anti-VEGF drugs. All three are effective at treating diabetic macular oedema, and the average improvement in vision is about 1.5 lines. Roughly 25% of patients will have their visual acuity improve by three or more lines and 50% by two or more lines. An average of seven injections will be required in the first year of treatment with a PRN regime.

Not all patients with diabetic macular oedema need to be treated with anti-VEGF. Laser treatment still has an important role: macular oedema which does not involve the fovea is best treated with laser. These patients will normally have good vision, and the laser will help to preserve it. Moreover, laser is usually effective with a single treatment, which is much easier for the patient than repeated monthly injections.

If new vessels are present, they should be given pan-retinal laser treatment first, before any macular oedema is treated using anti-VEGF. This is because anti-VEGF makes the new vessels regress very quickly. As the treated vessels become fibrotic, they contract, which can cause a retinal detachment.

Retinal vein occlusion

There is good evidence from clinical trials that all three anti-VEGF drugs will reduce the risk of loss of vision following central retinal vein occlusion. About 50% of patients will gain three or more lines, with a mean improvement of about two lines. There is also a reduced risk of rubeosis and secondary glaucoma with anti-VEGF treatment.

Lucentis has been shown to improve outcomes after branch retinal vein occlusion as well. However, as many of these patients will improve spontaneously, this evidence is not quite as strong.

In summary, anti-VEGF drugs are probably the most significant advance in ophthalmology in the last decade. They have enabled us to treat what were previously untreatable conditions. They are not a perfect solution, however.

• They do not cure the underlying problem, so repeated treatment is necessary and most patients will require a lifetime of regular monitoring.
• The drugs are expensive, and even high-income countries have struggled with the costs and logistics of delivering thousands of intracocular injections every year.
• Although anti-VEGF drugs are the most effective treatment for many retinal diseases, the visual improvement is modest, averaging about two lines of vision. Relatively few patients will regain normal vision.
• Patients who present late, with very advanced disease and a visual acuity of less than 3/60, may not benefit from treatment.
• Most PRN treatment regimes rely on OCT imaging, which is rarely available in low and middle income countries. We have little information on the use of anti-VEGF in this setting, and we cannot be sure that the good results achieved in Europe and North America will be replicated in Africa, India, or China.

Despite these reservations, anti-VEGF drugs are going to play an increasing role in the prevention of blindness worldwide. As the global population ages, and becomes more overweight, both AMD and diabetic retinopathy will become more common. The drugs will become cheaper, and we may find better ways of monitoring treatment so that expensive OCT is no longer essential.