedogsqld.com.au](mailto:admin@guidedogsqld.com.au)

Website:

[www.guidedogsqld.com.au](http://www.guidedogsqld.com.au)

## **Vision Devices and Rehabilitation**

and for information on support groups in your area

### Vision Australia

Address: 373 Old Cleveland Rd

Coorparoo QLD 4151

Phone: 1300 847 466

Website: [www.visionaustralia.org](http://www.visionaustralia.org)

Email: [info@visionaustralia.org](mailto:info@visionaustralia.org)

## **Further information**

Retina International

Website: [www.retinainternational.org](http://www.retinainternational.org)

Foundation Fighting Blindness:

<http://www.blindness.org/Stargardt/>

Scottish Sensory Centre

<http://www.ssc.education.ed.ac.uk/resources/vi&multi/eyeconds/MacDys.html>