



## North Shore Eye Centre

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## MACULAR DEGENERATION TREATMENT

### **What Is Macular Degeneration**

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Macular degeneration is the degeneration of the central part of the retina (macula), which is responsible for central vision and can cause loss of vision. There are 2 types of macular degeneration: the 'dry' type and the 'wet' type. The dry type is generally caused by aging and thinning of the macular layers and results in a gradual loss of vision.

The wet type involves growth of abnormal blood vessels in the retina. These blood vessels are fragile and can leak fluid and blood, causing scar tissue to form behind the eye, and can lead to damage of the macula. This affects central vision, which is required for daily activities, causing distorted and blurred vision. The degeneration may result in vision loss that is quick, severe and permanent.

Treatment of macular degeneration (AMD) does not cure the disease but aims to stabilise the disease process and maintain the best vision for as long as possible.

### **Treatment Of Macular Degeneration (AMD)**

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There are no treatments available for the dry form, however a major national eye institute study (AREDS) reported benefits of certain nutrients such as zinc, Lutein, Vitamins A, C and E, indicating they may be valuable in slowing down the progression of dry macular degeneration.

There is no cure for AMD, and the current treatments are unable to completely restore lost vision, however some treatments may delay the progression of the disease, stabilise or reduce the rate of vision loss, or even improve vision. Treatment methods include: Transpupillary Thermotherapy, Photodynamic Therapy, Intravitreal Triamcinolone, Avastin, Lucentis and Retaane.

#### **Transpupillary Thermotherapy**

Transpupillary thermotherapy (TTT) is a technique, which involves the use of laser treatment to seal up the leaking blood vessels. The aim is to prevent the progression of AMD. Lasers have been used for wet macular degeneration, however the laser used in this particular method has lower power and therefore it limits the damage to the overlying retinal tissue.



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### **Photodynamic Therapy with Visudyne**

Photodynamic Therapy (PDT) is a treatment that has been shown to help slow the growth of abnormal blood vessels in patients with wet AMD degeneration. This treatment combines Visudyne (a light activated drug) and “cold” laser to slow down the rate of visual loss in the treatment of conditions with abnormal blood vessels. The laser activates the drug in a targeted area of the eye, producing a reaction that destroys abnormal blood vessels. PDT with Visudyne can stabilise vision and reduce the risk of vision loss in certain patients with wet AMD.

The Visudyne drug is injected intravenously into the arm. The chemical flows through the blood vessels within the body, including the abnormal blood vessels in the macula, at the back of the eye. The Visudyne is then activated, by directing a "cold" laser into the eye. This produces a chemical reaction that destroys abnormal blood vessels. It uses a gentle laser, which does not destroy the overlying retina. A patient who receives this treatment may require up to 6 injections of Visudyne.

### **Intravitreal Triamcinolone – Kenalog**

Intravitreal triamcinolone (IVT) is a steroid medication that is injected into the vitreous cavity of the eye. It is typically used to reduce swelling and inflammation inside the eye and is used to treat eye conditions such as cystoid macular oedema, diabetic macular oedema and some cases of wet AMD.

Most patients who receive this injection see floaters in their vision for up to 3 weeks. Unlike the use of steroid tablets, which are associated with weight gain, increased blood pressure, osteoporosis, diabetes and stomach ulcers, the use of small doses of steroid administered directly into the eye is thought to limit the risk of side effects. The main problem with IVT is that its effect usually lasts only 3 to 6 months, but also it can raise the pressure inside the eye.

### **Anti- Vascular Endothelial Growth Factor (anti-VEGF) Therapy**

Recent treatments have involved injections into the eye, which bind to a vessel growth factor known as vascular endothelial growth factor (VEGF). Vascular endothelial growth factor (VEGF) is a naturally occurring molecule that triggers the growth of new blood vessels and the leakage of fluids and molecules from blood vessels. VEGF is responsible for the development of new abnormal blood vessels under the retina. Anti-VEGF therapy blocks the effect of new blood vessel growth and leakage. The two injections known as Avastin and Lucentis have similar effects on VEGF, however Lucentis is a smaller fragment.

### **Lucentis**

Lucentis (also known as Ranibizumab) is a form of medical treatment that is administered into the eye every month and has been developed to specifically treat the wet type of macular degeneration. It has been investigated in clinical trials with results supporting the treatment of AMD. The reports indicate significantly better

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outcomes in patients treated with intravitreal Lucentis than other treatments in patients with choroidal neovascularization in the wet form of AMD.

### **Avastin**

Avastin also involves monthly injections directly into the eye. It is being used for the treatment of proliferative (neovascular) eye diseases such as choroidal neovascular membrane in macular degeneration, neovascular glaucoma, proliferative diabetic retinopathy, diabetic macular oedema and macular oedema secondary to retinal vein occlusion. Avastin also works by blocking the VEGF, and preventing the growth of new blood vessels.

Avastin works in a similar way to Lucentis, with positive results in the studies that have been investigated. It is a drug that was originally approved for the treatment of metastatic colorectal cancer, but is also being used for the treatment of AMD. When Avastin was given to cancer patients, some patients experienced serious complications such as gastrointestinal damage or wound healing complications, stroke, heart attack, hypertension and congestive heart failure. However the patients that experienced these complications were given 400 times the dose that is given to treat eye disease, and the drug was administered through an intravenous infusion that spreads the drug throughout the body. It is believed that the risk of these complications for patients being treated for eye conditions is low. Patients receiving Avastin for eye conditions are generally healthier than the cancer patients, and receive a much smaller dose, which is delivered directly into the eye.

### **Retaane – Anecortave Acetate**

Retaane is an injection for the treatment of wet AMD. The active substance in Retaane is Anecortave and it is similar in structure to cortisol, which is a natural hormone in the body. It is able to stop or slow down the development of new blood vessels by interfering with the production of the proteins needed to build the vessels, and the growth factors needed for the blood vessels to spread.

Retaane is not injected into the vitreous of the eye, but instead it is deposited behind the eye, along the white part of the eye (the sclera). It is delivered as a 'depot' injection, a type of injection where the medicine is prepared in such a way that it is absorbed very slowly. This method of delivery avoids the risk of intraocular infection and retinal detachment, which are the most common side effects associated with injecting therapeutic agents directly into the eye. Retaane depot requires less frequent administration, once every six months compared to some other eye injections used to stop the growth of blood vessels that are used as often as 9 -12 times a year. Unlike other treatments, there have been no reports of drug-related elevation of eye pressure or cataract formation. According to an independent safety panel, no clinically significant side effects have been associated with Retaane depot treatment.

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