

Therapeutic Interventions for Neovascular AMD

Early and Intermediate AMD - No therapy has been developed to treat mild and/or intermediate AMD. Antioxidant and mineral supplementation has been shown to reduce the risk of progression of early and intermediate AMD to GA (AREDS & AREDS2). Supplements containing vitamins C & E, zinc & copper and lutein & zeaxanthin are recommended.

Late AMD - No approved treatments currently exist to prevent or slow the progression of geographic atrophy. However, there are treatment options available for people diagnosed with neovascular AMD (summarized below):

Anti-VEGF therapy for neovascular AMD¹

Anti-VEGF (vascular endothelial growth factor) therapy is currently the standard treatment for people with neovascular AMD. Three anti-VEGF drugs are currently approved:

- Ranibizumab (tradenname: Lucentis)
- Aflibercept (tradenname: Eylea)
- Pegaptanib (trade name: Macugen)

Another anti-VEGF agent, called bevacizumab (tradenname: Avastin), which is approved for the treatment of certain cancers, is not licensed for the treatment of neovascular AMD. However, it can be prescribed by doctors in some countries on an 'off-label' basis.

These agents are all administered by intravitreal injections (injected into the eye) in a day surgery procedure. Anaesthetic eye drops are used to numb the eye and a thin needle is used to inject the drug into the eye.

All four agents work in a similar way – they block the actions of a molecule called vascular endothelial growth factor (VEGF), which is responsible for promoting the growth of abnormal blood vessels from the choriocapillaris into the retina.

Aflibercept and ranibizumab are injected once a month for the first three months of treatment.^{2,3} After 3 months Aflibercept is injected every two months with treatment intervals being reassessed at 12 months, depending upon how the condition develops. After 3 months, the frequency of ranibizumab injections is determined by the physician depending on how the disease progresses.

¹ Age-related macular degeneration (AMD): Drug therapy for wet AMD. PubMed Health - Informed Health Online [Internet], 29 July 2015 ed, 2015.

² Eylea (Aflibercept) Summary of Product Characteristics. Bayer AG, Germany.

³ Lucentis (Ranibizumab) Summary of Product Characteristics. Novartis, Switzerland

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Pegaptanib is injected every 6 weeks (9 times per year) with the recommendation that treatment should be stopped if there is no treatment benefit (defined as loss of less than 15 letters of visual acuity) after 2 consecutive injections (i.e. at the 12-week visit).⁴

Clinical studies shown that these agents are able to temporarily stop or at least delay vision loss in people with AMD. In some cases, vision improves with treatment. However, it is important to note that these agents are not a permanent cure for this condition.

Other approved treatments for neovascular AMD:

Laser photocoagulation⁵ - Uses a high-energy laser beam to cauterize the abnormal blood vessels underneath the macula, stopping leakage of blood and fluid, and thus progression of the disease. A major side effect is that is that laser photocoagulation can also destroy surrounding healthy retinal tissue, leading to the risk of vision loss after treatment. Therefore, this technique is not recommended if blood vessel growth is underneath the fovea. Recurrence of blood vessel growth after treatment is also common. With the availability of anti-VEGF therapy, laser photocoagulation is only used in a selected group of patients with neovascular AMD.

Photodynamic therapy⁶ - Introduced in the 1990s, this technique uses a light-activated drug, verteporfin, which is injected intravenously and attaches to abnormal blood vessels in the macula. A low-powered laser is shone into the affected eye in order to activate the drug, which then selectively destroys the abnormal vessels. Photodynamic therapy is now less commonly used for the treatment of neovascular AMD, in favour of anti-VEGF therapy. However, it may still be used in selected patients.

⁴ Macugen (pegaptanib). Summary of Product Characteristics. Pfizer, USA.

⁵ Hanout M, Ferraz D, Ansari M, Maqsood N, Kherani S, Sepah YJ, *et al.* Therapies for neovascular age-related macular degeneration: current approaches and pharmacologic agents in development. *BioMed research international*. 2013;2013: 830837.

⁶ Newman DK. Photodynamic therapy: current role in the treatment of chorioretinal conditions. *Eye*. 2016;30(2): 202-210.